

Weak Generic Sentences: Partitioning and Comparison

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1 Introduction

This paper addresses the question of what is the exact interpretation of weak generic sentences that take a bare plural subject and that are of the form *As are P*. Different from “regular” generic sentences like (1-2), the property denoted by the predicate *P* in such a weak generic sentence holds true of proportionally rather than of all individuals from the set denoted by the subject. The most famous example of this type of generic sentences is probably the Port Royal Puzzle (PRP) sentence in (3): the sentence expresses a true proposition (or at least so when it first appeared in the late 17th century), even though most Dutchmen do not know how to sail, not to mention being good at sailing. Similarly, the sentence in (4) is perceived (by some people) to be true despite the fact that most Bostonians drive carefully.

- (1) Lions have manes.
- (2) Dogs are mammals.
- (3) Dutchmen are good sailors.
- (4) Bostonians are careless drivers.

The interpretation of weak generic sentences of the form *As are P* is qualitatively different not only from that of “regular” generic sentences, but also from that of weak generic sentences whose predicate is a regular, non-copular verb phrase (e.g., (5-6)) (Cohen 1999, 2001, Nickel 2013, cf. Carlson 1977). Acknowledging these distinctions, in this paper I specify the precise meaning of weak generic sentences of the form *As are P*. I will use the PRP sentence in (3) to represent all such weak generic sentences. During the discussion, I do not concern myself with the syntactic representation of the sentence. Rather, my focus is to address two important questions concerning the sentence, given in (Q1-Q2):

- (5) Frenchmen eat horsemeat.

(6) Anopheles mosquitoes carry malaria.

Q1: Which sub-group of Dutchmen is relevant for evaluating the sentence?

Q2: How good at sailing should the sub-group be so as to verify the sentence?

The paper is organized as follows. My analysis of weak generic sentences makes reference to the *GEN*(eric) operator. But weak generic sentences have been taken in the literature as classic evidence against quantificational approaches to generic sentences. In Section 2, I show that the most crucial argument cited in such literature does not guarantee the intended conclusion. In Section 3, I review two prominent analyses of weak generic sentences, by Cohen (1999, 2001) and by Nickel (2013). The two analyses complement each other: one analysis's merits remedy the other's flaws. In Section 4, I offer a *hybrid* analysis that makes use of the analytic insights from Cohen and Nickel. Before concluding the paper, I discuss how my analysis avoids the shortcomings in the two scholars' analyses.

2 The generic quantifier

It was argued, most notably by Carlson (1977), that the interpretation of generic sentences should not make reference to the *GEN* operator. A crucial piece of evidence that Carlson cited has to do with the entailment pattern of weak generic sentences. In this section, I show that Carlson's argument receives a more adequate alternative explanation and actually does not guarantee his conclusion.

According to Carlson (1977), if the PRP sentence involves a covert quantificational operator, its LF would be something like (7), which involves a covert *GEN* operator. The LF is reminiscent of (8), which involves overt quantifiers and corresponds to the sentences in (9). Carlson claimed that the sentences in (9) entail the corresponding sentences in (10). He further claimed that the PRP sentence should similarly entail (11), if (7) is indeed the LF for the PRP sentence. However, the entailment from the PRP sentence to (11) does not hold. Carlson (1977) took the absence of this entailment relation as evidence that generic sentences, including weak generic sentences, resist a quantificational analysis.

(7) *GEN*{x: x is a Dutchmen}[x is a good sailor]

(8) ALL/MOST/SOME{x: x is a Dutchmen}[x is a good sailor]

(9) All/Most/Some Dutchmen are good sailors.

(10) All/Most/Some Dutchmen are sailors.

(11) Dutchmen are sailors.

Carlson's (1977) argument hinges on an assumption which seems correct at first glance. However, close scrutiny would suggest otherwise. Carlson took the sentences in (9) to entail the corresponding sentences in (10). The entailment,

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however, does not necessarily go through (Menendez-Benito 2007, Larson 1998). This point is best illustrated by the lack of entailment between the sentences in (12) and (13). Although the majority of chisels can function as good screwdrivers, chisels are by no means screwdrivers.

(12) Most chisels are good screwdrivers.

(13) Most chisels are screwdrivers.

What is at issue for the lack of entailment between (12) and (13) appears to be that two distinct senses of the word *screwdriver* are used. The most natural reading of (12) expresses the presumably true proposition that most chisels can serve as good screwdrivers. The word *screwdriver* is used intensionally in this sentence and denotes the functions/characteristics of a screwdriver. However, the same word in (13) refers to the physical hand tool that happens to be called “a screwdriver.” The former use of nouns is anything but rare. For example, the word *teacher* in (14) makes reference to properties that make a (good) teacher, not (necessarily) to individuals who take a teaching job.

(14) Everyone in the medical field is a born teacher, so just keep your ears and mind open.

When the word *screwdriver* is controlled to have the same meaning in a pair of sentences similar to (12-13), the entailment holds. For example, the word is used intensionally in both (15) and (16), and the former sentence entails the latter.

(15) Most chisels can function as good screwdrivers.

(16) Most chisels can function as screwdrivers.

The above discussion predicts that the entailment relation between the PRP sentence and the sentence in (11) would go through when the meaning of *sailor* is held constant. The actual situation is complicated by other factors, however. The word *sailor* in the PRP sentence (under the weak generic reading) makes reference to the skills and qualities that make a person able to sail. The sentence would not allow the weak generic reading when *sailor* is interpreted as one in the sailing profession. The absence of a weak generic reading of the sentence in (17) confirms this claim. By contrast, for the sentence in (11), the most natural meaning of the word *sailor* denotes individuals of the sailing profession. This discrepancy in the lexical meanings of *sailor*, I think, is responsible for the lack of entailment between the PRP sentence and the one in (11).

(17) Dutchmen are good sailors by profession.

Thus, the lack of entailment should not be taken as a solid argument against a quantificational analysis of (weak) generic sentences. The conclusion is important: my analysis to be laid out in Section 4 makes use of the *GEN* quantifier.

3 Previous analyses and their problems

There are several proposals regarding the exact interpretation of weak generic sentences. The studies by Cohen (1999, 2001) and Nickel (2013) are two recent attempts. The merits of one proposal can solve the problems of the other, and they constitute primary motivations for the analysis that I will pursue in this paper.

3.1 A probabilistic approach

Cohen (1999, 2001) took a mathematical probabilistic approach to generic sentences. He divided them into two categories: absolute and relative generic sentences. Absolute generic sentences are illustrated in (1-2). Cohen's "relative generic sentences" corresponds to "weak generic sentences" in this paper.

According to Cohen, the interpretation of a generic sentence of the form *Ks P* requires computing the set of alternatives to the property denoted by *P* ($ALT(P)$). This applies to the interpretation of both absolute and relative/weak generic sentences. However, absolute generic sentences do not, and relative ones do, require the computation of the set of alternatives to *K* ($ALT(K)$). Take the absolute generic sentence in (18a) as an example. The set of alternatives to the predicate *bear-live-young* contains all means of reproduction: $\{bear-live-young, lay-eggs, undergo-mitosis\}$. Although probably less than half of all mammals give birth to live young, more mammals give birth to live young than laying eggs or undergoing mitosis. The sentence still holds true. More generally, Cohen (2001) defined the probabilistic semantics of absolute generic sentences as in (19):

(18) a. Mammals bear live young.

b. $ALT(bear-live-young) = \{bear-live-young, lay-eggs, undergo-mitosis\}$

(19) An absolute generic sentence *Ks P* is true iff the probability that a randomly chosen *K* that satisfies at least one of the properties in $ALT(P)$ has the property *P* is greater than .5.

The semantics in (19), however, cannot account for the truth conditions of relative/weak generic sentences. The PRP sentence expresses a true proposition, but its truth clearly does not require that more than 50% of Dutchmen who have a non-zero level of sailing skills ("Dutch sailors" henceforth, with the word *sailor* being used in an intensional sense) are good at sailing. According to Cohen's (1999, 2001) analysis, the interpretation of relative/weak generic sentences of the form *Ks P* makes reference not just to $ALT(P)$, but also to $ALT(K)$:

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- (20) A relative/weak generic sentence $Ks P$ is true iff the probability that a randomly chosen A that satisfies at least one of the properties in $ALT(P)$ has the property P is greater than the probability that a randomly chosen alternative that satisfies one of the members of $ALT(K)$ and one of the members of $ALT(P)$ has the property P .

Under this interpretation mechanism for relative/weak generic sentences, the PRP sentence is true if and only if the probability of a randomly selected Dutch sailor being good at sailing is greater than the probability of a randomly selected international sailor being good at sailing.¹

3.2 Problems with the probabilistic approach

Overall, Cohen's (2001) analysis is too permissive. First, according to Cohen, the PRP sentence is true, as long as the proportion of good Dutch sailors (i.e., Dutchmen with good sailing skills) to the entire Dutch sailor population exceeds the corresponding proportion for the contextually relevant alternative nationalities. What matters is the number of **good** sailors relative to the number of sailors of any non-zero level of sailing skills, both for the Dutch population and for the international population. Cohen did not consider the skill distribution of those sailors whose sailing skills fall below the contextual standard of good sailing skills. Furthermore, Cohen assumed that this contextual standard is the same for the Dutch sailor population and for the international sailor population. A problem arises here. Take the scenario schematized in Figure 1: 30% of Dutch sailors exceed the contextual standard of good sailing skills, and the rest have bad sailing skills. Somehow, no Dutchman has "OK" sailing skills that fall between "good" and "bad." On the other hand, 15% of international sailors are good at sailing, and the other 85% are either OK or bad. With Cohen's analysis, the sailing skills of Dutch sailors are evaluated by the same standard as for international sailors. Can this scenario verify the PRP sentence? The answer depends on the distribution of the sailing skills of those international sailors whose sailing skills are OK or bad. If most of them belong to the "OK" category such that a significant number of international sailors outperform Dutch sailors, the PRP sentence is most likely false. If most of the 85% "OK" and "bad" international sailors belong to the "bad" category so that a significant number of Dutch sailors outperform international sailors, the sentence may be true.² Cohen's analysis wrongly predicts the PRP

¹ Whether the alternative set to an element H (say, "Dutch sailor") contains the denotation of H itself does not matter for the purpose of this paper. Therefore, the reader can understand "international sailor," being alternative to "Dutch sailor," as including either non-Dutch sailors **and** Dutch sailors, or just non-Dutch sailors alone.

² The careful reader may notice that I am talking rather loosely here. Exactly what I mean by "a significant number of" will be explicated in Section 4.

sentence to be necessarily true in the scenario in Figure 1, because the proportion of good Dutch sailors among all Dutch sailors (i.e., 30%) exceeds the corresponding proportion for the international sailor population (i.e., 15%).

Figure 1: Extreme skill distribution among Dutch sailors

Dutch	30% good	70% bad
Alternative	15% good	85% OK or bad

Second, Cohen’s analysis would predict that two contradictory propositions can have the same truth value in certain cases. This occurs when the probability of a randomly chosen Dutch sailor being a good sailor and the probability of a randomly chosen Dutch sailor being a bad sailor both exceed the corresponding probability for the international sailor population. Imagine a scenario where 30% of Dutch sailors are good at sailing, 40% OK, and 30% bad (Figure 2). Among the international sailor population, the figures are 20%, 60%, and 20%, respectively. Cohen’s analysis predicts the PRP sentence and the sentence *Dutchmen are bad sailors* to be both true in the scenario.

Figure 2: Similar distribution of good and bad sailors

Dutch	30% good	40% OK	30% bad
Alternative	20% good	60% OK	20% bad

Third, weak generic sentences are systematically available for relative gradable predicates (21). They are also consistently available for fixed, non-maximum standard gradable predicates like *wet*, *dirty*, *lemon*, and *suicidal*. The claim is verified by the availability of a weak generic reading of the sentences in (22).³ By contrast, weak generic sentences are not available for maximum standard gradable predicates like *full* and *transparent* or for non-gradable predicates like *locked* and *6-feet tall*. The two sentences in (23), for example, do not allow a weak generic reading (cf. Nickel 2010). Cohen’s analysis does not offer any insight into this lexical restriction, and as such, is insufficient.

- (21) a. Luxury cars are expensive.
- b. Europeans are tall.
- (22) a. Shoes worn by football players are dirty after a game.

³ That *suicidal* is a fixed standard gradable predicate can be seen from the infelicity of using “pick the suicidal one” in cases where two individuals have significantly varied tendencies to commit suicide (Kennedy 2007, Syrett et al. 2010). Moreover, the standard associated with predicates like *wet*, *dirty*, *lemon*, and *suicidal* is not the maximum value on their scale. Hence, the name “fixed, non-maximum standard gradable predicates.”

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- b. Students in the university are suicidal.
(23) a. Buses in the city are full of passengers.
b. Americans are 6-feet tall.

3.3 A distributive approach

Nickel (2013) postulated that weak generic sentences of the form *As are P* should be interpreted similarly to the distributive reading of degree sentences like (24a). The distributive reading of (24a) does not require every member of John's family to be taller than a single common contextual standard. Rather, the sentence is true when every member is tall with respect to the standard for the comparison class s/he belongs to (adult men, adult women, and six-year-olds). The idea is represented in (24b), in which the subscript i indicates the comparison class that an individual belongs to, and " Deg_{height} " stands for the height scale.

- (24) a. Everyone in John's family is tall.
b. $[\forall x_i: \text{Member-of-John's-Family}(x_i)](Deg_{height}(x_i) > \text{STND}(x_i))$

Extending the idea to weak generic sentences, Nickel (2013) proposed that evaluating the PRP sentence requires considering how each sub-group of Dutch sailors do in comparison to the contextual standard of sailing skills appropriate for that sub-group. In order for the PRP sentence to be true, there need to be *GEN*-many Dutchmen in each sub-group whose sailing skills exceed the contextual standard of sailing skills for that sub-group:

- (25) $[GEN(x_i): \text{Dutch.sailor}(x_i)] (Deg_{good.sailor}(x_i) > \text{STND}(x_i))$

3.4 Problems with the distributive approach

Nickel's analysis requires evaluating every partition of the population denoted by the bare plural subject of a weak generic sentence with respect to a contextual standard for that partition. The requirement makes predictions that are too strong. For more accessible intuition, let us take the contemporary weak generic sentence in (26). Presumably, many Brazilians play soccer. It is likely that though the top five partitions (out of six) of those Brazilians who can play soccer ("Brazilian soccer player" henceforth) have better skills than their respective international counterpart, Brazilian soccer players whose soccer skills fall in the very bottom partition somehow underperform their international counterparts. Nickel's analysis would predict the sentence in (26), intended for a weak generic reading, to be false in this scenario. However, the sentence is judged to be true (by some speakers), or at least not necessarily false (by some others), especially when the bottom partition does not account for a big proportion of Brazilian soccer players. The

truth of the sentence only requires that **a good number** (to be specified in Section 4) of Brazilian soccer players outperform their international counterparts.

(26) Brazilians are good soccer players.

Second, Nickel did not specify how to partition Dutchmen with respect to their sailing skills. His analysis allows the partitioning to be very coarse or very fine-grained. This lack of specification invites a potential problem. That is, when there is a big variation in terms of sailing skills within some coarse partition of Dutch sailors, the coarse partitioning of the Dutch sailor population and of its international counterpart may verify the PRP sentence, but a finer partitioning where the internal variation stands out would falsify it. This amounts to saying, undesirably, that the PRP sentence does not have consistent truth conditions.

Third, absolute gradable predicates (*full* and *dirty*) and non-gradable predicates (*locked* and *six feet tall*) do not have contextual standards that can co-vary with a higher binding *GEN* operator. Nickel's (2013) analysis would predict that non-gradable and absolute standard gradable predicates cannot license a weak generic reading. The prediction is only partially borne out. Although it holds for non-gradable predicates and maximum standard absolute gradable predicates (*full* and *flat*), it does not hold for non-maximum standard absolute gradable predicates (*dirty* and *suicidal*) (22).

4 Partitioning and degree comparison

Despite the insufficiencies discussed above, Cohen's and Nickel's analyses have their own analytical strengths. More importantly, the strengths of one analysis can remedy the problems of the other. Cohen's proposal rightly makes reference to two alternative sets: (1) the set alternative to the denotation of the bare plural subject of a weak generic sentence, and (2) the set alternative to the denotation of the predicate of a weak generic sentence. The use of alternative sets in analyzing weak generic sentences nicely captures the well-accepted observation that these sentences "[distinguish] the subject referent from other entities that might belong to the same category" (Krifka et al. 1995: p.83). Evaluating the PRP sentence requires considering not just how well Dutch sailors sail, but also how well international sailors sail, as well as how sailing skills within each sailor population are distributed. Nickel's analysis, on the other hand, takes recourse to the insight that the interpretation of weak generic sentences involves degree comparison. Association with different degrees of satisfying the predicate is precisely what "distinguishes the subject referent from other entities that might belong to the same category" (ibid). The evaluation of the PRP sentence needs to compare how well (partitions of) the Dutch sailor population sail to how well (the corresponding partitions of) the international sailor population sail.

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The analysis that I would like to pursue precisely combines the merits of the two proposals, by making use of degree comparison in the context of alternative sets. To begin with, I follow Nickel (2013) to assume that weak generic sentences are subject to the same general tripartite interpretation scheme as “regular” generic sentences (27). When this tripartite structure is taken as given, the issue of interpreting weak generic sentences narrows down to addressing the question of which part(s) of the structure contribute(s) the weak interpretation (“weakness” for short) of weak generic sentences.

(27) *GEN* ($x_1, x_2, \dots x_n$) [restrictor] (matrix)

Among the three constituents in the structure (the *GEN* operator, restrictor, and matrix), it is most obvious that *GEN* should not be responsible for the “weakness” of weak generic sentences; for, if so, we would have to assume there to be a weak *GEN* and a “regular” *GEN*. Doing so would invite many conceptual and empirical problems. Here are two most pressing ones. What determines whether *GEN* associated with a particular generic sentence is weak or strong? Why are generic sentences not always ambiguous between weak and strong readings?

Then, can the matrix be responsible for the “weakness” of weak generic sentences? The answer is also negative. The interpretation of weak generic sentences involves degree comparison between (partitions of) the population denoted by the subject and (the corresponding partitions of) the contextually relevant alternative population. Degree comparison does not give rise to “weakness.” The sentence in (28), for example, involves degree comparison but clearly lacks a weak generic interpretation. As the matrix is the only constituent that can specify degree comparison, this amounts to saying that the matrix does not contribute the weak interpretation of weak generic sentences.

(28) Lions are bigger than wolves.

Now that the *GEN* operator and the matrix are ruled out as being responsible for the “weakness” of a weak generic sentence, I argue the “weakness” is contributed by the restrictor. The analytic intuition is as follows. As the quantificational domain for the *GEN* operator, the restrictor specifies an appropriate subset of the individuals from the denotation of the subject, and the corresponding subset from the alternative set to the denotation of the subject. The degree comparison relation specified by the matrix holds true of the two restricted subsets of individuals in a generic manner. The restricted subsets and the degree comparison relation, however, are available from nowhere in the surface form of a weak generic sentence. They are present only in the LF of the sentence. Moving from the semantic interpretation to the surface form involves widening the quantificational domain from a restricted subset of the subject denotation to the whole set. This

domain widening is responsible for the weak reading of weak generic sentences.

Thus, interpreting weak generic sentences comes down to determining which proper subset of the subject denotation is the actual quantificational domain of for the *GEN* operator. For example, take the PRP sentence again. The restricted Dutch population to be quantified by *GEN* cannot be the intersection of the set denoted by *Dutchmen* and the set denoted by *sailor*. For the PRP sentence to be true, Dutch sailors are not required to generally sail better than international sailors or better than some standard of sailing skills associated with the international sailor population. Otherwise, we would predict the sentence in (29) to have exactly the same weak generic meaning as the PRP sentence, and the same prediction, *mutatis mutandis*, would hold true between the sentence in (30) and the weak generic sentence in (4). However, neither prediction is borne out.

(29) Dutchmen who know how to sail are good sailors.

(30) Boston drivers are careless drivers.

Hence, the relevant Dutch population in the quantificational domain should be an even smaller set than the set of all Dutch sailors. The linguistic contexts in the PRP sentence specify only one possible means to derive this subset, *viz.*, based on the standard of good sailing skills. The *GEN* operator quantifies over Dutchmen whose sailing skills are good with respect to the comparison class containing all Dutch sailors. This Dutch population can be defined by using (31), where $STND(\text{good Dutch sailor})$ is the standard of good sailing skills within the Dutch sailor population. When determining whether or not a Dutchman is a good sailor among his compatriots, it is wrong to use the whole Dutch population as the comparison class, because every Dutchman who can sail at all may be considered to have good sailing skills when compared to Dutchmen with no sailing skills at all. Whether a Dutchman is considered a good Dutch sailor should be evaluated with respect to the Dutch *sailor* population, not to the whole Dutch population.

(31) $\text{Dutch sailor}(x) \wedge Deg_{\text{good sailor}}(x) > STND(\text{good Dutch sailor})$

The next task is to decide to what the sailing skills of Dutch sailors in the quantificational domain are compared. Conceptually, there are two most likely possibilities for the comparison item: (i) the standard of good sailing skills among the international sailors (Xie 2011), or (ii) the sailing skills of corresponding international sailors. The option in (i) produces too weak truth conditions for the PRP sentence and should be dismissed. Unless Dutchmen with good sailing skills within the Dutch sailor population are outliers, there are always *GEN*-many Dutch sailors who are good relative to the Dutch standard of good sailing skills. Then, when the corresponding international standard is identical to or lower than the Dutch standard, it is necessarily the case that *GEN*-many Dutch sailors sail better

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than the international standard. Thus, the (i) option would predict the PRP sentence to be always true when the Dutch standard of good sailing skills equals or exceeds the corresponding international standard. This prediction cannot be right, because it amounts to saying that what is at stake for evaluating the PRP sentence is whether the Dutch standard of good sailing skills is higher than the international standard. In what sense is the sentence still a generic sentence? Thus, I adopt the (ii) option and conclude that the sailing skills of good Dutch sailors should be compared to the sailing skills of good international sailors.

Given the above discussion, the PRP sentence requires comparing the two populations in (32a-b) with respect to their sailing skills. The two populations are quantified by the *GEN* operator and can be represented more formally as in (33a-b). The degree comparison relation specified by the matrix is given in (34).

(32) Domains of quantification:

- a. Dutchmen whose sailing skills are good with respect to the Dutch-internal standard of good sailing skills
- b. International population whose sailing skills are good with respect to the international standard of good sailing skills

(33) a. Dutch sailor (x) \wedge $Deg_{\text{good sailor}}(x) > \text{STND}(\text{good Dutch sailor})$

b. Int'l sailor (y) \wedge $Deg_{\text{good sailor}}(y) > \text{STND}(\text{good int'l sailor})$

(34) $Deg_{\text{good sailor}}(x) > Deg_{\text{good sailor}}(y)$

By filling the components in (33-34) in the corresponding slots in the general interpretation structure for generic sentences (i.e., (27)), the precise meaning of the PRP sentence is given in (35). The PRP sentence is true if and only if good sailors within the Dutch sailor population generally sail better than good sailors within the international sailor population. It is clear that only a subset of the Dutch sailor population is directly relevant for evaluating the sentence. Compared to the entire Dutch population, this subset is presumably small. This is where the “weakness” perceived in the PRP sentence comes from. The matrix component in (35) involves degree comparison, which is inspired by Nickel’s (2013) analysis.

(35) $GEN(x, y) [Dutch\ sailor(x) \wedge Deg_{\text{good sailor}}(x) > \text{STND}(\text{good Dutch sailor}) \wedge$
 $int'l\ sailor(y) \wedge Deg_{\text{good sailor}}(y) > \text{STND}(\text{good int'l sailor})] (Deg_{\text{good sailor}}(x) >$
 $Deg_{\text{good sailor}}(y))$

The notion and use of an “alternative set,” coming from Cohen’s (1999, 2001) analysis, can provide a more formal definition of *Dutch sailor* and *international sailor*. For the PRP sentence, the alternative set to the subject denotation, $ALT(\text{Dutchmen})$, contains the Dutch population and the population of other nationalities relevant in the context. The alternative set to the predicate *good sailor*, $ALT(\text{good sailors})$, contains all individuals with a non-zero level of sailing

skills. More formally, it is something like $\{x: x \text{ is a good sailor, an OK sailor, or a bad sailor}\}$. People who do not know how to sail at all are excluded from the alternative set. The denotation of the subject *Dutchmen* can conjoin with ALT(good sailors) to yield a set that contains all Dutchmen sailors. ALT(Dutchmen) can conjoin with ALT(good sailors) to yield the set that contains all international sailors. *Good Dutch sailor* and *good international sailor* can be formally defined in a similar fashion. Replacing *Dutch sailor*, *international sailor*, and so on in (35) would yield the final formal definition of the semantics of the PRP sentence, which I skip due to space consideration.

5 Theoretical advantages of my analysis

In this section, I show how my analysis avoids the problems with Cohen's (1999, 2001) and Nickel's (2013) proposals noted in Section 3. Cohen used the same standard of good sailing skills for the Dutch population as for the international population. Moreover, he did not consider how exactly sailing skills are distributed within each individual population. In my analysis, the Dutch-internal standard and the international standard of good sailing skills are determined relative to two different comparison classes. The distribution of sailing skills of Dutch sailors and the distribution of sailing skills of international sailors both matter for deciding on the respective standard. When Dutch sailors who sail badly (in Cohen's sense, i.e., with respect to the common standard for Dutch sailors and international sailors) account for a big proportion of Dutch sailors, the Dutch-internal standard of good sailing skills is dragged low. In this case, Dutch sailors who are considered good at sailing within the Dutch sailor population do not necessarily sail better than the international counterparts. When the number of such Dutch sailors is contextually large, there may be no *GEN*-many good Dutch sailors who sail better than good international sailors, rendering the PRP sentence false.

In Section 3, I argued that Cohen's analysis wrongly predicts the PRP sentence to be necessarily true in the scenario depicted in Figure 1. According to my proposal, whether the sentence is true, at least in part, depends on the distribution of the sailing skills of Dutch sailors and how it compares to the distribution of the sailing skills of international sailors. If international sailors of the "OK" category account for only a small percentage, say 10%, of all international sailors, such that *GEN*-many Dutch sailors whose sailing skills are good with respect to their fellow Dutch sailors sail better than their international counterparts, then the PRP sentence is true. This scenario is illustrated in Figure 3. On the other hand, international sailors of the "OK" category may account for a big percentage, say 75%, of international sailors, such that the international standard of good sailing skills is elevated beyond the Dutch standard. In such cases, there may be no *GEN*-many good Dutch sailors whose sailing skills exceed those of their international counterparts. If this is indeed the case, the PRP sentence would be false (Figure 4).

Figure 3: A small % of “OK” sailors in the int’l population

Dutch	30% good		70% bad
Alternative	15% good	10% OK	75% bad

Figure 4: A big % of “OK” sailors in the int’l population

Dutch	30% good		70% bad
Alternative	15% good	75% OK	10% bad

Second, in my analysis, the semantic interpretation of weak generic sentences makes reference to the *GEN* operator. According to von Fintel (1997: p. 33), *GEN* “is lexically specified to trigger a Homogeneity Presupposition.” The use of *GEN* signals the presupposition that individuals in the quantificational domain behave uniformly with regard to the property specified in the matrix. Moreover, von Fintel argued that generic bare plural sentences obey the principle of the Excluded Middle (36) (adapted from von Fintel’s (76)).

$$(36) \text{ GEN } [p](q) \text{ iff } \sim \text{GEN } [p](\sim q).$$

With this independently proposed theorem, my analysis, which involves the same tripartite interpretation structure as in (36), can explain why the sentence *Dutchmen are bad sailors* cannot be true when the PRP sentence is true. *Dutchmen are bad sailors* entails that Dutchmen are not good sailors. By the Excluded Middle principle in (36), the latter generic sentence further entails that it is not the case that (generically) Dutchmen are good sailors. This contradicts the assumption that the PRP sentence is true. Hence, *Dutchmen are bad sailors* must be false.

Third, Nickel’s analysis requires partitioning all Dutch sailors based on their sailing skills. Evaluating the PRP sentence makes reference to every partition. In addition, Nickel did not specify how to partition Dutch sailors with respect to their sailing skills. The partitioning can be very coarse or very fine. The first two problems that I noted in Nickel’s analysis in Subsection 3.4 arise exactly from the requirement of exhaustive partitioning and the lack of specification for how to partition. My analysis neither requires exhaustive partitioning, nor allows random partitioning. As such, it avoids the first two problems in Nickel’s analysis.

Fourth, different from Nickel’s proposal, my analysis does not involve a standard that co-varies with a higher operator. What matters most is the “>” relation between the sailing skills of good Dutch sailors and the sailing skills of their international counterpart. My analysis predicts weak generic sentences to be available for predicates whose semantics is compatible with the “>” relation. Such predicates include relative gradable predicates (e.g., *bad* and *expensive*) and fixed,

non-maximum absolute standard gradable predicates (e.g., *wet*, *suicidal*, and *lemon*). Maximum standard absolute gradable predicates are not compatible with the “>” relation and should not be able to license a weak generic reading for sentences of the form *As are P*. Non-gradable predicates also cannot license a weak generic reading, but for a different reason: they do not involve standards to begin with. The predictions are all borne out in my analysis, as confirmed by the sentences in (22-24).

6 Concluding remarks

Weak generic sentences have received considerable attention in the literature. In this paper, I reviewed two important recent proposals: Cohen (1999, 2001) and Nickel (2013), both of which face empirical challenges and theoretical flaws. My analysis makes use of alternative sets and degree comparison. The semantics of the PRP sentence requires that *GEN*-many Dutch sailors whose sailing skills are good relative to their fellow Dutch sailors sail better than international sailors whose sailing skills are good relative to other international sailors.

My discussion above is limited to weak generic sentences of the form *As are P*. As already said, there is another type of generic sentences that also appear to have a weak reading, but is not subject to the same interpretation mechanism ((5), (6), (37)). Generic sentences of this second type predicate a potentiality or ability of the referent of the subject (Nickel 2010). A viable paraphrase of (37b), for example, is that a “normal” seed germinates in some possible world or another. Factoring in this extra layer of modality, the interpretation of (37) would be the same as that of “regular” generic sentences. The weak generic reading of (37) comes from pragmatic consideration of how things really are in the actual world.

- (37) a. Sharks attack bathers.
- b. Seeds germinate.

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References

- Carlson, Gregory. 1977. *Reference to kinds in English*. Ph.D. dissertation, University of Massachusetts, Amherst.
- Cohen, Ariel. 1999. *Think generic!: The meaning and use of generic sentences*. Stanford, CA: CSLI Publications.
- Cohen, Ariel. 2001. Relative readings of *many*, *often*, and generics. *Natural Language Semantics* 9:41–67.
- von Stechow, Kai. 1997. Bare plurals, bare conditionals, and *only*. *Journal of Semantics* 14:1-56.
- Kennedy, Christopher. 2007. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30:1–45.
- Krifka Manfred, et al. 1995. Genericity: An introduction. Gregory Carlson and Francis Pelletier, eds., *The generic book*. Chicago, IL: U. of Chicago Press.
- Larson, Richard. 1998. Events and modification in nominals. *Proceedings of the 8th Semantic and Linguistic Theory*, 145-168, Ithaca, NY: CLC Publications.
- Menendez-Benito, Paula. 2007. Course Materials for 24.921. ms. MIT.
- Nickel, Bernhard. 2010. Sharks and mosquitos, habits and capacities. Ms. Harvard
- Nickel, Bernhard. 2013. Dutchmen are good sailors: Generics and gradability. In Alda Mari et al., eds., *Genericity*, 390-405, Oxford: Oxford University Press.
- Syrett, Kristen, et al. 2010. Meaning and context in children's understandings of gradable adjectives. *Journal of Semantics* 27. 1–35.
- Xie, Zhiguo. 2011. *The relevance of gradability in natural language: Chinese and English*. Ph.D. dissertation, Cornell University.

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