

## Deriving polarity from granularity\*

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**Abstract** In this paper, we present a way to unify Positive Polarity Items formed with *some* NP and minimizers, such as *lift a finger*. The connection is made via granularity properties of the two classes of polarity sensitive expressions. We begin with an observation in Strawson 1974 that the use of *some* NP involves an inference about the availability of a more precise identification of NP. Then, we show that the meaning of minimizers can be captured as the mirror image of the same granularity inference. To model our account, we use the granularity system in van Rooij 2011. We propose pragmatic requirements on the use of *some* NP and minimizers that explain both their granularity inferences and their polarity properties. Finally, we discuss how our proposal can be viewed as reconciliation of referential and alternative-based approaches to polarity.

**Keywords:** positive polarity items, minimizers, granularity, precision, polarity, negation

### 1 Introduction

In this paper, we present a way to unify Positive Polarity Items (PPIs) formed with *some* NP and minimizers, such as *lift a finger*. The connection is made via granularity properties of these two classes of polarity sensitive expressions. We propose pragmatic requirements on the use of *some* NP and minimizers that explain their granularity inferences. Then, we show that the same pragmatic requirements can be used to account for polarity sensitive distribution of *some* NP and minimizers. Finally, we discuss how our proposal can be viewed as reconciliation of referential and alternative-based approaches to polarity.

The paper is divided into two parts. In the first part, we focus on polarity properties of *some* NPs and minimizers. We begin with the famous observation made by Strawson (1974) that the use of *some* in (1)a is degraded, compared to (1)b, and his insight that the use of *some*, as opposed to *a*, signals that the speaker has an additional, more precise, way to identify the reference than the property given by NP. In a general context, this additional inference of *some* is more easily satisfied

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with the NP like *insect* (which can be further divided into ants, mosquitoes, wasps, etc.) than with the NP like *wasp* (which without special entomological knowledge is difficult to separate into groups).

- (1) a. I've been stung by a/#some wasp.  
b. I've been stung by a/some insect.

To capture this additional inference of *some*, we formulate the condition of use for *some* that states that a sentence containing *some* can be felicitously used only if there is a more precise contextual structure in which a corresponding existential statement is verified.

Then, we show that the meaning of minimizers can be captured as the mirror image of the same granularity inference. We propose, contrary to some mainstream analyses (e.g., Krifka 1995; Chierchia 2013), that minimizers are simple indefinites and their minimality interpretation comes from their condition of use, which is the mirror image of that for *some*. In particular, we say that a sentence with a minimizer is felicitous only if there is no more precise contextual structure in which a corresponding negated existential statement is verified.

The granularity inferences of *some* and minimizers reflect human natural ability to reason and think at different levels of precision and granularity. To take an example from Hobbs 1985, we can think of a road as a line when we are planning a trip, as a surface when we are driving, and as a volume when we are repairing potholes. We provide general background on the idea of granularity and how it was used to account for different phenomena in linguistics. To formulate our account, we use the granularity system developed in van Rooij 2011.

In the second part of the paper, we turn to polarity properties of *some* and minimizers. We show that opposite polarity properties of *some* NP and minimizers are derivable from pragmatic requirements on the granularity of the context structure where they can be felicitously used. That is to say, we argue that polarity can be viewed as a 'side-effect' of the granularity properties of these expressions. We also discuss how our proposal can be viewed as reconciliation of referential and alternative-based approaches to polarity.

The flow of the paper is as follows: In the next section, we discuss granularity properties of *some* NPs and minimizers and state conditions of use for these expressions in informal terms. Section 3 provides some background on the notion of granularity and section 4 presents van Rooij's (2011) system of contextual structures that we use in this paper. In section 5, we formalize the conditions of use for *some* NPs and minimizers using van Rooij's (2011) system. In section 6, we turn to polarity properties of *some* NPs and minimizers and show how they can be derived from their granularity properties. Section 7 discusses how our proposal can be viewed

as reconciliation between referential and alternative-based approaches to polarity. Section 8 concludes.

## 2 Granularity inferences of *some* NP and minimizers

That *some* NP and minimizers have inferences related to granularity is not new. In this section, we briefly review the discussion of these inferences found in the literature. What we add to the picture is that granularity inferences of *some* NP and minimizers can be treated as mirror images of each other. Our discussion here will be rather informal. In the following sections, we show how the ideas presented here can be implemented in a particular framework, namely van Rooij's (2011) system of context structures.

We begin with the intuition concerning *some* NP that originates from Strawson 1974. Strawson (1974: 91-3) observes that there is an interpretative difference between *a* NP and *some* NP, which manifests itself in pairs like in (2) and (3).

- (2) a. I've been stung by a wasp.  
b. # I've been stung by some wasp.      cf. I've been stung by some insect.
- (3) a. She has just been delivered of a boy.  
b. # She has just been delivered of some boy.

According to Strawson (1974), sentences like (2)a and (3)a provide a satisfactory description of the situation in question. However, replacing *a* with *some* signals that the description falls short of being satisfactory and there is a better 'mode of substantiation' for the individual described by NP. In other words,

“the choice of ‘some’ rather than ‘a’ embodies what might be called an acknowledgment or recognition of the fact that the identification supplied, though perhaps the best the speaker can do, might be regarded as inadequate to the circumstances of the case”  
(Strawson 1974: 93)

For the most part, this additional mode of substantiation is harmless, as in the case of *I was stung by some insect*, which is fully natural in general contexts. This is because our world knowledge allows us to identify insects further, for example, as ants, bees, or wasps, and this information may be relevant for the purpose of conversation, for example, treating the sting.

But sometimes, the inference that the individual can be identified more precisely comes in conflict with common assumptions about our world knowledge, which results in infelicity. For example, the use of *some* in (2)b suggests that the description

of the insect as being a wasp is unsatisfactory. That is to say, there is a better way to identify that wasp, for instance as being a member of the Vespinae subfamily of social wasps. Unless (2)b is uttered in a conversation between entomologists, the mode of substantiation signaled by *some* is unmotivated. Similar reasoning explains the infelicity of (3)b in general contexts. As is the case with the *wasp*-example, in more elaborate contexts, (3)b can come out as appropriate (see Strawson 1974: 93).

We propose that the mode of substantiation associated with the use of *some* NP is an instance of a granularity inference roughly paraphrasable as follows: there is a better way of identifying the individual described by NP.

Our proposal is that *some* NP is a simple indefinite, that is to say, it has the denotation in (4)a. But it comes with an additional condition of use which requires that there is a possibility to identify the individual described by NP more precisely, see (4)b.

- (4) a. **some**(P)(Q) =  $\exists x [ P(x) \wedge Q(x) ]$   
 b. there is a contextual structure M in which the individual described by P is identified more precisely and  $\exists x [ P(x) \wedge Q(x) ]$  is verified by M

This condition of use not only accounts for the mode of substantiation signalled by *some*, but, as we propose in section 6, is responsible for the polarity properties of *some* NP.

Let us now turn to minimizers. The treatment of minimizers in terms of granularity (or precision) is best represented by Krifka 1995 (see also Chierchia 2013).<sup>1</sup> Krifka (1995) proposes that in sentences like in (5), expressions *a drop*, *a word*, *a syllable*, *a red cent* refer to minimal entities of a particular kind.

- (5) a. John didn't drink a drop (of alcohol) for two days.  
 b. Mary didn't utter {a word / a syllable}.  
 c. John doesn't have a red cent. (Krifka 1995: 32)

For example, *a drop* in (5)a denotes minimal quantities of liquid, defined as those quantities that do not have proper subparts, see (6):

- (6) **drop** =  $\lambda i. \{x \mid \text{liquid}_i(x) \wedge \neg \exists y [ y \subset_i x ] \}$   
 (where *i* can be thought of as an index of precision in the context)

<sup>1</sup> Krifka (1995) also proposes a unified analysis of minimizers like *tired at all* and PPIs like *rather tired* in terms of precision. However, he explicitly excludes *some* from the picture (p. 62) since for him sentences like *Mary saw something* do not introduce any alternatives and thus cannot be explained using implicature-based approach. The absence of  $\neg \exists$  reading for sentences with *some* is explained as a paradigmatic effect (Krifka 1995: 31-2). The present paper, on the contrary, argues for unifying *some* PPIs and minimizers.

The above analysis of minimizers captures two aspects of their distribution: (a) the observation that they are restricted to negative environments in which they are maximally informative and (b) what we will call *a minimality inference*. The minimality inference is the observation that minimizers are unnatural in situations in which some negligent, contextually irrelevant amount falsifies the sentence. This is best demonstrated in comparison with weak Negative Polarity Items (NPIs) which tolerate exceptions. For example, *a red cent* is infelicitous in a context in which you have some negligent amount of money in your pocket, but you are asked for a much larger sum. This contrasts with *any* which can be acceptable in such situations, see (7). The same point can be demonstrated using exceptives, see (8).

- (7) Context: you go to a store with your friend Mary. Mary sees a new coffee machine which she has been looking for. Mary asks you to borrow \$200 to buy the machine. You have your \$20 lunch money on you, but nothing else.
- a. I don't have any money on me.  
b. # I don't have a red cent on me.
- (8) a. Johnny didn't get any pocket money this week, except for \$5 for ice-cream on Friday.  
b. Johnny didn't get a red cent this week, #except for \$5 for ice-cream on Friday.

In this paper, we propose to rethink the meaning contribution of minimizers. In particular, we propose that minimizers like *some* NPs denote simple indefinites, see (9)a. Additionally, the distribution of minimizers is restricted by the condition of use which is the mirror image of that for *some* NP, see (9)b.

- (9) a. **a drop(Q)** =  $\exists x$  [ amount-of-liquid(x)  $\wedge$  Q(x) ]  
b. there is no contextual structure M such that the amount of liquid is identified more precisely in M and  $\neg \exists x$  [ amount-of-liquid(x)  $\wedge$  Q(x) ] is verified by M

There are two respects in which the conditions of use for *some* NP and minimizers are mirror images of each other. First, the condition for *some* NP requires there to be a contextual model where the individual is identified more precisely. On the other hand, the condition for minimizers states that the model with respect to which we evaluate our sentence is the most precise for there is no more precise model in which the individual is identified.

Second, the condition for *some* NP makes reference to an existential statement, whereas the condition for minimizers to its negation. In the second part of the paper, this feature will play a crucial role in deriving polarity properties of *some* NP and minimizers from their granularity.

Before we can elaborate on these conditions of use for *some* NP and minimizers, we need to provide some background on granularity and present van Rooij's (2011) framework for granularity which we adopt here.

### 3 Background on granularity

*Granularity* is a concept relating the different levels by which the world can be described. This is similar to the way in which an image may have a high or low resolution, depending on the number of pixels per unit of measurement - the higher the resolution, the more pixels are involved and the clearer the distinctions between elements that appear in the image. Granularity levels dictate the level of detail involved in breaking down categories into their smaller parts. The more fine-grained granularity is, the more details there are.

In linguistics, granularity has been widely used in the realm of vagueness, exploiting the notion of 'standard of precision' (e.g., Lewis 1979; van Rooij 2011). The basic idea is that an utterance such as *The table is flat* is considered true under a pragmatic standard of precision which is set to a lower than the maximal precision level, and is considered false if the precision standard is set to the maximal precision level, because no table is ever completely flat. Higher standards of precision require us to analyze our units of measurement more closely, distinguishing between finer details that lower standards of precision ignore.

The notion of granularity is also used to discuss number words (e.g., Krifka 2007; Sauerland & Stateva 2007). Here, it is used to set the interpretation of complex scalar expressions. For example, if the interpretation is required to be more precise, then a more fine-grained scale is used and if the interpretation is required to be less precise, then a more coarse-grained scale is used.

### 4 Context structures and refinement relation (van Rooij 2011)

To formalize our proposal for *some* NP and minimizers, we adopt the system developed in van Rooij 2011 for exploring vague predicates like *tall* and vagueness in general. Below we present main definitions of the system focusing on those elements that will be relevant for our account.

We say that a proposition  $p$  is evaluated with respect to a set of context structures  $\mathcal{M}$  such that each  $M \in \mathcal{M}$  is a tuple  $M = \langle I, C, V \rangle$ , where  $I$  = a set of individuals,  $C$  = a set of contexts,  $V$  = a set of valuation functions. Moreover, we say that for all  $M, M' \in \mathcal{M}$ ,  $I_M = I_{M'}$ ,  $C_M = C_{M'}$ , but  $V_M \neq V_{M'}$ . That is to say, different models are the same with respect to the set of individuals and contexts, but differ with respect to valuation functions. In particular, we will be interested in valuations of the equivalence relation  $\sim_P$ , roughly 'being as  $P$  as', and the strict ordering relation

$>_P$ , roughly 'being  $P$ -er than'. These relations may come out differently in different models, that is  $V_M(\sim_P) \neq V_{M'}(\sim_P)$  and  $V_M(>_P) \neq V_{M'}(>_P)$ .

Granularity is captured in terms of a *refinement* relation between models defined as follows:

(10) **Refinement relation (van Rooij 2011)**

Model  $M'$  is a *refinement* of model  $M$  with respect to predicate  $P$ , written  $M \leq_P M'$ , only if  $\exists x, y \in I, M \models x \sim_P y$ , but  $M' \not\models x \sim_P y$

In prose, (10) states that a model  $M'$  is more fine-grained with respect to some property  $P$  than another model  $M$  only if there is a pair of individuals which are equally  $P$  in  $M$  but not equally  $P$  in  $M'$ .

The refinement relation is constrained by the following condition:  $V_M(>_P) \subseteq V_{M'}(>_P)$  from which it follows that  $V_M(\sim_P) \supseteq V_{M'}(\sim_P)$ . This condition is motivated by the fact that if  $a \geq_P b$  and  $b \geq_P c$  in a more fine-grained model and  $a \sim_P c$  in a more coarse-grained model, it should be the case that in the coarse-grained model  $a \sim_P b$  and  $b \sim_P c$  (for all individuals in  $I$ ). That is to say, we want to ensure that if in a fine-grained model, Anna is taller than Bob and Bob is taller than Charlie, and in a more coarse-grained model, Anna and Charlie are in the same equivalence class of tallness, then Bob is also in that class, see van Rooij 2011 for more details.

The restriction above is important for our discussion because it highlights the connection between refinement and subdomain relations. The set of individuals described by  $P$  in a more fine-grained model is a subset of individuals described by  $P$  in a more coarse-grained model.

## 5 Capturing granularity inferences of *some* NP and minimizers

Let us again begin with *some* NP. We propose to formalize Strawson's (1974) insights about *some* in terms of granularity using the system developed in van Rooij 2011. As informally presented in section 2, we propose that *some* NP has the denotation of a simple indefinite. Additionally, a sentence with *some* NP has the condition of use that requires the corresponding existential statement be verified in a more fine-grained context structure. More formally, the condition of use for *some* NP is as in (11). In (11), the refinement of models is assumed to go along the dimension that, following Strawson 1974, we referred to as 'mode of substantiation'.

(11) **Condition of use for  $S$  containing *some* NP**

$S$  containing *some* NP (translatable as  $\phi$ ) is felicitous with respect to some model  $M \in \mathcal{M}$  iff the following holds:

- a.  $M \models \phi$

- b. there is  $M' \in \mathcal{M}$  s.t.  $M \leq_P M'$  and  $M' \models \exists x[P(x) \wedge Q(x)]$   
 (there is a more fine-grained w.r.t. P model that verifies  $\exists x[P(x) \wedge Q(x)]$ ,  
 where  $P$  is a property denoted by NP)

Let us look at Strawson's *wasp*-example again, repeated below:

- (12) #I was stung by some wasp. (non-entomologist context)

The condition in (11)a requires that the sentence be evaluated with respect to some model  $M$  in which its corresponding proposition is true.

Suppose in  $M$  we identify wasps as social wasps versus solitary wasps based on their observable behaviour and *I was stung by a social wasp* is true. Thus, the condition in (11)a is satisfied.

The condition in (11)b puts an additional requirement, namely that there is a more precise way of identifying a wasp, say as a *Vespinae* wasp (subclass of social wasps), and *I was stung by a Vespinae wasp* is also true.

Infelicity of (12) in general contexts arises since common knowledge (i.e., knowledge which is expected to be mutual to participants of conversation) does not ordinarily include knowledge about specific types of wasps like *Vespinae* wasps. Thus, the condition in (11)b is not met in general contexts.

On the other hand, in a conversation between entomologists, infelicity disappears. This is because shared entomological knowledge allow participants of the conversation to accommodate the inference that it is possible to identify the wasp in question more precisely (by its subclass, for example).

Now, let us look at minimizers. As mentioned earlier, we propose that minimizers are mirror images of *some* NP. Like *some* NP, minimizers have the denotation of a simple indefinite, but their condition of use is different. We say that a sentence  $S$  with a minimizer is felicitous only if its corresponding proposition is verified by some model and there is no more fine-grained model that verifies a corresponding negated existential statement, see (13). The refinement of models goes along the dimension of precision that is specified by NP (or VP in case of *lift a finger* and similar idioms).

- (13) **Condition of use for  $S$  containing a minimizer**

$S$  containing a minimizer (translatable as  $\phi$ ) is felicitous with respect to some model  $M \in \mathcal{M}$  iff the following holds:

- a.  $M \models \phi$   
 b. there is no  $M' \in \mathcal{M}$  s.t.  $M \leq_P M'$  and  $M' \models \neg \exists x[P(x) \wedge Q(x)]$   
 (there is no more fine-grained w.r.t. P model that verifies  $\neg \exists x[P(x) \wedge Q(x)]$ ,  
 where  $P$  is a property denoted by NP (or VP))



To see how the condition in (13) captures the minimality inference, we need to consider two situations: (a) the property  $P$  has a non-minimal value and (b) the property  $P$  has the minimal values.<sup>2</sup> We show below that (a) and (b) are practically equivalent and lead to the minimality inference of minimizers.

For the purpose of demonstration, let us reformulate (13) as its equivalent in (14) and focus on the use of *a drop* in (15) repeated from above.

- (14) **Condition of use for  $S$  containing a minimizer** (equivalent formulation)  
 $S$  containing a minimizer (translatable as  $\phi$ ) is felicitous with respect to some model  $M \in \mathcal{M}$  iff the following holds:
- a.  $M \models \phi$
  - b. for each  $M' \in \mathcal{M}$  s.t.  $M' \leq_P M$ ,  $M' \models \neg \exists x [P(x) \wedge Q(x)]$   
 (all more coarse-grained w.r.t.  $P$  models verify  $\neg \exists x [P(x) \wedge Q(x)]$ , where  $P$  is a property denoted by NP (or VP))
- (15) #John didn't drink a drop (of alcohol), except for a glass of beer.

We begin with the situation (a) where amount of liquid in *a drop* is a non-minimal value. Suppose the amount of alcohol described by *a drop* in (15) is 10ml and there is some model  $S$  that verifies that John didn't drink 10ml of alcohol. That is to say, (14)a is satisfied.

To satisfy (14)b, all more coarse-grained models need to verify that John didn't drink the amount of alcohol that is equivalent to 10ml in these models. Let us limit precision to two decimal digits, i.e., 10.00ml will be maximally precise for our purposes. We can construct a more coarse-grained model  $M'$  where acceptable specifications of the amount of alcohol equivalent to 10ml in (15) are 9.95 ml, 10.00 ml, and 10.05 ml. We can then continue to construct more and more coarse-grained models. In the most coarse-grained model  $M''$  acceptable specifications of *a drop* will be 0.01 ml (the minimal value given our precision limits), 9.90 ml, ..., 9.95 ml, 10.00 ml, 10.05 ml, 10.10 ml, ... . Thus, the condition (14)b is satisfied only if John didn't drink 0.01ml (the minimal amount) of alcohol. This is because 10ml when viewed from the most coarse-grained perspective is in the same equivalence class as the minimal amount 0.01ml. Thus, if  $\phi$  contains negation, (14) is satisfiable and it leads to the inference that John didn't drink at all, not even the minimal amount of alcohol. Note that if  $\phi$  translates a positive sentence, (14) is unsatisfiable because it leads to contraction. In the next section, we see how this derives polarity properties of minimizers.

In the situation (b) where *a drop* describes the minimal amount, the minimality inference is trivial. This situation is indistinguishable from the mainstream proposals

<sup>2</sup> We assume that maximal values are encoded as universal quantifiers.

where minimizers denote the minimal property. Thus, we see how the minimality inference is derived given the condition of use for minimizers.

## 6 Deriving polarity from granularity

Years of research dedicated to polarity sensitive items have shown that PPIs and NPIs (including minimizers) are not homogeneous classes.<sup>3</sup> They differ with respect to several dimensions, most prominently (a) strength (whether a PSI is (anti-)licensed in anti-additive (anti-veridical) or weaker contexts) and (b) locality (whether there is a particular syntactic domain in which a PSI is (anti-)licensed). There are other phenomena with respect to which PSIs do not behave uniformly, such as intervention effects (e.g., Linebarger 1980; Homer 2009; Chierchia 2013), parasitic licensing (e.g., den Dikken 2002, 2006; Hoeksema 2007), and context sensitivity (e.g., Heim 1984; Israel 1996; Sailer 2009). Many approaches to polarity have been developed over the years including a referential and alternative-based approaches which we will briefly discuss in the next section. Although a lot of progress has been made, polarity items has shown remarkable resistance to unification. The position we take in this paper is that there is no reason to strive for unifying all phenomena that exhibit polarity sensitivity. A detailed analysis of certain parallelisms between subclasses of PPIs and NPIs can be more fruitful at the present stage of our understanding of polarity system in natural languages.<sup>4</sup>

With the above in mind, we want to put forward a way to rethink the source of polarity of a subclass of PPIs and NPIs, namely *some* NP and minimizers. We hypothesize that their polarity is a consequence of their granularity discussed in the first part of the paper. This hypothesis will show us a way to reconcile referential and alternative-based approaches to polarity in section 7.

Recall from above that we propose that sentences with *some* NP and minimizers have conditions of use repeated in (16) and (17). These conditions account for their granularity inferences. For our discussion below, it is important to keep in mind that (16)b and (17)b make reference not to  $\phi$  itself, but rather to a corresponding positive (for *some* NP) and negative (for minimizers) existential statements.

### (16) Condition of use for *S* containing *some* NP

*S* containing *some* NP (translatable as  $\phi$ ) is felicitous with respect to some model  $M \in \mathcal{M}$  iff the following holds:

<sup>3</sup> Some important work on polarity include Fauconnier 1975; Ladusaw 1980; Heim 1984; Kadmon & Landman 1993; van der Wouden 1997; Zwarts 1998; Giannakidou 1998, 2011; Szabolcsi 2004; Chierchia 2006, 2013; Gajewski 2011; Collins & Postal 2014; Spector 2014; Barker 2018; Homer & Bhatt 2019; Zeijlstra to appear.

<sup>4</sup> See Zeijlstra to appear for a similar idea.

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- a.  $M \models \phi$
- b. there is  $M' \in \mathcal{M}$  s.t.  $M \leq_P M'$  and  $M' \models \exists x[P(x) \wedge Q(x)]$   
 (there is a more fine-grained w.r.t. P model that verifies  $\exists x[P(x) \wedge Q(x)]$ ,  
 where  $P$  is a property denoted by NP)

(17) **Condition of use for  $S$  containing a minimizer**

$S$  containing a minimizer (translatable as  $\phi$ ) is felicitous with respect to some model  $M \in \mathcal{M}$  iff the following holds:

- a.  $M \models \phi$
- b. for each  $M' \in \mathcal{M}$  s.t.  $M' \leq_P M$ ,  $M' \models \neg \exists x[P(x) \wedge Q(x)]$   
 (all more coarse-grained w.r.t. P models verify  $\neg \exists x[P(x) \wedge Q(x)]$ , where  $P$   
 is a property denoted by NP (or VP))

Our exploration below will proceed in the same order as above: we begin with *some* NP and then turn to minimizers. In both cases, we focus only on polarity properties related to the strength of (anti-)licensing contexts. Extension of our hypothesis to other polarity phenomena, such as locality, ‘shielding’, ‘rescuing’, intervention, etc. shall be left for future research.<sup>5</sup>

PPIs formed with *some* have the following important for us polarity properties: (i) they are acceptable in positive sentences, (ii) they are not acceptable under anti-additive (AA) operators, such as *not* and *nobody*, and (iii) they are acceptable under non-anti-additive downward-entailing (DE) operators, such as *at most* and *less than*, see (18).<sup>6</sup>

- (18) a. I was stung by some wasp.  
 b. I was not stung by some wasp. (\*not > some)  
 c. At most five children were stung by some wasp. (at most > some)

To see how the condition in (16) derives the distribution in (18), let us consider  $\mathcal{M} = \{M1, M2, M3\}$  where M1 is the most coarse-grained context structure and M3 is the most fine-grained context structure with respect to P, i.e.,  $M1 \leq_P M2 \leq_P M3$ . Suppose P identifies individuals as ‘wasps’ in M1, ‘social wasps’ in M2, and ‘Vespinae wasps’ in M3, as shown in (19). Recall that wasps can be roughly divided into social and solitary species and Vespinae subfamily belongs to social species. That is to say, Vespinae wasps  $\subset$  social wasps  $\subset$  wasps.

- (19) a.  $V_{M1}(\sim_P) \rightsquigarrow \{a, b, c\}$  wasps  
 b.  $V_{M2}(\sim_P) \rightsquigarrow \{a, b\}$  social wasps

<sup>5</sup> For definitions of ‘shielding’ and ‘rescuing’ see, for example, Szabolcsi 2004; Homer & Bhatt 2019.

<sup>6</sup> A function  $F$  is downward-entailing iff for any  $A \leq B$ ,  $F(B) \leq F(A)$ . A function  $F$  is anti-additive iff  $F(A \vee B) = F(A) \wedge F(B)$ .

c.  $V_{M3}(\sim P) \rightsquigarrow \{a\}$

Vespinae wasps

Now, let us say that the proposition corresponding to the positive sentence in (18)a is verified by M1 where it means that the speaker was stung by a wasp. That is to say, the condition (16)a is met. The condition in (16)b requires there to be a more fine-grained model in which the existential statement is true. This condition is satisfiable by M2 and M3 since *I was stung by a wasp* is compatible with (but does not entail) *I was stung by a social wasp* as well as with *I was stung by a Vespinae wasp*. The same reasoning can be made if we start with M2, but not M3 which does not satisfy (16)b because it is the most fine-grained model. Compatibility is all what is required for (16)b to be satisfied. Thus, *some* NP is acceptable in positive sentences.

Under negation, as in (18)b, the condition in (16)b is unsatisfiable as it leads to contradiction. Let us again assume that the proposition expressed by (18)b is verified by M1. That is to say, that the speaker was not stung by a wasp is verified. The condition in (16)b requires that there is a social wasp (or a Vespinae wasp) that stung the speaker which is a contradiction for social wasps and Vespinae wasps are subsets of wasps. This precludes *some* from scoping below negation.

In cases there *some* NP finds itself under the scope of a non-anti-additive DE operator, the condition in (16)b is satisfiable. In fact the proposition in a more fine-grained model is entailed by the proposition in a more coarse-grained model. For instance, if the proposition from (18)c is verified by M1, that is, *At most five children were stung by a wasp* is true, it is also true that *At most five children were stung by a social wasp* or *At most five children were stung by a Vespinae wasp*. Thus, we see that *some* NP is acceptable under the scope of non-anti-additive DE operators.

Let us now look at minimisers and their polarity properties. As illustrated in (20), minimizers (i) are not acceptable in positive sentences, (ii) are acceptable in AA environments, and (iii) have mixed acceptability under non-anti-additive DE operators.

- (20) a. \* John budged an inch/slept a wink.  
 b. John didn't budge an inch/sleep a wink.  
 c. At most ten people budged an inch.  
 d. \* At most ten people slept a wink. (Chierchia 2013: 226)

Again, let us consider  $\mathcal{M} = \{M1, M2, M3\}$  where M1 is the most coarse-grained context structure and M3 is the most fine-grained context structure with respect to P, i.e.,  $M1 \leq_P M2 \leq_P M3$ . Suppose P is an abstract precision property that characterized budging events as follows: in M3 budging has precision 3 (three

decimal digits) and only events of budging with this precision are picked by the equivalence relation, in M2 with precision 2, more budging events are equivalent, M1 with precision 1 picks all budging events, see (21).<sup>7</sup>

- (21) a.  $V_{M1}(\sim P) \rightsquigarrow \{e, f, g\}$  precision 1  
 b.  $V_{M2}(\sim P) \rightsquigarrow \{e, f\}$  precision 2  
 c.  $V_{M3}(\sim P) \rightsquigarrow \{e\}$  precision 3

The condition of use for minimizers requires that the proposition be verified by M2 or M3<sup>8</sup> and in addition all more coarse-grained models verify the corresponding negated existential statement. It is easy to see that the reasoning here parallels the one we had for *some* NP. When minimizers occur in positive sentences, the two parts of the condition result in contradiction. This is because *John budged an inch with precision 3* is inconsistent with *John didn't budge an inch with precision 2* (or 1) for the same reason for which *I was stung by a Vespinae wasp* is inconsistent with *I was not stung by a social wasp* (or a wasp).

In negative sentences, as desired, the condition of use is satisfiable for *John didn't budge an inch with precision 3* is compatible with (but does not entail) *John didn't budge an inch with precision 2* (or 1). The same way, *I was not stung by a Vespinae wasp* is compatible (but does not entail) *I was stung by a social wasp* (or a wasp).

The picture with non-anti-additive DE contexts is more involved because minimizers show different (degrees of) acceptability here. In general, the condition of use in (17) predicts that minimizers are acceptable in non-anti-additive DE contexts which accounts for the distribution of *budge an inch*. This is because *At most five people budge an inch with precision 3* is compatible with *More than five people budge an inch with precision 2* (or 1). Again, consider an easier case of *At most five children were stung by a Vespinae wasp* being compatible with *More than five children were stung by a social wasp* (or a wasp).

To account for the fact that some minimizers, such as *sleep a wink*, are infelicitous in non-anti-additive DE contexts, an additional mechanism needs to be put in place. We tentatively propose that in such cases, the contribution of the DE quantifier is ignored when evaluating the condition of use, which can now be satisfied whenever there is no event characterized with precision specified by all more coarse-grained models. For example, for (20)d the modified condition of use amounts to the following: we have *At most five people slept a wink with precision 3* and *Nobody*

<sup>7</sup> 'Precision' here does not have to be taken literally as characterizing movement along a particular dimension. It can be interpreted idiomatically as ranking events by their helpfulness. We will not dwell on this issue here.

<sup>8</sup> We assume that there must be at least one more coarse-grained model.

*slept a wink with precision 2* (or 1). This is contradictory the same way as *At most five people were stung by a Vespinae wasp* and *Nobody was stung by a social wasp* (or a wasp).

We leave our proposal for minimizers in non-anti-additive DE contexts as tentative here with the hope to return to it in future work. However, we want to point out two considerations. First, any (unified) account of minimizers will have to supply additional machinery to explain the diverse distribution of minimizers in non-anti-additive DE contexts. For example, Chierchia (2013: 227) has to postulate different exhaustification operators for minimizers like *budge an inch* and *sleep a wink* only to account for their distribution in non-anti-additive DE contexts. Our tentative proposal does not score worse or better here. But our proposal performs better in capturing another fact and this is our second point. Interestingly, *some* PPIs, unlike minimizers, do not show variability in non-anti-additive DE contexts, although there are PPIs that are anti-licensed in such contexts, for example, Dutch *allerminst* and English *almost* (van der Wouden 1997; Spector 2014). Our system predicts this because as we saw above there is an entailment relation between a true statement satisfied in a more coarse-grained model and the same statement satisfied in a more fine-grained model.

## 7 Reconciliation

In the previous section, we discussed the hypothesis that polarity properties of *some* NP and minimizers can be derived from their granularity and mentioned that this can provide us a way to reconcile some approaches to polarity. In this section, we discuss how this can be done; but before we begin, we need to clarify the scope of our reconciliation effort. First, we will not discuss syntactic accounts to polarity of which Collins & Postal 2014 is one of the most comprehensive recent implementations. Our proposal is part of the semantic-pragmatic approach, therefore our reconciliation stays within the borders of this camp. Second, we will not concern ourselves with the anti-additivity versus anti-veridicality debate (at least not directly). Recent discussions of this debate can be found in Giannakidou 2011; Kuhn 2021; Zeijlstra to appear.

What we would like to focus on here is a way to reconcile referential and alternative-based approaches. Both of these approaches are part of the semantic-pragmatic camp, but they differ with respect to what they identify as the underlying source of polarity.

Referential accounts suggest that PSIs are referentially distinct from simple indefinites which, they claim, explains their polarity properties.<sup>9</sup> For example,

<sup>9</sup> Some representative work here include Lin 1996, 1998; Giannakidou 1998, 2011, 2018, a.o.

referential accounts for NPIs suggest that NPIs are ‘referentially deficient’ (e.g., [Giannakidou 2011](#)). This makes the referential accounts well suited to capture the distribution of what is sometimes called ‘superweak’ NPIs, such as Mandarin Chinese *shenme*.<sup>10</sup> As illustrated in (22), *shenme* is an NPI, but it is licensed in a superset of contexts in which weak NPIs like English *any* are licensed. The environments in which *shenme* is felicitous can be characterized as ‘non-veridical’.<sup>11</sup> In particular, *shenme* is felicitous in the presence of uncertainty adverbs, such as *probably* and *perhaps*, which do not license *any* (cf. \**Perhaps John read anything*).

- (22) a. \* Wo xihuan shenme ren.  
           I like what man  
           ‘I like somebody.’  
       b. Wo mei mai shenme (dongxi).  
           I not buy what thing  
           ‘I didn’t buy anything.’  
       c. Yexu ta you shenme hao de xiangfa.  
           perhaps he have what good DE idea  
           ‘Perhaps he has some good idea.’ (Lin 1998: 231, 220, 223)

The reasoning here is as follows: because *shenme* is referentially deficient, it cannot be used in contexts that give rise to entailment of existence of the referent satisfying its description. This generalization is captured, for instance, by the Non-entailment of existence condition in (23). Because non-veridical contexts do not give rise to entailment of existence, *shenme* (or superweak NPIs in general) are acceptable in these contexts.

(23) **Non-entailment of existence condition**

The use of a (superweak) NPI is felicitous iff the proposition in which it appears does not entail existence of a referent satisfying its description.

(adapted from [Lin 1998](#): 230)

Parallel reasoning has been proposed to capture the distribution of *some* PPIs (see [Zeijlstra to appear](#)). In particular, [Zeijlstra \(to appear\)](#) proposes that *some* PPIs are subject to the Non-entailment of non-existence condition in (24), which explains their infelicity in anti-additive contexts. Note that this suggests that *some* PPIs have, in a sense, ‘stronger’ referentiality than simple indefinites, which, in turn, can be viewed as additional ‘mode of substantiation’ identified by [Strawson \(1974\)](#) and discussed in the first part of this paper.

<sup>10</sup> *Shenme* is investigated in [Huang 1982](#); [Li 1992](#); [Cheng 1994](#); [Lin 1998](#), a.o.

<sup>11</sup> Informally, an operator *F* is non-veridical if *Fp* does not entail or presuppose that *p* is true in some epistemic model.

(24) **Non-entailment of non-existence condition**

The use of a *some* PPI is not felicitous iff the proposition in which it appears entails non-existence of a referent satisfying its description.

(based on Zeijlstra to appear)

The alternative-based approach to polarity also claims that PSIs are different from simple indefinites and this explains their restricted distribution.<sup>12</sup> But the difference lies in a different dimension. Accounts adopting this approach suggest that PSIs come with a set of (focus-like) alternatives which need to be incorporated into the meaning of a sentence in a way that ensures maximal informativity. For example, *anything* is analyzed as an indefinite in (25)a that introduces a set of subdomain alternatives in (25)b. These alternatives are incorporated into the meaning of a sentence by applying a covert ONLY operator in (25)c, which results in contradiction in non-downward-entailing contexts (e.g., Chierchia 2013).

- (25) a. **anything**(Q) =  $\exists x \in D [ \text{thing}(x) \wedge Q(x) ]$   
 b. ALTs:  $\{ \exists x \in D' [ \text{thing}(x) \wedge Q(x) ] : D' \subset D \}$   
 c. ONLY(p) =  $p \wedge \forall q \in \text{ALT}(p) [ p \not\subseteq q \rightarrow \neg q ]$   
 (p is true and all non-entailed alternatives of p are false)

A parallel account of PPIs like *something* has been developed in this framework, which proposes that PPIs introduce super-domain alternatives and are exhausted by a covert EVEN operator, see (26) (e.g., Nicolae 2012).

- (26) a. **something**(Q) =  $\exists x \in D [ \text{thing}(x) \wedge Q(x) ]$   
 b. ALTs:  $\{ \exists x \in D' [ \text{thing}(x) \wedge Q(x) ] : D' \supset D \}$   
 c. EVEN(p) =  $p \wedge \forall q \in \text{ALT}(p) [ p \text{ is less likely than } q ]$   
 (p is true and p is less likely than any of its alternatives)<sup>13</sup>

It would be unfair to say that referential and alternative-based accounts have not had common points. For example, Chierchia (2013: 157-8) when developing an account of one type of emphatic NPIs proposed to measure domains with respect to how likely it is to find something in a domain. For him, the larger the domain, the more likely it is to find something in it.

Let us take this connection and substitute ‘likelihood’ with ‘easiness’. Suppose that when a speaker introduces a new referent with an indefinite, she can choose one of three options depending on her conversational goals: (i) stay neutral with respect to how easy it is for the addressee to identify the referent, (ii) signal that with some

12 Important work within this camp include Kadmon & Landman 1993; Krifka 1995; Lahiri 1997; Chierchia 2006, 2013, among many others.

13 p is less likely than q if p entails q and q does not entail p



additional effort the addressee can identify the referent more easily (more precisely), and (iii) signal that the referent is identified with maximal precision. In the first case, she would use a simple indefinite like *a wasp* with no polarity properties and no effect on precision. In the second case, the speaker would modify NP with *some* to indicate that there is an additional mode of substantiation available which makes identification of the referent easier. This choice is detectable by the granularity inference of *some* NP discussed in the first part of this paper. Also, this strategy comes with a cost - some felicity restrictions which we traditionally recognize as polarity properties of *some* NP. In the third case, the speaker uses a minimizer signaling that no further specification can make identification of the referent easier. The cost of this choice is distributional restrictions due to the condition of use for sentences with minimizers.

Because the last two strategies involve evaluation of a sentence with respect to some precision model in a set of models in which valuation functions return different values for equivalence relation for individuals in question, the use of *some* NP and minimizers can be viewed as ‘introducing’ different domains of quantification. This feature is made central in the alternative-based approach to polarity.

On the other hand, the conversational strategies described above show that *some* NP and minimizers are referentially distinct from simple indefinites with respect to how easy it is to identify the newly introduced referent. This is the part underscored by referential accounts. Thus, we see that analyzing polarity properties of some PSIs as a consequence of their granularity gives us a way to view different approaches to polarity as facets of one complex phenomenon.

## 8 Conclusion

In this paper, we presented a way to unify PPIs formed with *some* NP and minimizers, such as *lift a finger*. The connection was made via granularity properties of the two classes of polarity sensitive expressions. We began with an observation in Strawson 1974 that the use of *some* NP involves an inference about the availability of a more precise identification of NP. Then, we showed that the meaning of minimizers can be captured as the mirror image of the same granularity inference. We used the granularity system in van Rooij 2011 to model our account. We proposed pragmatic requirements on the use of *some* NP and minimizers that explain both their granularity inferences and their polarity properties. Finally, we discussed how our proposal can be viewed as reconciliation of referential and alternative-based approaches to polarity.

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