Rearticulated Psychological View of Generics and Worldly Truthmakers

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1. Introduction

Generics are sentences like

(1) Tigers are striped.

(2) Ducks lay eggs.

(3) Mosquitoes carry the West Nile virus.

The curious thing about generics is that we generally think that they are true even though we know that there are counterexamples to them. We know that there are stripeless tigers. Only about half of ducks lay eggs, and less than 1% of mosquitoes actually carry the virus. Yet we think that (1), (2), and (3) are true. In contrast,

(4) Ducks are female.

(5) Bees are sterile.

are false. Surprisingly, the very same set that makes (2) true, fails to make (4) true. Concerning (5), over 90% of bees actually are sterile. Thus, (4) and (5) make it even more puzzling why we think that the set from (1) to (3) is true.

The accounts of generics are predominantly semantic. These treatments aim to come up with truth conditions for generics in a systematic way. The semantic accounts aim to explain compositionally why (2) is true and (4) is false. In contrast, Sarah-Jane Leslie argues that a psychological view can explain generics better. She thinks that generics do not have compositional truth conditions at all. Rather, the truth of generics is based on much looser *worldly truthmakers*. In this pa-

per, I develop a rearticulated account of the relationship between generics and the worldly truthmakers. The account is slightly different from Leslie's. Crucially, the *rearticulated psychological view* allows one to distinguish genuine generics like (3) from false generalizations like

(6) Pitbulls maul children.

(7) Muslims are terrorists.

Even though it is somewhat unclear, one interpretation is that Leslie thinks that (3), (6), and (7) are all generics. They are all generated by the psychological mechanism. (Leslie 2007, 384–385; 2017, 393–421.) In contrast, the rearticulated view allows one to distinguish a genuine generic from sentences that are false and therefore cannot be generics. After all, generics are, by definition, sentences that allow counterexamples but are still considered to be true. The rearticulation is based on the assumption that generics are a valuable source of information about the world. Only genuine generics convey valuable information, false generalizations not so much.

Moreover, the rearticulated psychological view enables a comprehensive response to Rachel Katharine Sterken's (2015) critical assessment of Leslie's psychological view. Sterken makes three claims: (i) Leslie's worldly truthmakers are open to numerous counterexamples; (ii) contrary to Leslie's thought, generics are context-sensitive; and (iii) generics do not express cognitively primitive generalizations. At the heart of my response is the distinction between genuine generics like (3) and sentences like (6) and (7) which admittedly do look like generics but in actuality are not generics at all. Namely, they are not supported by worldly truthmakers.

2. Semantic views

The semantic views have two important features. First, it is widely accepted among the semanticists that the structure of (1) is

Gen(x) [Tiger(x)] [striped(x)].

Secondly, the views rely on an extensional interpretation of the *Gen*-operator. To put it a bit crudely, the basic idea is that the *Gen*-operator specifies a relationship between two sets in

the scope of the operator. Furthermore, *Gen* is an operator over individuals. In (1), the operator picks the relevant proportion of individuals at the intersection of the set of tigers and the set of striped things. Importantly, the assumption is that the operator does the picking in a compositional way. To illustrate, existential and universal quantifiers are compositional too. They contribute to the truth conditions of sentences in which they appear in a systematic way. The truth conditions for

(8) Some *K*s are *F*.

require that the intersection of the set of *K*s and the set of *F*s is not empty. That is, at least one *K* has to be *F*. The truth conditions for

(9) All *K*s are *F*.

require that the set of *K*s is a subset of *F*s. Similarly, the semantic views aim to come up with a semantic interpretation for *Gen* so that it systematically picks the right proportion of individuals in the scope of the operator.

3. Against semantic views

3.1 Structure of generics

Leslie agrees that the structure of a generic like "*K*s are *F*" is

Gen(*x*) [*K*(*x*)] [*F*(*x*)].

That is, she agrees that generics involve a hidden operator over individuals. In contrast, David Liebesman proposes what might be called *kind-predication* according to which the structure of (1) is simply

(10) *Panthera Tigris* is striped,

in which *Panthera Tigris* is a noun phrase denoting a kind. Hence, generics involve predications of properties to kinds. (Liebesman 2011, 409–442.) Against this, consider:

(11) Cats lick themselves.

If (11) was a kind-predication, then any cat that licks another cat would make it true, but that is not what (11) means. So the following structure for (11) is much more plausible:

Gen(*x*) [Cat(*x*)] [Licks(*x*, *x*)].

This structure captures the idea that cats lick themselves. This tips the scales in favour of *Gen*-analysis, according to Leslie (2015, 34–39). Nevertheless, Leslie refrains from any further semantic analysis of *Gen*. She has two reasons for this.

3.2 Asymmetry in complexity

Leslie's master argument is what she calls *asymmetry in complexity*. The asymmetry in complexity is based on linguistic evidence concerning language-learning, especially in children. The studies concerning language learning suggest that children "find generics so much easier to comprehend than quantified statements [...]" while "[e]xplicit quantifiers, whose semantics have proved quite tractable for the theorist, are *more challenging* for the young child than generics." (Leslie 2007, 380.) However, the semantic accounts of generics are far more complex than the formal representation of, say, universal quantification. The semantic accounts often involve very sophisticated formal semantics, but the linguistic evidence suggests that generics are very easy to understand. Leslie concludes that there must be another explanation for generics that does not rely on highly sophisticated formal semantics. Nevertheless, I am not entirely convinced by this argument. It seems to me that linguistic competence and the formal representation of that competence are two different things, and a complex representation of an utterance does not mean that the utterance itself is difficult to understand. Consider the following sentence:

(12) Riding a bike without a helmet is dangerous.

I would assume that even small children understand (12) and, reluctantly perhaps, accept it as true. However, the formal representation of (12) is surprisingly complex. First, it is not a conjunction

(13) Riding a bike is dangerous and not wearing a helmet is dangerous.

because neither conjunct is true. Rather, (12) involves a compositionally complex expression of cycling and not wearing a helmet of type $\langle e \rightarrow t \rangle$, which is formed with lambda abstraction:

$\lambda x\ (Cy(x) \wedge \neg We(x))$.

The (second-level) property of being dangerous of type $\langle \langle e \rightarrow t \rangle \rightarrow t \rangle$ is then predicated on this complex (first-level) property:

$Da(\lambda x\ (Cy(x) \wedge \neg We(x)))$

Even though the formal representation of (12) is fairly complex, small children can still understand it and know it to be true. To me, this shows that linguistic competence and the formal representation of that competence are two different things.

3.3 Conjunctive generics

I think that the second reason involving *conjunctive generics* is more important than Leslie's master argument. Consider two generics:

(14) Peacocks lay eggs.

(15) Peacocks have fabulous tails.

Then form the conjunction

(16) Peacocks lay eggs and have fabulous tails.

People assent to this conjunction. However, this conjunction is very difficult for any extensional semantic view because (16) is not true of any single peacock (females lay the eggs and males have the tails). On the basis of this, Leslie says that, rather than based on extensional semantics, the inference from (14) and (15) to (16) is based on inferential rules. Specifically, (16) is based on the conjunction introduction rule. (Leslie 2007, 390–391 and 400.)

It is important to note that Leslie's explanation based on inferential rules is directly at odds with the semantic explana-

tion because the inferential rules like the introduction rule for conjunction

(∧-*I*) $A; B \vdash A \wedge B$

holds regardless of the content of *A* and *B*. In this sense, you might call the inferential rules "logical." The aim of the semantic views is that the truth of a conjunction like (14) stems from the semantic content of (14) and (15), and, according to the semantic view, the *Gen*-operator has a crucial role in determining the content of (14) and (15) and therefore the truth conditions of (16). (This point is revisited in Section 6.2.)

4. Psychological generalizations and worldly truthmakers

In the face of the two problems, Leslie proposes a different approach. She says that generics are based on a primitive mechanism of generalization. Importantly,

> [t]hese cognitively primitive generalizations do not operate on set extensions, or any such abstraction. They are not grounded in such extensional or statistical information, but rather depend on factors such as how striking and important the information in question happens to be. (Leslie 2007, 394.)

According to Leslie, generics do not have truth conditions in the sense that the *Gen*-operator would contribute to the truth conditions compositionally. Rather, generics have much looser worldly truthmakers. Leslie distinguishes three types of generics: (i) majority generics, (ii) characteristic generics, and (iii) striking-feature generics. The main purpose here is to clarify the relationship between generics and the worldly truthmakers. While rearticulating is needed for all three types, the focus is on the striking-feature generics. It is the most interesting type and also the most controversial.

Concerning majority generics, the truth of (1) requires that the majority of tigers actually are striped. The world has to be such that the majority of tigers are striped. If it was that only a small number of tigers were striped, (1) would not be true.

(2) is a characteristic generic. This type of generalization categorizes kinds, such as animal kinds, on the basis of characteristic features, and reproduction is a characteristic feature.

It characterizes ducks as egg-layers. In contrast, (4) is not true because being a female does not characterize ducks in any significant way. Concerning the truthmakers for characteristic generics, the world has to be such that the male ducks are only negative counterexamples. That is, the male ducks do not present an alternative way of reproduction. They do not, for example, give birth to live ducklings. At the same time, (5) is also false because it makes a claim about the reproduction of bees. Hence, it should be construed as a characteristic generalization instead of a majority generalization. This is further discussed below but, at this point, it should be pointed out that the non-sterile bees are positive counterexamples which falsify (5).

Finally, (3) is a striking-feature generic. Leslie argues that the primitive mechanism of generalization is often triggered by information that is striking, horrific or appalling. The primitive mechanism is triggered because the mechanism is looking for a *good predictor* of the striking or horrific feature. Even though only a few members of the kind possesses the generalized property, one would still be well-served to be forewarned about the property. The truth of (3) relies heavily on the disposition to carry the virus: "It is important, for example, that the virus-free mosquitoes be capable of carrying the virus" (Leslie 2007, 385). That is, even if only a small portion of mosquitoes carry the virus, the rest are disposed to carry it.

At this point, two things should be mentioned. First, the constraint concerning the positive and negative counterexamples also applies to striking-feature generics. The second point is that the striking-feature generics are also a reason to favor the psychological view. Namely, the semantic views struggle to explain the truth of striking-feature generics like (3) just because less than 1% of mosquitoes actually carry the virus.

5. Rearticulating the psychological view

My central argument is that Leslie's view on the relationship between generics and worldly truthmakers needs rearticulation. The rearticulation comprises two things: (a) If we articulate the relationship between generics and the worldly

truthmakers more carefully, the articulation yields a clearer distinction between genuine generics and false generalizations. It seems to me that Leslie is not clear enough on this matter. (b) I argue that the psychological mechanism is optimized to our perceptual capacity. This can explain some of the puzzling aspects of generics. As we move on to Sterken's objections, all of these rearticulated items are discussed. As it turns out, (a) and (b) are crucial to my response to Sterken.

5.1 Distinction between generics and generalizations

To start with the distinction between genuine generics and false generalizations, Leslie gives the following examples of striking-feature generics:

(17) a. Mosquitoes carry the West Nile Virus.

b. Sharks attack bathers.

c. Pitbulls maul children.

Soon after this, Leslie adds the most controversial sentence to the list of striking-feature generalizations:

(18) Muslims are terrorists.

One rather plausible interpretation is that Leslie thinks that all of these sentences are generics. (Leslie 2007, 384–385.) They are all generated by the primitive mechanism of generalization. It is just that some of them are supported by the worldly truthmakers and others are not. (17a) is true while (18) is clearly false. In contrast, I propose a different view. I argue that only (17a) is a genuine generic and (17b), (17c), and (18) are not. The reason is that while they are no doubt products of the generalization mechanism, they are not supported by worldly truthmakers (more detailed reasoning below.) This emphasizes the role of worldly truthmakers in distinguishing genuine generics from those which are not. This is based on the assumption that generics are a valuable source of information about the world. False generalizations do not convey valuable information about the world. Leslie forms a worldly truthmaker constraint for a generic "*K*s are *F*":

The counterinstances, if any, are negative, and:

If *F* lies along a characteristic dimension for the *K*s, then some *K*s are *F*.

If *F* is striking, then some *K*s are *F* and the others are disposed to be *F*.

Otherwise, the majority of *K*s are *F*.

The rearticulation just insists that we stay faithful to these truthmakers. For example, if a bunch of bigots believe that all Muslims are disposed to commit terrorist attacks, that does not make (18) a generic. What is needed is that the world actually is such that all Muslims are disposed to commit terrorist attacks. But they are not. Hence, (18) is not a generic. Similarly, it is highly unlikely to me that pitbulls are disposed to attack humans or children specifically. Admittedly, there are some statistics that seem to support this idea. However, as an owner of a pitbull, I am aware of the problems that these statistics present. First, in many statistics pitbulls are categorized by type, not by breed. As a result, many crossbreed dogs are entered in the pitbull-type category. If, for example, a labrador-pitbull crossbreed bites someone, it is categorized as a pitbull, not as a labrador. This prejudices the categorization immensely. In fact, I cannot help thinking about the infamous and racist one-drop rule of the yearly 20th century legal system in the US. Furthermore, even if it is true that pitbulls do actually cause more problems than other dog breeds, it is most likely to do with the abuse they have endured as it is a fact that pitbulls are popular dogs in the cruel dogfighting business and among other abusers. So, on the basis of the statistics, you cannot tell if pitbulls have an inherent disposition to be aggressive towards humans or that other dog breeds or types lack this disposition. Therefore, there is no truthmakers for (17c). As we move on to (17b), my confidence fades a bit as I do not have a pet shark. However, there lies the problem, people generally do not have sharks as pets and they remain rather mysterious animals. Nevertheless, biologists who work on shark do seem to suggest that shark are more likely to swim away when they encounter humans. So it is more likely to be true that sharks are disposed to swim away when encountering a human being. Hence, even

though I am slightly uncertain about this one, I am inclined to rule (17b) as false.

My rearticulated view seems to be in conflict with Leslie's view. The different truth values in (17) shows this. However, it is difficult to tell where exactly we disagree. It could be that we disagree about the theory but it could also be that we disagree about the empirical facts concerning pitbulls and sharks. It seem to me that Leslie is somewhat vague concerning the distinction between genuine generics and false generalizations. She explicitly says that the sentences in (17) are true generics but it is somewhat unclear what she thinks about (18). She does not explicitly say if the fact that it is a (false) generalization triggered by the psychological mechanism is enough to make it a generic. If we exclude (18), then the difference between my rearticulation and Leslie's view might not be theoretical but rather a factual difference. It could be that Leslie and I simply disagree about the facts concerning pitbulls and sharks. Either way, I argue that this clarification between genuine generics and false generalization is crucial for the plausibility of the psychological view as discussed in Section 6.3.

5.2 Perceptual optimization

I claim that the best way to interpret the psychological mechanism is that it works in conjunction with our perception, and it is designed to be as efficient as possible (given our imperfect perceptual capacity). In other words, the generalization mechanism is optimized to our actual perceptual capacity. (3) illustrates this again. Given our poor ability to distinguish those mosquitoes which actually carry the virus from those which do not, the mechanism is locked on to the whole mosquito kind. If the virus made the mosquitoes grow ten times bigger and turned them bright orange, we would not have a generic like (3). Instead, we would have a universally quantified sentence

> (19) All huge and bright orange mosquitoes carry the West Nile virus.

Needless to say, this would be very convenient concerning the threat of the West Nile virus. But in reality, we cannot

identify the virus-carrying mosquitoes. So the mechanism is locked on to the entire kind. At the same time, we do have the capacity to distinguish mosquitoes from other insects. Thus, the mechanism is locked on only to mosquitoes, not to insects in general. It might be counterproductive to believe that insects carry the virus as that would cause needless panic. (Leslie 2007, 383–386.)

On the other hand, we could imagine that our perceptual capacities were much better than they actually are. Imagine that we could smell viruses just like some dogs can smell some viruses. Let's assume that the odor of the West Nile virus resembles vanilla. We then could have a universally quantified sentence:

(20) All mosquitoes with a hint of vanilla scent carry the West Nile virus.

Leslie herself does not talk about this aspect of the psychological mechanism, but it seems to me that this addition is very much in line with what Leslie says about the purpose of the mechanism:

> It is clear that this mechanism ought to be an efficient information gathering mechanism, since it is our most basic and immediate means of obtaining information about categories. One way such a mechanism might be efficient is for it to take advantage of regularities out there in the world. (Leslie 2007, 383–384)

If the mechanism is tuned to its highest efficiency, then surely it should accommodate our imperfect information gathering mechanisms—in this case, our inability to distinguish virus-carrying mosquitoes from virus-free mosquitoes either visually or by the odor.

6. Sterken's three objections

The rearticulated relationship between generics and the worldly truthmakers has an important role in my response to Sterken's objections. She argues that (i) Leslie's worldly truthmakers are open to numerous counterexamples; (ii) contrary to Leslie, generics are context-sensitive; and (iii) generics do not express cognitively primitive generalizations. (i) is

divided to two: counterexamples to characteristic generics and counterexamples to striking-feature generics. While responding to characteristic counterexamples, we also get a response to (ii), which questions Leslie's claim that the *Gen*-operator does not have a compositional contribution. The objection is based on Sterken's claim that only a semantic interpretation of *Gen* can explain the context-sensitivity associated with generics. Finally, even though my response to (i) and (ii) at least partly relies on my rearticulated view, the response to (iii) relies solely on my rearticulation.

A few points about Sterken's strategy should be mentioned as her strategy also affects my counterstrategy. First, concerning the counterexamples, Sterken claims that because there are *numerous* counterexamples to Leslie's view, the evidence just keeps stacking up against Leslie. I go on to demonstrate that this thought is erroneous. There are not *numerous* counterexamples to the psychological view. Secondly, her discussion focusses on striking-feature generics. Namely, she argues that there are no striking-feature generics. If this was the case, it would indeed be a severe blow to Leslie's view because striking-feature generics are the most celebrated feature of her view. Striking-feature generics set the psychological view apart from the other views because they can explain why (17a) is a genuine generic. If it turns out that there are no striking-feature generics, then Leslie "loses a great deal of the evidence for her psychologically based theory—plausibly the best evidence for a psychologically based theory," says Sterken (2015, 2503). Her denial of striking-feature generics leads to the third point. She argues that we should not always trust our intuition about generics. Even though the sentences in (17) seem like genuine generics, it turns out that they are not. I agree that we should not always trust our intuition about generics. As I already mentioned, I agree that (17b) and (17c) are not generics. However, this does not mean there are no striking-feature generics at all because (17a) is such. There are striking-feature generics, but they are not as common as Leslie thinks.

6.1 Counterexamples to characteristic generics

The counterexamples to characteristic generics have to be negative. Sterken presents the following set of characteristic generics. She says that all of them have positive counterexamples:

(21) a. Mammals give birth to live young.

b. Birds fly.

c. Swedes have blond hair.

d. Dutch people are tall.

e. Reptiles lay eggs.

f. Dobermans have floppy ears.

Sterken argues that these are all genuine characteristic generics, but they have positive counterexamples.

At the very beginning, I admit that (21a) is a genuine counterexample to Leslie's view and also to my rearticulated view. The platypus is a positive counterexample to (21a): Platypuses are mammals but they lay eggs. However, the rest are not counterexamples to the psychological view. That means that the evidence does not stack up against the psychological view. There are not numerous counterexamples to the psychological view.

To start with (21b), I do not think that is a characteristic generic. It is a majority generic. Sterken says that there are about 40 species of birds that cannot fly. Given that there are over 18 000 species of birds, (21b) well passes muster for a majority generic. Importantly, with majority generics, it does not matter whether the counterexamples are positive or negative. The plausibility of the rearticulated view then turns on the question about the nature of the ability to fly. Is it a characteristic feature or just a feature that the majority of birds share? One of the key features of the rearticulation is the order of truthmakers. According to the rearticulation, characteristic or striking-feature generalization trumps majority generalization. In our present case, it seems to be somewhat problematic. On the present interpretation of (21b), the ability to fly is a feature that the majority of birds have. Initially, one

might think this is counterintuitive. Surely, it is characteristic for birds that they fly. However, to maintain the rearticulated psychological view, I have to insist that the ability to fly is not a characteristic feature of birds. The seeming characteristic nature of flying among birds stems from the fact that the vast majority of birds do fly.

It is true that the stereotypical conception of the Swedes is that they are blonds. But that is only a stereotype, and stereotypes are very often misleading. As Sterken says, contrary to the stereotype, many Swedes have brown hair. (Sterken 2015, 2497.) (Just because stereotypes can be misleading, I will not go through Sterken's points which are based on stereotypes. I think this is justified given that the examples based on stereotypes have only a minor role in her argumentation.)

It is important to distinguish (21c) from (21d): (21c) is based on a stereotype, but (21d) is based on a fact. The average height of the Dutch is the tallest in Europe. As such, (21d) does seem to present a tricky case for the psychological view. As Sterken points out, every short Dutch person is a positive counterexample to (21d). However, we should be clear whether the counterexamples are against the generic sentence or against its truthmaker. I argue that it is against the truthmaker. In that case, we need to be clear about the truthmaker. Concerning 21d, the truthmaker is the statistical fact that the Dutch are the tallest in Europe *on average*. This has a dramatic effect on the counterexamples. The shorter Dutch are no longer counterexamples to the truthmaker. The shorter Dutch people are included in the average height of the Dutch. Rather, a counterexample would be a taller average height in another European country. But there is no such counterexample. It is a fact that, on average, the Dutch are the tallest in Europe. After Greg Carlson, it could be argued that (21d) should be interpreted as

(22) The average Dutch person is tall.

According to Carlson, (22) is a genuine generic but the interpretation of the noun phrase is purely intensional. The term "average Dutch person" does not have an extension. You cannot have lunch with the average Dutch person. (Carlson 1989, 167–192, especially 184.) Nevertheless, this is not what we are after here. My counterargument rests solely on the

distinction between generics and their truthmakers. According to the current proposal, (21d) is interpreted as "*Gen x* [Dutch(*x*)] [tall(*x*)]" and (22) is the truthmaker for the generic. In other words, (21d) is true because it is a statistical fact that, on average, the Dutch are the tallest in Europe. As result, if (21d) is interpreted as a characteristic generic, as Sterken intended, it is true because it has no counterexamples. It is also true, if it is interpreted as a majority generic because it is a statistical fact that the Dutch are the tallest in Europe.

Initially, I thought that (21e) is true, but when Sterken laid out the facts about reptiles, I changed my mind. Namely, there are plenty of reptiles that give birth to live babies: snakes, chameleons, and some lizards (Sterken 2015, 2497). In the light of this evidence, I am ruling (21e) as false and so it cannot be a genuine generic. Here we can see one important consequence of my rearticulated view. In order to evaluate which sentences are genuine generics and which are not, you need information about the world. Knowledge about worldly truthmakers is very important when figuring out genuine generics. In some cases, one must go against one's initial urge to generalize certain features across the whole kind. Especially, if there is contrary evidence as (21e) illustrates.

Concerning (21f), Sterken's informants thought that it is true. However, in my informal inquiries, the most common answer was something like "Erm, don't they have pointy ears?" So, according my informants, (21f) is false and a better candidate for a generic might be

(23) Dobermans have pointy ears.

If indeed (21f) is a generic at all, you might view it as a majority generic. A quick picture search revealed that, in the first 30 pictures, a Doberman had pointy ears in 25 pictures. So it is very typical that Dobermans have pointy ears. Sterken does admit that the truth of (21f) requires a very specific context:

> [(21f)] uttered in a context in which the speaker is discussing the biological properties of dobermans, is intuitively true despite the fact that most dobermans have the alternative property of possessing pointy ears. (Sterken 2015, 2497.)

On the basis of this, Sterken argues that generics manifest context-sensitivity. (21f) is true when talking about the bio-

logical properties of Dobermans (and (23) is false). (21f) is false when discussing dog breeders' aesthetic standards (and (23) is true). This point is at the heart of Sterken's objection (ii), as she thinks the context-sensitivity of generics is strong evidence for a semantic interpretation of the *Gen*-operator. Sterken proposes a test for context-sensitivity of generics:

> *A-quantifier test*: Substitute the (hidden) *Gen*-operator with explicit adverbial substitutes like "typically" or "normally." If there is no variation in the truth conditional contribution between the explicit substituents, then these cannot be the source of contextual variation. Therefore, the source of contextual sensitivity has to be *Gen*.

If this test is applied to (21f), we then have two versions:

(24) a. Typically, dobermans have floppy ears.

b. Normally, dobermans have floppy ears.

Sterken relies on her informants again. She reports that her informants think that both of them are false regardless of the context. It would seem that this rules out the usual adverbial suspects and the culprit for contextual sensitivity has to be *Gen* since the generic form is the only one that presents context-sensitivity. According to Sterken, this is bad news for Leslie because she does not give any semantic interpretation of *Gen*. As Sterken aptly points out, context-sensitivity could easily be explained with quantificational domain restriction, but this requires an extensional treatment of *Gen* which Leslie refuses to give. (Sterken 2015, 2503–2505.) I assume that, with the quantificational domain restriction, Sterken means a situation in which the domain from which the *Gen*-operator picks up the relevant individuals is contextually restricted. For example, when Oxford University announces that all students are required to report to the vice chancellor's office by the end of week, it does mean that every student in the world needs to report to the office, just the Oxford students. The domain in this case is restricted to Oxford University, even though it isn't explicitly said in the announcement. Similarly, you could say that, in (17c), the domain is restricted to adult Dobermans and, in (23), the domain is restricted to Doberman puppies. Crucially, the restriction relies on a strict analogy

between the semantic interpretation of the universal quantifier and the semantic interpretation of the *Gen*-operator.

However, Sterken's test is far from conclusive. Without hesitation, I say that (24a) is false and I would imagine my informants would say that too, given their belief that Dobermans have pointy ears. But I hesitate with (24b). My intuition says that it is true that normally, without any interference, Dobermans do have floppy ears. So it is far from clear that the only possible culprit for context-sensitivity is *Gen*. There are other suspects for it. I think this is enough to cast a doubt on the idea that there has to be an extensional interpretation for *Gen*. To be clear, I am not taking a stand on the question of whether generics are context-sensitive or not. All I am saying is that if they are, then Sterken has not shown a reason to think that the responsibility for the sensitivity rests solely on *Gen*.[1]

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[1] While discussing the context-sensitivity of generics, Sterken offers another point against Leslie. Sterken argues that in the following examples, the a-sentences are false generalizations, but when they are contextually embedded in b-sentences they become true:

1. a. Mammals lay eggs.
   b. Birds lay eggs. Mammals lay eggs, too.
2. a. Novels are paperbacks.
   b. Manuscripts are always paperbacks. Novels are paperbacks, too.
3. a. Bees are sterile.
   b. Many insects face reproductive challenges. However, only bees are sterile.

Nevertheless, I do not think these examples are successful. Let's consider a publishing editor encountering sentences like (1b)–(3b). I would imagine that she would have a lot to say about them, namely that, as they stand, they are either highly misleading or downright false and they need rewriting:

1* b. Birds lay eggs. Some mammals lay eggs, too.

2* b. Manuscripts are always paperbacks. Many novels are paperbacks, too.

Finally, 3b is clearly false because bees are not sterile. So it needs considerable rewriting:

3* b. Many insects face reproductive challenges. However, only bees are on the brink of sterility.

6.2 Counterexamples to striking-feature generics

Striking-feature generics are a crucial part of Leslie's psychological view, as the view handles nicely generics like (renumbered here as)

(25) a. Mosquitoes carry the West Nile Virus.

b. Sharks attack bathers.

c. Pitbulls maul children.

Other views struggle to explain these. However, according to Sterken, this turns out to be false advertisement. The celebrated feature of Leslie's view should not be celebrated because there are no striking-feature generics. As a consequence, there is no need to explain them. In contrast, I argue that there are striking-feature generics but fewer than Leslie thinks. According to my rearticulated view, only (25a) is a genuine generic, the others are not.

Sterken starts with the truthmakers for striking-feature generics:

> "*K*s are *F*" is true if:
>
> (i) the counterinstances (if any) are negative and;
>
> (ii) if *F* is striking, then some *K*s are *F* and the others are disposed to be *F*.

She points out that, according to this disposition clause, as she calls it, many false generalizations come out as striking-feature generics. For example,

(26) Humans kill themselves.

Suicide is a pretty striking and horrific and, notably, only humans commit suicide. Sterken also says that the counterexamples, those humans who do not kill themselves, are negative. On the face of these facts, it seems that in Leslie's view (26) is a genuine generic. Yet in reality, it is false.[2] Sterken

[2] Interestingly, some of my informants thought that "Humans commit suicide" is true. They thought that it is true because only humans commit suicides. However, I am not confident enough to say that this should be the sole objection to Sterken. Still, I think it is worth mentioning.

grants the possibility that (26) has not zoomed in to the right predictor of suicide: "Perhaps amongst humans, there is a subclass which serves as a better predictor" (Sterken 2015, 2501). So let us consider:

(27) Depressed people kill themselves.

Here the predictor zooms in to a set of depressed people but still (27) is false, according to Sterken. When responding to this, it should be remembered that the mechanism latches on to the whole mosquito-kind due to perceptual optimization. We cannot distinguish between the mosquitoes which carry the virus from the mosquitoes which do not. So, by locking on to the entire mosquito-kind, the mechanism is as efficient as it can be. However, with suicide we can do better than (27). Namely, we can consult various medical professionals. They could inform us that severe depression coupled with, say, *XYZ*-disorder is a high risk factor in committing suicide. Consider,

(28) Severely depressed people with *XYZ*-disorder commit suicide.

This might be true but, in my view, there are genuine moral reasons not to put it this way. The mechanism generalizes striking and often negative features but Leslie and others have argued that the mechanism can also work the other way round. The generic form can lead to generalizing and *essentializing* negative features of a social kind. This again leads to a negative view of that social kind because it is thought that the negative feature is an essential feature of the kind (with no possibility of a cure).[3] (Rhodes et al. 2012, 1–6.) The important point is the contrast with (25a). Even if we consulted the experts in the field of mosquitoes, we still would not be able to distinguish virus-free mosquitoes from those which carry it. To repeat, the mechanism locks on to the best possible predictor, given our imperfect perceptual capacity.

Nevertheless, Sterken's final blow to Leslie's view is that this (or any manoeuvre like this) cannot save the psychologi-

[3] I am much more comfortable with a phrase like "Severe depression coupled with XYZ disorder is a high risk factor in suicide."

cal view because the damage is already done with (25a). The real problem is that the disposition condition for the mosquitoes is already too weak. "To get a sense of just how weak the disposition clause must be," Sterken invites us to consider:

(29) Insects carry the West Nile virus.

According to her, this is intuitively true. But since the disposition to carry the virus is locked on to mosquitoes, (29) comes out false in Leslie's view. (Sterken 2015, 2501.) But here is my question: In what sense is (29) true? Generics famously do not confirm to any obvious monotonicity patterns, and the contrast between (25a) and (29) is a vivid example of this. Since only about 1% of mosquitoes carry the virus, it is tempting to say that (25a) presents similar monotonicity patterns as the existential quantifier. But that would be a mistake. Existential quantification is an upward monotonic quantifier. Namely, you can always go from the subset to the superset:

(30) Some tall men like tea. Thus, some men like tea.[4]

So if the hidden *Gen* in (19a) was similar to the existential quantifier, then the inference from the subset of mosquitoes to the superset of insects would be good. However, there is a strong negative response to (29), something like "Not all insects!" So to say that (29) is true is highly counterintuitive. Indeed, it is part of the appeal of the psychological view that it can explain why a generic like (25a) does not conform to the monotonicity patterns. The mechanism is locked on to mosquitoes, not to insects in general. Sterken actually captures the explanation perfectly: "[O]n a strict reading of Leslie's disposition clause [(29) is] false since not all insects share the relevant disposition of carrying disease [...]"[5] (Sterken 2015, 2501).

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[4] In contrast, the universal quantifier is downward monotonic:

All men like tea. Thus, all tall men like tea.

[5] Sterken's further example also turns against herself. She thinks that, according to Leslie's view

4. Homosexuals carry HIV.

is true but, in reality, it is just a prejudicial and false generalization (Sterken 2015, 2502). But why would it be true in Leslie's view? The disposition to carry HIV is not limited to gay people. Heterosexuals are dis-

It should also be emphasized that monotonicity is a semantic notion. Hence, the weird monotonicity patterns support Leslie's claim that the only acceptable inferences involving generics are based on rules of inferences as inferential rules are not semantic. As discussed earlier, the conjunctive generics are not based on any extensional interpretation of the *Gen*-operator, according to Leslie. Rather, they are based on "logical rules" like the conjunction introduction rule. I called them "logical" because the introduction of conjunction of *A* and *B* is independent of the semantic content of *A* and *B*. In the present context, it can argued that the inferences concerning generics are not based on the usual extensional monotonicity patterns. Rather, they are based on perceptual optimization. The generalization is locked on to mosquitoes because mosquitoes are the optimal kind in relation our capacity to distinguish one insect kind from another.

6.3 Generics and primitive generalizations

Sterken's final claim is that generics are not based on primitive generalizations. The most compelling evidence for this is disagreements concerning striking-feature generics. Consider the following disagreements:

(31) *A*: Let's stay inside. Mosquitoes are out there, and they carry the West Nile virus.

B: That's not true. Almost none of them do.

(32) *A*: Pitbulls maul children.

B: That's not true. There have only been a few isolated incidences.

(33) *A*: Sharks attack bathers.

B: That's not true. They almost never do.

Sterken argues that these are all genuine disagreements. Furthermore, *B*'s responses are quite compelling. So the disa-

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posed to carry it too. So the mechanism is not locked on to homosexuals and (4) comes out false in Leslie's view.

greements from (31) to (32) show that the striking-feature generics are systematically false:

> These kinds of dialogues I suggest should be taken as evidence that [the sentences in (25)] are not true in general—when we think they are true we are making a mistake. (Sterken 2015, 2010)

According to Sterken, this also suggests that there are no striking-feature generics since all of them are false. Nevertheless, here are similar disagreements. Only *B*'s responses are changed. Importantly, *B*'s altered responses reflect the central feature of my rearticulated psychological view:

(31*) *A*: Let's stay inside. Mosquitoes are out there and they carry the West Nile.

B: That's true. Fortunately, only few actually carry it. Unfortunately, we cannot tell which ones.

(32*) *A*: Pitbulls maul children.

B: That's not true. Various studies show that pitbulls are no more dangerous than golden retrievers.

(33*) *A*: Sharks attack bathers.

B: That's not true. Only around 0.00...002% of bathing instances involve shark attacks.

Admittedly, *B* is a very well-informed participant. She has extensive knowledge of mosquitoes, the probabilities of shark attacks, and studies on pitbulls. I think this reflects the fact that it takes a bit of knowledge to separate genuine generics from those which are not. In my rearticulated psychological view, we need the knowledge about the worldly truthmakers because the worldly truthmakers only support genuine generics. As it turns out, the worldly truthmakers support only (25a). In contrast, Sterken thinks that even the sentence about mosquitoes is false. From this, she infers that there are no striking-feature generics. In contrast, I argue that there are striking-feature generics. However, there are fewer of them than Leslie thought. Only generics supported by the worldly truthmakers are genuine generics and the generic about mosquitoes is supported by worldly truthmakers.

7. Conclusion

The central feature of the rearticulated psychological view is the insistence that the worldly truthmakers should be taken seriously. This enables one to separate genuine generics from those which are not. This is particularly important concerning striking-feature generics. It significantly narrows down the number of striking-feature generics. Still, according to the rearticulated view, there are striking-feature generics.

I have shown that Sterken's claims from (i) to (iii) are far from conclusive. The fact there are fewer striking-feature generics than Leslie thought does not mean that there are no striking-feature generics at all, as Sterken suggests. Moreover, there is no conclusive argument from context-sensitivity that the *Gen*-operator has to be interpreted compositionally. Finally, I have countered the claim that there are *numerous* counterexamples to the psychological view. There is only one counterexample, that pesky Platypus. This counterexample could be downplayed in various ways. For example, it would probably turn out to be a very challenging case for any view of generics, but I will not argue for that here. Instead, I admit that it is a real counterexample even to the rearticulated view and it deserves more attention. However, I think that that is beyond the scope of this article.

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References

Carlson, Greg, N. (1989). "On the Semantic Composition of English Semantic." In G. Chierchia, B. H. Partee, and R. Turner (eds.), *Properties, Types and Meaning, Volume II: Semantic Issues*. Dordrecht: Kluwer Academic Publishers, 167–192.

Leslie, Sarah-Jane (2007). "Generics and the Structure of the Mind." *Philosophical Perspectives* 21, 375–403.

Leslie, Sarah-Jane (2008). "Generics: Cognition and Acquisition." *Philosophical Review* 117(1), 1–47.

Leslie, Sarah-Jane (2015). "Generics Oversimplified." *Noûs* 49(1), 28–54.

Leslie, Sarah-Jane (2017). "The Original Sin of Cognition: Fear, Prejudice and generalization." *Journal of Philosophy* 114(8), 393–421.

Liebesman, David (2011). "Simple Generics." *Noûs* 45(3), 409–442.
Rhodes, Marjorie, Sarah-Jane Leslie, and Christina M. Tworek (2012). "Cultural Transmission of Social Essentialism." *Proceedings of the National Academy of Sciences (PNAS)*, 109(34), 1–6.
Sterken, Rachel Katharine (2015). "Leslie on Generics." *Philosophical Studies* 172, 2493–2512.