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Introduction

Generics are sentences like "birds fly" and "ducks lay eggs". They express a generalization over a category or over its members. Various experimental studies (especially Gelman et al. 2010, and Rhodes et al. 2012) provided evidence that generics promote the essentialization of the categories they are about. That is, generics lead to believe that the categories they are about have an underlying nature responsible for the similarities among the category members. In this dissertation, I'm interested in what linguistic features of generics, if any, make them particularly suited to promote the essentialization of the categories they are about. This is my main research question.

Sally Haslanger (2011, 2012, 2014) offers an explanation for why generics favor essentialization. She argues that generics convey that the connection between the members of the category (Ks) and the predicated property (F) "holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). When a generic gets accepted, this claim becomes common ground and licenses the inference to the claim that the Ks have F by virtue of what it is to be a K. This presupposes that there exists an essence of the category K. As a result, the category K gets essentialized. Indeed, essentializing a category amounts to believe that its members share an essence and this chain of inferences leads to accepting that there exists an essence of category K.

Hence, Haslanger's proposal shows how generics can lead to essentializing the categories they are about. In this work, I elaborate on Haslanger's theory. I point out that Haslanger characterizes the claim conveyed by generics (namely, that the connection between Ks and F holds primarily by virtue of some important fact about the Ks *as such*) as both constant and variable across contexts. I propose that the claim conveyed by generics is complex and it is constituted by two propositions: the *robustness proposition* and the *explanatory implicature*. The former is invariable and the latter varies according to the context.

I apply the tests for presuppositions and implicatures to determine what type of implicit the *robustness proposition* (namely, the claim that the connection be-

tween Ks and F holds primarily by virtue of some important fact about the Ks as such) belongs to. The claim does not project nor passes the *Hey, wait a minute* test for pragmatic presuppositions. On the other hand, it is cancelable, indeterminable, and non-detachable. That is, it possesses three properties of conversational implicatures. Since the *robustness proposition* is constant across contexts, I conclude that it is a generalized conversational implicature. I rely on Stephen Levinson's (2000) theory of generalized conversational implicatures to investigate the mechanism generating the robustness implicature. I conclude that the *robustness proposition* arises due to the unmarkedness of generics: Levinson's I-principle, which applies to unmarked forms, invites the recipient to assume the strongest connection. Given that generics are unmarked, this principle applies to them, generating the implicature that *the connection between Ks and F holds primarily by virtue of some important fact about the Ks as such.* This allows me to show how the implicature can be worked out, which means the *robustness proposition* is calculable, another crucial feature of conversational implicatures. The *explanatory implicature*, instead, is a particularized conversational implicature. It arises from the flouting of the Maxim of Relation and further specifies what relation, relevant in the context, links the category and the property.

That generics implicate the *robustness proposition* partially answers my research question *what linguistic features of generics, if any, make them particularly suited to promote the essentialization of the categories they are about.* Haslanger's proposal explains how generics, through the robustness proposition, lead to the conclusion that category K has an essence. But this is not sufficient to show that generics are *particularly suited* to promote essentialization. This requires that the robustness proposition is peculiar to generics. I argue that this is the case as similar sentences do not implicate the robustness proposition. In particular, I take into account quantified sentences, namely sentences that, unlike generics, specify what proportion of category members have the predicated property. When the property is attributed to a high proportion of category members, the sentence seems to convey that there is a robust connection between the category and the property. Since quantified sentences are marked, though, the robustness proposition cannot be induced by Levinson's I-principle, because it only applies to unmarked forms. I then propose that the robustness proposition in these cases is arrived at through an abductive reasoning: the best explanation for the fact that all ducks eat wheat is that a robust connection links the category of ducks and property of eating wheat. This hypothesis is consistent with the pattern I found, that shows the robustness proposition is conveyed almost always with "all", often with "most", less frequently with "many", and never with "some".

So, even though some quantified sentences convey that a robust connection links category and property, only generics implicate it: the mechanisms leading to the robustness claim are different and the generalized conversational implicature is distinctive of generics. Hence, it can explain why generics are particularly suited to foster essentialization.

My conclusion is that, as proposed by Haslanger, generics convey that "the connection between Ks and F holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). In particular, I argue that this is a generalized conversational implicature of generics and it arises due to their unmarkedness. This implicature, which I labeled the *robustness proposition*, is distinctive of generics and similar sentences either lack it or convey it through different mechanisms. The *robustness proposition* can explain why (and how) generics promote the essentialization of the categories they are about.

The structure of my dissertation is as follows. In the first chapter, I provide some linguistic background and I identify my the target of my research. I'm not concerned with all the sentences that have been referred to as "generic", but only on what Bernhard Nickel (2016) calls "characteristic generic", and only with those that have a Bare Plural subject NP. In the second chapter, I present Ariel Cohen's (1996) semantics of generics. His theory accounts for the statistic variability of generics on probabilistic grounds. As I will argue, it is a merit of this theory that it makes no reference to normality.

The third chapter is devoted to the topic of essentialism. I present Leslie's hypothesis that generics foster the essentialization of the categories they are about and some empirical evidence supporting it. Then, I present Jennifer Saul's (2017) objection to these experiments and I argue that a better understanding of the phenomenon is needed. Finally, I take into account Haslanger's proposal. I show how it can account for two phenomena: the promotion of essentialization and the different generalizations generics can convey. I conclude the chapter by pointing out that Haslanger doesn't take a stand on whether the *robustness proposition* is a presupposition or an implicature. Investigating this point is the main aim of the fourth chapter. Here I introduce presuppositions and implicatures with their features and distinctions. Then, I apply the linguistic tests, concluding that the *robustness proposition* is a generalized conversational implicature. I proceed by presenting Levinson's theory, which I employ to explain how the implicature arises. In the last section, I discuss the *explanatory implicature*.

The fifth and last chapter explores alternative explanations and the consequences of the results of chapter four. I exclude that the *robustness proposition* is implicated by utterances involving kind terms and I argue that it is derived

through abduction with some quantified sentences. I then take into account the hypothesis, predicted by Levinson's theory, that quantified sentences convey an implicature complementary to the one of generics. I show that this is not the case and that quantified sentences are not the only marked form lacking the complementary implicature predicted by Levinson's principles: technical terms and extended expressions do not convey it either. Based on this data, I propose a revision of Levinson's M-principle which, as I show, does not predict that quantified sentences, technical terms, and extended expressions convey a complementary implicature. I conclude the chapter by motivating why the *robustness proposition* cannot be a clausal implicature.

Chapter 1

Linguistic background

This chapter provides an overview of various linguistic properties of generics. I will present different ways to characterize generics, varieties of generics, ways to distinguish generics from non-generics, and the subset of generics I will focus on in this work. But first, let me begin with a contrast. Consider (1):

(1) a. Dogs bark.
    b. Dogs are sitting on my lawn.

Sentence (1-a) tells something about dogs *in general*, about the kind Dog; (1-b) talks about *certain specific* dogs, those sitting on my lawn. (1-a), but not (1-b), expresses a *general fact*, a generalization. That is, (1-a), but not (1-b), is a *generic*. But what allows (1-a) to express a general fact? What makes it a generic? Theorists have given different answers, locating the source of genericity in different elements of a sentence. In the next section, I will start by presenting the analysis provided in *The Generic Book*, one of the key texts on generics.

1.1 The locus of genericity

In the introduction to "The Generic Book" (1995), Krifka and colleagues distinguish two phenomena associated with genericity: *kind-referring NPs* and *characterizing sentences*. I will present them in turn.

1.1.1 Kind-referring NPs

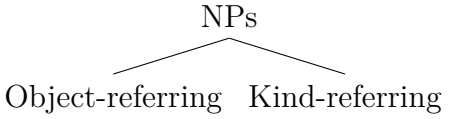
Kind-referring NPs are those Noun Phrases that denote or designate a kind.[1] Krifka et al. (1995) provide the following examples:[2]

(2) a. The potato was first cultivated in South America.
b. Potatoes were introduced into Ireland by the end of the 17th century.
c. The Irish economy became dependent upon the potato.

"The underlined noun phrases (NPs) in [(2)] do not denote or designate some particular potato or group of potatoes, but the kind Potato (*Solanum tuberosum*) itself." (Krifka et al. 1995: 2). Because of that, the sentences above concern the kind Potato; they state a general fact about potatoes. That is, these sentences receive a generic interpretation and this is due to the NPs occurring in them. In other words, kind-referring NPs are the sources of genericity in (2). Kind-referring NPs are opposed to *object-referring NPs*, that refer to individuals or collections of individuals, as "potatoes" in (3):

(3) Potatoes are boiling in the pot.

According to Krifka et al., then, Noun Phrases can either be *kind-referring* or *object-referring*:



Krifka et al. provide three tests to tell kind-referring and object referring NPs apart. As the authors specify, these tests are "indicative, and not criterial" (Krifka et al. 1995: 9). In what follows, I'll briefly present the tests.

1.1.1.1 Test: kind predicates

The goal of this test is to determine *what types* of NPs can refer to kinds.[3] Traditionally, three types of NPs have considered to be able to refer to kinds:

[1] As it becomes clear from the examples they provide, Krifka et al. take "kind" not to be restricted to natural kinds: they discuss social kinds and artifacts as well. This use is shared by the other authors in the literature on generics. However, since "kinds" is sometimes used for natural kinds only, I will sometimes use the term "categories" instead. This terminological choice is meant to avoid confusion and it does not reflect any substantial assumption.

[2] By calling these NPs "kind-referring" I do not mean to suggest that they are referential expressions. Rather, I simply adopt Krifka et al.'s nomenclature, which is standard in the literature on generics.

[3] This test is number 2 in Krifka et al.'s (1995) original numbering.

Bare Plural, Definite Singular, and Indefinite Singular NPs. Bare Plural NPs are constituted of a plural noun only, as "lions", Definite Singular NPs are constituted of a singular noun preceded by a definite article, as "the lion"; and Indefinite Singular NPs are constituted of singular noun preceded by an indefinite article, as "a lion". However, with this test, Krifka et al. exclude non-taxonomic Indefinite Singular NPs from the range of possibly kind-referring NPs.

This test consists in checking for the acceptability of sentences with a *kind predicate*. These are predicates like *extinct* and *invented*, that can only be predicated of kinds: an individual cannot be extinct, only a kind can. Or like *be a mammal* and *be domesticated*, that favor a kind-referring interpretation of an argument when a general term (i.e., not a proper name) is used. The NPs that can refer to kinds are those that, paired with kind predicates, give rise to acceptable sentences. As the examples (from Krifka et al. 1995) below show, the types of NPs that pass this test are Definite Singular, Bare Plural, taxonomic Indefinite Singular, and Bare Singular NPs:

(4) a. The lion will become extinct soon.
b. Lions will become extinct soon.
c. * A lion will become extinct soon.
d. A (certain) lion (namely the Berber lion) will become extinct soon. (taxonomic reading)
e. Bronze was invented as early as 3000 b.C.

Non-taxonomic Indefinite Singular NPs, like "a lion" in (4-c), do not pass the test. Hence, Krifka et al. do not consider these NPs as possibly kind-referring. According to them, Indefinite Singular NPs cannot receive a generic interpretation. Yet, sometimes they seem to receive a generic interpretation, as for example in (5):

(5) A lion roars.

Krifka et al., though, argue that the generic reading of "a lion" in (5) is only apparent and it is due to the generic character of the sentence as a whole. Since Indefinite Singular NPs only get a generic interpretation when occurring in characterizing sentences, it is not the NP to give rise to genericity in these cases. Rather, according to Krifka et al., the source of genericity is the sentence itself.

Thus, Krifka et al. distinguish between NPs that can refer to kinds (i.e., Bare Plural, Definite Singular, taxonomic Indefinite Singular, and Bare Singular NPs), thus being the source of genericity themselves, and non-taxonomic Indefinite Sin-

gular NPs, that can get a generic interpretation only in characterizing sentences, where genericity does not come from the NP.

In discussing this test, Krifka et al. do not take into account number-specified NPs, like "two/three/four/... lions", and explicitly quantified NPs, like "some lions", "few lions", "many lions", "most lions", "all lions". The former are constituted of a noun preceded by a number while the latter are constituted of a noun preceded by an explicit quantifier ("some", "few", "many", "most", and "all"). When combined with kind predicates, (non-taxonomic) number-specified and explicitly quantified NPs give rise to unacceptable sentences:

(6) a. *Two lions will become extinct soon.
b. *Three lions will become extinct soon.
c. *Four lions will become extinct soon.

(7) a. *Some lions will become extinct soon.
b. *Few lions will become extinct soon.
c. *Many lions will become extinct soon.
d. *Most lions will become extinct soon.
e. *All lions will become extinct soon.

Hence, according to this test, number-specified and explicitly quantified NPs cannot refer to a kind. In this respect, they are similar to Indefinite Singular NPs. However, while Indefinite Singular NPs can occur in characterizing sentences, where they receive a generic interpretation, number-specified and explicitly quantified NPs do not: in footnote 2 on page 3, Krifka et al. claim that characterizing sentences are opposed not only to particular sentences but also to explicitly quantified general sentences. This opposition seems to be due to a property of the Logical Form of generics: as I will discuss in section 2.1, according to Krifka et al. there is a generic quantifier GEN in the logical form of characterizing sentences. This operator must bind some variable and, thus, there must be a free variable for GEN to generalize over. If another operator, as for example a quantifier, binds all the variables, the resulting sentence is not characterizing. I will expand more on this point in section 2.1.

To recap, with this test, Krifka et al. identify four types of Noun Phrases that can refer to a kind: Bare Singulars, Bare Plurals, Definite Singulars, and taxonomic Indefinite Singulars. These NPs, though, behave differently, as the following test shows.

1.1.1.2 Test: well-established kinds

This test in based on an observation by Vendler (1967), Nunberg and Pan (1975), Carlson (1977), and Dahl (1985).[4] They pointed out that sentences with a Definite Singular NP whose nominal constituent is not semantically related to a well-established kind are odd under a generic reading. So, under a generic reading, while (8-a) is perfectly acceptable, (8-b) is odd:

(8) a. The Coke bottle has a narrow neck.
b. ??The green bottle has a narrow neck.

According to Krifka et al., this contrast is due to the fact that "there exists a well-established kind for Coke bottles, but there is no well-established kind for green bottles." (Krifka et al. 1995: 11). The authors conclude that not any nominal constituent can form a kind-referring NP: only those associated with well-established kinds can.

As Krifka et al. point out, Indefinite Singular NPs do not give rise to a similar contrast: (9-a) and (9-b) are both acceptable, although only the first concerns a well-established kind.

(9) a. A Coke bottle has a narrow neck.
b. A green bottle has a narrow neck.

Recall that, with the previous test, Krifka et al. concluded that non-taxonomic Indefinite Singulars cannot refer to a kind: these NPs can only be object-referring. Hence, the NPs in (9-a) and (9-b) are object-referring. This is, according to the authors, the reason why both sentences are acceptable: there is no constraint on the nominal constituent of object-referring NPs, contrary to what happens for kind-referring ones. So, while any nominal constituent can form an *object-referring* NP, to form a *kind-referring* NP a nominal constituent has to be semantically associated with a well-established kind.[5]

Krifka et al. further observe that Bare Nouns pattern with Indefinite Singulars in this respect. As the examples below show, both Bare Singular and Bare Plural NPs give rise to acceptable sentences even with a nominal constituent that is not associated with a well-established kind:

(10) a. Green bottles have a narrow neck.

[4] This test is number 3 in Krifka et al.'s (1995) original numbering.

[5] As Krifka et al. explicitly declare, they do not attempt at providing an analysis of what makes a kind well-established. They present it as an intuitive notion.

b. Gold which is hammered flat is opaque.

Since Bare Singular and Bare Plural NPs can be formed with any nominal constituent, just like Indefinite Singular NPs, Krifka et al. conclude that Bare Nouns might have an object-referring reading. Moreover, these NPs might also have a kind-referring reading, as showed by test *kind predicates*. "In principle, therefore, bare nouns may well have two interpretations: they can be kind-referring, as shown in the previous test, and they may also be object-referring, as shown by the facts cited here." (Krifka et al. 1995: 11).

A few issues concern this test. First, it is not clear, as the authors themselves acknowledge, whether "it tests for reference to a kind or whether it tests only for reference to a "well-established" kind, whatever that may turn out to be in the end." (Krifka et al. 1995: 12). Second, as pointed out by Ariel Cohen (1996), the constraint on Definite Singular NPs does not seem to depend on whether their nominal component is semantically related to a well-established kind. Consider the following pair:

(11) a. ?The politician never misses a photo opportunity.
b. The successful politician never misses a photo opportunity.

As the examples show, the Definite Singular is acceptable with *successful politician* but not with *politician*. Yet, clearly it is not the case that the former, but not the latter, is connected with a well-established kind. It seems, then, that the distribution of Definite Singular NPs depends on various factors and it does not have to do with the unexplained notion of "well-established" kinds.

A final issue concerns the scope of the test: the authors introduce it by saying that it "helps to distinguish object-referring NPs from kind-referring NPs". However, it is not clear *how* the test does this. The test distinguishes between nominal components that can form a kind-referring NP from those that can form an object-referring one and it identifies those *types* of NPs that are always kind-referring (namely, the Definite Singulars) from those that can have both a kind-referring and an object-referring interpretation (namely, Bare Nouns). It is not clear to me, though, how this helps distinguishing between object-referring and kind-referring NPs. One possibility is that, to check whether a Bare Noun is kind-referring, we can check whether its Definite Singular counterpart (that is, a Definite Singular formed with the same nominal constituent as the Bare Noun we are considering) is acceptable: if it isn't, then the corresponding Bare Noun is object-referring. However, this would not tell us whether all the Bare Nouns that can successfully transformed into Definite Singulars are actually kind-referring or not. Moreover,

Krifka et al. do not explicitly propose this application of the test.

The last test they offer, instead, is explicitly designed to determine whether a certain NP is kind-referring. I will present it below.

1.1.1.3 Test: Upward-entailing

This is probably the most famous test concerning genericity.[6] Its aim is to distinguish between kind-referring and object-referring NPs *in non characterizing sentences*. It consists in substituting the target NP with a less informative one. For example, replacing "Berber lions" by "lions", or "lions" by "feline" or "mammals". If the target NP is object-referring, the substitution occurs salva veritate. When the NP is kind-referring, instead, substituting it for a less informative one can turn a true sentence into a false one: truth preservation is not guaranteed. This is illustrated by the following examples:

(12) a. *Berber lions* escaped from the zoo. (true)
b. *Lions* escaped from the zoo. (true)

(13) a. *Berber lions* are extinct. (true)
b. *Lions* are extinct. (false)

If some *Berber lions* escaped from the zoo, then it is also true that some *lions* (or *felines*, or *mammals*, or *animals*) did. That's because a Berber lion is a particular type of lion (and of feline, mammal, and animal) and *each* individual Berber lion is also a lion (a feline, a mammal, and an animal). Hence, an episode of zoo-escaping that involves a Berber lion also involves a lion (a feline, a mammal, and an animal) because that individual Berber lion is a lion (a feline, a mammal, and an animal). So, when predicating something about *individual* Berber lions, we can substitute the NP "Berber lion" for a less informative one salva veritate. But if we are saying something about Berber lions *in general*, about the *kind* Berber lion, then this monotonicity effect does not hold. That's because something true of a certain kind might not hold for other kinds higher in the taxonomy. For example, while lions have manes, this is not true of felines (or mammals or animals) in general. So, we cannot conclude that *lions* are extinct (13-b) from the fact that *Berber lions* are extinct (13-a). Indeed, while the latter is true the former is false.

This test, as Krifka et al. observe, only works in upward-entailing contexts. That is, it doesn't work for NPs that occur in negated sentences. Moreover, it

[6] This test is number 6 in Krifka et al.'s (1995) original numbering.

doesn't work for NPs in characterizing sentences because the subject NP in the logical form of these sentences occurs in a restrictor position (which I introduce in section 2.1), "and in this position neither kind nor object-referring NPs show monotonicity phenomena." (Krifka et al. 1995: 14). They use the examples (14-a) and (15-a) to show this point:

(14) a. *Berber lions* are well adapted to cold weather. (true)
b. *Lions* are well adapted to cold weather. (false)

(15) a. *A Berber lion* is well adapted to cold weather. (true)
b. *A lion* is well adapted to cold weather. (false)

Both (14-a) and (15-a) are characterizing sentences and in neither case it is possible to substitute the NP salva veritate: in both cases, this substitution turns a true sentence into a false one. Importantly, this happens also for (15-a), whose NP is object-referring (as proved by test *kind predicates*). This shows that, when occurring in characterizing sentences, even substituting an object-referring NPs does not guarantee truth-preservation.

Also in this case, Krifka et al. do not explicitly say *how* to apply the test in order to determine whether a NP refers to a kind or to an object. Arguably, the idea is that *if* truth is preserved upon substitution (in non-characterizing sentences without negation), *then* we can conclude that the NP refers to an object. That is, it seems that for Krifka et al. not only object-referring NPs "can be replaced by "less informative" NPs without making the sentence false" (Krifka et al. 1995: 13). Rather, they seem to assume that it works the other way round as well: the fact that truth is preserved upon substitution exposes the object-referring nature of the (substituted) NP. This, though, is not explicit in their presentation of the test.

In presenting these tests, I made reference to characterizing sentences a few times. But what are they exactly? And how can we identify them? In what follows, I'll focus on this type of sentences.

1.1.2 Characterizing sentences

Characterizing sentences "do not express specific episodes or isolated facts, but instead report a kind of a *general property*, that is, report a regularity which summarizes groups of particular episodes or facts." (Krifka et al. 1995: 2, emphasis in the original). The authors provide the following examples of characterizing sentences:

(16) a. John smokes a cigar after dinner.

b. A potato contains vitamin C, amino acids, protein and thiamine.

Sentence (16-a) reports, according to Krifka et al., "some kind of generalization over events" (1992: 2). (16-b), instead, does not report a generalization over *events*, but over "properties of individual potatoes" (*ibidem*).

According to Krifka et al., the second type of genericity is a "feature of the whole sentence" (Krifka et al. 1995: 3).[7] The authors emphasize that the type of genericity displayed by (16-a) and (16-b) is distinct from the one related to the NP. This can be appreciated by the fact that the sentences in (16) receive a generic reading even though their NPs are object-referring. Indeed, "John" refers to an individual, and "a potato" is an Indefinite Singular, thus it cannot refer to a kind, as established with test *kind predicates* above. That (16-a) and (16-b) receive a generic reading (i.e., they express a general statement) while having an object-referring NP shows that the generic reading is not due to NP, but it comes, so to speak, from a different source. From this observation, Krifka et al. conclude that kind-referring NPs and characterizing sentences are two distinct types of genericity. Importantly, this does not mean that they are incompatible: rather, these two phenomena can occur combined (see section 1.1.3).

Characterizing sentences are opposed to *particular sentences*, "which express statements about particular events, properties of particular objects, and the like" (Krifka et al. 1995: 3). Examples of particular sentences are (1-b) from above (reprinted here) and (17) below:

(1-b) Dogs are sitting on my lawn.

(17) John is smoking.

As mentioned before, Krifka et al., in footnote 2 on page 3, claim that characterizing sentences are also opposed to explicitly quantified general sentences ("quantified sentences" for short), as (18):

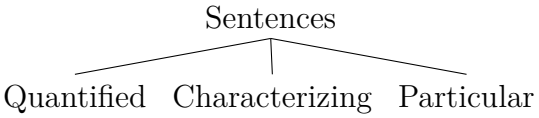
(18) Each potato in this room was grown in Alberta.

However, on page 8, Krifka et al. state that "characterizing sentences put no limitations on what kinds of NPs may occur in them" and explicitly mention quantified NPs. So, it is not clear whether they take explicitly quantified sentences

[7] A partially different analysis is provided in Mari, Beyssade, and Del Prete 2013. In particular, they argue that genericity in (16-a) comes from the VP rather than being a feature of the whole sentence.

to be opposed to characterizing sentences or to be included among them. As mentioned above, the logical form of characterizing sentences lacking an explicit quantifier seems to be different from that of explicitly quantified sentence (an issue explored in section 2.1). Hence, there seems to be a reason to tell these sentences apart. Therefore, I will consider characterizing sentences distinct from quantified sentences, according to what the authors claim in footnote 2.

The classification of sentences presented so far can be represented as follows:



How can we distinguish between these types of sentences? Quantified sentences are quite easy to recognize: they are identified by the occurrence of an explicit quantifier. Telling characterizing from particular sentences, instead, is not a trivial task since "[l]ike kind-referring NPs, they often are not clearly marked" (Krifka et al. 1995: 6). The following constructions, according to the authors, enforce a characterizing reading:

1. adverbs like "usually", "typically", "always", "often", "sometimes", "rarely", "never", etc.;[8]

2. auxiliary constructions in the past tense like the English "used to";

3. agentive nouns, like "smoker";

4. the derivation of deverbal adjective with the suffix "-able";

5. verbal predicates in the middle voice, as in "This shirt *washes easily*.";

6. special lexical items like "to have to habit/inclination/disposition", "to frequent", "to tend to", "a typical" (before a NP);

7. specialized morphological forms (absent in English), as the verbal prefix "-hu" in Swahili.[9]

Moreover, as for kind-referring NPs, Krifka et al. provide a battery of (indicative, as they specify) tests to identify characterizing sentences. I present them below.

[8]Notice, however, that these adverbs seem to involve explicit quantification, which clashes with the generic operator present in the logical form of characterizing sentences. See section 2.1.

[9]Notice that if all and only characterizing sentences in Swahili contained this prefix, then studying its semantics would be crucial to understand this form of genericity. However, Swahili provides other ways to express characterizing sentences. Even in a language with a specialized morpheme, there are unmarked ways to express genericity.

1.1.2.1 Test: adverbs

This test aims at distinguishing characterizing from particular sentences.[10] It consists in adding an adverb like "usually" or "typically" to the target sentence. If the insertion causes only a *minor* change in meaning, then the original sentence was characterizing. On the other hand, "[i]f the original sentence is particular, these adverbs change the meaning from a report of a specific event or a particular fact to a general rule." (Krifka et al. 1995: 9). The authors illustrate how this test works by means of the following examples:

(19) a. A lion has a bushy tail.
b. A lion *usually* has a bushy tail.

(20) a. A lion stood in front of my tent.
b. A lion *usually* stood in front of my tent.

While the first pair of sentences are close in meaning, the insertion of "usually" in (20-a) resulted in a quite different sentence: (20-a) reports a specific event, but (20-b) expresses a regularity. This reveals (19-a) to be characterizing and (20-a) to be particular.

1.1.2.2 Test: stative and dynamic

This test too helps identifying characterizing sentences.[11] It makes use of the distinction between stative and non-stative (or dynamic) sentences. When describing the test, Krikfa et al. characterize this distinction in an intuitive way: they just say that it roughly corresponds to the distinction between sentences that express regularities (i.e., characterizing sentences) and those that report particular events (i.e., particular sentences). A few pages later, though, they offer this more precise definition: "[s]tative sentences express a *property* of the subject referent; dynamic sentences report an *event* in which the subject referent is involved." (Krifka et al. 1995: 16, emphasis in the original). The authors claim that all characterizing sentences are stative. Particular sentences can be stative, though they usually are dynamic.[12]

Given that characterizing sentences are always stative, Krifka et al. claim that a linguistic form that excludes stative predicates will also rule out characteriz-

[10] This test is number 1 in Krifka et al.'s (1995) original numbering.

[11] This test is number 4 in Krifka et al.'s (1995) original numbering.

[12] They provide "Simba is in the cage" as an example of a particular dynamic sentence. Indeed, according to Krifka et al., "[t]ough stative, [sentences like] these are also episodic, because they do not express long-lasting properties and because they pattern with other episodics" (Krifka et al. 1995: 16-17), as for example the *ser/estar* distinction in Spanish.

ing interpretations.[13] English progressive is such a form: it is not possible to use it with stative predicates, as the unacceptability of "John is weighting 175 pounds" shows. Hence, the authors argue that "it is very difficult to transform a characterizing sentence into the progressive without losing its generic character." (Krifka et al. 1995: 12). So, for example, while (21-a) expresses a regularity, its progressive counterpart (21-b) does not:

(21) a. The Italian drinks wine with dinner.
b. The Italian is drinking wine with dinner.

Krifka et al. do not explicitly state how this observation allows us to tell characterizing and particular sentences apart. It seems to me that the test might work in this way: if the use of a form that excludes stative predicates (as English progressive) causes only a *minor* change in meaning, then the original sentence was characterizing.

1.1.2.3 Test: non-accidental properties

Krifka et al. present this test as a way to distinguish characterizing from particular sentences.[14] They start by assuming that characterizing sentences do not express accidental properties, an observation they attribute to Goodman (1955), Lawler (1973), Dahl (1975), and Burton-Roberts (1977). Rather, characterizing sentences "state properties that are in some way "essential"" (Krifka et al. 1995: 13). Krifka et al. do not provide an analysis of what an essential property is, as they declare in footnote 10 on page 13. However, they take it that the distinction between essential and accidental properties is real as it reflects in a linguistic contrast. Indeed, they point out that (22-c), but not (22-a) and (22-b), "is bad" (Krifka et al. 1995: 13):

(22) a. The madrigal is popular.
b. Madrigals are popular.
c. ??A madrigal is popular.

According to Krifka, (22-c) can only be read as a characterizing sentence: they

[13] Although Krifka et al. talk about stative *sentences* in the other passages, even on the same page, in a few sentences on page 12, they write "stative *predicates*". They do not explicitly discuss the relation between stative *predicates* and *sentences*, but it seems reasonable to assume that stative *sentences* are those with stative *predicates*.

[14] This test is number 5 in Krifka et al.'s (1995) original numbering.

claim that it cannot be interpreted as reporting a specific fact.[15] However, if, as Krifka et al. assume, characterizing sentences do not express accidental properties, then (22-c) cannot be a characterizing sentence: it expresses an accidental property of madrigals (namely, that of being popular).[16] Since (22-c) can only be read as a characterizing sentence but it cannot be one, it "is bad".

Sentences (22-a) and (22-b) express an accidental property just like (22-c). Why, then, do they seem fine? Krifka et al. do not directly tackle this question. However, a possible explanation is the following. Just like (22-c), (22-a) and (22-b) can only be read as stating a general fact (at least when uttered out of the blue). The only way for (22-c) to express a general statement is to be a characterizing sentence. Indeed, it cannot display the first type of genericity because its NP is an Indefinite Singular and, with test *kind predicates*, Krifka et al. established that Indefinite Singular NPs cannot be kind-referring. On the contrary, the NPs in (22-a) and (22-b) (i.e., a Definite Singular and a Bare Plural, respectively) can be kind-referring. So, even though these sentences cannot be characterizing sentences, because they state an accidental property, they receive a generic interpretation thanks to their kind-referring NPs.

To wrap up: (22-c) is bad because it cannot express a specific fact but it cannot express either type of genericity. In particular, its NP cannot be kind-referring because it is an Indefinite Singular and the sentence cannot be characterizing because it attributes to madrigals an accidental property. Sentences (22-a) and (22-b), on the other hand, are fine. I hypothesized that the reason for this fact is that their NPs are kind-referring. Hence, although these sentences, just like (22-c), cannot be characterizing because they express an accidental property of madrigals, they can still state something general about madrigals. They can do that thanks to their NPs, which are kind referring: (22-a) and (22-b) display genericity because their NPs are kind-referring. Unlike (22-c), which cannot display either type of genericity, (22-a) and (22-b) cannot display the second type of genericity (that of characterizing sentences) but do display the first one (that of kind-referring NPs).

[15] It seems to me there there are contexts where this can happen. For example, in a discussion about certain madrigals, (22-c) could mean that *one of these* is popular. Still, Krifka et al. seem to be right in claiming that (22-c), when uttered out of the blue, can only be interpreted as stating something in general about madrigals.

[16] It is important to specify that *being popular* is an accidental property *of madrigals* because, as Krifka et al. remark, what counts as accidental depends on the object in question. The same property can be accidental if predicated of a certain object and central (or essential) if predicated of another. So, for example, *being popular* is an accidental feature of madrigals but it is central to football players. Consequently, as observed by Nunberg and Pan (1975), "A football hero is popular" is acceptable: it states a non-accidental property.

To capture the fact that what property is predicated matters, Krifka et al. compare the sentences in (22) with those in (23):

(23) a. The madrigal is polyphonic.
b. Madrigals are polyphonic.
c. A madrigal is polyphonic.

All the sentences above are acceptable, including (23-c). Again, (23-c) can only be interpreted as stating a general fact and its NP, being an Indefinite Singular, cannot be kind-referring. But this time the sentence is characterizing. Indeed, it expresses a central property of madrigals: *being polyphonic*. Hence, that (22-c) is bad while (23-c) is fine depends on what property is expressed. In both cases, the sentence can display genericity only by being characterizing because the NP is an Indefinite Singular and cannot be kind-referring. But (22-c) expresses an accidental property and, thus, cannot be a characterizing sentence. (23-c), instead, states a central property and can, therefore, be characterizing. Consequently, (23-c) is acceptable.

How does the observation that (22-c), but not (23-c), is bad serve to test for characterizing sentence? Krifka et al. do not provide explicit instructions. A possibility is the following: the test works by classifying sentences that state accidental properties as particular. That is, it distinguishes characterizing from particular sentences according to what properties are expressed, on the assumption that characterizing sentences do not express accidental properties. The issue, then, becomes determining *what* properties count as accidental or not *for each type of objects*.[17] Doing this might not be a trivial task. The observation that sentences which attribute accidental properties are "bad" with an Indefinite Singular NP could help this task. Indeed, to determine whether a certain sentence expresses a central property for a certain type of objects, one might check whether the corresponding sentence with the Indefinite Singular NP is acceptable. If it is, the property is central; if, instead, the Indefinite Singular counterpart is bad, then the property is accidental. This could be how Krifka et al.'s fifth test is meant to work.

This test, though, is problematic. A first issue is that some sentences stating accidental properties are fine even with Indefinite Singular NPs. Consider, for example, the following sentences (proposed by Krifka 2013 as examples of descriptive generalizations with Indefinite Singular NPs):

[17]Indeed, as observed above, the same property (e.g., *being popular*) might be accidental for a type of things (e.g., madrigals) and central for another (e.g., football heroes).

(24) a. A trout can be caught by many different methods.
b. A hedgehog makes a good pet.
c. A poodle should be clipped by a professional groomer.
d. A madrigal sounds best with all the voice-parts doubled.

The subject NPs of sentences (24-a)-(24-d) are Indefinite Singular. Thus, by test *kind predicates*, they are object-referring. Yet, they seem to state something general about respectively, trouts, hedgehogs, poodles, and madrigals. That is, they receive a generic reading. But since their NPs are object-referring, the generic reading must be a result of the sentences being characterizing. However, the sentences in (24) cannot be characterizing: they don't predicate central properties and, by assumption, characterizing sentences only express central or essential features. Hence, we might expect these sentences to be "bad". But they seem perfectly acceptable. How can it be?

Four explanations are possible: either Indefinite Singular NPs can be kind-referring, contra the results of test *kind predicates*; or the properties in (24) are central to trouts, hedgehogs, poodles, and madrigals, although that might seems counterintuitive; or there are other sources of genericity other than kind-referring NPs and characterizing sentences; or characterizing sentences can actually predicate accidental properties as well. Exploring all these possibilities may shed light on other aspects of genericity, beyond the mere function of this test. However, doing this exceeds the scope of my dissertation. The reason why I made these remarks was to point out that this test does not seem to work the way Krifka et al. thought and, therefore, I won't rely on it.

A second issue related to this test concerns the assumption that characterizing sentences only state central or essential properties. Krifka et al. attribute this observation to Goodman (1955), Lawler (1973), Dahl (1975), and Burton-Roberts (1977). However, only Östen Dahl explicitly discusses characterizing sentences.

Krifka et al. do not cite a particular passage in Nelson Goodman's book, but the most relevant one seems to be on pages 77 and the following, where he discusses the distinction between lawlike and accidental hypothesis. However, Goodman doesn't explicitly mention characterizing sentences. Rather, the examples he provides are universally quantified sentences, which, as pointed out above, are not characterizing sentences.

John Lawler (1973) presents the contrast between (22-a) "The madrigal is popular" and (22-c) "A madrigal is popular" in a discussion on generic Noun Phrases. His conclusion is not that characterizing sentences only express central features, but that *Indefinite Singular NPs* "seem most natural in definitional

sentences" and "are less acceptable when an accidental quality is predicated of them" (Lawler 1973: 112). According to Lawler, then, the oddness of (22-c) shows that there are certain *constraints* on the distribution of Indefinite Singular NPs. A similar conclusion is reached by Östen Dahl, who argues that what he calls "indefinite generic noun phrases", which include Bare Plural and Indefinite Singular NPs, "always involve a quantification over possible objects rather than over actual ones." (Dahl 1975: 108). That is, they always occur in *nomic statements*, which Dahl defines as statements that "concern also possible, non-actual cases" (Dahl 1975: 100).

Noel Burton-Roberts (1977) focuses on generic NPs only. He argues that generic sentences are metapredications: a speaker uttering them asserts that the predicate is analytic of the subject. The predicate in (22-c) "is patently synthetic [with respect to the subject] but it is being predicated as analytic, hence its oddity." (Burton-Roberts 1977: 169). However, Burton-Roberts takes only sentences with an Indefinite Singular NP to be generic. He considers Indefinite Singular to be "the generic proper" and Bare Plurals to be "not generic at all" (Burton-Roberts 1976: 442). Hence, his perspective is significantly different from Krifka et al.'s, for whom Indefinite Singular NPs, being only object-referring, do not display genericity. It is not clear, then, how Burton-Roberts' conclusion can be embraced by Krifka et al. His observation, moreover, is not that *characterizing sentences* only express central properties, but that sentences with *Indefinite Singular NPs* and synthetic predicates are odd.[18]

A claim about characterizing sentences, that correspond to what he calls "generic tense", is made by Dahl. He writes: "[m]y suggestion is that when we use generic tense, we state that a law or a principle of some sort 'is in force' at a certain time. In other words, we make a nomic statement." (Dahl 1975: 103). Dahl further clarifies that the validity of such a law does not have to be timeless and "may very well be restricted in time" (*ibidem*). Importantly, nomic statements are opposed to *accidental generalizations*, in which "we only talk about a set of actual cases" (Dahl 1975: 100). Hence, Dahl's claim seems to be that characterizing sentences cannot be about a set of actual cases only, but have to concern non-actual cases as well. This, though, might be true of sentences that do not express central features. So, for example, sentences in (24) seem to concern possible cases, although they do not predicate central features of, respec-

[18]More precisely, Burton-Roberts argues that "the degree to which an X-synthetic predicate is tolerable in a metapredication on X is a function of the degree to which it is *conceivable-as-analytic* in respect of X" (1977: 170), where conceivability-as-analytic is defined as a graded and subject-oriented notion.

tively, trouts, hedgehogs, poodles, and madrigals. This characterization of the constraint on characterizing sentences, thus, seems more in accordance with the data than Krifka et al.'s does.

To recap, Krifka et al.'s fifth test is problematic on two levels. First, it is based on a controversial observation. Namely, that sentences with Indefinite Singular NPs that predicate accidental properties are "bad". This observation, correct with respect to example (22-c) "A madrigal is popular", is at odd with sentences in (24), "A trout can be caught by many different methods", "A hedgehog makes a good pet", "A poodle should be clipped by a professional groomer", "A madrigal sounds best with all the voice-parts doubled". The latter, indeed, seem acceptable and yet their subject NP is Indefinite Singular and the property they predicate is not central. Secondly, the test is based on a misattributed assumption: that characterizing sentences only express central properties. The authors cited by Krifka et al. did not make this claim. However, Krifka et al. do not provide an argument for this assumption precisely because, according to them, Goodman (1955), Lawler (1973), Dahl (1975), and Burton-Roberts (1977) argued for it already. These authors, though, defended a different claim and not this assumption. Hence, the test's premise (that characterizing sentences only express central properties) turns out to be unfounded and in need of a justification.

With this discussion I conclude the section on characterizing sentences. So far, I presented kind-referring NPs and characterizing sentences separately. However, these types of genericity are related and they can occur combined in the same sentence. I'll discuss the relation between the two phenomena in the next subsections.

1.1.3 Co-occurrence

In the previous subsections, I focused on kind-referring NPs and on characterizing sentences individually. Indeed, as Krifka et al. (1995) argue, these phenomena are distinct. This, though, does not mean they are unrelated. On the contrary, they are deeply connected:

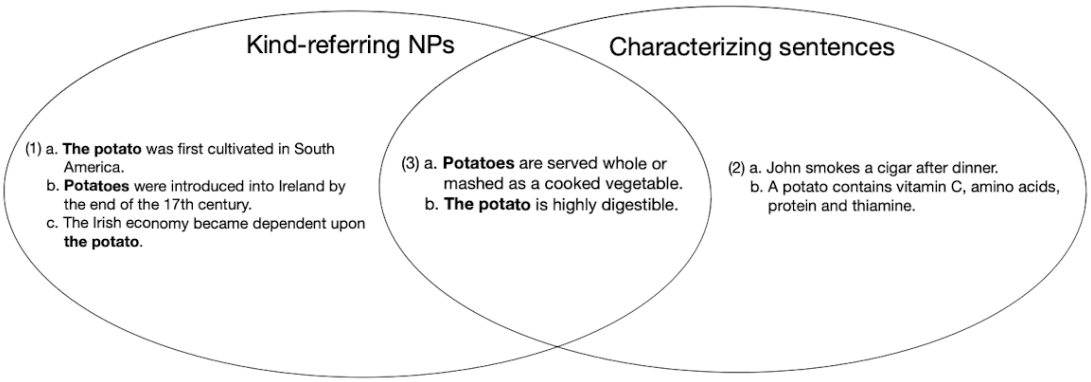
> It is quite obvious that reference to kinds and characterizing sentences have something in common: with kinds we *abstract away* from particular objects, whereas with characterizing sentences we *abstract away* from particular events and facts.
>
> (Krifka et al. 1995: 4, emphasis added)

Indeed, both kind-referring NPs and characterizing sentences are expressions

of genericity. Importantly, moreover, they can co-occur: the same sentence can have a kind-referring NP and be characterizing. Krifka et al. offer the following as examples of characterizing sentences with kind-referring NPs:

(25) a. Potatoes are served whole or mashed as a cooked vegetable.
b. The potato is highly digestible.

The subject NPs in (25) denote the kind Potato (i.e., they are kind-referring) and the sentences express a regularity (i.e., they are characterizing). Sentences like these belong to the intersection between the two types of genericity. The following diagram represents this overlap:



To recap, kind-referring NPs and characterizing sentences are, according to Krifka et al., two different phenomena. They can, though, co-occur in the same sentence. That is, the two types of genericity overlap, as shown by the above diagram.

In the next section, I will focus on how the interaction of different elements influence the generic reading of a sentence.

1.1.4 Interaction

Genericity is defined by Krifka et al. (1995) as a property of the NP (kind-referring NPs) or of the sentence as a whole (characterizing sentences). However, some elements of the sentence other than the NP can enforce or prevent a generic reading of the NP, and the NP can enforce or prevent a characterizing reading of the sentence. That is, there is an *interaction* between different elements of the sentence that influence the possibility to get a generic reading, whether of the NP or of the sentence as a whole.

With test *kind predicates*, Krifka et al. identify the types of NPs that can refer to kinds, namely Definite Singular, Bare Plural, taxonomic Indefinite Singular,

and Bare Singular NPs. However, a Noun Phrase of these types (with the exception of Definite Singular NPs) can also be object-referring. For example, (26) is about some salient dogs, and not about the kind Dog:

(26) Dogs are on the front lawn.

The NP "dogs" in (26) above is object-referring and does not receive a generic reading. That's not because of the NP itself: it is a Bare Plural, and Bare Plurals can be kind-referring. However, the predicate (*being-on-the-front-lawn*) is not applicable to the kind Dog. It certainly is odd to say "the kind Dog is on the front lawn" or even "dogs, in general, are on the front lawn". Unlike a sentence with a kind-referring NP, (26) has an existential quantifier occurring in its logical form. For this reason, sentences like (26) are said to be *existentials*.

As pointed out by Krifka et al. (see test *stative and dynamic* above), the progressive tense in English rules out characterizing interpretations. This tense, moreover, has an influence on the interpretation of the NP as well. Indeed, the NP of a sentence with the progressive tense can hardly get a kind-referring interpretation. Compare, for example, (27) and (28):

(27) Dogs run.

(28) Dogs are running.

In the most natural interpretation, (27) means that dogs, in general, run and its NP is kind-referring. (28), instead, means that *certain* salient dogs are running. The NP in (28) is object-referring and it does not seem possible for it to get a generic (i.e., kind-referring) interpretation. The progressive tense enforces the sentence to get a particular reading. So, a sentence with the progressive tense is tied to report a particular fact or episode. Typically, a particular event involves certain specific individuals. That is, the NPs of particular sentences are typically object-referring. Clearly, there are exceptions to this, otherwise the two types of genericity (kind-referring NPs and characterizing sentences) would always co-occur. In particular, kind predicates can occur in particular sentences but can only be combined with kind-referring NPs. Hence, a sentences with such a predicate, albeit particular, will always display genericity in the Noun Phrase.

I'm not interested in covering all the cases where a kind-referring NP can occur in a particular sentence. My aim in surveying these examples is to draw attention to the interaction between the two types of genericity. In particular, I want to highlight that the interpretation of the NP depends on the predicate as well. As Dahl puts it, "the possibilities of interpreting an indefinite noun phrase

as generic or non-generic often depend on the generic or non-generic character of the verb of the sentence." (1975: 108). But the verb is not the only element to influence the interpretation of the NP. Consider, for instance, (29):

(29) Dogs bark.

This sentence, uttered out of the blue, means that dogs, in general, bark. Its Noun Phrase is kind-referring. However, in the appropriate context, (29) can refer to certain individual dogs. For example, imagine the following exchange:

(30) A: What's this noise?
B: Dogs bark.

B's reply does not mean that dogs, in general, bark. Rather, it means that there are some dogs that bark. Hence, in this context, the NP "dogs" is object-referring, and an existential quantifier occurs in the logical form of (29). That is, (29), when uttered out of the blue, receives a generic interpretation. However, in certain contexts, it can be interpreted as an existential.

When discussing about genericity, it is important not to take existentials into account. Existential sentences do not display genericity and they are not relevant to discussions about genericity. However, as the examples above show, telling existentials from sentences that display genericity is not always a trivial task. In particular, one cannot simply rely on the syntactic form of the NP, but has to take into account other factors as well. Context and the intended referent(s) are crucial in determining whether a sentence displays some form of genericity or not.

So far I have focused on how the generic or non-generic character of other elements of the sentence can influence the interpretation of the NP. However, the interaction goes in the other direction as well: the NP affects the generic character of a sentence as a whole. I will now turn to this aspect of the interplay.

In section 1.1.2, I presented the distinction between quantified and characterizing sentences. These sentences differ in their logical form for the generic operator GEN, as I will discuss in section 2.1, needs a free variable to generalize over and in quantified sentences a different operator binds the variables. At the surface level, these types of sentences are distinguished by the presence of an explicit quantifier ("some", "few", "many", "most", "all"...). That is, the Noun Phrase is what distinguishes quantified from characterizing sentences.

Hence, there are some NPs that, by virtue of some syntactic feature (namely, the presence of a number or a quantifier), rule out a characterizing reading of the sentence. But this is not the only way a NP prevents the sentence from receiving

a generic reading. Consider, for example, (31):

(31) a. People in this room are philosophers.
b. The bird you see on the Eiffel Tower is a raven.
c. The number I wrote in my diary is lucky.

The sentences above are particular. This interpretation is enforced by the NP occurring in them ("people in this room", "the bird you see on the Eiffel Tower", and "the number I wrote in my diary"). Notice that the NPs in (31), unlike number-specific and quantified NPs, do not have a distinguishing syntactic feature. These NPs display a degree of specificity that is incompatible with a generic reading. That is, the NPs in (31) identify certain objects involved in a specific event, described by the sentence. But since the sentences report a specific event, they cannot be generic. Rather, the sentences in (31) receive a particular, i.e., non-generic, interpretation. So, even though characterizing sentences are not defined in virtue of what NPs occur in them, certain NPs prevent a characterizing reading.

In this subsection, I have focused on how different elements of the sentence contribute to the generic or non-generic interpretation of a NP or of a sentence. In particular, I have highlighted how the predicate can enforce an object-referring reading of a Noun Phrase and how certain NPs can rule out the characterizing interpretation of a sentence. The moral of this section is that the two types of genericity identified by Krifka et al., while distinct, are deeply related. They both abstract away from something more particular, whether objects or events, and they can co-occur. Moreover, there is a mutual influence between the NP and the other elements of the sentence. Hence, whether one type of genericity is instantiated partly depends on the features of the element that can bear the other type of genericity (the sentence as a whole or the NP).

So far, I focused on Krifka et al.'s (1995) work. Their analysis provides a fundamental linguistic background to the study of generics. In this dissertation, though, I mostly discuss philosophical works on generics, and the target of this literature does not correspond to either sentences with kind-referring NPs or characterizing sentences. Rather, it corresponds to a subset of Bernhard Nickel's (2016) *characterizing generics*, namely to characterizing generics with a Bare Plural subject. In the next section, I will present Nickel's taxonomy and I will argue that focusing on these sentences is not an arbitrary choice.

1.2 Identifying my research focus

Krifka et al. (1995) identify two phenomena connected with genericity, kind-referring NPs and characterizing sentences. However, the sentences discussed in the philosophical literature on generics do not fall neatly in these categories. Most authors focus, whether they explicitly state it or not, on a subset of characterizing sentences or on a combination of it with a subset of sentences with kind-referring NPs. In particular, philosophers usually do not discuss sentences with kind-referring NPs in positions other than the subject nor characterizing sentences that ascribe properties to an individual: typically, philosophers are only concerned with characterizing sentences that express generalizations based on properties of Ks, the members of the kind the sentence is about. In this dissertation, I discuss primarily works by philosophers, especially Sarah-Jane Leslie and Sally Haslanger. For this reason, I will focus on the same subset of generic sentences they discuss. To clearly identify my research target, I will appeal to Bernhard Nickel's (2016) taxonomy of generics.

Nickel defines generics as "sentences that concern kinds in one of a set of related ways" (2016: 20). He singles out sentences with kind predicates (i.e., predicates that can only be predicated of kinds, not of isolated individuals) as the clearest cases of generics:

(32) a. Diamonds are rare.
b. Ravens are widespread.
c. Dodos are extinct.

Since kind predicates select for kinds, the NPs of these sentences are kind-referring. However, Nickel's first category of generics does not coincide with the set of sentences that have kind-referring NPs. Rather, it is a subset of it: while all sentences with kind predicates have a kind-referring NP, not all sentences with kind-referring NPs have kind predicates. For instance, Krifka et al. (1995) provided the following as examples of sentences with kind-referring NPs, but their predicates are not kind predicates. Therefore, these sentences display Krifka et al.'s first type of genericity, but not Nickel's:

(25) a. Potatoes are served whole or mashed as a cooked vegetable.
b. The potato is highly digestible.

Moreover, Nickel does not consider sentences with generic NPs in nonsubject position. So, Krifka et al.'s example (2-c) has a kind-referring NP but does not

belong to Nickel's core cases of generics:

(2-c) The Irish economy became dependent upon the potato.

That is, Nickel's first category differs from Krifka et al.'s not simply because one is concerned with sentences and the others with Noun Phrases: the overlap is not complete even considering the *sentences* with kind-referring NPs.

Nickel then introduces a second category of generics, which he dubs "characterizing generics". These are sentences that intuitively concern kinds but do not predicate properties restricted to kinds. Sentences that belong to this group ascribe properties that also individuals can possess, like (33) below, or that groups of individuals (but not kinds) can have, as in (34):[19]

(33) a. Ravens are black.
b. Tigers have stripes.
c. Coke bottles have short necks.

(34) a. Lions gather under acacia trees.
b. Buffalo form protective circles.
c. Killer bees are dangerous.

Nickel identifies a third and last category of generics, that of ascriptions of habits, dispositions, and capacities, which he abbreviates as "habituals":[20]

(35) a. Jane drinks coffee. (habit)
b. My Peugeot goes 120mph. (capacity)
c. This glass breaks when struck. (disposition)

Clearly, the examples above are characterizing sentences, in Krifka et al.'s (1995) classification. The two categories, though, do not coincide: there are some characterizing sentences that do not fall into Nickel's third category. For example, (16-b) is a characterizing sentence but it is not, arguably, an ascription of habits, dispositions, and capacities (Nickel's type 3). Rather, it seems to be a characterizing generic (type 2) in Nickel's taxonomy:

(16-b) A potato contains C, amino acids, protein and thiamine.

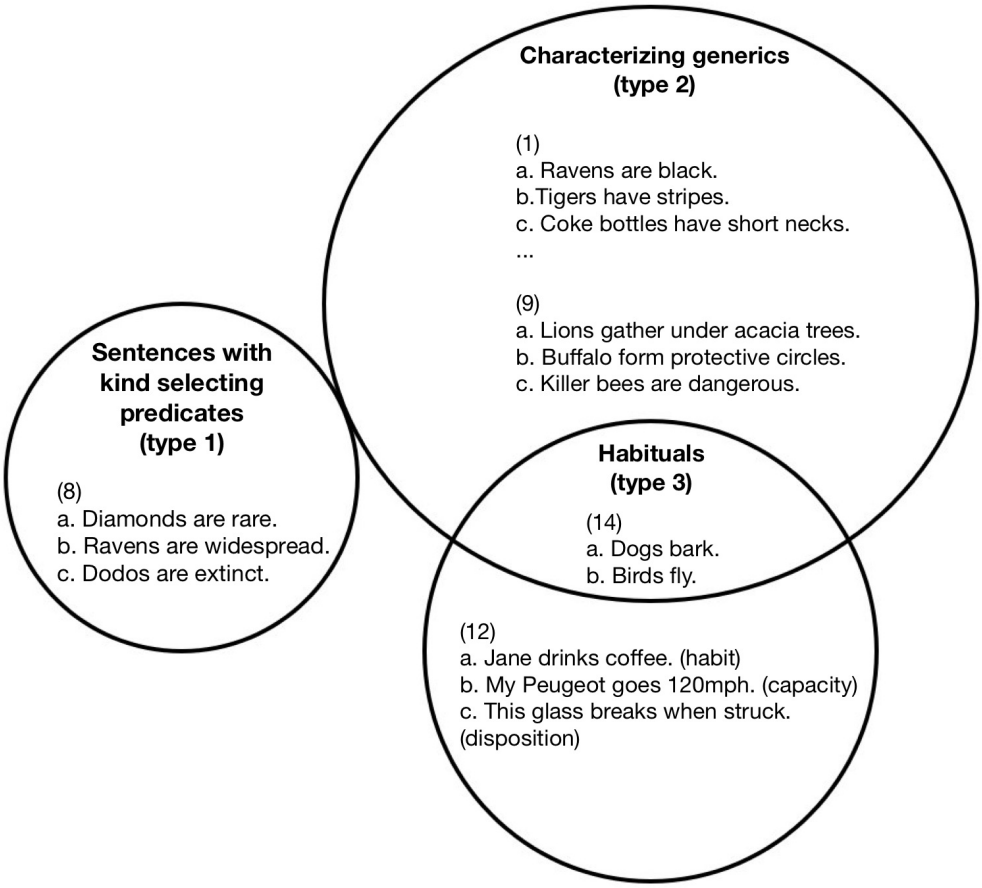
So, according to Nickel, generics are sentences either with a kind selecting predicate, or that characterize a kind, or that ascribe habits, capacities, and dispo-

[19]The examples are Nickel's (2016), respectively from pages 13-14 and 20.
[20]Examples are taken from page 21 of Nickel (2016).

sitions. These types of generics are not mutually exclusive: some sentences may belong to multiple categories. Nickel claims that "[t]he most common combination occurs when a sentence is used to characterize a kind *by* ascribing a habit, capacity, or disposition." (Nickel 2016: 22, emphasis in the original). As examples of this combination, he provides the following:

(36) a. Dogs bark.
b. Birds fly.

The diagram below represents Nickel's categorization of generic sentences (I have retained the examples' original numbering):[21]



While Krifka et al. (1995) are equally concerned with all characterizing sentences, Nickel only focuses on characterizing generics and does not discuss habituals (except for those which are also characterizing generics). That's because

[21]Other overlaps might be possible. For example, "animals are exterminated in mass extinctions" seems to both have a kind selecting predicate (thus, belonging to type 1) and express a disposition (thus, belonging to type 3). However, Nickel does not explicitly discuss it and, for this reason, I decided not to include it in the diagram.

Nickel, unlike Krifka et al., takes characterizing generics and habituals to be two distinct phenomena. While Krifka et al., as I will mention in section 2.1, single out habituals, they nonetheless take it that the same operator underlies all characterizing sentences, both (what Nickel calls) characterizing generics and habituals. However, Nickel points out, "habituals offer more interpretative options than do characterizing sentences." (2016: 23). In particular, he claims that while "[t]he difference between an ascription of habit and the ascription of a capacity seems to be a real ambiguity" (*ibidem*), there is no corresponding ambiguity for characterizing generics. Nickel shows that ascriptions of habit differ from ascriptions of capacity by means of the following example:

(37) The Eurostar goes 120 mph, but my Peugeot does not. My Peugeot goes 55 mph.

Nickel claims that what is denied in the first sentence is an *habit*, not a *capacity*. So, while it is true that the Peugeot has the *capacity* of going 120 mph, it does not have the *habit* of so doing. This difference, according to Nickel, shows that there is a real ambiguity between ascribing a habit and a capacity. There is no similar difference in the case of characterizing generics: no systematic ambiguity between two readings arises for these sentences. Hence, Nickel concludes that two distinct operators underlie characterizing generics and habituals, the latter allowing for more interpretative options. Since the operators are distinct, an account of characterizing generics does not have to work for habituals as well, and vice versa. For this reason, Nickel does not take into account both types of generics. Since he is especially concerned with kinds, he focuses on characterizing generics exclusively. As mentioned above, the philosophical works I discuss only concern characterizing generics. Consequently, I will focus just on these sentences. As Nickel has shown, this move can be justified on independent grounds: characterizing generics and habituals are different phenomena and, thus, do not have to be treated together.

Nickel further narrows his research to characterizing generics whose subject NP is a Bare Plural. That is, he is not concerned with sentences whose subject NP is a Definite or an Indefinite Singular, nor with sentences where the Bare Plural NP is not the subject. The exclusion of Indefinite Singular NPs should not be a surprise, given the discussion in 1.1.1.1: as already observed by Krifka et al. (1995), these NPs cannot be combined with kind predicates. This fact led Krifka et al. to exclude Indefinite Singulars from the range of possibly kind-referring NPs. For Nickel, that Indefinite Singulars, unlike Bare Plurals, cannot combine

with kind predicates shows that these NPs are subject to additional constraints compared to Bare Plural NPs. For this reason, he argues that an account of Indefinite Singulars should be developed from a theory of Bare Plurals, conjoined with a consideration of the further constraints that only apply to them. Hence, Nickel concerns himself only to sentences with Bare Plural NPs, leaving those with Indefinite Singular NPs out.

The same reasoning grounds Nickel's exclusion of sentences with Definite Singular subject NPs. These sentences too are acceptable under stricter conditions than their Bare Plural counterparts. Indeed, as observed above (subsection 1.1.1.2), sentences with Definite Singular NPs that don't concern well-established kinds are odd. On the contrary, sentences with Bare Plural NPs are acceptable regardless of whether the nominal constituent is associated with a well-established kind or not. Thus, Nickel argues that an account of Definite Singulars should follow one of Bare Plurals and focuses on the latter.

Finally, Nickel talks about sentences with Bare Plural *subject* NPs. He does not consider sentences in which the Bare Plural occupies a different position. Nickel does not explicitly defend this move, which is arguably justified by a difference between these types of sentences (i.e., those with Bare Plural subject NPs and those with nonsubject Bare Plural NPs). He notices this difference in a footnote:

> Bare plurals also often have existential force when they appear somewhere other than in the subject position, as *wheels* does in *cars have wheels*, which conveys that it's characteristic of cars that there are some wheels on them, but does not convey that it's characteristic of wheels that they are had by cars.
>
> (Nickel 2016, chapter 2, footnote 8, emphasis in the original)

Krifka et al. (1995) also noted a contrast between subject and non subject Bare Plurals. According to them, "bare plural NPs in [object] position are not normally accepted by speakers". They illustrate this point by means of the following examples:[22]

(38) a. #Shockley invented transistors.
b. Transistors were invented by Shockley.

(39) a. #The Sumerians invented pottery wheels.
b. Pottery wheels were invented by the Sumerians.

[22]The examples are taken from Krifka et al. (1995): 70-71.

(40) a. #The French settlers in Mauritius exterminated dodos.
b. Dodos were exterminated by the French settlers in Mauritius.

The first sentence of each pair, where Bare Plurals are in object position, are odd. But when the sentence is passivized and the Bare Plural comes to occupy the subject position, as in the b. examples, the sentences are perfectly acceptable.[23]

This contrast, however, does not always arise. As Krifka et al. observe, sentences in (41) have object Bare Plural NPs but are not odd:

(41) a. Tasneem hates cigarettes.
b. Dutch people despise Belgians.

Krifka et al. attribute this difference (that between (38)-(40), on the one hand, and (41) on the other) to the nature of the predicate. While the verbs in (38)-(40) are kind-selecting, those in (41) are not. The authors conclude that "bare plurals can be easily interpreted as definite (and hence kind-referring) only when they are in topic position; if they are in the subject position of a thetic sentence like (113b) [Pandas were roaming the camp] or in a nonsubject position, they tend to be interpreted as indefinite" (Krifka et al. 1995: 73). Hence, a. sentences in (38)-(40) are odd because the Bare Plural NPs, being in nonsubject position, are interpreted as indefinite but the verbs occurring in them, being kind-selecting, require kind-referring objects: the mismatch between what the verbs require and how the Bare Plurals ("BPs" for short) are interpreted results in the unacceptability of these sentences.

While I remain neutral as to whether this explanation is correct or not, I restrict myself to consider sentences where the Bare Plural NP is in subject position. If, as it seems, Bare Plural objects are more constrained than Bare Plural subjects, then focusing on BP subjects only is in line with Nickel's strategy: an account of BP objects will be based on an understanding of BP subjects, plus the additional constraints.

In this section, I presented Nickel's (2016) taxonomy of generics, which differs from Krifka et al.'s (1995). I rely on Nickel's categorization to identify my research target. Indeed, in the remainder of this dissertation, I follow Nickel in focusing on

[23]Burton-Roberts (1977) discusses the difference between active and passive forms of generic sentences, arguing that generic sentences "when active they do not have passive counterparts and when passive they do not have active counterparts." (page 161). He points out that "Dams are built by a beaver" does not paraphrase "A beaver builds dams", nor "A hole is lived in by a rabbit" paraphrases "A rabbit lives in a hole". Importantly, however, Burton-Roberts is only concerned with Indefinite Singular generic sentences and he does not take sentences with Bare Plural NPs to be generics. Since, as stated above, I focus on sentences with Bare Plural NPs instead, I will not discuss his account further.

characterizing generics with Bare Plural subject NPs only. This choice depends on the attempt to align, in identifying the object of my study, with the authors I discuss. These authors, as mentioned above, are only concerned with characterizing generics with Bare Plural subjects. This selection is not arbitrary. As Nickel argued, ascribing a habit is a different linguistic phenomenon from generalizing over members of a kind, thus they should be treated separately. Indefinite Singular and Definite Singular NPs are more constrained than Bare Plurals, hence one can account for Indefinite Singulars and Definite Singulars adding specific rules to a theory of Bare Plurals, which should be developed first. Similarly, sentences with BPs in nonsubject position require a separate discussion, as they are more constrained (i.e., are acceptable under additional conditions) than those with subject BPs. Again, as argued by Nickel, one should account for the basic type of sentences, namely the one with subject BPs, and add further constraints afterwards to deal with the more restricted types (that is, those with nonsubject BPs).

1.3 Chapter recap

In this chapter, I have defined the target of my research: characterizing generics with Bare Plural subject NPs. I started by presenting Krifka et al.'s (1995) categorization of phenomena associated with genericity. They distinguish between kind-referring NPs, namely Noun Phrases that denote or designate a category, and characterizing sentences, namely sentences that report a generalization of facts or events. I then turned to the characteristics of these two phenomena. In doing this, I presented and discussed Krifka et al.'s tests. In subsection 1.1.4, I explored various factors that can enforce or prevent a generic reading of a sentence.

I have concluded this chapter by motivating my focus on characterizing generics with Bare Plural subject NPs. I have appealed to Nickel's work (2016), where he provides a category of generics which corresponds to what is usually discussed in the philosophical literature on generics. These are the sentences that express a generalization over members of a kind. Nickel calls them "characterizing generics" and he distinguishes them from both sentences with kind-selecting predicates and ascriptions of habits, capacities, and dispositions (that he calls "habituals"). I further follow Nickel in limiting my focus to characterizing generics with Bare Plural NPs only. Nickel justifies this move on the observation that sentences with Definite and Indefinite Singular NPs are subject to additional conditions: he pro-

poses to focus on the basic type of sentences first and to extend the study to the more constrained sentences afterwards. A similar reasoning lead me to exclude sentences with BPs in positions other than the subjects. These sentences, indeed, are less acceptable than the ones where the Bare Plural is in subject position, as pointed out by Krifka et al. (1995) and by Nickel (2016). Thus, a focus on characterizing generics with Bare Plural subject NPs is not arbitrary. Moreover, it reflects the (not always explicit) choice made by the authors I discuss.

In the next chapter, I will present the semantic account of generics I adopt. The first section concerns the most popular theory of the logical form of generics, namely the one based on the dyadic operator GEN. I then discuss some data showing that generics do not reflect simple statistic facts. Finally, I present Ariel Cohen's (1996) semantics of generics.

Chapter 2

A semantic theory of generics

In the previous chapter, I introduced the phenomenon of genericity. The first section was devoted to Krifka et al.'s (1995) work, where the authors put forward the distinction between kind-referring NPs and characterizing sentences. Since neither category corresponds to what is covered in the philosophical literature on generics, I appealed to Nickel's (2016) to restrict my focus. In this thesis, indeed, I'm only concerned with characterizing generics that have a Bare Plural subject NP.

In this chapter, I present the semantic theory of generics that I adopt, namely Ariel Cohen's (1996). I start with a section on the logical form of generics. I present Carlson's (1977) theory first, I discuss why it was overcome and I conclude the section introducing the dyadic operator GEN. The second section concerns the statistic variability displayed by generics: as various data show, no single simple statistical condition can identify true generics. I conclude this chapter by presenting Cohen's theory, which makes use of the dyadic operator GEN and which accounts for the troublesome examples discussed in section 2.2.

2.1 Logical Form

The debate on the logical form of sentences that display genericity ("generics" henceforth) can be traced back to the first studies on this topic. Different solutions have been proposed since then. I begin this section by presenting Carlson's (1977, 1979) proposal, based on two monadic quantifiers, G and G'. This theory, though, proved unsatisfactory and was replaced by a dyadic quantifier analysis, that I present in subsection 2.1.1.

Carlson (1977) focuses on the interpretation of English Bare Plural Noun Phrases. He observes that these NPs do not give rise to the same scope ambigui-

ties as quantified NPs do. For example, (1-a) can mean that there is a particular police officer Devika wants to meet or that she wants to meet some police officer, no matter who. For (1-b) only the second interpretation is available:

(1) a. Devika wants to meet a police officer.
b. Devika wants to meet police officers.

Similarly, (2-b) can only mean that everyone read a different book, while (2-a) also means that everyone read the same book:

(2) a. Everyone read a book on giraffes.
b. Everyone read books on giraffes.

Sentence (3-a) only has a reading according to which the very same dog was everywhere, which is absurd, while (3-b) means that different dogs are in different places, which is perfectly plausible:

(3) a. A dog was everywhere.
b. Dogs were everywhere.

The interpretations (1-a), (2-a), and (3-a) get depend on how the existential quantifier introduced by the NP combines with other elements in the sentence. (1-a) and (2-a) have two possible readings, one where the existential quantifier takes wider scope with respect to the predicate *want* (in (1-a)) or with respect to the universal quantifier (in (2-a)). The existential quantifier in (3-a), instead, can only take narrow reading with respect to the universal quantifier, but the Bare Plural in (3-b) can only take wide scope. These data show that Bare Plural and Indefinite Singular NPs have different scope ambiguities. Carlson further argues that other quantified NPs pattern with Indefinite Singular NPs, showing the behavior of Bare Plurals unique. Consider the examples below:

(4) Max killed a rabbit for three hours.

(5) Max killed rabbits for three hours.

(6) a. Max killed several rabbits for three hours.
b. Max killed all rabbits for three hours.
c. Max killed many rabbits for three hours.
d. Max killed most rabbits for three hours.
e. Max killed some rabbits for three hours.
f. ...

The existential quantifier introduced by the Indefinite Singular NP in (4) takes wide scope and the sentence means that the same rabbit was killed for three hours. The same happens for sentences in (6): the quantifier introduced by the quantified NPs takes wide scope. Consequently, the sentences say that Max killed *the same rabbits* during that time. Sentence (5), instead, means that different rabbits where killed during that time. That is, the sentence where the Bare Plural occurs receives a different reading from both the one with Indefinite Singular and those with quantified NPs.

Based on these data, Carlson concludes that English Bare Plurals are not quantificational. Rather, he argues that they work like proper names and they refer to kinds. Kinds, according to him, are entities that belong to the domain of discourse, just like individuals. For example, the Bare Plural "Dodos" in (7), according to Carlson, refers to the kind dodo:

(7) Dodos are birds.
[LF] Bird(D)

"D" in the logical form of (7) above is a constant that stands for the kind dodo.

Carlson's solution smoothly accounts for sentences with kind selecting predicates, like *extinct* and *be invented*, that can only take kinds as arguments. To appreciate this point, consider the contrast below:

(8) Dodos are extinct.

(9) # Pat the dodo is extinct.

Carlson's solution accounts for the difference between (8) and (9): the former is acceptable because its subject NP, being a Bare Plural, refers to a kind. Hence, it well combines with the kind predicate *extinct*. The subject NP of (9), instead, refers to an individual and, thus, cannot combine with *extinct*, which requires a kind term. Therefore, the sentence is not acceptable.

So, Carlson's assumption that Bare Plural NPs refer to kinds perfectly explains sentences with kind predicates. However, this does not seem correct for every occurrence of Bare Plural NPs. Take for instance (28) from above:

(28) Dogs are running.

The Bare Plural "dogs" in (28) does not refer to the kind Dog: it refers to some salient dogs instead. Hence, it seems that the BP is not kind-referring here. One possibility is that Bare Plural NPs are ambiguous between a kind-referring

and an object-referring reading.[1] However, Carlson rejects this hypothesis. He points out that kind-referring and existential interpretations of Bare Plurals seem to have a complementary distribution. That is to say, in most contexts, a Bare Plural can receive only one reading but not both. So, for example, the BPs in (10) receive a kind-referring but not an object-referring reading; vice versa for those in (11):[2]

(10) a. Smokers are rude.
b. Cats meow.
c. Elephants are quite easily trained.

(11) a. Indira noticed plumbers in Jersey City.
b. Yousef personally knows actresses.
c. Sir Mendehall fed whooping cranes last night.

Based on this evidence, Carlson argues that BPs are not ambiguous. For if they were, then both readings should be available for each occurrence of a Bare Plural and they should not be complementary in distribution. So, according to Carlson Bare Plural NPs unambiguously refer to kinds.

But if Bare Plurals refer to kinds on all occasions, then how are we to explain sentences like (28) and (11)?[3] Carlson argues that Bare Plurals get an existential reading in these contexts due to the interpretation of the predicate. According to Carlson, the domain of discourse contains three types of entities: objects, kinds, and stages. Objects and kinds are individuals; stages are temporally bounded portions of individuals. A kind's stages are its members. Carlson further introduces a distinction among predicates, related to the differences between entities:

Stage-level predicates These predicates express some temporal properties, like *being available* or *being drunk*. These predicates are called "stage-level" because they express properties of the *stages* of the individuals they apply to.

Individual-level predicates These predicates express a permanent property of an individual (object or kind). These predicates are called "individual-level" because they express characteristic properties of individuals. Examples of these predicates are *intelligent* and *tall*.

[1] This is, for example, what Krifka et al. (1995) argue for.

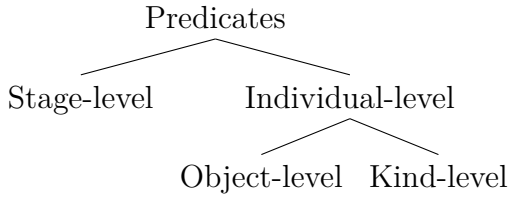
[2] The examples are adapted from Carlson 1977: 22-23.

[3] Notice that the BPs in (11) are in object position and do not receive a kind-referring interpretation: as observed above, Bare Plurals hardly get a kind-referring interpretation when do not occur in subject position.

Kind-level predicates Predicates like *extinct* and *be invented*, that only select for kinds.

Ambiguous predicates These predicates are ambiguous between expressing a temporal and a permanent property of individuals. The two interpretations correspond to different logical forms.

Carlson's taxonomy of predicates can be represented as follows:



How does this account for existential readings of Bare Plurals? Stage-level predicates introduce an existential quantification over stages but combine with individuals. That is, these predicates combine with objects or kinds, but express a property of some of their temporal parts only. So, for instance, (12-a) says that some stages of Ali are available, and (12-b) says that some stages of the kind Dog, namely some individual dogs (recall that a kind's stages are its members), are available:

(12) a. Ali is available.
b. Dogs are available.

Just as "Ali" refers to the entire individual even in a sentence like (12-a), the Bare Plural "dogs", according to Carlson, always refers to the kind Dog. In a sentence like (12-b), though, the predicate introduces an existential quantification over stages of Dog, namely individual dogs. This is how the existential reading of Bare Plurals is obtained in Carlson's theory.

Ambiguous predicates have two interpretations, one akin to individual-level predicates and the other akin to stage-level predicates. The latter introduces an existential quantification over stages, leading to a non-generic reading. "Run" is an example of such predicates. Hence, (13) has two readings, which are represented in (14):

(13) Dogs run.

(14) a. $run''(d)$
b. $\exists y^s[R(y,d) \wedge run'(y^s)]$[4]

[4]R stands for the realization relation, which connects an individual to its stages. Notice that the stages of a kind are the members of the kind itself.

In the first interpretation, (13) says (something like) that the members of the kind Dog, in general, run. In the second one, it means that there are some particular dogs (say, Bella, Charlie, and Max) that run.

Carlson (1977) introduces two type-shifting operators, G' and G (which he then renames "Gn' " and "Gn" in Carlson 1979). G' transforms predicates that apply to objects into predicates that apply to kinds. In this way, we can predicate of a kind the property of an individual member, as for example *run*. G, instead, derives the habitual form of ambiguous predicates from their episodic form. So, (14-b) is the basic form of *run*, and the habitual form is derived from it using G:

(15) $G(\lambda x^s[run'(x^s)])$

In this way, Carlson can assume that only episodic forms are listed in the lexicon, and he does not need to postulate two entries for ambiguous predicates: habitual forms are derived. Introducing G allows him to capture the systematic ambiguity between episodic and habitual predicates: every verb that has an episodic interpretation also has a habitual interpretation because the latter is derived from the former.

Carlson's analysis, though, runs into problems. For example, Carlson cannot account for the following sentences:

(16) a. Suhaee is looking for parts of that machine.
b. Vladimir is looking for machines.

(17) a. Aboubakar didn't see people in the next room.
b. Nala didn't see people.

Sentence (16-a) can either mean that Suhaee is looking for any part of the machine or that she is looking for some specific part of it. That is, (16-a) has two readings, one where the Bare Plural is generic and the other where it is existential. In Carlson's theory, as seen above, the different readings of a Bare Plural depend on the predicate. This solution, though, cannot be applied to (16-a) because both readings arise with the very same verb. The same holds for (17-a). It seems, thus, that the interpretations of (16-a) and (17-a) depend on something other than the verb. An explanation of this fact, however, is beyond reach of Carlson's original theory.

Moreover, (16-b) and (17-b) do not display the same ambiguity as (16-a) and (17-a). Yet, the b. sentences have the same predicates as their a. counterparts. Again, the data cannot be explained, as in Carlson's proposal, by appealing to features of the verb. The differences between (16-a) and (16-b) and between

(17-a) and (17-b) seem to be due to the particular Bare Plural NPs occurring in them. This suggests that certain BPs, like "parts of that machine" and "people in the next room", do not refer to kinds, contra Carlson. Since little of my work hinges on this, I will not explore this issue further.[5]

Another fact Carlson is unable to account for is the second reading of (18):[6]

(18) Typhoons arise in this part of the Pacific.

(19) Reading 1: Typhoons typically arise in this part of the Pacific.
Reading 2: This part of the Pacific is such that are typhoons that arise in it.

This was one of the crucial reasons that led to the abandonment of Carlson's proposal. Carlson himself (1989) argued that a theory based on a dyadic operator is preferable to his original analysis. Such a theory is still one of the most popular. I will present it in what follows.

2.1.1 Dyadic operator GEN

Certain sentences, like (18) from above, have multiple generic readings. However, a monadic operator, like Carlson's G (or Gn), can only derive one generic reading for each sentence. To get multiple generic readings, the sentence has to be partitioned in two constituents and a dyadic operator is needed to related them. Several authors (Heim 1982, Farkas and Sugioka 1983, Krifka et al. 1995, among others) have proposed that a phonologically unrealized dyadic operator is present in the logical form of generic sentences. In what follows, I will present the dyadic operator proposal more in detail. The semantics of this operator will be the topic of the next section.

Let GEN be such a dyadic operator.[7] GEN differs from Carlson's Gn in various respects. First, while Gn operates at the level of the VP, GEN is a sentential operator. That is, it takes a sentence and returns another sentence. Moreover, Gn is a type-shifting operator, while GEN is an unselective quantifier, i.e., it binds all the free variables in the sentence. GEN is modeled on Lewis' (1975) account of adverbs of quantification, namely *always*, *often*, *sometimes*, *never*... According to Lewis, these adverbs correspond to a sentential unselective

[5]See Mari, Beyssade, and Del Prete 2013, section 1.1.2, for an exploration of the ambiguity hypothesis.

[6]The example is Gary Milsark's (1974).

[7]Some authors have used a different notation while introducing this operator. Farkas and Sugioka 1983, for example, called it "G". I use GEN because it is the now standard notation.

quantifier. Thus, the theorists adopting GEN propose that a quantifier akin to an adverb of quantification underlies generics.

As stated above, GEN is a dyadic quantifier relating two constituents. As a result, the logical form of the sentence is a tripartite structure as follows:

(20) GEN[x_1,...,x_n; y_1,...,y_n](Restrictor[x_1,...,x_n]; Matrix[{x_1},...,{x_n}; y_1,...,y_n])[8]

With the dyadic quantifier GEN we can now derive the two interpretations of (18):

(18) Typhoons arise in this part of the Pacific.

(21) Reading 1: GEN[x;y](x are typhoons; y is this part of the Pacific & x arise in y)
Reading 2: GEN[x;y](x is this part of the Pacific; y are typhoons & y arise in x)

The two readings differ in what material goes in the restrictor and what in the matrix. With "typhoons" in the restrictor, we get the interpretation according to which arising in this part of the Pacific is a general property of typhoons; with "this part of the Pacific" in the restrictor, we get the reading that it is a general property of this part of the Pacific that typhoons arise in it.

A variety of factors influence the partition of semantic material between restrictor and matrix. Focus plays a major role. As Krifka et al. point out "the focused part of an utterance with an operator such as GEN is always in the matrix and not in the restrictor" (1995: 27). So, while we typically get the second reading with normal intonation, we can get the first one by changing stress.

In the previous chapter, I mentioned that overt quantifiers can rule out a generic reading. For example, Krifka et al. define the generic operator only for sentences where an overt quantificational adverb does not occur: "[l]et GEN be the generic quantifier underlying characterizing sentences that lack an overt quantificational adverb." (1995: 26). A sentence underlain by GEN cannot contain an overt quantificational adverb because GEN needs at least a free variable to quantify over. If a sentence contains an overt quantificational adverb, then this adverb, which is a sentential operator combining with the whole sentence, binds the free variables leaving none free for GEN to bind. Since no free variables are left, GEN cannot combine with such a sentence.

I also wrote that Krifka et al. cast quantified sentences, namely sentences with

[8]Sometimes the matrix is called "nuclear scope".

a quantified NP, as different from characterizing sentences. While the authors do not explicitly expand on this issue, a possible reason for this distinction is, again, that the quantifier in the NP binds the free variables preventing GEN to combine with the sentence. However, the operator of a quantified NP only works at the level of the NP, unlike a quantificational adverb, which works at the sentence level. This operator, thus, should only bind variables in the NP: variables in other parts of the sentence could remain free even though a quantifier occurs in the NP. If so, GEN could still combine with the sentence. Krifka et al., though, set apart sentences that generalize over situations rather than individuals and label them "habituals". Hence, a possible conclusion is that a quantified sentence can be a habitual sentence but not a characterizing sentence expressing a generalization over individuals. This could be why Krifka et al. distinguish quantified from characterizing sentences.

It's worth noting that quantified sentences differ from generic sentences generalizing over individuals in various respects. Importantly, quantified sentences have straightforward truth-conditions, specified by the explicit quantifier occurring in them, while those of generics are tricky. In particular, generics display a certain statistic variability in that there doesn't seem to be a specific proportion of Ks (the members of the kind the sentence is about) having F (the predicated property) that verifies all and only true generics. Even more puzzingly, certain true generics possess more counterinstances (i.e., members of the kind that lack the predicated property) than some false generics. In the next subsection, I will present some data showing this fact. The statistic variability displayed by generics constitutes one of the biggest challenges to providing a semantics for these sentences.

2.2 Statistic variability

In quantified sentences, an explicit quantifier ("some", "many", "most", or "all") specifies what proportion of Ks have F:

(22) a. Some ducks are sterile.
b. Many ducks lay eggs.
c. Most tigers are striped.
d. All tigers are feline.

The truth-conditions of quantified sentences are straightforward: *some*-quantified sentences are true iff at least one K has F; *many*-quantified sentences are true

iff sufficiently many K has F; *most*-quantified sentences are true iff the majority (i.e., more than 50%) of K has F; and *all*-quantified sentences are true iff every K has F. For example, (22-a) is true iff at least one duck is sterile, (22-c) is true iff the majority of tigers are striped, and (22-d) is true iff every tiger is a feline. The truth-conditions of generics, instead, are troublesome. First, generics tolerate exceptions. For example, (23) is intuitively true even though there are some white ravens:

(23) Ravens are black.

Hence, for a generic to be true it is not necessary that every member of the kind K has the predicated property F. This means that GEN cannot have the same force as "all". One might wonder whether it can have the same force as "most". As stated above, *most*-quantified sentence are true iff the majority (i.e., more than 50%) of Ks has F. However, a generic can be true despite a majority of counterinstances. For one, (24) is true albeit most lions don't have manes: only adult male lions do.

(24) Lions have manes.

Consequently, GEN cannot correspond to "most". While (24) is true in face of the majority of counterinstances, the corresponding *most*-quantified sentence (25) is not:

(25) Most lions have manes.

Even more radically, a generic can be true despite the totality of counterinstances. For example, (26) can be true even if no OrangeCrusher2000 ever crushed an orange:

(26) OrangeCrusher2000s crush oranges.[9]

This makes GEN different from *some*: while at least one member of the kind has to possess the predicated property for a *some*-quantified sentence to be true, such condition is not necessary for the truth of a generic.

As the examples above have shown, there is no proportion of Ks (i.e., members of the kind the generic is about) that has to have F (i.e., possess the predicated property) for a generic to be true. In other words, that a certain proportion of Ks have F is not a necessary condition for true generics. The same holds for

[9]This example is taken from Leslie (2007).

sufficient conditions, as the following examples show.

As we have seen, that some Ks have F is not necessary for a generic to be true. It is not sufficient either: there are plenty of false generics that predicate a property some, and even many, members of the kind possess. The sentences below are just some examples:

(27) a. Lions are female.
b. Ravens are albino.
c. Swans are black.
d. Canadians are left-handed.

For each of the above generics, there are some individuals that verify them. This, though, is not sufficient to make the sentences true. On the other hand, such circumstances are sufficient to make the corresponding *some*-quantified sentences true:

(28) a. Some lions are female.
b. Some ravens are albino.
c. Some swans are black.
d. Some Canadians are left-handed.

Again, this evidence runs against the hypothesis that GEN is equivalent to "some". A similar point can be made concerning the putative equivalence between GEN and "most". Indeed, that most Ks have F is not sufficient to make the generic "Ks are F" true. For example, (29-a) and (29-b) are false, although over 80% of, respectively, books and Canadians have the predicated property:[10]

(29) a. Books are paperbacks.
b. Canadians are right-handed.

Finally, not even the totality of Ks having F is sufficient to make a generic true. Indeed, certain generics are false despite all Ks having F. A classical example is the following:

(30) Supreme Court Judges have a prime Social Security number.[11]

If Supreme Court Judges may or may not have a prime Social Security number, (30) strikes as false even if all of them have such a number. As Cohen (1996)

[10]The percentage of paperbacks is reported in Leslie (2007); that of handedness is based on Papadatou-Papastou et al. (2019).
[11]This example is taken from Cohen (1996).

observes, it seems necessary that a law requires Supreme Court Judges to have a prime Social Security number for (30) to be true. Hence, that all Ks (Supreme Court Judges, in this case) have F (a prime Social Security number, in this case) is not sufficient for the truth of a generic.

As the examples above show, GEN does not correspond to either *some*, or *most*, or *all*. Moreover, there doesn't seem to be a necessary or a sufficient condition for the truth of generic sentences that is based on simple statistical facts: a generic can be true even if no K has F and false even if all Ks have F. In Bernhard Nickel's words "there is no single, simple statistical condition that successfully distinguishes true from false generics" (2016: 15).[12] This observation is even clearer upon observing the pair below:

(31) a. Ducks lay eggs.
b. Ducks are female.

Indeed, (31-a) is true and (31-b) is false, and yet egg-laying ducks are less than female ones. Only female ducks lay eggs, but not all of them do: chicks, old, and sterile ducks do not. If a single, simple statistical condition governed generics' truth-conditions, then we should expect (31-a) to be false even more so given (31-b)'s falsity, or, on the contrary, (31-b) to be true even more so given (31-a)'s truth. That (31-a) is true and (31-b) false, though, is really surprising.

In this section, I have shown how the truth-conditions of generics, unlike those of quantified sentences, do not reflect simple statistical facts. Ariel Cohen (1996), though, proposes a probabilistic account of generics that can deal even with the pair in (31). In what follows, I will present his theory.

2.3 Cohen's theory

In a nutshell, Cohen proposes that generics receive either an *independent* or a *dependent* reading. Generics under the *independent* reading are true iff the probability that a relevant individual (i.e., a relevant member of the kind the generic is about) has F (the predicated property) is greater than 0.5; generics under the *dependent* reading are true iff the probability that a relevant individual has F is greater than the probability that a member of an alternative kind has F. These truth-conditions, according to what is called "homogeneity constraint", have to hold for all the salient partitions of the set of relevant individuals. Cohen

[12] As Nickel himself specifies, this conclusion only applies to *simple* statistical conditions since more complex statistical account, like Cohen's, can deal with the data presented in this section.

defines relevant individuals as the members of K (the kind the generic is about) which satisfy at least one alternative to F. Alternatives of F, written ALT(F), are those terms that share a minimal presupposition (i.e., a presupposition which is not entailed by any other presupposition) with F. Similarly, alternatives to K (the kind the generic is about) share a minimal presupposition with K.

The main ingredients of Cohen's theory are: two readings (independent and dependent), a probabilistic condition (different according to the reading), the alternatives to the predicated property (ALT(F)), the alternatives to the kind the generic is about (ALT(K)), and the restriction to relevant individuals. In what follows, I will present each component in turn, starting from relevant individuals and alternatives.

2.3.1 Relevant individuals and alternatives

Ariel Cohen provides a probabilistic semantics for generic sentences. He proposes to evaluate each generic with respect to relevant individuals only. Cohen relies on a mechanism that allows to restrict the set of Ks (the members of the category the generic is about) to the relevant individuals. Cohen reports an observation by Richmond H. Thomason (1988) to provide a rationale for his theoretical choice. Thomason takes into account the following example:

(32) People have a hard time finding Carnegie Mellon University.

He points out that, to evaluate (32), we only take into account people that *look for* Carnegie Mellon University: someone who doesn't even *try* to find it is not relevant for judging (32). As Cohen puts it "[i]n evaluating [(32)], it seems that we are comparing people who find CMU with difficulty, to people who find CMU with ease: if more people find it difficult than people who find it easy, [(32)] is true, otherwise it is false." (1996: 33). Sentence (32) seems to say that people have difficulty *as opposed to ease* in finding Carnegie Mellon University. In line with this observation, in Cohen's semantics, only relevant individuals are taken into account when attributing a truth-value to a generic sentence. This reflects our intuitions around (32): in evaluating it, we only consider people who look for CMU, not just anyone.

Cohen defines the relevant individuals for a certain generic as the members of kind K that satisfy one of the alternatives to F, the predicated property. The set of alternatives to F (indicated as "ALT(F)") consists of properties that belong to the same dimension of F. So, for instance, the alternatives to *lay eggs* are ways of procreating, namely *laying eggs* itself, *giving birth to live young*, and

undergoing mitosis; the alternatives to *fly* are forms of locomotion, namely *flying* itself, *walking*, *jumping*, *swimming*, and so on. Sentence (31-a) says that ducks lay eggs *as opposed to* giving birth to live young or undergoing mitosis; (33) says that birds fly *as opposed to* walking, jumping or swimming:

(31-a) Ducks lay eggs.

(33) Birds fly.

While *lay eggs* and *fly* belong to, respectively, ALT(*lay eggs*) and ALT(*fly*), the set of alternatives to a property does not always include the property itself: F may not belong to ALT(F). Indeed, Cohen proposes the alternatives to a negated property to be the same as the alternatives to the unnegated property. Hence, if the negated property does not belong to ALT(F), it does not belong to ALT(notF) either.

But why should ALT(F) and ALT(notF) be identical? This fact follows from how the sets of alternatives are built in Cohen's theory. Before analyzing the technical details, though, let's see why this is correct from an intuitive point of view. Consider (34):

(34) Ducks do not lay eggs.

As discussed above, the majority of ducks do not lay eggs: only adult, fertile, female ducks lay eggs. Yet, (34) is false. This is no longer surprising, though, if we think of what individuals are relevant for this generic sentence. As for its non-negated counterpart, (31-a), we don't take into account male ducks or chicks to evaluate (34). Rather, we only consider those ducks that procreate. That is, the relevant individuals for (34) are ducks that have one property among *laying eggs*, *giving birth to live young*, and *undergoing mitosis*. Intuitively, then, (34) has to be evaluated with respect to the same set of alternatives as (31-a). This result is obtained if ALT(*lay eggs*) and ALT(*not lay eggs*) are identical sets. The equivalence between the two sets depends on how alternatives are derived. Cohen proposes that the alternatives to a property are properties that share a minimal presupposition with it. Since a term and its negated counterpart share the same presupposition(s), a negated property has the same alternatives as the non-negated property: ALT(F) is identical to ALT(notF).

Cohen motivates appealing to presuppositions by means of an example:

(35) Roses are red.

As he observes, (35) should be evaluated with respect to the set of colors. It says that roses are red *as opposed to* pink, blue, yellow, and so on. Hence, intuitively ALT(*red*) is the set of colors and Cohen looks for a way to get this result. A first hypothesis is that alternatives share the same entailment: being red entails being colored and ALT(*red*) includes properties that entail being colored; colors entail being colored, thus they belong to ALT(*red*). This solution, though, is incorrect. Indeed, as Cohen points out, since *scarlet* entails being red, assuming alternatives are identified by F's entailment incorrectly predicts that shades of red should be possible alternatives for evaluating (36):

(36) Sage flowers are scarlet.

Colors, and not shades of red, seem to be the correct alternatives to *scarlet* in (36). The sentence says that sage flowers are scarlet *as opposed to* pink, blue, yellow, and so on, not *as opposed to* carmine and crimson. If the latter interpretation was correct, we should expect (36) to be true if scarlet is the only shade of red sage flowers come in, even if the scarlet flowers are only a small minority. If, instead, scarlet is contrasted with other colors (rather than with shades of red), then we would expect (36) to be false in a similar scenario, and this seems more intuitive.

Hence, if alternatives were identified by entailment, shades of red could be alternatives to *scarlet*. This, however, is incorrect, as example (36) shows. Consequently, Cohen concludes that it is not entailment to individuate alternatives. It has to be something that returns the set of colors for both *red* and *scarlet*. Cohen appeals to Searle's (1959) discussion on the topic. In particular, Searle points out that both *is red* and *is scarlet* presuppose *is colored*, but *is scarlet* does not presuppose *is red*.[13] Searle employs a semantic notion of presupposition. He writes:

> A term A presupposes a term B if and only if it is a necessary condition of A's being either true *or false* of an object x, that B must be true of x. For example, as we ordinarily use these words, in order for it to be either true or false of something that it is red, it must be coloured.
>
> (Searle 1959: 149, emphasis in the original)

While *scarlet* entails both *colored* and *red*, it only presupposes *colored*. Focusing on presupposition, then, Searle can distinguish between *red* and *colored* with respect to *scarlet*.

[13]For short, following Searle, I will say that *red* presupposes *color* for the remainder of the discussion.

However, Cohen points out, an appeal to presupposition is not sufficient to handle (36): *scarlet* does not only presuppose *colored*. It also presupposes, for example, *physical object*. But *scarlet* in (36) is contrasted with colors, and not with other properties of physical objects (as, for instance, specific sizes, weights or shapes). Hence, Cohen needs a different notion, one that selects colors and not properties of physical objects as alternatives to *scarlet*. Cohen, thus, focuses on what distinguishes *colored* and *physical object* with respect to *scarlet*. He observes that *colored* is more specific than *physical object*: anything with a color is a physical object, but some physical objects (i.e., transparent objects) have no color. This observation is reflected in the entailment relations between the terms: *scarlet* presupposes both *colored* and *physical object*, but *physical object* is entailed by *colored*, while *colored* is not entailed by *physical object*. Cohen calls "minimal presupposition" a presupposition which is not entailed by any other presupposition. He employs this notion to define alternatives: "[t]he alternatives to a property share a minimal presupposition with it, i.e. a presupposition which is not entailed by any other presupposition" (Cohen 1996, p. 208).[14]

We are now in the position to see, from a technical point of view, why ALT(notF) should be identical to ALT(F): alternatives are determined by presupposition, and both a term and its negation share the same presuppositions. *Scarlet* presupposes *colored* and so does *not scarlet*: *colored* is a minimal presupposition of both *scarlet* and *not scarlet*; hence, the alternatives to both terms is the set of colors.

Another important fact is that alternatives are not mutually exclusive: the same individual or kind can have multiple alternative properties. For example, the alternatives to *fly* are forms of locomotion, as *fly* itself, *walk*, *jump*, and *swim*. Members of certain kinds can move in multiple ways: for instance, a seagull both flies and walks; a frog both jumps and swims. However, it is not always possible to have multiple alternative properties: for example, one either undergoes mitosis or gives birth to live young; no organism does both. That these properties are incompatible, though, does not depend on how the set is built. Since some alternatives are compatible with each other, the set is not construed to rule out the possibility that an individual (or a kind) has various alternative properties.

To recap, Cohen argues that generics are evaluated with respect to relevant individuals only. He defines relevant individuals as the Ks (the members of the kind the generic is about) that satisfy at least one of the alternatives to F (the predicated property). Alternatives are determined by minimal presuppo-

[14]Cohen also provides a formal definition of alternatives based on the notion of minimal absolute determinable. See Cohen (1996): 107-111.

sition, namely a presupposition that is not entailed by any other presupposition: ALT(F) is the set of terms that share a minimal presupposition with F. A term does not always belong to the set of its alternatives: ALT(F) may not include F. In particular, since a term and its negation have the same presuppositions, ALT(notF)=ALT(F). So if notF doesn't belong to ALT(F), it does not belong to the set of its own alternatives (ALT(notF)) either. Finally, the alternatives are not mutually exclusive and, in certain cases, it is possible to possess multiple alternative properties.

As mentioned above, Cohen argues that generics can either receive an *independent* or a *dependent* reading. In what follows, I will discuss this component of his theory.

2.3.2 Dependent and Independent readings

Let's consider (32) once again:

(32) People have a hard time finding Carnegie Mellon University.

This example was meant to show that generics are evaluated with respect to relevant individuals only. ALT(F) in this case being the set of alternative difficulties in finding CMU, and relevant individuals being people that encountered some alternative level of difficulty in finding CMU. But after a restriction to relevant individuals is performed, what makes (32) true? Intuitively, "if more people find it difficult than people who find it easy, [(32)] is true, otherwise it is false" (Cohen 1996: 33). According to this quote, (32) is true iff the majority of relevant individuals (namely, people who look for CMU) has the predicated property (namely, *having a hard time finding CMU*). The truth-conditions of generics that receive an independent reading are based on this observation. However, rather than referring to quantity ("the majority"), Cohen formulates the truth-conditions in terms of probability. This allows him to treat sentences with mass terms, that are uncountable. For example, it is impossible to determine what is *the majority* of gold. Hence, the truth of (37) cannot depend on whether the majority of gold is shiny:

(37) Gold is shiny.

What matters here, instead, is probability: (37) is true iff gold it is *likely* to be shiny. While, as specified above, I do not focus on mass terms in this work, this brief discussion about (37) serves to explain why Cohen moves from quantity to

probability.

Now consider (38):

(38) The Frenchperson eats horsemeat.

Sentence (38) is intuitively true, but only a minority of French people eat horsemeat. That's possible, according to Cohen, because (38) involves a comparison among nationalities: (38) "would be true just in case the likelihood of a Frenchman's eating horsemeat is greater than the likelihood that a person of arbitrary alternative nationality eats horsemeat" (Cohen 1996: 58). Cohen calls the reading that sentences like (38) receive "dependent". Generics under a dependent reading involve a comparison with alternative kinds and are true iff the probability that a relevant individual has the predicated property is greater than the probability that a member of an arbitrary alternative kind has that property.

Cohen does not provide a principle to determine what reading a certain generic gets. Correctly identifying the relevant reading, though, is crucial to Cohen's theory because its predictions for a sentence vary according to the reading received. For example, (38) would incorrectly be predicted to be false under an independent reading. To predict the truth-value of a certain generic one must first determine which reading it gets. As it stands, Cohen's theory lacks a principle to identify the relevant reading and it simply appeals to intuitions.

Cohen further requires the truth-conditions for each readings to hold for all salient partitions of the kind. This requirement is meant to ensure that the domain of the generic quantifier is homogeneous, hence called "homogeneity constraint". Cohen added the homogeneity constraint for technical reasons, concerned with the theory of probability he adopts. The constraint, though, allows him to cope with some problematic examples, as I will show in the next subsection.

To wrap up, Cohen proposes that generics can receive an *independent* or a *dependent* reading and provides different truth-conditions for each one. He joins the two in one definition, giving disjunctive truth-conditions of generic sentences. Generics with different readings have the same logical form, but get different interpretations. Different state of affairs make a generic true, depending on how it was interpreted. Cohen's formulation of the generics' truth-conditions is the following, where **gen** is the generic quantifier as presented in the previous section (there indicated as "GEN"), $P(\phi \mid \psi)$ is the conditional probability of ϕ given ψ,

and $\bigvee A$ is the (possibly infinite) disjunction of all the properties in A:[15]

Truth-conditions of generics

Let $\textbf{\textit{gen}}(\psi, \phi)$ *be a sentence, where* ψ *and* ϕ *are properties. Let*

$$A = \{\psi' \wedge \phi' \mid \psi' \in \mathbf{ALT}(\psi) \;\&\; \phi' \in \mathbf{ALT}(\phi)\}.$$

Then $\textbf{\textit{gen}}(\psi, \phi)$ *is true iff for every* Ω*, a salient partition of* ψ*, and for every* $\omega \in \Omega$*,*

$$P(\phi \mid \psi \wedge \omega \wedge \bigvee A) > r,$$

where the value of r is determined by the reading of the sentence:

1. *r=0.5 (independent reading).*
2. $r = P(\phi \mid \omega \wedge \bigvee A)$ *(dependent reading).*

"In words", he writes, "the generic sentence $gen(\psi, \phi)$ is true just in case the relative frequency of ϕs is greater than r not only among all ψs, but among all salient subclasses of the class of all ψs" (Cohen 1996, p. 90).

So far, I presented Cohen's semantics of generics. In the next subsection, I will show how this theory deals with troublesome examples, like the pair "Ducks lay eggs" and "Ducks are female". As pointed out above, these example are not easily accounted for by appealing to statistical facts. Given that Cohen's semantics is stated in probabilistic terms, it is interesting to see how it deals with these sentences.

2.3.3 A solution to the challenge

In the previous chapter, I discussed a set of examples that challenge statistical accounts of generics. In particular, I pointed out that the truth-values of (31) are at odds with the truth of generics depending on a single statistical condition:

(31) a. Ducks lay eggs.
b. Ducks are female.

[15] Cohen further refines the truth-conditions of generics so as to apply them to frequency adverbs and to habituals too. I won't discuss these refinements since I'm not concerned with frequency adverbs or habituals. For the complete formulation see Cohen 1996, chapter 6.

Indeed, female ducks outnumber egg-laying ducks. Hence, if the truth of generics was a matter of quantity, (31-b) should have better chances to be true than (31-a). Yet, (31-a) is true and (31-b) is false. Cohen's semantics, despite being based on statistical conditions, can correctly predict the truth-value of (31-a) and (31-b). Let's consider them in turn.

Sentence (31-a) is intuitively true. How is it analyzed in Cohen's theory? First, we have to determine which reading (31-a) gets. Since it doesn't seem to involve a comparison with alternative kinds, (31-a) presumably receives an independent reading: it says that ducks lay eggs *as opposed to* reproducing differently. We then have to determine the alternatives to *lay eggs* and the relevant individuals. ALT(*lay eggs*) is the set of reproduction manners {*laying eggs, giving birth to live young, undergoing mitosis*}, as observed above. Indeed, *lay eggs* minimally presupposes *reproduces* and terms for reproduction manners minimally presuppose *reproduces* as well. In other words, terms for ways of reproduction share a minimal presupposition with *lay eggs* and, thus, constitute its alternatives. Given that ALT(*lay eggs*) is the set of reproduction manners, the relevant individuals for (31-a) are ducks that either lay eggs or undergo mitosis or give birth to live young. Since no duck undergoes mitosis or gives birth to live young, the relevant individuals for (31-a) are egg-laying ducks. Since the generic received an independent reading, it is true iff the probability that an egg-laying duck lays eggs is greater than 0.5 (and this has to hold for all the salient partitions of ducks, by the homogeneity constraint). Clearly, this is the case and (31-a) is correctly predicted to be true by Cohen.

Let's consider (31-b). This sentence is intuitively false. Again, no comparison with alternative kinds seems involved and (31-b) receives an independent reading: it says that ducks are female *as opposed to* male. Quite intuitively, the alternatives to *be female* is the set of sexes, namely {*female, male*}. That's predicted by Cohen because *be female* minimally presupposes *sexed* and terms for sexes minimally presuppose *sexed* as well. In other words, {*female, male*} share a minimal presupposition with *be female* and, thus, constitute its alternatives. Given that ALT(*female*) is the set of sexes, the relevant individuals for (31-b) are sexed ducks. Every duck has a sex: every duck is either male or female. Hence, the relevant individuals for (31-b) are all ducks. Since the generic received an independent reading, it is true iff the probability that a sexed duck is female is greater than 0.5. By the homogeneity constraint, moreover, this has to hold for all the salient partitions of ducks. Cohen claims (1996: 98-99) that gender (or, more precisely, sex) is often a salient partition and it clearly is salient for (31-b). The probability that male ducks are female, though, is 0. Therefore, (31-b) does

not satisfy the homogeneity constraint and it is correctly predicted to be false by Cohen. Notice that, even if sex is a salient partition for (31-a) as well, the domain of relevant individual for this generic cannot be partitioned according to sex. Indeed, the relevant individuals for (31-a) are procreating ducks, namely adult female fertile ducks, and no male belongs to this domain. Hence, the homogeneity constraint doesn't threaten the truth of (31-a), but it crucial to predict (31-b)'s falsity.

In this section, I showed how Cohen copes with the troublesome pair in (31). These examples constitutes a challenge to statistical accounts of generics and yet Cohen's theory deals with them correctly.[16] A further merit of this theory is refraining from an appeal to normality. I argue that this is an advantage because, as I will show in the next chapters, claims of normality in generics are cancelable. Hence, they don't belong, I hold, to the semantics of generics. Rather, they are part of the pragmatics. In particular, I will argue, following Sally Haslanger (2011, 2012, 2014), that a claim of normality typically arises as an implicature when a generic is uttered. Given its empirical and theoretical adequacy, I adopt Cohen's semantics of generics.

[16]Leslie (2007) and Nickel (2016) have criticized of Cohen's theory. However, see Kirkpatrick (2019), Hoeltje (2017), and Rosola (2017) for replies to these criticisms.

Chapter 3

Generics and essentialism

3.1 Introduction

Sarah-Jane Leslie (2007; 2017) argues that generics lead to essentializing the categories they are about, namely generics promote the belief that the members of K (the category the generic is about) share a common nature. Experimental evidence seems to support this claim (see especially Gelman et al. 2010; Rhodes et al. 2012). Membership to an essentialized category was treated as warranting strong generalizations over the members of such category. That is, participants in the experiments expected that members of essentialized categories share the same properties. This is particularly worrisome when it comes to social categories as generalization over categories is the first step towards prejudice and discrimination.

However, Jennifer Saul (2017) argued that the empirical studies conducted so far do not conclusively prove that generics promote essentialization. She contends that the sentences employed in these experiments are clearly weaker than generics and to prove that generics foster essentialization they should be contrasted with equally powerful statements. Hence, whether generics promote essentialization is a contested matter and more empirical evidence is called for. In this work, I wish to approach the question theoretically. I will investigate whether there is any property of generics that could *in principle* explain their (supposed) key role in promoting essentialization. If there is no possible candidate, then it would be unreasonable to expect the experiments to find a special link between generics and essentialization. Imagine, instead, that generics turn out to possess a feature that might make them particularly suited for promoting essentialization. In this case, we would expect empirical studies to confirm Leslie's hypothesis. Moreover, we would have an account for this phenomenon.

Sally Haslanger (2011, 2012, 2014) argues that generics foster essentialization due to an implicit claim they convey. According to her, generics convey that the connection between the category K and the predicated property F "holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450, emphasis in the original). If the generic is accepted, this implicit claim enters the common ground and licenses the inference to the conclusion that the Ks share an essence, a common nature. As a result, the category K is essentialized. This mechanism explains how generics can foster essentializing beliefs on the categories they are about.

Haslanger's proposal can also account for another feature of generics, namely that the same generic can convey a statistical regularity, a principled connection, or a norm. For example, "boys don't cry" can mean that a large proportion of boys don't cry (statistical regularity), that not crying is a distinctive property of boys (principled connection), or that boys should not cry (norm). Haslanger (2014) argues that this phenomenon is due to the interaction between the implicit claim carried by generics and two assumptions: that robust regularities are due to the nature of things (Essentialist Assumption) and that things should express their natures (Normative Assumption).

Haslanger's proposal, then, proves powerful as it accounts for two distinct characteristics of generics: their ability to promote essentialization and the different types of generalizations they convey. In this chapter, I will present Leslie's hypothesis and discuss her proposal of a default mechanism of generalization. I will then summarize some empirical studies that support Leslie's hypothesis and present Saul's criticism. Finally, I will turn to Haslanger's proposal and show how it accounts for both the essentialization and the multiple generalizations phenomena.

3.2 Generics and essentialization

In "The Original Sin of Cognition: Fear, Prejudice and Generalization" (2017), Leslie defines what it means to essentialize a category:[1]

> We *essentialize* a kind if we form the (tacit) belief that there is some hidden, nonobvious, and persistent property or underlying na-

[1] In the literature discussing generics, "kinds" is conventionally used to refer to both natural and social kinds as well as to artifacts. In quotations from works on generics, like the one below and the others in this dissertation, "kinds" refers to artifacts, natural kinds, and social kinds. However, since in other areas of philosophy "kinds" is used for natural kinds only, I will sometimes employ the more neutral term "categories" to avoid confusion, as anticipated in chapter 1.

> ture shared by members of that kind, which causally grounds their common properties and dispositions.
>
> (Leslie 2017: 405, emphasis added)

> I will understand a kind or group to be *essentialized* just in case its members are viewed as sharing a fundamental nature that causally grounds a substantial number of their outwardly observable properties. This nature need not be biologically grounded, nor need it be seen as immutable or strictly necessary for membership in the kind.
>
> (Leslie 2017: 409, emphasis added)

The relevant notion of essentialism here is the *psychological* one, namely "the view that certain categories have an underlying reality or true nature that one cannot observe directly but that gives an object its identity, and is responsible for other similarities that category members share." (Gelman 2004: 404). This is distinct from *philosophical* essentialism, the view that an individual or a category has certain features necessarily, that is, in all possible worlds. In this work, I will use "essentialism" to refer to the psychological notion only. I am not concerned with philosophical essentialism and with discussions over necessary characteristics.

As Leslie clarifies, the supposed nature does not need to be something that reflects or can be traced back to biology. For example, Muslims are not taken to be biologically defined, and yet they are taken to be "*fundamentally different* from other groups of people, while also being *fundamentally all alike*"' (Leslie 2017: 411, emphasis in the original). In other words, the belief that Muslims do not share a biological nature does not impede the essentializing of the group.

Essentializing a social category is strongly problematic. Indeed, essentialized categories, Leslie argues, are the target of our generalizations. That is to say, we form stereotypes and prejudices over those social categories that we take to share a nature that causally grounds their properties and dispositions. Stereotypes and prejudices influence our actions and constitute the basis for racism, sexism, and other forms of discrimination.

There are many ways in which stereotypes affect our behavior. For example, members of a social group can face violence due to a negative stereotype. This is what, according to Leslie, caused a massive increase of hate crimes towards Muslims in the U.S.A. after the terrorist attacks of September 11th:

> Many of these crimes were committed against Muslim women and children; the perpetrators surely were not under the impression that

> their victims were themselves involved in or personally responsible for the 9/11 bombings. It was sufficient that the victims were Muslims. We might characterize the reasoning of the hate crime perpetrators as moving from the horrific events of 9/11 – events which involved a rather small number of extreme individuals – to *the conclusion that the arbitrary Muslim deserved to be victimized in virtue of being Muslim.* The conclusions drawn from the 9/11 attacks did not concern just the bombers and their supporters, but concerned Muslims in general.
> (Leslie 2017: 400, emphasis added)

Leslie argues that this way of generalizing is due to *humans' default mechanism of generalization.* In particular, this mechanism leads humans to generalize striking properties of few individuals to a category that is a good predictor for the possession of such properties. However, we rarely know which categories are actually good predictors for a certain property. This lack of knowledge, though, does not prevent us from generalizing. This does not mean that we generalize over random groups. For example, from the fact that all terrorists of September 11th had black hair, we do not conclude that black-haired people are terrorists. Rather, we generalize over essentialized categories. That's why some people generalized the property of being terrorist to Muslims, a group that, as observed above, is essentialized.

Leslie further maintains that generics give voice to humans' default mechanism of generalizations (Leslie 2007: 381, 383). She presents various psychological and linguistic data in support of this thesis.[2] Moreover, that generics express default generalizations can solve the Paradox of Generic Acquisition. That is, the surprising fact that children acquire generics earlier and easier than quantified sentences, even though generics have a tricky semantics while quantified sentences have a straightforward truth-conditions.[3]

Essentialized categories are, according to Leslie, the target of our default mechanism of generalization. And although, as Leslie observes, "the disposition to essentialize *some kinds or others* may be an immutable feature of our cognition, this does not determine *which* kinds we essentialize. While the available cross-cultural evidence suggests that essentialization may be a universal human

[2]In this work, I am not concerned with the truth of Leslie's hypothesis. I won't, therefore, consider the evidence for and against it.

[3]James Kirkpatrick (2019), chapter 4, though, questions that this is the case. He points out that *gen* is closer to an adverb of quantification than to quantificational determiners and quantificational determiners are acquired later than adverbs of quantification. Moreover, generics are acquired at about the same age as other adverbs of quantification. Kirkpatrick, thus, concludes that the acquisition pattern is not paradoxical, contra Leslie's claim.

phenomenon, there is significant cross-cultural variation in *which* kinds are seen as essentialized" (Leslie 2017: 415, emphasis in the original).

The language we are exposed to, among other factors, seems to make a difference in this respect. *Which* categories we essentialize is determined in part by the language we are exposed to. Leslie cites many empirical findings that support this hypothesis. For example, Graham, Kilbreath, and Welder (2004) found that 13-month-olds children expect dissimilar objects to share non-obvious properties if introduced with the same noun. This suggests that linguistic cues can shape our expectations on similarities between objects.

Generics seem to function as a linguistic cue that directs our cognitive system in selecting the targets of essentialization: several experiments provide evidence that generics lead to essentialize the categories they are about (Gelman, Star, and Flukes 2002, Gelman, Ware, and Kleinberg 2010, Rhodes, Leslie, and Tworek 2012, and Wodak, Leslie, and Rhodes 2015). I will present these studies in the next subsection.

3.2.1 Empirical evidence

A growing number of studies (Gelman et al. 2002, Gelman et al. 2010, and Rhodes et al. 2012, among others) found a relation between generics and *psychological essentialism*. These experiments provide evidence that generics play a peculiar role in leading both adults and children to develop essentialist beliefs about novel categories. Subjects in these experiments were divided into different groups and presented with a category. The category was novel in order to avoid answers based on pre-existing beliefs and biases that the subjects might hold. Each group of participants was given different lines of texts. Then, the experimenters compared how much subjects in each group essentialized the novel category. They measured subjects' tendency to explain the presence of a property F in terms of category K's supposed nature, or to infer that things with F are likely to belong to K, or to infer that the members of category K will share other properties besides F. The subjects exposed to generics showed a greater tendency to essentialize the novel category than those in the other groups.

In what follows, I will describe one of these experiments more in detail: Rhodes et al. (2012), which comprises three studies. Rhodes et al.'s (2012) experimental design traces Gelman et al.'s (2010). The main difference between the two is that the former introduced the participants with a *social* category and the latter with an *animal* category. Since I am here concerned with the effects of generics on the essentialization of social categories, I decided to present Rhodes et al. (2012)

instead of the original experiment.

To conduct their first study, Rhodes et al. (2012) created three illustrated storybooks regarding a fictional group of people called "Zarpies". Every picture was accompanied by a text-line, which described the depicted property, involving Bare Plural generics, as (1), or non-generic sentences, with or without labels, as, respectively, (2) and (3):

(1) Look at this Zarpie! Zarpies eat flowers.

(2) Look at this Zarpie! This Zarpie eats flowers.

(3) Look at this one! This one eats flowers.

In order to avoid the influence of possible participants' preexisting essentialist biases, Zarpies were depicted heterogeneous for ethnicity, gender, and age. Participants in the first study were both adults and four-year-old children. They were randomly assigned to either the generic or one of the specific (i.e., non generic) conditions.

Adults read the storybook twice, afterwards they were given a battery of tests designed to assess the extent to which they essentialized Zarpies. The acquisition of essentialist beliefs was measured by evaluating how strongly the participants expected a particular property to be innate, extensible to other members, or due to the category membership. Participants that took possession of a property to be due to intrinsic causes, to pass on to offspring, and to be shared by other Zarpies, were interpreted as bearing essentialist beliefs. Participants that, instead, took possession of a property to be due to incidental causes, to derive from upbringing, and not to be extensible to other Zarpies, were interpreted as not bearing essentialist beliefs.

Children, instead, listened to the storybook (read by an experimenter) two times in a first research session, then two times again in a second research session approximately three days later. After about three other days, they completed the tests measuring their essentialist beliefs about Zarpies. The first study confirmed that, as hypothesized by the experimenters, both adults and children in the generic condition essentialize Zarpies to a greater extent than the participants in the other two conditions.

The reason why participants in the generic condition essentialized Zarpies to a greater extent may not have been due to the use of generics per se; rather, the results of the first study may have been caused by the comparison between plural and singular Noun Phrases. Indeed, the NPs occurring in the generic condition were plural, while those in the two specific conditions were singular. To exclude

this alternative hypothesis, Rhodes et al. (2012) conducted a second study also employing generics with singular NPs. The storybook in the generic condition contained sentences with indefinite singular NPs, like (4); the one in the specific condition was written with sentences like (5):

(4) Look at this Zarpie! A Zarpie sleeps in tall trees.

(5) Look at this Zarpie! This Zarpie sleeps in tall trees.

This time, the study was completed in one research session for both adults and children. The book was read only twice to the children, and they completed the essentialist beliefs tests on the same day. To rule out that eventual differences were due to this change in the procedure rather than to the singular NP, a group of children was assigned again to a bare plural generic condition. Both adults and children in the generic conditions essentialized Zarpies to a greater extent that the participants in the specific condition. Furthermore, no difference was found between responses in the bare plural and indefinite singular generic conditions.

This study provided evidence that the results of the first experiment were not simply due to the comparison between plural and singular NPs, but that the generic construction itself leads to essentialize Zarpies more than specific statements. It also showed that the use of generics facilitated children's acquisition of essentialist beliefs very rapidly, while the first study demonstrated that this effect persists over time.

In their third and final study, Rhodes et al. (2012) tested the hypothesis that, in parent-child interactions, holding essentialist beliefs about a social category leads parents to produce more generics. Parents were randomly divided into two groups. Zarpies were presented as a very distinct social category, both biologically and culturally, to the first but not the second group of parents. The text presented to the latter, instead, described Zarpies as a non-distinct social group. Subsequently, both groups received a book about Zarpies that contained the same pictures used in studies 1-2, but without text-lines. Parents were asked to describe to their child the people and events depicted. The experimenters found that parents in the first group, who read the paragraph describing Zarpies as a very distinct social group, were more likely to produce generic language than those in the second group, who read the other paragraph. Parents in the first group also produced more negative evaluations about Zarpies.

Based on these results, Rhodes et al. (2012) concluded that generics promote essentialization of novel categories. Gelman et al. (2002), Gelman et al. (2010), and Wodak et al. (2015) reached the same conclusion. However, Saul (2017)

questions this claim. According to her, these experiments do not establish that generics play a special role in essentialization. I will present her criticism in the next subsection.

3.2.2 Saul's objection

Gelman et al. (2002), Gelman et al. (2010), Rhodes et al. (2012), and Wodak et al. (2015) argued that their findings show that generics foster the essentialization of novel categories. According to Saul, the evidence provided does not support this conclusion. The results obtained depend on the fact that "this K has F" is obviously a weaker claim than "Ks have F":

> A claim that [Ks] have property [F][4] attributes a shared property to a greater number of [Ks] than a claim that a particular [K] has property [F]. If all that I know about [Ks] is that they share some property then it will seem (at least somewhat) reasonable to infer that [Ks] have a shared nature. By contrast, if all that I know about [Ks] is that one of them has some property, I'll be more hesitant to attribute a shared nature to [Ks]. But there is no good reason to believe that generics are playing a key role here. It is entirely possible, given the evidence, that other attributions of a shared property would have exactly the same effect.
>
> (Saul 2017: 10)

According to Saul, "this K has F" is not comparable to "Ks have F" since they clearly differ in strength. Moreover, she argues, "this K has F" is not appropriate for another reason:

> I suspect that this form of words ['this K has property F'] will, at least in contexts where we're being introduced to [Ks], carry the implicature that [Ks] with property [F] are not the norm. [...] This suggests, then, that 'this [K] has property [F]' is an especially bad choice of contrast term for the generic claim.
>
> (Saul 2017: 10-11)

As Saul reports, Gelman et al. (2002) (unlike, for instance, Rhodes et al. 2012 described above) did not test "this K has property F". Categories in this study

[4] In the original text Saul uses "F" for the category and "P" for the property. However, since so far, following Leslie, I have used "K" for the category and "F" for the property, I substituted the letters in the quotations from this paper, for sake of uniformity.

were presented either with a quantified sentence like "some Ks have F" and "all Ks have F" or with a generic like "Ks have F". Subjects exposed to *all*-quantified sentences showed the greatest tendency to essentialize, followed by subjects exposed to generics. Subjects confronted with *some*-quantified sentences essentialized the least. Hence, universal quantified statements seem to promote essentialization more than generics. This result, is not surprising since *all*-quantified sentences do not tolerate exceptions, contrary to generics.

Gelman et al. (2002) demonstrate also that generics license more inferences than *some*-quantified sentences. This, again, is no surprise since *some*-quantified sentences are especially weak. Saul argues that generics should be compared with stronger sentences, like "many Ks have F"; "most Ks have F"; "this K has F, and this K has F, and this K has F, and...". She hypothesized that these constructions lead to essentializing too. However, they have not yet been tested, and Gelman et al. (2002) makes no exception.

Therefore, Saul concludes that the empirical findings cited by Leslie do not prove that generics especially promote essentialization of novel kinds. To prove this point, they should be compared with *many*- and *most*-quantified sentences and with repeated observations ("this K has F, and this K has F, and this K has F, and..."). She writes:

> If my supposition here is correct, then these property attributions ['many Ks have property F'; 'most Ks have property F'; 'this K has property F, and this K has property F, and this K has property F, and...'] may also lead to essentialising. And yet, they have not been tested. All that we know so far is that attributing a property to [Ks]is more likely to lead to essentialising than attributing a property to a [K]. It seems to me that this is an insufficient evidence base for inferring a special problem with generics and trying to re-phrase our utterances.
>
> (Saul 2017: 10)

It seems to me that Saul is right that the current data are not conclusive. The experiments conducted so far are not enough to establish whether generics play a special role in promoting essentialization. In particular, the data collected hitherto are compatible with other statements promoting essentialization to the same extent, or even to a greater extent, than generics: since "many Ks have F"; "most Ks have F"; "this K has F, and this K has F, and this K has F, and..." have not been tested, it is possible that they foster essentialization even more than generics do. One way to settle this issue is to conduct more experiments.

I argue that before conducting more experiments a better understanding of the matter is needed.

3.3 A defense of a theoretical approach

In the previous section, I presented some experiments providing evidence that generics play a special role in essentializing: they seem to encourage the formation of essentialist beliefs about the categories they are about. As observed by Saul (2017), these experiments are not conclusive and she calls for more empirical research. It seems to me that we need to take a step back. In order to conduct effective experiments, we need to formulate accurate hypothesis, and this presupposes a good grasp of what is going on. If we don't know what could make generics particularly suited for promoting essentialization, designing good experimental studies is difficult.

Generics are obscure under several points of view. Above all, their semantics is tricky. And, crucially for the question at issue, we don't know *how* they might encourage the formation of essentialist beliefs. My claim here is that investigating this issue is beneficial for future empirical studies: it allows researchers to formulate better hypothesis that, in turn, can improve the experimental design. As seen above, overlooking certain constructions did not allow Gelman et al. (2002), Gelman et al. (2010), Rhodes et al. (2012), and Wodak et al. (2015) to prove what they were trying to demonstrate. Comparing generics with the relevant sentences is required for an experiment to be successful. To me, then, it is important to identify what sentences should be tested and, for this purpose, it is crucial to better understand what is the mechanism leading to essentialization. Determining what, if anything, can encourage the formation of essentialist beliefs would allow us to single out the sentences that might activate this process, the ones possessing the relevant features. These will be the sentences to test.

Theory is necessary to formulate empirical questions and hypothesis, and even though this is quite uncontroversial, very little work has been done on investigating the mechanism behind essentialization. Leslie, for one, does not tackle this issue. As seen above, she discusses what happens *when* a category gets essentialized. But she does not give an account of *how* the essentialization occurs, what process results in the category being essentialized. Again, I believe that understanding how this works is important both in itself, as a theoretical question, and for improving the related empirical research. Thus, I will devote the rest of this work to investigate what linguistic feature of generics, if any, encourages people

in believing that the Ks share a common essence.

My starting point is Haslanger's proposal (2011, 2012, 2014), that offers a possible account of *what* enables generics to promote essentialization and *how* this works. She argues that generics encourage the formation of essentialist beliefs due to an implicit claim: that the connection between Ks and F "holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). According to Haslanger, this claim further licenses an inference to the conclusion that the Ks share an essence, thus, promoting essentialist beliefs over category K. I will present her proposal in the next section.

3.4 Haslanger's proposal

The question I'm concerned with in this work is what linguistic feature of generics, if any, allows them to promote essentializing. To address this question, I rely on Haslanger's proposal (2011, 2012, 2014):

> In uttering a generalization, one has several options. One can express the generalization using a quantified statement such as:
>
> All [most/some] [Ks] are [F].[5]
>
> One can also use a generic:
>
> [Ks] are [F].
>
> In choosing a generic, it appears that one is saying of a kind of thing, specified in the statement, that its members are, or are disposed to be [F] (or to [F]) *by virtue of being of that kind*. The speaker conveys that being [F] is somehow rooted in what it is to be a [K]: [F]-ing is what [Ks] do (or are disposed to do) by virtue of being [K]. This locates the source of the [F]ness in being a [K].
>
> (Haslanger 2012: 457)

Haslanger maintains that a speaker expressing a generalization with a generic, as opposed to a quantified statement, conveys that Ks are F *by virtue of being K*. In other parts of the article, Haslanger phrases the conveyed claim differently and it seems that this claim is not conveyed by the utterance of a generic directly.

[5] In the original text Haslanger uses 'F' for the kind and 'G' for the property. For the sake of uniformity, I substituted the letters in the quotations of Haslanger's paper to let 'K' for the kind and 'F' for the property.

Rather, it is arrived at by a two-step process. First, according to Haslanger, Bare Plural generics ("generics of the form Ks are F") convey that the connection between the category and the property holds primarily by virtue of some important fact about the category as such:

> with generics of the form Ks are F [...] there is normally an implication that the connection between the Ks and F [...] holds primarily by virtue of some important fact about the Ks *as such*.
>
> (Haslanger 2012: 450, emphasis in the original)

Take, for instance, (6):

(6) Muslims pray five times a day.

According to Haslanger's proposal, a speaker uttering (6) conveys (7):

(7) The connection between *being Muslim* and *praying five times a day* holds primarily by virtue of some important fact about Muslims *as such*.

If a speaker utters a sentence and no one challenges it, the proposition expressed enters the common ground, that is, the set of assumptions shared by the participants in a conversation. It becomes a background information, which the speakers can take for granted and rely on. The implicit claims conveyed with the utterance, if unchallenged, enter the common ground too. Hence, when (6) is uttered, (7) is added to the common ground. The participants to the conversation can now assume that the connection between *being Muslim* and *praying five times a day* holds primarily by virtue of some important fact about Muslims *as such*.

Specifically, according to Haslanger, this piece of information licenses the inference to the further claim that *praying five times a day* depends on the generic essence of Muslims, that is, it depends on the essence *of the category* of Muslims. Generic essence, indeed, is the essence of a category. It is opposed to objectual essence, namely the essence of an individual:

> Kinds "have$_g$" an essence that constitutes *what it is to be of that kind*; individuals are instantiations of this kind-essence and "have$_o$" the kind-essence as their individual essence.
>
> (Haslanger 2012: 454, emphasis added)

The passage from (7) to the claim of generic essence constitutes the second step. Haslanger describes the process in this passage:

> if one asserts that [Ks are F], then it is implicated that under "normal" circumstances it is something about being [a K] that makes [a K an F], that [Ks] *as such* are disposed to be [F].This is a pragmatic implicature and can normally be defeated or canceled. But if unchallenged, it licenses the inference from the generic [Ks are F] to a claim of generic essence: [Ks are F] by virtue of what it is to be [a K].
>
> (Haslanger 2012: 457-458, emphasis in the original)

The idea, then, is that a speaker uttering a generic conveys that, under "normal" circumstances, *it is something about being a K that makes a K an F, that Ks as such are disposed to be F*. If unchallenged, this claim enters the common ground and licenses the inference to a claim of generic essence. In other words, uttering a generic, according to Haslanger, conveys an implicit claim that, in turn, *licenses an inference* to a claim *concerning the essence* of category K, what it is to be a K.

Now, Haslanger does not further detail how this results in the essentialization of K. But, clearly, that having F is due to the generic essence of Ks *requires* that Ks *have* a generic essence. How can Ks have F by virtue of the generic essence of Ks if there is no such essence? We might argue, then, that such information (i.e., that Ks *have* a generic essence) is added to the common ground, if not present yet.

Let's see how this work with the help of our example (6). According to Haslanger's proposal, a speaker uttering (6) conveys (7):

(6) Muslims pray five times a day.

(7) The connection between *being Muslim* and *praying five times a day* holds primarily by virtue of some important fact about Muslims *as such*.

As seen above, (7), if unchallenged, is added to the common ground and licenses the inference to a claim of generic essence:

(8) Muslims pray five times a day by virtue of what it is to be a Muslim.

But (8) presupposes that Muslims "have$_g$" an essence that constitutes *what it is to be a Muslim*. That is, (8) presupposes that Muslims have a generic essence, that there exists an essence of the category of Muslims:

(9) There exists a generic essence of Muslims.

Since (8) presupposes that there exists an essence of Muslims, this information

is added to the common ground, if it didn't belong to it already. Our common ground now includes all the ingredients to essentialize Muslims: that there exists an essence of Muslims and that a certain feature of Muslims depends on this essence, as expressed by (8). Recall Leslie's definition:

> We *essentialize* a kind if we form the (tacit) belief that there is some hidden, nonobvious, and persistent property or underlying nature shared by members of that kind, which causally grounds their common properties and dispositions.
>
> (Leslie 2017: 405, emphasis added)

To essentialize a kind we need to believe (a) that there is some underlying nature shared by members of this category and (b) that this underlying nature causally grounds their common properties and dispositions. Our common ground now includes both pieces of information: (a) is provided by (9) and (b) by (8). If, based on them, we form the belief that Muslims have an underlying nature, which causally grounds their common properties and dispositions, we will essentialize the category of Muslims. This is how generics can encourage the formation of essentialist beliefs.

To recap, Haslanger claims that a speaker uttering a generic of the form "Ks are F" (that is, a Bare Plural generic) conveys that *the connection between the Ks and F holds primarily by virtue of some important fact about the Ks as such.* If unchallenged, this implicit claim enters the common ground and licenses an inference to a claim of generic essence. Such a claim presupposes that *there is* a generic essence of K. As a result, the common ground includes the information that (a) that there is some underlying nature shared by members of K and (b) that this underlying nature causally grounds their common properties and dispositions. That is, the common ground contains the ingredients for essentializing a category. Generics can encourage the formation of essentialist beliefs through the process described.

According to Haslanger, however, not every utterance of generics conveys that the connection between the Ks and F holds primarily by virtue of some important fact about the Ks *as such.* In particular, she claims, the claim is not conveyed when no explanation is being called for. In the next section, I will consider this exceptions and present the reasons motivating it.

3.4.1 Statistical generics: an exception

According to Haslanger "in cases where it is obvious that there is no non-accidental connection between the kind and the predicate, [...] there is no implicature" (Haslanger 2012: 471). That is, Haslanger distinguishes between generics that indicate non-accidental connections, like (33), and those that indicate accidental connections, like (10):

(33) Birds fly.

(10) Cars have radios.

This distinction might seem *ad hoc*, but is not: it is consistent with a broader difference between these categories of generics. Specifically, they differ in distribution. As discussed above (see Krifka et al.'s test on non-accidental properties), generics that express mere statistical regularities, contrary to those indicating non-accidental connections, cannot occur with an Indefinite Singular Noun Phrase. This fact is exemplified, e.g., by the contrast between (11) and (12):

(11) a. Cars have engines.
b. The car has an engine.
c. A car has an engine.

(12) a. Cars have radios.
b. The car has a radio.
c. # A car has a radio.

The sentences in (11) indicate a principled connection and are all acceptable, but the indefinite singular (12-c), that expresses a statistical connection, does not receive a generic interpretation. An empirical study (Leslie et al. 2009) also found different acceptance patterns between statistical and non-statistical generics (i.e., respectively, those expressing statistical connections and those indicating principled connections), as Haslanger reports (2012: 471, footnote 26).

Haslanger (2014) provides an explanation for why statistical generics do not convey the implicit claim. She first hypothesizes that "[t]he shared background assumptions about the natures of the kinds in question prevent the implicature" (Haslanger 2014: 381). The idea is that (10) does not convey that the connection between cars and *having a radio* is robust (i.e., it holds primarily by virtue of some important fact about cars *as such*) *because* this clashes with our background assumptions about cars. Claims that contradict what is assumed do not automatically get added to the common ground. Hence, that we know *having a radio*

does not belong to the essence of cars might prevent the implicit claim that the connection is robust from entering the common ground.

However, she points out, sometimes conveyed claims at odds with the common ground get successfully added to it. Haslanger provides this example: her family's common ground includes the information that they will have dinner together tonight. This, though, does not prevent her from communicating the contrary through implicature. If she says "I'm going to the theater tonight", implicating that she won't have dinner with her family, the implicature enters the common ground even though it clashes with the pre-existing assumption that they would have dinner together. Hence, that a conveyed claim contradicts the common ground is not sufficient to eschew it.

She concludes that "[g]iven that claims of generic essence are efforts to offer an explanation in terms of significant features of the kind in question, when an explanation is not being called for, there is no implicature" (Haslanger 2014: 382). The clearest case of a request for explanation is a direct question. For example, I call for an explanation by asking, looking at a starving dog on a mountain trail, "Why is she so emaciated?". Replying "dogs don't eat pinecones", Haslanger argues, would convey that dogs, as such, don't eat pinecones. The implicature arises in this case because an explanation for why the dog is emaciated was called for.

What distinguishes between utterances of generics conveying that the connection between the Ks and F is robust and those that don't is the context of utterance. In particular, whether in that context an explanation was called for or not. This distinction enables Haslanger to account for a further feature of generics, namely that they convey different generalizations. I will explore this issue in the next subsection.

3.4.2 Generics and multiple generalizations

Generics display a peculiar behavior: the same generic can indicate a statistical regularity, a principled connection, or a norm. Consider, for example, (13):

(13) Philosophers are rational.

The above sentence can, according to the context, mean that a large proportion of philosophers are rational (statistical regularity), that being rational is a characteristic property of philosophers (principled connection), or that philosophers *should* be rational (social norm). Consider the following fictional context:

C1 The dataset supported the generalization that *philosophers are rational*. The experimenters remained neutral as to whether an explanation can be provided for this correlation.

It seems that, in this context, (13) simply points at a statistical fact: a correlation emerging from the dataset. Suppose now that (13) is uttered in the following exchange:

C2 A: How can Jane be so impassive in this situation?
B: Philosophers are rational.

In this case, (13) has a different meaning: B is saying that being rational is somehow characteristic of philosophers. Finally, consider C3, where the speaker addresses a philosopher:

C3 You should calm down: *philosophers are rational*.

Here (13) indicates a social norm: it says that being rational is what a philosopher *should* do.

Sally Haslanger (2014) offers a pragmatic account of this phenomenon. According to Haslanger, what allows (13) to indicate a principled connection in context C2 is the implicit claim conveyed by the (utterance of the) generic. As seen above, Haslanger argues that generics, in certain contexts, convey that "the connection between the Ks and F holds primarily by virtue of some important fact about the Ks *as such*, or by virtue of *what it is to be a K*" (Haslanger 2014: 370, emphasis in the original). That is, (13) in C2 conveys (14):

(14) The connection between *being philosopher* and *being rational* holds primarily by virtue of some important fact about philosophers *as such*.

This implicit claim interacts with an assumption that, according to Haslanger (2014: 379), is typically part of the common ground:

Essentialist Assumption Robust (meaningful?) regularities are not accidental. They are due to the nature of things.

The implicit claim conveyed by sentence (13) in C2, joined with the *Essentialist Assumption* further licenses an essentialist claim about philosophers. That is, a statement claiming that being rational is grounded in the generic essence of philosophers. Essences explain facts, behaviors, and characteristics of individuals. Thus, Haslanger argues, generics import an explanation: membership to

category K *explains* the possession of property F.

Sometimes, the common ground includes a further assumption:

Normative Assumption Things should express their natures and under normal conditions they will. Abnormal circumstances are not good and should be avoided or changed.

In such contexts, the essentialist claim (resulting from the interaction between the implicit claim of generics and the Essentialist Assumption) combines with the *Normative Assumption*, inducing "that it is right and good for [Ks] to be [F], and [Ks] that are not [F] are defective" (Haslanger 2014: 380). This is what happens in context C3: given the essentialist claim about philosophers and the *Normative Assumption*, (13) indicates a social norm. Since being rational is grounded in the generic essence of philosophers and since, according to the *Normative Assumption*, things should express their natures, then philosophers *should be rational*.

What about C1? Since no explanation in called for in this context, generic (13) does not convey that the connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*. Consequently, the sentence expresses a mere statistical claim and no further specifications of the connection are communicated.

To sum up, according to Haslanger, if a generic is meant to provide an explanation for a certain fact, it conveys that "the connection between the Ks and F holds primarily by virtue of some important fact about the Ks *as such*". This implicit claim combines further with the *Essentialist Assumption*, inducing an essentialist claim. In some contexts, the essentialist claim further combines with the *Normative Assumption*. As a result, the generic indicates a norm. Generics can indicate different types of generalizations, then, because of the claim they convey when an explanation is called for and because of its interaction with other elements of the common ground, namely the *Essentialist* and the *Normative Assumptions*. If no explanation is called for, the generic simply expresses a statistical relation, with no further implicature.

This theory has consequences for the semantics of generics. Haslanger proposes to "postulat[e] one basic type (perhaps statistical?) of generics, and accounting for the different uses of generics in terms of implicatures" (Haslanger 2014: 382-383). In this view, all generics have the same semantics, defined for statistical generics. What distinguishes a generic that indicates a principled connection or a norm lies in pragmatics and does not affect the truth-conditions of these sentences. It should be noticed, though, that Haslanger does not provide the truth-conditions for statistical generics. Her proposal, however appealing, is

underdeveloped as it stands and needs to be implemented with a semantics of statistical generics. As stated above, I adopt Cohen's theory. My proposal, then, is to integrate Haslanger's pragmatics with Cohen's semantics. This combination seems promising as Cohen's account does not involve reference to normality and relies on statistical considerations only.

3.5 To be determined

As seen in the previous section, Haslanger's proposal can account for two distinct phenomena related to generics: their (supposed) ability to promote essentializing and the different types of generalization generics can convey. As Haslanger acknowledges, her analysis is not fully spelled out. In particular, she does not take a stand on the nature of the implicit claim she hypothesizes. Even if she uses the term "implicature" in some passages, in two footnotes she specifies that the implicit claim generics conveyed could be of a different kind:

> I'm actually not sure whether it is better to consider it an implication or a presupposition. I'm willing to adjust my account to accommodate evidence for either. My goal in this paper is programmatic and I am aware that much more work needs to be done on the details.
> (Haslanger 2014: 370, footnote 9)

> It is a difficult and contested matter how to distinguish what enters the common ground through implicature and what enters through presupposition. For my purposes, little hinges on this [...]. I will use the model of implicature to account for the examples we're looking at, but it may be that they are better handled differently.
> (Haslanger 2014: 377, footnote 32)

Which category does the implicit claim of generics belong to? Is it a presupposition, an implicature or something else? I will devote the next chapter investigating these points. For this purpose, I will apply the tests for presuppositions and implicatures.

3.6 Conclusions

In this chapter, I presented Leslie's hypothesis that generics encourage the formation of essentialist beliefs on the categories they are about. She cites several

studies (Gelman et al. 2002, Gelman et al. 2010, and Rhodes et al. 2012, among others) that provided evidence for this hypothesis. Saul (2017), though, argued that these experiments do not demonstrate that generics *especially* promote essentializing. To prove this, generics should be contrasted with equally strong sentences: "many Ks are F", "most Ks are F", and "this K is F, and this K is F, and this K is F, and...". Thus, Saul calls for more empirical research.

I contended that a better understanding of the mechanism behind essentializing would improve the experimental design of further studies. Hence, I analyzed the relation between generics and essentialization under a theoretical point of view. The question I focused on is: what linguistic feature of generics, if any, encourages the formation of essentialist beliefs, and how? To answer this question, I relied on Haslanger's proposal that (non-statistical) generics convey that the connection between Ks and F *holds primarily by virtue of some important fact about the Ks as such.* When a generic is accepted, this implicit claim enters the common ground and licenses the inference to a claim of generic essence, which presupposes that *there is* a generic essence of Ks. holding these beliefs amounts to essentializing kind K.

Finally, I showed how this theory can account for another phenomenon connected to generics. A generic can indicate different types of generalizations: a statistical regularity, a principled connection, or a norm, depending on the context. According to Haslanger, these uses of generics have the same semantics. The difference lies in the pragmatics: those indicating a principled connection convey an essentialist claim and those indicating norms convey a normative claim. Generics expressing statistical regularities, instead, lack these implicit claims. This proposal has the advantage of assuming a unified semantics for generics. Haslanger does not argue for any particular semantic theory of generics. I endorsed Cohen's as it exclusively relies on statistical observations.

I concluded the chapter by pointing out that Haslanger does not investigate whether the implicit claim conveyed by generics is a presupposition or an implicature. In the next chapter, I will focus on this point. I will start by applying the tests for presupposition and implicature.

Chapter 4

The implicatures of generics

4.1 Introduction

In the previous chapter, I presented Haslanger's proposal: non-statistic Bare Plural generics convey that the connection between the kind K and the predicated property F "holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). As I pointed out, Haslanger does not take stand on the nature of this claim. In this chapter, I apply the linguistic tests to determine whether this implicit claim (which I will refer to as the "robustness proposition") is a *presupposition*, an *implicature*, or neither of the two. First, I apply the tests for presuppositions, that the *robustness proposition* does not pass. I then proceed in testing for implicatures. These tests give positive results. Thus, I conclude that the *robustness proposition* is an *implicature*.

I further investigate what kind of implicature the *robustness proposition* is. Since it is cancelable, it is not a conventional implicature but rather a conversational one. Furthermore, given that this implicature arises in every context unless defeated, I conclude that it is generalized and not particularized. Finally, I present Levinson's theory of generalized conversational implicatures and I apply it to generics. I propose that generics, by being unmarked, give rise of an *I-implicature*.

Haslanger, though, seems also to argue that the implicature varies according to what form of explanation is called for in a particular context. In this case, the implicature would be a particularized conversational implicature. I argue that the best way to understand Haslanger's argument is to posit two distinct implicatures: the *robustness proposition*, a generalized conversational implicature, and the "explanatory implicature", a particularized conversational implicature. While the *robustness proposition* accounts for the essentializing power of generics,

the *explanatory implicature* accounts for the different generalizations they convey.

4.2 Presupposition or implicature?

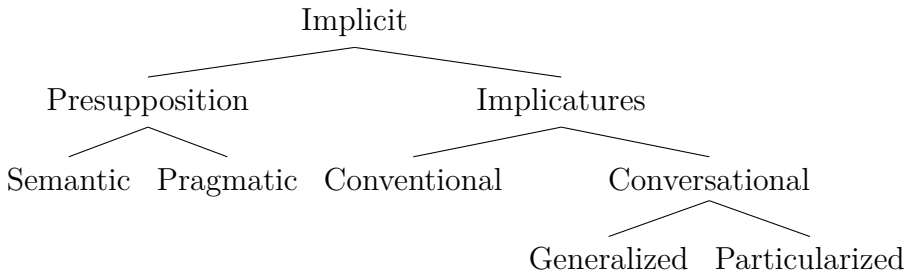
In the previous chapter, I presented Haslanger's proposal. According to her, non-statistical generics of the form Ks are F (i.e., with a Bare Plural subject NP) convey "that the connection between the Ks and F holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). That is, Haslanger argues that non-statistical Bare Plural generics convey that the connection between Ks and F is *robust*. She does not, however, take stand on whether this claim is a presupposition or an implicature. I will devote this section to investigate on this issue.

Intuitively, a presupposition is what is taken for granted rather than being asserted. An implicature is, roughly, a defeasible consequence of a sentence.

Presuppositions can be semantic or pragmatic. A *semantic presupposition* of a sentence must be true in order for the sentence to be truth evaluable; a *pragmatic presupposition* is a proposition that the speaker assumes to be true. The latter is a broader notion: a speaker pragmatically presupposes all the semantic presuppositions of the sentences they utter, but not every pragmatic presupposition is semantic as well.

Paul Grice, who introduced the notion of implicature, distinguished two main types of implicatures: conventional and conversational. *Conventional implicatures* are determined by the conventional meaning of the words used; *conversational implicatures* follow from assumptions underlying conversational exchanges. According to Grice, speakers conform to the Cooperative Principle, which prescribes to make one's conversational contribution compliant with the purposes of the conversation one is involved in. Conversational implicatures arise when speakers contravene the Cooperative Principle.

Conversational implicatures can be distinguished further, according to the conditions in which they emerge. Those arising by default in all contexts, unless some unusual contextual assumptions defeat them, are generalized. Particularized conversational implicatures, instead, can arise only provided some specific contextual assumptions. The resulting taxonomy is illustrated in the tree below:



In what follows I will use some standard tests to determine what type of implicit is the claim conveyed by generics. If it is a *semantic presupposition*, it should display a projective behavior; the "Hey, wait a minute" test will determine if it is a *pragmatic presupposition*. If the implicit claim can be canceled, then we might be dealing with a *conversational implicature*, otherwise it may be a *conventional implicature*. Finally, to distinguish between *particularized* and *generalized* conversational implicature we should consider whether the claim arises by default or if a specific context is required.

4.2.1 Tests for presuppositions

As anticipated above, we can distinguish two notions associated with the phenomenon of presupposing: *semantic presupposition* and *pragmatic presupposition*. The former is a relation between propositions or sentences, while the latter is a relation between a proposition and a person. As Robert Stalnaker (1973: 447) characterizes them:

Semantic Presupposition "one sentence presupposes another just in case the latter must be true in order that the former have a truth value at all";

Pragmatic Presupposition "[a] person's presuppositions are the propositions whose truth he takes for granted, often unconsciously, in a conversation, an inquiry, or a deliberation. They are the background assumptions that may be used without being spoken".

Notice that a semantic presupposition is typically also a pragmatic presupposition as speakers tend to take for granted the propositions that are necessary for the truth of what they say. For example, (1) semantically presupposes that Ali used to smoke:

(1) Ali quit smoking.

If Ali didn't use to smoke, then (1) is neither true nor false. A speaker uttering (1) takes for granted (i.e., pragmatically presupposes) that Ali used to smoke. The reverse, though, doesn't hold: not all pragmatic presuppositions are semantic presuppositions as well. Indeed, speakers can take for granted propositions that go beyond what has to be true for their utterances to have a truth-value. Take for example (2), (1)'s translation in Italian:

(2) Ali ha smesso di fumare.

A speaker uttering (2) pragmatically presupposes that their audience understands Italian. This, however, is not a *semantic* presupposition of (2): the sentence has a truth-value even though the audience does not understand Italian. If (2) semantically presupposed that the speaker's audience knows Italian, then the presupposition's truth would be necessary for (2) to have a truth-value: (2) would have a truth-value only if the audience actually understands Italian.

Let's now focus on semantic presuppositions. One distinctive feature of this type of presuppositions is their ability to project. That is, if a sentence S presupposes P then so do larger structures embedding S, like the following:

(3) a. Not S.
b. Is it the case that S?
c. If S, then Q.

Let's see it by means of an example:

(4) a. Jane realized that Italy is in Europe.
b. [Presupposition:] Italy is in Europe.

(5) a. Jane did not realize that Italy is in Europe.
b. Did Jane realize that Italy is in Europe?
c. If Jane realized that Italy is in Europe, then she will pass the exam.

Sentence (4-a) presupposes (4-b) and so do sentences (5-a)-(5-c). The projective behavior of presuppositions can be used to determine whether a sentence S has a presupposition P: if P survives in constructions (3-a)-(3-c), then it is a candidate for being a presupposition of S. Let's apply this test to a generic sentence. Intuitions are sharper with respect to generics about natural kinds than with respect to those about social kinds (henceforth "social generics"). Therefore, I will test a generic about a natural kind first and, if the outcome is positive, I will test a social generic to check whether the result replicates. Consider (6):

(6) Ducks eat wheat.

Sentence (6) is a non-statistical Bare Plural generic. Hence, according to Haslanger's hypothesis, it should convey what I dub the "robustness proposition" (or RP), namely (7):

(7) [RP:] The connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

Let's apply the projection test to check whether (6) presupposes (7):

(8) **Test #1: projection**

a. Ducks do not eat wheat.
#The connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

b. Do ducks eat wheat?
#The connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

c. If ducks eat wheat, then Daisy Duck eats wheat.
?The connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

Sentences (8-a) and (8-b) do not seem to presuppose (7), and it is not clear whether (8-c) does.[1] This datum indicates that (7) is not a semantic presupposition of (6). It could still be a *pragmatic* presupposition, though: as observed above, not all pragmatic presuppositions are semantic presuppositions as well. The *Hey, wait a minute* test (Shanon 1976, von Fintel 2004) can help us check for this possibility. Indeed, since some presuppositions are pragmatic but not semantic, a test for the former may identify presuppositions that elude the tests for the latter. According to Katharina Felka (2015), the *Hey, wait a minute* test "is capable to detect pragmatic presupposition. For if a speaker takes a proposition ϕ for granted in uttering S, then one can object 'Hey wait a minute!' " (Felka 2015: 1410). To show that, Felka proposes the following example, where speaker A, in uttering the first sentence in (9), *pragmatically* presupposes their audience to understand German:

(9) A: In der Küche gibt es Kaffee.
(Translation: there is coffee in the kitchen)

[1] I here use the hash to indicate that the claim is not conveyed and the question mark to indicate uncertainty on whether it is conveyed.

B: Hey, wait a minute. I don't understand German.

C: #Hey, wait a minute. I had no idea that there was coffee in the kitchen.

B's reply is appropriate since it questions A's pragmatic presupposition. On the contrary, C's reply is not appropriate since it questions what is asserted rather than what is presupposed. The *Hey, wait a minute test*, therefore, seems able to detect not only semantic presuppositions but (solely) pragmatic ones too. Let's apply it to our generic (6):

(10) **Test #2: Hey, wait a minute**

A: Ducks eat wheat.

B: #Hey, wait a minute. I had no idea that the connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

B's utterance does not seem an appropriate reply to A's one. Therefore, the pair (6)-(7) does not pass the test for pragmatic presuppositions either. It seems, thus, that (7) is not a presupposition of (a speaker uttering) (6). But the possibility that (7) is an implicature of (6) still remains an option. I will check for it in the next subsection.

4.2.2 Tests for implicatures

According to the definition given in Chierchia and McConnell-Ginet (1990), S conventionally or conversationally implicates Q when "Q follows from the interaction of the truth conditions of S together with either linguistic conventions on the proper use of S or general principles of conversational exchange" (p. 286). Conventional implicatures are generated by the conventional meaning of linguistic expressions, while conversational implicatures arise due to the Cooperative Principle and the maxims of conversation. This principle prescribes the speakers to make their conversational contribution "such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged" (Grice 1975: 26). Grice further articulates this principle in four maxims: Quantity, Quality, Relation, and Manner. The Maxim of Quantity requires the speaker (Q1) to make their contribution as informative as required (for the purposes of the exchange) and (Q2) not to make their contribution more informative than is required. The Maxim of Quality prescribes to make a contribution that is true by (1) avoiding saying what one believes to be false and (2) avoiding saying what one doesn't have adequate evidence for. Ac-

cording to the Maxim of Relation, the utterance should be relevant. Finally, the Maxim of Manner asks the speaker to be perspicuous by (M1) avoiding obscurity of expression, (M2) avoiding ambiguity, (M3) being orderly, and (M4) being brief, that is, avoiding unnecessary prolixity. Implicatures arise from the violation or the flouting of one of these maxims.

Grice identifies five features of conversational implicatures:

Cancelability a conversational implicature "may be explicitly canceled, by the addition of a clause that states or implies that the speaker has opted out, or it may be contextually canceled, if the form of utterance that usually carries it is used in a context that makes it clear that the speaker is opting out" (Grice 1975: 39);

Nondetachability "[t]he implicature is nondetachable insofar as it is not possible to find another way of saying the same thing (or approximately the same thing) which simply lacks the implicature" (Grice 1989a: 43);

Calculability "[t]he presence of a conversational implicature must be capable of being worked out" (Grice 1975: 31). That is, as Stephen C. Levinson puts it, "for every putative implicature it should be possible to construct an argument [...] showing how from the literal meaning or the sense of the utterance on the one hand, and the co-operative principle and the maxims on the other, it follows that an addressee would make the inference in question to preserve the assumption of co-operation" (Levinson 1983: 117);

Non-conventionality "initially at least, conversational implicata are not part of the meaning of the expressions to the employment of which they attach" (Grice 1975: 39).

Indeterminability "an expression with a single meaning can give rise to different implicatures on different occasions, and indeed on any one occasion the set of associated implicatures may not be exactly determinable" (Levinson 1983: 117-118).

Grice further argues that, even though the presence of these features is not sufficient to provide a decisive test for implicatures, "at least some of them are useful as providing a more or less strong prima facie case in favor of the presence of a conversational implicature" (Grice 1989a: 43). Cancelability and calculability are the most reliable tests for implicatures. Non-detachability and indeterminability are features that can provide further support to the hypothesis that a putative

implicature is a genuine one. I will present the tests for each feature by means of an example. Then, I will apply the tests to a generic sentence to gather support for or against the hypothesis that the robustness proposition is an implicature.

Before turning to the tests, I wish to emphasize a consequence of the non-conventionality property. As Levinson observes (1983: 117), from the fact that conversational implicatures are not part of the literal meaning of linguistic expressions it follows that the truth-value of a sentence and of its implicatures are independent. This is to say, not only a true sentence can have a true implicature, it can also have a false implicature. The same holds for a false sentence, that can have a true implicature as well as a false one. For example, if I say that some students passed the exam, I implicate that not all of them did. The implication arises (unless defeated) regardless of whether at least one student passed the exam (and my utterance is true) or none of them did (and my utterance is false). It arises, moreover, independent of whether some students did not pass the exam, which means the implicature is true, or every student passed it, which means the implicature is false. Hence, that a claim strikes as false doesn't mean it isn't implicated. It's important to bear this in mind when approaching the tests to avoid mistaking an implicature's falsity with its absence.

4.2.2.1 Cancelability

Contrary to other kinds of entailments, as logical implications and presuppositions, conversational implicatures can be canceled in certain contexts. Consider the following *sentence-implicature* pair:

(11) A: Shall we meet on the 4th?
B: I'll be in Modena.
a. [Particularized conversational implicature:] We cannot meet on the 4th.

B's reply conveys the conversational implicature (11-a). The sentence "I'll present at the PhD conference in Modena" does not usually implicate that the interlocutors cannot meet on the 4th. Rather, the implicature in (11-a) arises because of the specific features of this context. Therefore, it is *particularized* conversational implicature. This implicature can be canceled. For example, adding an "but I should be back in the evening" to B's utterance will result in a sentences that lacks the implicature (11-a):

(12) A: Shall we meet on the 4th?

B: I'll present at the PhD conference in Modena, *but I should be back in the evening.*

a. #We cannot meet on the 4th.

Generalized conversational implicatures can be canceled too. Take, for instance, sentence (13-a):

(13) a. Some students passed the exam.

b. [Generalized conversational implicature:] *Not all* students passed the exam.

Sentence (13-a) implicates that not all students passed the exam. Notice that the sentence is presented out of context: that the implicature arises anyway shows that it does not depend on any peculiar contextual assumption. Thus, (13-b) is not a particularized conversational implicature, rather, it is generalized. Even if (13-a) usually gives rise to (13-b), it is still possible to cancel it:

(14) a. Some students passed the exam, *actually all of them did.*

b. #*Not all* the students passed the exam.

Sentence (14-a) does not implicate that not all the students passed the exam. The addiction of "actually all of them did" does not give rise to a contradiction: if all the students passed the exam, then it is also true that some of them did. The second clause in (14-a) does not contradict the meaning of the sentence, one of its logical entailments or presuppositions. It just cancels the implicature.

Thus, it is possible to add a clause that cancels a conversational implicature, whether particularized or generalized. Conventional implicatures, instead, are not cancelable. Consider the example below:

(15) a. Leila is rich but nice.

b. [Conventional implicature:] Being rich is opposed to being nice.

c. # Leila is rich but nice, *and there is no contrast between being rich and being nice.*

The term "but" induces the conventional implicature that being rich is opposed to being nice, and the added clause in (15-c) does not prevent the implicature from arising. The clause in italics is in contrast with the implicature, but it does not cancel it. As a result, sentence (15-c) is contradictory.

Let's now turn to the generic sentence (6) and to its putative implicature (7):

(6) Ducks eat wheat.

(7) [RP:] The connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

Is the putative implicature (7) cancelable? That is, is there any clause that, added to (6) makes up a sentence that does not convey the robustness proposition, namely (7)? If the putative implicature (7) can be canceled, then it might be a conversational implicature (like (11-a) and (13-b) above). If, instead, it is not possible to cancel (7), it could be a conventional implicature (as (15-b)). As the following test shows, (7) is cancelable:

(16) **Test #3: cancelability**

a. Ducks eat wheat *because it's available in their habitats*.

b. #The connection between ducks and eating wheat holds primarily by virtue of some important fact about ducks *as such*.

The clause introduced by "because" seems to indicate that the connection between ducks and eating wheat does not hold primarily by virtue of some important fact about ducks *as such*, as it depends on what is available where they live. With this specification, sentence (6) does not convey (7) anymore. Hence, the robustness proposition (7) is cancelable, and this constitutes evidence that is a conversational implicature. Let's see whether the same result obtains with the social generic (13):

(13) Philosopher are rational.

The putative implicature of (13), namely the robustness proposition, reads:

(17) [Implicature?] The connection between philosophers and being rational holds primarily by virtue of some important fact about philosophers *as such*.

In this case as well, the robustness proposition is cancelable:

(18) **Test #3: cancelability**

a. Philosophers are rational *only in appearance*.

b. #The connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*.

If the rationality of philosophers is only apparent, then it is not due to some important fact about philosophers *as such*: the clause in italics cancels (17).

Both (7) and (17) are cancelable, and this constitutes evidence that the robustness proposition is a *conversational* implicature. This hypothesis gains further support since RP possesses two other features of conversational implicatures: nondetachability and indeterminability.

4.2.2.2 Nondetachability and indeterminability

A putative implicature "is nondetachable insofar as it is not possible to find another way of saying the same thing (or approximately the same thing) which simply lacks the implicature" (Grice 1989b: 43). The following rephrasing of (13) all convey the *robustness proposition*, showing that it is nondetachable:

(19) **Test #4: nondetachability**

a. Philosophers resist emotions.
b. Philosophers are cold.
c. Philosophers are impassive.
d. Philosophers follow reason.
e. ...

Moreover, the *robustness proposition* is indeterminable. That is, the implicature conveyed by (13) may not be exactly determinable and it can be expressed in different ways, as for example:

(20) **Test #5: indeterminability**

a. The connection between philosophers and *being rational* is robust.
b. There is a strong link between philosophers and *being rational*.
c. There is something special about philosophers that makes them rational.
d. Philosophers *as such* are rational.
e. ...

Thus, the tests revealed that the *robustness proposition* is cancelable, nondetachable, and indeterminable. These, joined with calculability, are the distinctive features of conversational implicatures. I have not applied the test for calculability because I need to introduce Levinson's I-principle first. Based on the results obtained so far, I conclude that the robustness proposition is a conversational implicature.

What kind of conversational implicature is it, generalized or particularized? Does it depend on peculiar features of the context, like the particularized impli-

cature *we cannot meet on the 4th* in (11) from above? Or does it arise by default, like the generalized implicature *not all students passed the exam* in (13)? Generic (13) conveys the *robustness proposition* even when uttered out of the blue. Moreover, the implicature is constant across different contexts. Consider C2-C3 from above:

C2 A: How can Jane be so impassive in this situation?
B: Philosophers are rational.

C3 You should calm down: *philosophers are rational*.

Sentence (13) implicates in both contexts that the connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*. The implicature is conveyed in both contexts and what is implicated does not depend on specific features of the context. Hence, I argue, the *robustness proposition* is a *generalized* conversational implicature.

I hypothesize that it is the generic construction that induces the robustness proposition. Specifically, I argue that this implicature arises due to the unmarkedness of generics: these sentences are a very simple way of attributing a property to a category. A speaker uttering a generic provides no explicit information concerning what links Ks and F. Thus, they allow the addressee to assume that "the connection between the Ks and F holds primarily by virtue of some important fact about the Ks *as such*". This is predicted by assuming, with Levinson (2000), that the speaker's utterances are enriched by default. Such enrichment depends on a principle, which he dubs "I-principle", that underlies conversational exchanges. Levinson proposes the I-principle in the context of his theory of generalized conversational implicatures, to which I devote the next section.

4.3 Levinson's theory

In *Presumptive Meanings* (2000), Stephen C. Levinson proposes a theory of generalized conversational implicatures ("GCIs" for short). He defines GCIs as default inferences "that capture our intuitions about a preferred or normal interpretation" (2000: 11). He proposes (2000: 31-33) that GCIs depend on three heuristics:

Heuristic 1 What isn't said, isn't;

Heuristic 2 What is simply described is stereotypically exemplified;

Heuristic 3 What's said in an abnormal way, isn't normal;
or Marked message indicates marked situation.

The heuristics above serve to increase the informativeness of a sentence. Indeed, they rule out more states of affairs that the sentence alone would. In a way, they enable the speaker to say more with their words. So, for example, a speaker uttering (21) communicates more than what the sentence expresses, they also convey (22):

(21) Some of the people who showed up at the party had more than one drink.

(22) a. Not all the people who came to the party had more than one drink.
b. The drinks were alcoholic.
c. Those people were not guests.

Indeed, the speaker conveys (22-a) by Heuristic 1: since they did not say "all", then it is not the case that all people had more than one drink. Heuristic 2 enables the speaker to communicate that the drinks were alcoholic without having to explicitly specify it since drinks are stereotypically alcoholic. Finally, the information load of (21) is increased with (22-c): the description "the people who showed up at the party" is an abnormal way to refer to the guests. Therefore, this indicates, by Heuristic 3, that those people were not guests.

Levinson, further, points out that these heuristics are intimately related to some of Grice's maxims. In particular, the first two heuristics are related to the Maxim of Quantity. Specifically, Heuristic 1 is related to the first submaxim, Q1: "make your contribution as informative as required (for the purposes of the exchange)" (Grice 1975: 27), and Heuristic 2 to the second one, Q2: "do not make your contribution more informative than is required" (*ibidem*). The third heuristic is related to the Maxim of Manner, "be perspicuous", and in particular to the first and fourth submaxims, M1: "avoid obscurity of expression" and M4: "avoid prolixity".

Given the relationship that heuristic 1 has with the Maxim of Quantity, Levinson dubs it *Q-heuristic*. He names the second one *I-heuristic* to recall Atlas and Levinson's (1981) "Informativeness Principle", that is a version of this heuristic. Finally, *M-heuristic* is the one associated with the Maxim of Manner. The resulting picture is the following:

Q-heuristic What isn't said, isn't	**I-heuristic** What is simply described is stereotypically exemplified	**M-heuristic** What's said in an abnormal way, isn't normal; Marked message indicates marked situation
Maxim of Quantity **Q1** Make your contribution as informative as required	**Maxim of Quantity** **Q2** Do not make your contribution more informative than is required	**Maxim of Manner** **M1** Avoid obscurity of expression **M4** Avoid prolixity

Each heuristic has distinct features and is responsible for different implicatures. Let's analyze them in detail.

4.3.1 Q-implicatures

Q-implicatures are implicatures generated by the use of a linguistic expression that contrasts with other expressions. For example, scalar implicatures belong to this category. Q-implicatures arise due to the Q-heuristic "what isn't said, isn't", which excludes the states of affairs expressed by the linguistic expressions that the speaker did not use. This principle, as Levinson specifies, does not mean that a speaker should spell out everything that is the case. Rather, it has to be understood as restricted to a *contrast set*, namely a set constituted by linguistic expressions with similar form but contrastive semantic content. "[F]or sets of alternates, use of one (especially a weaker) implicates inapplicability of another (especially an otherwise compatible stronger alternate)" (Levinson 2000: 36). Levinson provides the following examples of contrast sets:

- **Scalar scales**: <all, some>. E.g., from "some" to 'not all';
- **Negative scales**: <none, not all>. E.g., from "not all" to 'not none, i.e., some';
- **Clausal scales**: <since p q, if p q>. E.g., from "if p then q" to 'p is uncertain';
- **Non-entailment scales**: <succeed, try>. E.g., from "try" to 'not succeed';
- **Non-entailment sets**: {yellow, red, blue,...}. E.g., from "yellow" to 'not red, blue,...' .

So, for instance, using "some" implicates the inapplicability of "all", that is, it implicates 'not all'. Therefore, sentence (23-a) gives rise to the generalized conversational implicature of kind Q- in (23-b):

(23) a. Some students passed the exam.
b. [Q-implicature:] *Not all* the students passed the exam.

The underlying Gricean reasoning is that, if the speaker did not say that all the students passed the exams, then they wanted to convey that some of them did not.

Different conditions constrain which expressions can form a contrast set. So, for example, for two expressions to form a clausal scale, they have to be similar with respect to their semantics and length, but differ in that only one entails its embedded sentence.

Levinson expounds the Q-principle as follows (2000: 76):[2]

(24) ***Q-principle***

Speaker's maxim: Do not provide a statement that is informationally weaker than your knowledge of world allows, unless providing an informationally stronger statement would contravene the I-principle. Specifically, select the informationally strongest paradigmatic alternate that is consistent with the facts.

Recipient's corollary: take it that the speaker made the strongest statement consistent with what they know, and therefore that:

a. if a speaker used an expression A, weaker than an expression B, and A and B belong to a contrast set, then one can infer that the speaker knows that the stronger statement containing B instead of A is false;

b. if a speaker asserted a sentence S, and S fails to entail an embedded sentence Q, which a stronger statement R would entail, and $\{S,\ R\}$ form a contrast set, then one can infer that the speaker does not know whether Q obtains or not.

Q-implicatures depend on "what else might have been said but was not" (Levinson 2000: 41). For this reason, they are metalinguistic in nature: they depend on how the lexicon of a particular language is structured. They are obtained through a negative inference, based on what the speaker did *not* use: what is implicated is

[2]Levinson's own formulation of the *Recipient's corollary* contains some notions and notations that I do not need for the purposes of my work. I simplified it accordingly.

a presumption that a certain state of affairs, that is picked up by the expression the speaker did not use, is not the case.

4.3.2 I-implicatures

The I-heuristic leads to infer that the situation referred to is stereotypical; that is, it has the typical features associated with that kind of situation. Levinson dubs the resulting implicatures "I-implicatures". An example is the following:

(25) a. The pyramid is on the table.
b. [I-implicature:] *The pyramid is in canonical position, resting on its base.*

The idea behind this is that, if the speaker did not specify a particular way in which the pyramid is placed on the table, then they did not need to do so because the position is the canonical one.

Levinson provides a list of well-known phenomena that fall under the range of the I-heuristic:

- **Conditional perfection**. E.g., from "if you mow the lawn, I'll give you 5$" to 'if *and only if* you mow the lawn, I'll give you 5$';
- **Conjunction buttressing**:
  - *temporal sequence.* E.g., from "p and q", where p and q describe events, to 'p and *then* q';
  - *causal connectedness.* E.g., from "p and q", where p and q describe events, to 'p *therefore* q';
  - *teleology, intentionality.* E.g., from "p and q", where p and q describe events, to 'p *in order to* q';
- **Bridging inferences**. E.g., from "John unpacked the picnic. The beer was warm" to 'the beer was *part of* the picnic';
- **Inference to stereotype**. E.g., from "a bird" to 'a *flying* bird' (not, e.g., a penguin);
- **Negative strengthening**. E.g., from "I don't like John" to 'I positively *dislike* John';
- **Preferred local coreference**. E.g., from "John came in and he sat down" to 'John came in and *John* sat down';

- **Mirror maxim**. E.g., from "Harry and Sue bought a piano" to 'Harry and Sue bought a piano *together*' (not one each);
- **Noun-noun compounds** (NN-relations). E.g., from "the oil compressor gauge" to 'the gauge *that measures* the state of the compressor *that compresses* the oil';
- **Specializations of spatial terms**. E.g., from "the spoon is in the cup" to 'the spoon has *its bowl-part* in the cup';
- **Possessive interpretations**:
  - e.g., from "Wendy's children" to 'the children to whom Wendy *is parent*';
  - e.g., from "Wendy's house" to 'the house Wendy *lives in*';
  - e.g., from "Wendy's responsibility" to 'the responsibility *falling on Wendy*';
  - e.g., from "Wendy's theory" to 'the theory Wendy *originated*'.

These implicatures depend on a tendency towards economy that leads the speakers to avoid stating what is obvious. Consequently, the hearers are licensed to conclude from a simple description that the situation is stereotypical. Levinson spells out this principle in the following way (2000: 114-115):

(26) ***I-principle***

Speaker's maxim: **the maxim of Minimization**. "Say as little as necessary"; that is, produce minimal linguistic information sufficient to achieve your communicational ends (bearing Q in mind).

Recipient's corollary: **the Enrichment Rule**. Amplify the informational content of the speaker's utterance, by finding the most *specific* interpretation, up to what you judge to be the speaker's m-intended point, unless the speaker has broken the maxim of Minimization by using a marked or prolix expression.[3]

[3]An *m-intention* is a complex reflexive intention that a speaker S has to communicate x by uttering U to a recipient R iff S intends:

a. R to think x;

b. R to recognize that S intends (a);

c. R's recognition of S's intending (a) to be the prime reason for R thinking x.

See Grice 1989b: chapter 5, cited in Levinson 2000: 13.

Specifically:

a. Assume the richest temporal, causal, and referential connections between described situations or events, consistent with what is taken for granted.

b. Assume that stereotypical relations obtain between referents or events, unless this is inconsistent with (a).

c. Avoid interpretations that multiply entities referred to (assume referential parsimony); specifically, prefer coreferential readings of reduced NPs (pronouns or zeros).

d. Assume the existence or actuality of what a sentence is about if that is consistent with what is taken for granted.

Unlike Q-implicatures, I-implicatures make no metalinguistic reference. Rather than depending on the structure of the lexicon, they depend on rich assumptions about the world. The inference leading to them is positive in character: it involves determining what *is* the case, rather than excluding states of affairs.

I-implicatures invite a stronger interpretation from a weaker statement: "they are inferences to a more informative proposition that would entail what is said" (Levinson 2000: 133). Consequently, the representation of I-implicatures will normally include the content of what is said:

> it follows from the nature of I-implicatures that they are enrichments of what is said, whereas Q-implicatures merely exclude something else that might have been said but wasn't. Thus we can often represent the Q-implicature as a conjunct which does not itself include the content of what is said, whereas I-implicatures are not so satisfactorily represented in this way. (Levinson 2000: 121)

4.3.3 M-implicatures

The last kind of GCIs proposed by Levinson is that of *M-implicatures*. They are generated by the M-heuristic, "what is said in an abnormal way, isn't normal" or "marked message indicates marked situation". What produces an M-implicature is the use of a marked expression. So, M-implicatures are invoked by the form of the expression rather than by its meaning.

For example, uttering (27-a) M-implicates (27-b):

(27) a. Xin made the car move.

b. [M-implicature:] The car was moved in some abnormal way, e.g., by pushing it.

The expression "to make move" is marked, and "to move" is its unmarked counterpart. The Gricean reasoning, in this case, being "if the speaker has gone out of his way to avoid the simpler expression, he must be intending to refer to an event that contrasts to that which would have been describable with the simple lexicalized causative" (Levinson 2000: 141). Using the unmarked expression "to move", would I-implicate that the car was moved in the normal way, namely by driving it. Therefore, if a speaker wants to avoid this interpretation, they have to use a marked expression.

Some examples of the phenomena that give rise to M-implicatures are:

- **Lexical doublets**. E.g., from "beverage" to 'non-alcoholic drink';
- **Rival word formations**. E.g., from "cook"='one who cooks' to "cooker"='thing that cooks';
- **Periphrastic forms**. E.g., from "you are permitted to leave" to 'I'm not asking you to leave';
- **Periphrastic causatives**. E.g., from "Sue made the car move" to 'she did that in an unusual way';
- **Litotes**. E.g., from "she is not unhappy" to 'she is not fully happy';
- **Lexical expressions**. E.g., from "the picture of the child" to 'the relation between the child and the picture is not the closest possible, i.e. the child did not paint it (rather, the picture depicts the child)';
- **Explicit morphemes**. E.g., from "she went to *the* school" to 'she did not go there to study (rather, e.g., she went there to apply for a job)';
- **Repetition and reduplication**. E.g., from "she slept and slept" to 'she slept longer than usual'.

M-implicatures are intimately related to I-implicatures. While an unmarked expression I-implicates that the situation described is stereotypical, "the use of a marked expression signals an opposing interpretation" (Levinson 2000: 136). That is, the marked expression generates an M-implicature opposed to the I-implicature conveyed by the corresponding unmarked expression. The I-heuristic leads the audience to infer that the situation is stereotypical; the M-heuristic leads

the audience to infer that it is *non*stereotypical. More precisely, "M-implicatures seem to be essentially parasitic on corresponding I-implicatures: whatever an *unmarked* expression U would I-implicate, the marked alternative (denotational synonym) M will implicate the *complement* of U's denotation" (Levinson 2000: 137).[4]

Levinson formulates the corresponding principle as follows (2000: 136-137):

(28) ***M-principle***

Speaker's maxim: Indicate an abnormal, nonstereotypical situation by using marked expressions that contrast with those you would use to describe the corresponding normal, stereotypical situation.

Recipient's corollary: What is said in an abnormal way indicates an abnormal situation, or marked messages indicate marked situations, specifically:

> Where S said "p" containing marked expression M, and there is an unmarked alternate expression U with the same denotation D which the speaker might have employed in the same sentence-frame instead, then where U would have I-implicated the stereotypical or more specific subset d of D, the marked expression M will implicate the complement of the denotation d, namely $\overline{d}$ of D.

M-implicatures, just like Q-implicatures, depend on "what else might have been said but was not" (Levinson 2000: 41). Consequently, M-implicatures are metalinguistic, and the inference leading to them is negative. They are metalinguistic since they make reference to other expressions available, namely the unmarked ones; the inference is negative because it is based on what the speaker did *not* want to communicate.

M-implicatures are invoked by the *form* of an expression, rather than by its meaning, and are strictly connected to I-implicatures. The use of a marked expression signals that the speaker wanted to avoid the stereotypical interpretation induced by the I-principle. Thus, M-implicatures pick up the complement of the denotation of what the unmarked expression I-implicates.

[4]In this quotation, Levinson characterizes the M-implicature as complementary to U's denotation. However, when stating the M-principle, he writes that the marked expression will M-implicate the complement of what its unmarked counterpart *I-implicated*, not of its unmarked counterpart's denotation. I take the principle's formulation to be the correct one, but I do sometimes quote this passage because it is particularly concise and effective, although imprecise.

4.3.4 Comparing Q-, I-, and M-implicatures

To recap, Levinson argues that three heuristics give rise to different types of generalized conversational implicatures. Such heuristics are related to the Gricean maxims. They work in distinct manners and the implicatures they give rise to have different properties.

In particular, Q- and M-implicatures are metalinguistic in nature because they hinge upon the structure of the lexicon; they depend on what might have been said but was not. Q-implicatures rely on oppositions among expressions that differ in informativeness. Such expressions form contrast sets and the use of one expression implicates the inapplicability of the other items in the set. M-implicatures are parasitic on I-implicatures. They are generated by marked forms, that implicate an opposite interpretation to the one I-implicated by the corresponding unmarked expression.

The inferences that lead to Q- and M-implicatures are negative: they are based on what was not said. They exclude the states of affairs associated with what could have been said but was not.

I-implicatures, instead, are arrived by through a positive specification of what is said. They are generated by inferences to the stereotype and depend on world knowledge, rather than on lexical opposition. Specifically, they are based on assumptions about the stereotype associated with the entity or situation referred to. Since they are based on world knowledge and not on the structure of the lexicon, they are not metalinguistic.

To underline similarities and differences, I summarized the features of the three types of GCIs in a table:

Q-implicatures	**I-implicatures**	**M-implicatures**
Underlying heuristics and maxims		
Q-heuristic	I-heuristic	M-heuristic
Maxim of *Quantity* **Q1** Make your contribution as informative as required	Maxim of *Quantity* **Q2** Do not make your contribution more informative than is required	Maxim of *Manner* **M1** Avoid obscurity of expression **M4** Avoid prolixity
Examples		
• Scalar implicatures; • Negative scalar implicatures; • Clausal implicatures; • Non-entailment scales; • Non-entailment sets.	• Conditional perfection; • Conjunction buttressing; • Bridging inferences; • Inference to stereotype; • Negative strengthening; • Preferred local coreference; • Mirror maxim; • Noun-noun compounds; • Specialization of spatial terms; • Possessive interpretations.	• Lexical doublets; • Rival word formations; • Periphrastic forms; • Periphrastic causatives; • Litotes; • Lexical expressions; • Explicit morphemes; • Repetition and reduplication.
Properties		
Contrast sets	*Unmarked* forms	*Marked* forms
Contrast between *semantically strong/weak* items	Background *stereotypical* assumptions	Contrast between *synonymous surface forms*
Inapplicability of *alternative* expressions	Inference to the *stereotype*	Picks up the *complement* of the denotation of the unmarked expression
Metalinguistic basis	*Nonlinguistic* knowledge	*Metalinguistic* basis
Subject to *metalinguistic negation*	Outside the scope of *metalinguistic negation*	Subject to *metalinguistic negation*
Negative inference	*Positive* inference	*Negative* inference
Rules out the states of of affairs picked up by alternative expressions	*Enriches* the content of what has been said	*Rules out* the states of affairs associated with the stereotype
Represented *independently* of the content of what is said	Their representation usually *includes* the content of what is said	Represented *independently* of the content of what is said

Here, I presented Levinson's theory of generalized conversational implicatures. In the next section, I will apply it to (non-statistical) characteristic generics (with bare plural subject NPs). I will argue that these sentences I-implicate the robustness proposition and that this implicature arises because generic sentences are unmarked.

4.4 The GC implicature of generics

The I-principle presented above allows the audience to get the richest information from utterances, unless such an interpretation is discouraged by the use of marked expressions. This implies that utterances of generics should be enriched, unless generics are marked constructions.

In her Ph.D. dissertation, Sarah-Jane Leslie (2007) claims that generics, being the linguistic default, are unmarked and quantified sentences are their marked counterpart. If this is correct, generics are candidates for inducing an I-implicature, and quantified sentences for inducing the related M-implicature.

Markedness is a relational property: a form is marked with respect to an corresponding unmarked form. Therefore, to determine whether generics are unmarked we need to compare them with a possible marked counterpart. Leslie identifies quantified sentences as the marked counterpart of generics. Verifying this hypothesis requires establishing what makes a form marked. Levinson provides the following characterization of *markedness*:

> On the formal side, marked forms, in comparison to corresponding unmarked forms, are morphologically complex and less lexicalized, more prolix or periphrastic, less frequent or usual, and less neutral in register. On the meaning side, such forms suggest some additional meaning or connotation absent from the corresponding unmarked forms. (Levinson 2000: 137)

The hypothesis that quantified sentences are the marked counterpart of generics fits with the formal side of the above characterization. Indeed, quantified sentences are morphologically more complex than generics, in that they involve an explicit quantifier absent in generics. For the same reason, quantified sentences are also more prolix than generics. Therefore, generics are unmarked and quantified sentences marked according to Levinson's notion of markedness. Consequently, we may expect generics to induce an I-implicature and quantified sentences to induce complementary M-implicatures.

Recall the I-heuristic, "what is simply described is stereotypically identified". The related I-principle invites the speaker to "say as little as necessary; that is produce minimal linguistic information sufficient to achieve your communicational ends (bearing Q in mind)". Generics express a relationship between a kind K and a property F. They do that in a simple way. In particular, they employ the least linguistic material possible to express such a relationship: just a noun referring to the kind K or to its members (preceded by an article is the NP is a Definite or an Indefinite Singular) and the VP expressing the property F. Therefore, it seems to me, the I-principle should apply to generics, that, thus, should convey an I-implicature.

What do generics I-implicate? The I-principle invites the recipient to enrich the content of an utterance and, in particular, to "assume the richest temporal, causal and referential connection between situations or events". Generics do not connect situations or events, but they attribute a property to a category. I argue that the richest connection that recipients should assume when confronted with a generic concerns the relationship between the category and the property. The resulting I-implicature being that the relationship is robust. The underlying Gricean reasoning in this case being: if the speaker did not specify what relationship exists between the category and the property, then they meant the strongest connection, namely that "the connection between the Ks and F holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). In other words, I argue that the claim conveyed, according to Haslanger, by generics (which I labeled the robustness proposition) is an I-implicature. We can now see how this implicature is calculated. Consider (6) from above:

(6) Ducks eat wheat.

Sentence (6) is a generic. The I-principle applies to it, inviting the recipient to enrich its meaning with the robustness proposition. We can work out the reasoning leading to the I-implicature as follows:

(29) **Test #6: calculability**

a. The speaker uttered (6), "ducks eat wheat".
b. Generics are unmarked and the I-principle applies to them.
c. By the I-principle, the recipient should assume the richest connection between the category and the property.
d. Thus, (6) implicates the *robustness proposition*, namely that the connection between ducks and *eating wheat* holds primarily by virtue of

some important fact about ducks *as such*.

Mutatis mutandis for the social generic (13) "Philosophers are rational":

(30) **Test #6: calculability**

a. The speaker uttered (13), "philosophers are rational".
b. Generics are unmarked and the I-principle applies to them.
c. By the I-principle, the recipient should assume the richest connection between the category and the property.
d. Thus, (13) implicates the *robustness proposition*, namely that the connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*.

Calculability is one of the defining features of implicatures. Therefore, being able to construct an argument from (6) and (13) to the (respective) robustness proposition constitutes further evidence that we are dealing with genuine implicatures.

My claim, thus, is that the robustness proposition arises due to Levinson's I-principle and is, therefore, an I-implicature. The robustness proposition possesses all the hallmarks of I-implicatures. It is not metalinguistic in character: it does not involve reference to "what else might have been said but was not" (Levinson 2000: 41). It is arrived by through positive inferences and it enriches the content of what is said with a more informative proposition.

I, therefore, conclude that generics convey by default an I-implicature that the connection between Ks and F holds primarily by virtue of some important fact about the Ks as such. In the next section, I will argue that they convey an additional implicature, which details the specific kind of relation connecting the category K and the predicated property F. As anticipated above, this implicature changes according to the context. Specifically, it depends on the form of explanation relevant in the context. For this reason, I label it "explanatory implicature".

4.5 The PC implicature of generics

So far, I argued that the implicit claim of generics hypothesized by Haslanger is indeed an implicature. Specifically, I argued that it is a generalized conversational implicature. I based this claim on the observation that the implicature is quite constant across contexts and arises even when a generic is uttered out of the blue. However, this seems to be only part of the story. Indeed, according to Haslanger

the demand for an explanation influences what is implicated. Thus, it seems that the implicature will vary according to the explanation at stake in a certain context:

> [W]hen generics are asserted to provide an explanation of a phenomenon, they (defeasibly) implicate that there is an explanatorily robust relationship between the kind and the property indicated. Because there are different sorts of explanations that might be called for, the generic may implicate a specific kind of relation that is relevant to the particular form of explanation.
> (Haslanger 2014: 382)

So, it seems that generics convey, on the one had, the robustness proposition, and, on the other hand, a more detailed specification of the relation connecting K and F. While the former remains constant across contexts, the latter varies, as the specification depends on what form of explanation is relevant in a certain context. I argue that the implicit claim of (non-statistical Bare Plural) generics is complex and it is constituted by two different propositions. The first proposition characterizes the link between Ks and F as robust. This proposition is relatively invariant and is, as I argued, a *generalized* conversational implicature. However, a second implicature arises which crucially depends on what explanation is called for. Given its dependence on the context, I argue that this proposition is a *particularized* conversational implicature. This implicature depends on the context and, in particular, by what explanation is called for in a certain conversational exchange.

As seen above, Haslanger argues that "claims of generic essence are efforts to offer an explanation in terms of significant features of the kind in question" (Haslanger 2014: 382) and that generics convey, through a two-step process, a claim of generic essence. Moreover, she claims that "generics may implicate *a specific kind of relation* that is relevant to the particular form of explanation" that is called for in a certain context (Haslanger 2014: 382, emphasis added). Haslanger, following Aristotle, takes explanations to be of four kinds, each relevant in different contexts: formal, efficient, material, and teleological. Consider the examples below:[5]

C4 A: What defines a philosopher?
B: *Philosophers are rational.*

[5] An immense thanks to Beatrice Michetti for helping me figuring out what I needed in these examples.

C5 a. A: How can Chesa be so impassive in this situation?
B: *Philosophers are rational.*
b. A: What destroyed Notre-Dame?
B: *Beams burn.*

C6 A: Why is it prohibited to smoke inside?
B: *Beams burn.*

C7 a. A: Why is she withholding her emotions?
B: *Philosophers are rational.*
b. A: Why are they throwing the beams in the fireplace?
B: *Beams burn.*

Context C4 calls for a *formal* explanation; contexts C5 for an explanation in terms of an *agent* or *efficient cause*; a *material* explanation is relevant in context C6; and a *teleological* explanation is salient in contexts C7. The same generic occurs in three different contexts: "philosophers are rational" occurs in contexts C4, C5, and C7, thus working as, respectively, *formal*, *efficient cause*, and *teleological* explanation. "Beams burn" occurs in contexts C5, C6, and C7, where it is offered as *efficient cause*, *material*, and *teleological* explanation, respectively.

My proposal is that the very same generic has a different implicature in each context and that this implicature is what allows the generic to provide different kinds of explanations according to what is called for. For this reason, I call it "explanatory implicature". This implicature, I argue, is additional to the *robustness proposition*. Consider for example "philosophers are rational" as it occurs in context C4 above. It implicates, I claim, both the *robustness proposition* ("RP" for short) and the *explanatory implicature* ("EI" for short):

C4 A: What defines a philosopher?
B: *Philosophers are rational.*
[RP:] The connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*.
[EI:] *Being rational* is what makes one a philosopher.

Similarly, "philosophers are rational" conveys both implicatures in contexts C5 and C7:

C5 a. A: How can Chesa be so impassive in this situation?
B: *Philosophers are rational.*
[RP:] The connection between philosophers and *being rational* holds

primarily by virtue of some important fact about philosophers *as such*.

[EI:] *Being rational* influenced the philosopher's reactions.

C7 a. A: Why is she withholding her emotions?

B: *Philosophers are rational.*

[RP:] The connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*.

[EI:] *Being rational* is the purpose of philosophers.

As we can observe, the *explanatory implicature* changes according to the context, contrary to the *robustness proposition*. For this reason, I argue that the *explanatory implicature* is a *particularized* conversational implicature. In particular, I argue that this implicature arises from the flouting of the Maxim of Relation. Let's see how this works for context C4. I propose that the implicature can be worked out with a reasoning along these lines:

(31) **Test #6: calculability**

a. The speaker uttered (13), "philosophers are rational", as an answer to my request to define a philosopher.

b. By the Maxim of Relation, (13) should be relevant to my request.

c. Therefore, the speaker intends (13) to express a definition of philosophers.

d. For this to be the case, the connection between the category and the property should be definitory.

e. Thus, the speaker has implicated that *being rational* is what makes one a philosopher.

Different relations between the category and the predicated property are relevant in each context C4-C7. Therefore, the specification of the connection implicated (and, thus, what is implicated) is different.

The explanatory implicature is cancelable too, as showed by the test below:

(32) **Test #3: cancelability**

C4 A: What defines a philosopher?

B: Philosophers are rational, *just as all humans. What distinguishes philosophers is a doubting attitude.*

The clause in italic cancels the implicature: unlike (13), B's utterance does not

implicate that *being rational* is what makes one a philosopher. The tests I applied show that the *explanatory implicature* possesses two central features of conversational implicatures: cancelability and calculability.I conclude, therefore, that it is a genuine implicature. Notice moreover that the addition in italic does not cancel the *robustness implicature*: B's reply still implicates that the connection between philosophers and *being rational* is robust. That it is possible to cancel one implicature while keeping the other proves that the *explanatory implicature* is distinct from the *robustness proposition*. Thus, the implicit claim of generic is composed of *two* implicatures and neither reduces to the other.

4.6 Conclusions

In the previous chapter, I presented Haslanger's theory that non-statistical generics convey that the connection between Ks and F holds primarily by virtue of some important fact about the Ks *as such*. I devoted this chapter to investigate what category this claim, which I dubbed the "robustness proposition", falls into. I started testing whether the robustness proposition projects. Since it doesn't, I concluded that it is not a semantic presupposition. The robustness proposition fails the *Hey, wait a minute test* as well, which led me to conclude that it is not a pragmatic presupposition either. I then checked whether the robustness proposition shares features with implicature: I tested for cancelability, nondetachability, and indeterminability. The positive results of these tests provided support for the hypothesis that the robustness proposition is a conversational implicature.

Before applying the test for calculability, I presented Levinson's theory of generalized conversational implicatures because I rely on it to work out the implicature. Crucially, I argued that the robustness proposition is a *generalized* conversational implicature because it arises even when generics are uttered out of the blue and it is constant in different contexts. This motivates my appeal to Levinson's theory of generalized conversational implicatures. I concluded my argument for the robustness proposition proposing that generics convey this claim due to their unmarkedness: since they are unmarked, Levinson's I-principle applies to them, encouraging the addressee to assume the richest connection between the category and the property.

In the last section, I argued that generics convey, in addition to the robustness proposition, a further implicature. I formulated this hypothesis to account for a tension in Haslanger's theory: she argues, on the one hand, that non-statistical generics convey that the connection between Ks and F is robust but, on the other

hand, she claims that what is conveyed depends on the context. In particular, she proposes that "the generic may implicate a specific kind of relation that is relevant to the particular form of explanation" called for in a certain context (Haslanger 2014: 382). This characterization fits with the features of *particularized* conversational implicatures, but the robustness proposition is better understood as a *generalized* conversational implicature. Hence, I argued that generics convey two implicatures, the robustness proposition, which arises by default, and what I called the "explanatory implicature", which depends on the context. The former is a generalized conversational implicature; the latter is particularized.

In this chapter, I argued that generics convey the robustness proposition due to their unmarkedness. An alternative explanation identifies the kind terms as the source of the GCI conveyed by generics. In the next chapter, I will take into account this hypothesis and test for it. To this end, I check whether quantified sentences, that share various similarities with generics, convey the robustness proposition as well. I conclude that quantified sentences lack this implicature because they are marked. This, however, should imply that they convey a complementary M-implicature. Indeed, according to Levinson's theory, the I-principle applies to unmarked forms and the M-principle to the marked ones. However, quantified sentences do not convey an M-implicature either. I then provide other examples that lack the M-implicature predicted by Levinson theory: technical terms and (what I call) extended expressions. To account for these cases, I propose a revision of Levinson's M-principle. I conclude the chapter with a remark on clausal implicatures, explaining why they are not a viable option to account for the robustness proposition.

Chapter 5

Beyond generics. Alternatives and consequences

5.1 Introduction

In the previous chapter, I tested non-statistical characteristic generics with Bare Plural subject NPs, concluding that they give rise to a GCI of type *I* in Levinson's framework. One could put forward a different explanation for these results: what induces the implicature is not the generic itself, but rather the kind term occurring in it. In this chapter, I rule out this hypothesis upon testing non-generic sentences containing the same kind terms.

If generics convey the I-implicature, Levinson's theory predicts that their marked counterparts, namely quantified sentences, convey a complementary M-implicature. As I will show, however, is not the case. Quantified sentences are not the only marked forms lacking the M-implicature predicted by Levinson. Hence, I will propose a revision of Levinson's M-principle to account for these phenomena.

Finally, I will take into account the hypothesis that the robustness proposition of generics actually is a clausal implicature, and not an I-implicature. A proposal in terms of clausal implicature does not face the difficulty that comes with the I-/M-implicatures account. However, this solution is not viable.

5.2 An alternative explanation

In the previous chapter, I applied the tests for presuppositions and implicatures to the generics "ducks eat wheat" and "philosophers are rational".[1] The results sug-

[1]More precisely, I applied both battery of tests to "ducks eat wheat", but only those for implicatures to "philosophers are rational".

gest that they implicate what I dubbed the "robustness proposition", namely that the connection between Ks and F holds primarily by virtue of some important fact about Ks *as such*.[2] That is, "ducks eats wheat" implicates that the connection between ducks and *eating wheat* holds primarily by virtue of some important fact about ducks *as such*, and "philosophers are rational" that the connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*. I further argued, with Haslanger, that what gives rise to such implicatures is the generic construction. However, one might argue that what conveys the implicature is not the generic form, but rather the kind terms occurring in them. If this is the case, kind terms occurring in other constructions should give rise to the same implicature as well. The following examples, though, seem to contradict this hypothesis:

(1) a. Some ducks eat wheat.
b. Three ducks eat wheat.
c. A few ducks eat wheat.

(2) a. Some philosophers are rational.
b. Three philosophers are rational.
c. A few philosophers are rational.

Sentences in (1) do not seem to convey that the connection between ducks and *eating wheat* holds primarily by virtue of some important fact about ducks *as such*, even though the kind term "ducks" occurs in them. Similarly, sentences in (2) do not seem to convey that the connection between philosophers and *being rational* holds primarily by virtue of some important fact about philosophers *as such*.[3] Therefore, it does not seem to be the mere occurrence of kind terms to give rise to the robustness proposition.

But ruling this out is not sufficient to prove that what induces the implicature is the generic construction itself. If there were non-generic sentences that consistently conveyed the same implicature, it might be that its source is not the generic construction. Rather, some common feature of these two kinds of

[2]Since the claim in question is *pragmatically* conveyed, it would be correct to say that generics *usually* convey it, or that they convey it *by default*, or *in certain contexts*. For the sake of brevity, I will often omit this specification. This omission, however, does not mean that I take the claim to be *always* conveyed, regardless the context.

[3]Notice that it makes sense to apply the tests for implicature just in case a certain claim seems to be conveyed in some way by a sentence, to check *how* the claim is conveyed, whether by implicature or otherwise. Since in these cases that the connection between Ks and F is robust does not seem to be conveyed in the first place, it makes no sense to apply the tests for implicatures to sentences in (1) and (2).

sentences might be responsible for the implicature that I attributed to generics. Or it may also be that the implicature has different sources on each type of sentence. The best candidate for exploring these possibilities is a construction which closely resembles generics, namely quantified sentences. In the next section, I will take into account different quantified sentences to check whether they convey the robustness proposition. Intuitively, it seems that quantified sentences with weak quantifiers (e.g., "some") typically lack the claim, while those with strong quantifiers (e.g., "all") usually convey it. Finally, sentences with intermediate quantifiers (e.g., "most" and "many") seem to convey the robustness proposition only if certain conditions hold. I will argue that the mechanism giving rise to the robustness proposition in sentences with intermediate and strong quantifiers is different from the one responsible for the generalized conversational implicature of generics.

5.3 I-implicature and quantified sentences

Quantified sentences are sentences where a quantifier (e.g., "some", "many", "most", or "all") occurs, specifying what proportion of the members of a category have the predicated property. Their linguistic construction is similar to generics'. Therefore, it is interesting to investigate whether they convey the same claim as generic sentences. In this section, I will address this issue: I will take into account different examples of quantified sentences focusing on whether they convey the proposition that the connection between Ks and F holds primarily by virtue of some important fact about Ks *as such*. I will start from sentences involving quantifier "some", I will then consider *all*-quantified sentences, finally, I will turn to *most*- and *many*- quantified sentences.

Consider the examples below:

(3) a. Some dogs are spotted.
b. #The connection between dogs and *being spotted* holds primarily by virtue of some important fact about dogs *as such*.

(4) a. Some humans are vegetarian.
b. #The connection between humans and *being vegetarian* holds primarily by virtue of some important fact about humans *as such*.

(5) a. Some cats live in Canada.
b. #The connection between cats and *living in Canada* holds primarily by virtue of some important fact about cats *as such*.

It seems clear to me that (3-a), (4-a), and (5-a) do not convey that the connection between the kind (dogs, humans, and cats, respectively) and the predicated property (*being spotted*, *being vegetarian*, and *living in Canada*, respectively) is robust. One might wonder whether this depends on other elements of the sentences above beside their being quantified sentences. For instance, the type of property or kind could play a role.

Properties can be distinguished in various ways. A distinction that might be relevant to the present discussion is the one between properties that depend solely on intrinsic nature, partially on nature and partially on the environment, and entirely on the environment. *Being spotted* for a living being is a property of the first kind since being of a certain color depends on certain genes.[4] Eating habits belong to the second group because what one can eat is arguably restricted by one's biology but also by what is available in one's environment. Moreover, as in the case of vegetarianism, eating habits can further be influenced by deliberate choices. A property of the third type could be *living in a certain Country*, or *liking a certain musical genre*, which have little to do with one's biology.

Another difference that might be relevant is the one between properties expressed with the verb "to be" and properties expressed with other verbs. Indeed, the first kind of structure might convey that the property is an essential trait, while the second one might point to secondary features and mere accidents. This might influence the interpretation of the sentence. Importantly, Cella, Marchak, Bianchi, and Gelman (p.c.) found empirical evidence that this occurs with generics. In their studies, participants had to estimate what percentage of Ks (members of a kind) had F (the predicated property) given the generic "Ks are F". The percentages given for generics with *to be*-properties (which they call "traits") were significantly higher than those given for generics with properties of the other form (which they call "behaviors"). Given that the form of the property plays a role in the interpretation of generics, it is possible that the same happens with quantified sentences as well.

Since I want to investigate whether the linguistic construction of quantified sentences conveys the robustness proposition or not, I should rule out that the implicature does not arise because of the properties involved. To do this, I have

[4]I specify "for a living being" because artifacts come to have a certain color pattern for different reasons. Typically, artifacts are colored in a certain way due to dyeing. Of course, it is possible to dye a living being as well (think, for example, of dyed hair or of blue roses). However, it is much less common and, relevant for our discussion, that the color depends on a dye is not the standard interpretation of a sentence like (3-a). Hence, I think that disregarding the dyeing interpretation is legitimate when talking about living beings, but not when discussing artifacts. My specification aims at capturing this difference.

to take into account examples with all these types of properties. Notice that all the types of properties discussed are exemplified in sentences (3-a)-(5-a): the property in (3-a) depends entirely on biology, that in (4-a) partially on nature and partially on the environment, and that in (5-a) entirely on the environment. Moreover, the properties in (3-a) and (4-a) are traits, while that in (5-a) is a behavior. None of these examples convey that the relation between the kind and the property is robust. Therefore, I can exclude that the claim fails to be conveyed due to the type of the property predicated. Indeed, sentences with properties of different types yield the same result.

Finally, distinctiveness might play a role: maybe, for the claim to be conveyed, the property needs to be somehow distinctive of the kind. Notice first that such a condition did not seem to be required in the case of generics. "Ducks eat wheat" conveys the implicature even though *eating wheat* is not distinctive of ducks: many other animals feed on wheat. Moreover, examples (6-a) and (7-a) do not convey the robustness proposition notwithstanding the properties being peculiar to the kinds involved. Indeed, humans are the only creatures to be autistic and just a few kinds of animals, among which elephants, live in a circus.

(6) a. Some humans are autistic.
b. #The connection between humans and *being autistic* holds primarily by virtue of some important fact about humans *as such*.

(7) a. Some elephants live in a circus.
b. #The connection between elephants and *living in a circus* holds primarily by virtue of some important fact about elephants *as such*.

Another hurdle to the robustness proposition could be the type of the kind. Kinds can be of three types: natural, social, and artifacts. Sentences (3-a)-(5-a) are all about natural kinds. Hence, one might worry that this affected the presence of the robustness proposition. To rule out this hypothesis, I should provide examples of *some*-quantified sentences about social kinds and artifacts that nonetheless lack the robustness proposition. The following examples possess precisely these characteristics:

(8) a. Some Americans live in New York.
b. #The connection between Americans and *living in New York* holds primarily by virtue of some important fact about Americans *as such*.

(9) a. Some philosophers work in metaphysics.
b. #The connection between philosophers and *working in metaphysics*

holds primarily by virtue of some important fact about philosophers *as such*.

(10) a. Some cups are handleless.
b. #The connection between cups and *being handleless* holds primarily by virtue of some important fact about cups *as such*.

None of the above sentences convey the robustness implicature, neither those about social kinds nor the one about an artifact. Thus, the type of kinds and properties do not appear to be the reasons why the sentences above lack the robustness implicature. The strength of the quantifier, however, has a clear influence. As I will show in the next subsection, universally quantified sentences seem to convey the robustness proposition.

5.3.1 "All"-quantified sentences

Consider the universally quantified sentences below:

(11) a. All dolphins are mammals.
b. ?The connection between dolphins and *being mammal* holds primarily by virtue of some important fact about dolphins *as such*.

(12) a. All humans are mortal.
b. ?The connection between humans and *being mortal* holds primarily by virtue of some important fact about humans *as such*.

I do not have clear intuitions on whether (11-a) and (12-a) convey the proposition that the relation between the kind and the property is robust. On the contrary, the existentially quantified sentences considered in the previous subsection clearly lack it.[5] The strength of the quantifier, thus, appears to make a difference. However, property type and kind do not condition whether the robustness proposition is conveyed by universally quantified sentences either:

(13) a. All dolphins live in water.
b. ?The connection between dolphins and *living in water* holds primarily by virtue of some important fact about dolphins *as such*.

[5]I do not use the same examples I used with the quantified "some" because "all dogs are spotted", "all humans are vegetarians", and "all cats live in Canada" are false and it is more difficult to have clear intuitions about what false sentences convey. Hence, I decided to employ true sentences. On the other hand, I did not use "some dolphins are mammals" or "some humans are mortal" because they implicate that *not all* dolphins are mammals and humans are mortal. These implicatures are false and, again, I preferred avoiding that this could compromise the intuitions concerning the robustness proposition.

(14) a. All giraffes feed on leaves.
b. ?The connection between giraffes and *feeding on leaves* holds primarily by virtue of some important fact about giraffes *as such*.

(15) a. All Professors have a degree.
b. ?The connection between Professors and *having a degree* holds primarily by virtue of some important fact about Professors *as such*.

(16) a. All children are minors.
b. ?The connection between children and *being minor* holds primarily by virtue of some important fact about children *as such*.

(17) a. All Italians are European.
b. ?The connection between Italians and *being European* holds primarily by virtue of some important fact about Italians *as such*.

(18) a. All cars have wheels.
b. ?The connection between cars and *having wheels* holds primarily by virtue of some important fact about cars *as such*.

Sentences (13-a) and (14-a) concern natural kinds; (15-a), (16-a), and (17-a) concern social kinds; and (18-a) concerns an artifact. The property in (13-a) entirely depends on biology, that of (14-a) is partially determined by the environment (what is available in giraffes' habitat), and the others have little to do with nature. The property in (16-a) is clearly peculiar to children, the others have various degrees of distinctiveness. Regardless of which types of kinds and properties are involved, whether the examples above convey the robustness proposition is unclear. Crucially, the claim is not obviously absent and this is something to be accounted for. As mentioned above, if generics are not the only type of sentences conveying the robustness proposition, two are the possibilities: either the robustness proposition has the same source in generics and universally quantified sentences or it arises due to different factors.

In the previous chapter, I argued that the implicature arises due to the unmarkedness of generics: since generics are unmarked, the I-principle applies to them, inducing the implicature. If this is correct, the mechanism giving rise to the robustness proposition of universally quantified sentences has to be a different one. Indeed, the I-principle cannot apply to quantified sentences because they are marked. Specifically, they are marked with respect to generics. Consider Levinson's characterization of markedness once again:

> On the formal side, marked forms, in comparison to correspond-

> ing unmarked forms, are morphologically complex and less lexicalized, more prolix or periphrastic, less frequent or usual, and less neutral in register. On the meaning side, such forms suggest some additional meaning or connotation absent from the corresponding unmarked forms. (Levinson 2000: 137)

Quantified sentences involve an explicit quantifier absent in generics. For this reason, they are both morphologically more complex and more prolix than generics. Hence, according to the formal side of the above characterization, quantified sentences are marked. Marked forms block the I-principle, that, consequently, does not apply to quantified sentences.

To sum up, the robustness proposition of generics is induced, I argued, by the I-principle. This principle does not apply to quantified sentences because they are marked. Hence, the mechanism potentially giving rise to the robustness proposition for universally quantified sentences has to be different from the one at work with generics. This is particularly important for the underlying Gricean reasoning. Indeed, the reasoning I reconstructed for the implicature of generics was: if the speaker did not specify what relationship links the category and the property, then the recipient should assume the strongest connection, namely that "the connection between the Ks and F holds primarily by virtue of some important fact about the Ks as such". I argued that this reasoning is based on the I-principle, which invites the hearer to "assume the richest temporal, causal and referential connection between situations or events" (Levinson 2000: 114). Consequently, I proposed that the robustness implicature is worked out as follows:

(19) **Test #6: calculability**

a. The speaker uttered the generic "Ks are F".
b. Generics are unmarked and the I-principle applies to them.
c. By the I-principle, the recipient should assume the richest connection between the category K and the property F.
d. Thus, the generic implicates the *robustness proposition*, namely that the connection between Ks and F holds primarily by virtue of some important fact about Ks *as such*.

However, the above calculus cannot work for quantified sentences: because the I-principle does not apply to them. For this reason, step (19-b) cannot be formulated for quantified sentences. But without this step the conclusion cannot be reached:

(20) **Test #6: calculability**

a. The speaker uttered the universally quantified sentence "all Ks are F".

b. #Universally quantified sentences are unmarked and the I-principle applies to them.

c. By the I-principle, the recipient should assume the richest connection between the category K and the property F.

d. #Thus, the universally quantified sentence implicates the *robustness proposition*, namely that the connection between Ks and F holds primarily by virtue of some important fact about Ks *as such*.

Moreover, quantified sentences do specify what relation links the category and the property. Hence, the reasoning leading to the robustness proposition cannot be that, since the speaker did not specify what connection holds, they meant the strongest one. Therefore, it seems that the mechanism yielding the robustness proposition for universally quantified sentences cannot be the same as generics'. But what could this mechanism be? If the robustness proposition conveyed by universally quantified sentences is an implicature, as in the case of generics, then it should be calculable. However, it is not clear what the Gricean reasoning could be for universally quantified sentences.

My proposal is that the claim conveyed by universally quantified sentences is not a generalized conversational implicature. Rather, I argue, a different phenomenon is going on: the robustness proposition is arrived at by an abductive reasoning. I argue that the hearer runs an inference on the following lines: it is unlikely that all or even most of the members of a category possess a property despite lack of a robust relation between being K and having F. It is possible that all members of a kind happen to have a certain property completely by accident, but it is rare, and we don't usually assume that it is the case. Moreover, if there is a robust relation, then it is likely that all or almost all Ks have property F. Again, this is not certain, given possible impairing circumstances, but it is the most common situation. Thus, the *best explanation* for a very wide rate of Ks having F is that the kind and the property are deeply connected. That is, the speaker evaluating a universally quantified sentence concludes by abduction that the relation between the kind and the property is likely to be *robust*.

One might wonder whether this inference might constitute the Gricean argument we were looking for, thus proving that the robustness proposition conveyed by universally quantified sentences is, after all, an implicature. However, as Levinson argues (2000: 46), generalized conversational implicatures are not abductive

inferences. While both abduction and generalized implicatures are defeasible, only the latter are default. According to Levinson, generalized conversational implicatures are "the prototype of default inferences" (Levinson 2000: 49) for "only default logics [contrary to other reasoning systems, ed.] clearly have the two properties that generalized implicatures (GCIs) clearly exhibit: defeasibility and default or preferred presumption" (Levinson 2000: 46).

Levinson provides the following schemes of abductive and default inferences, where M(Q(x)) means 'Q(x) is consistent with what is known':

(21) *Abduction*

∀(x)(P(x)→Q(x))	(known law)
Q(a)	(observed fact)
——————————— A	
P(a)	(hypothesized explanation)

(22) *Default "logics"*

∀(x)([P(x) & M(Q(x))]→Q(x))	(conditionally assume Q(x))
P(a)	(known fact)
——————————— DL	
Q(a)	(assumed consistent fact)

I propose that the inference giving rise to the GCI of generics is something like the following:

(23) *Generics' robustness proposition*

∀(K,F)["Ks are F" & M(*robust connection*)(K,F)]→*robust connection*(K,F)

"Ducks eat wheat"

——————————————————————————— DL

robust connection(duck, eat wheat)

The first premise conditionally assumes that there is a robust connection between a kind K and a property F. The condition of this assumption is that a generic predicates F of Ks ("Ks are F") and that a robust connection linking K and F is consistent with what is known. The justification of this premise is given by the I-principle: the recipient should assume the richest connection between category K and property F. The second premise is constituted by a certain generic, "ducks eat wheat" in the example above. The conclusion is that there is a robust connection between ducks and *eating wheat*. The conclusion is, as desired, the generalized

conversational implicature of the generic in question.

Notice that the application of the I-principle is crucial in justifying the first premise. As observed above, the I-principle does not apply to quantified sentences because they are marked. Hence, a similar premise involving a quantified sentence would lack justification. Consequently, it is not possible to formulate an analogous default inference for universally quantified sentences. Instead, the reasoning leading to the robustness proposition conveyed by universally quantified sentences is, I argue, something like the following:

(24) *Universally quantified sentences' robustness proposition*
$\forall$(K,F)(*robust connection*)(K,F)$\rightarrow$"(almost) all Ks are F"
"(Almost) all ducks eat wheat"
——————————————————— A
robust connection(duck, eat wheat)

The first premise expresses a known law, according to which if a kind K and a property F are deeply connected, then "(almost) all Ks are F" is true. The second premise is constituted by a certain universally quantified sentence, "(almost) all ducks eat wheat" in the example above. The conclusion is that there is a robust connection between ducks and *eating wheat*, namely the robustness proposition.

Hence, both inferences have the same conclusion, namely that a robust connection holds between ducks and *eating wheat*. However, the conclusion is reached differently: (23) instantiates the scheme in (22); (24) that in (21). Since generalized conversational implicatures are, according to Levinson, default inferences, (23) leads to an implicature, while (24) does not. Hence, the robustness proposition of generics is a generalized conversational implicature, while that of universally quantified sentences is not.

It is worth noting that the conclusions of an abductive reasoning are not certain, but probabilistic. This could explain why the intuitions concerning the robustness proposition of universally quantified sentences are not as clear as those concerning the implicature of generics. That is to say, my hypothesis that different mechanisms give rise to the robustness proposition with universally quantified sentences and with generics explains the different strength of intuitions concerning the presence of the claim itself.

5.3.1.1 Incompatibility with world knowledge

A consequence of my proposal is that universally quantified sentences would not convey the robustness proposition if the world knowledge does not support the

inference leading to it. For, abduction also depends on world knowledge. That is to say, suppose we know that all members of a category possess a certain property even though no robust relation links Ks and F. This information would not allow us to run the abductive inference that would lead to the robustness proposition. Consequently, the corresponding universally quantified sentence would not convey the robustness proposition. To appreciate this point, let's consider a classic example.

Imagine that, by complete accident, all Supreme Court judges *happen* to have a prime Social Security number. This information does not support the abductive inference to the robustness proposition. Hence, the universally quantified sentence should not convey it. The prediction is borne out:

(25) All Supreme Court judges have a prime Social Security number.
The connection between Supreme Court judges and *having a prime Social Security number* holds primarily by virtue of some important fact about Supreme Court judges *as such*.

However, this result is consistent with the robustness proposition being an implicature. Indeed, implicatures, even generalized ones, do not arise if incompatible with background knowledge. Hence, that (25) lacks the robustness proposition does not constitute a conclusive case for the abductive proposal versus the implicature one. For it might be that the claim (generally) conveyed by universally quantified sentences really is an implicature, but (25) lacks it because the implicature is canceled since it clashes with our background information concerning Supreme Court judges.

Even though (25) does not directly show what is the mechanism responsible for the robustness proposition, it might provide a foothold for testing the hypotheses. One possibility, indeed, is that the two reasoning require different processing times. If that was the case, the corresponding generic in (26) could be used as a basis for comparison:

(26) Supreme Court judges have a prime Social Security number.
The connection between Supreme Court judges and *having a prime Social Security number* holds primarily by virtue of some important fact about Supreme Court judges *as such*.

Given the scenario described above, (26) does not convey that the connection between Supreme Court judges and *having a prime Social Security number* is robust. Since the robustness proposition (generally) conveyed by generics is an

implicature, we know that, in this case, it was canceled because incompatible with the context. Therefore, if the time required to process (25) is the same, we would have evidence that the mechanism is the same as well: the claim is an implicature that got canceled. If, instead, (25) and (26)'s processing times differ, the abductive proposal would gain support.

Moreover, if there is a population that can run abductive but not default reasoning (or vice versa), then my proposal predicts its members to be able to derive the claim of universally quantified sentences but not of generics (or vice versa). If, instead, such people would be able to derive both claims alike, this would be evidence that the reasoning is an abduction (or a default reasoning) in both cases. Hence, the evidence provided by such a test would allow to distinguish between the two theories. Running experimental studies goes beyond the scope of this dissertation. However, identifying a possible test bed is important anyway. Crucially, it shows that the competing theories are not indistinguishable and that they are falsifiable.

To sum up, I observed that universally quantified sentences might convey the robustness proposition just like generics. As I pointed out, though, the mechanism responsible for this claim cannot be the same as generics'. Indeed, the latter crucially relied on the unmarkedness of generics. Since universally quantified sentences are marked, this mechanism cannot apply to them. I then proposed that the robustness proposition conveyed by universally quantified sentences is not an implicature but, rather, the result of an abductive reasoning. This would explain why it is not as clear whether a universally quantified sentence conveys it: the conclusions of abductive inferences are probabilistic.

Furthermore, if my hypothesis is correct, the claim should be absent when the world knowledge does not support the inference. The prediction is borne out, as shown by (25), the Supreme Court judges example. However, the implicature proposal makes the same prediction since implicatures do not arise if incompatible with the context. One way to discriminate between the competing accounts would be to run empirical tests. For example, by measuring processing times.

I conclude by pointing out that a defender of the implicature proposal should provide a plausible Gricean reasoning for the robustness proposition of universally quantified sentences. Indeed, as I showed, the putative implicature of universally quantified sentences does not pass the calculability test for genuine implicatures.

5.3.2 "Most"- and "many"-quantified sentences

In the previous subsection, I argued that there is a different mechanism behind the proposition conveyed by generics and by universally quantified sentences. The robustness proposition conveyed by generics is an I-implicature, due to a enrichment of the sentence. That of universally quantified sentences, instead, is the result of an abduction: the best explanation for all Ks being F is that the kind and the property are deeply connected. This reasoning crucially rests on the assumption that it is unlikely that a wide rate of Ks are F despite lack of a robust relation between K and F. If this is correct, the frequency of the inference should increase with the strength of the quantifier. Consequently, we should expect the robustness proposition to be almost always conveyed with "all", often with "most", rarely with "many", and never with "some". This expectancy is met for *some*- and *all*-quantified sentences, as shown above. Let's check what happens with *most*-quantified sentences:

(27) a. Most dogs have four legs.
b. ?The connection between dogs and *having four legs* holds primarily by virtue of some important fact about dogs *as such*.

(28) a. Most tigers are striped.
b. ?The connection between tigers and *being striped* holds primarily by virtue of some important fact about tigers *as such*.

(29) a. Most humans have some illness.
b. #The connection between humans and *having some illness* holds primarily by virtue of some important fact about humans *as such*.

(30) a. Most barns are red.
b. #The connection between barns and *being red* holds primarily by virtue of some important fact about barns *as such*.

(31) a. Most caregivers are women.
b. #The connection between caregivers and *being women* holds primarily by virtue of some important fact about caregivers *as such*.

(32) a. Most Mexicans speak Spanish.
b. ?The connection between Mexicans and *speaking Spanish* holds primarily by virtue of some important fact about Mexicans *as such*.

As these examples show, sentences with "most" give rise to the expected pattern as well: the robustness proposition is clearly absent in certain cases, uncertain

in others. Notice that the examples above vary according to property type and kind. Sentences (27-a)-(29-a) concern natural kinds; (30-a) an artifact; and (31-a) and (32-a) concern social kinds. An entirely biological property is predicated in (27-a) and (28-a), an entirely cultural one in (30-a)-(32-a), and a mixed property is predicated in (29-a). Finally, the properties have various degrees of distinctiveness: *being striped* is characteristic of tigers, while *having four legs* is not that peculiar of dogs, and *speaking Spanish* for Mexicans lies in between.

As above, varying property and kind type ensures that the absence of the conveyed proposition is not due to one of these factors: if the robustness proposition was blocked due to the occurrence of natural kind terms, sentences about social kinds should convey it. Since some sentences about social kinds lack the robustness proposition as well, we can conclude that kind type is not the factor preventing the claim to be conveyed. Analogously for property type.

Finally, let's consider quantified sentences involving "many". As predicted, they do not convey the robustness proposition:

(33) a. Many dogs live with humans.
b. #The connection between dogs and *living with humans* holds primarily by virtue of some important fact about dogs *as such*.

(34) a. Many humans are female.
b. #The connection between humans and *being female* holds primarily by virtue of some important fact about humans *as such*.

(35) a. Many Americans voted for Obama.
b. #The connection between Americans and *voting for Obama* holds primarily by virtue of some important fact about Americans *as such*.

(36) a. Many Italians play soccer.
b. #The connection between Italians and *playing soccer* holds primarily by virtue of some important fact about Italians *as such*.

(37) a. Many water bottles are disposable.
b. #The connection between water bottles and *being disposable* holds primarily by virtue of some important fact about water bottles *as such*.

The pattern displayed by the quantified sentences is consistent with my hypothesis that quantified sentences do not implicate the robustness proposition. Rather, they sometimes give rise to an abductive reasoning that the connection between the property and the kind is robust. The likelihood with which the abduction

takes place is directly proportional to the strength of the quantifier occurring in the sentence: *some*-quantified sentences never give rise to such reasoning, *many*-quantified sentences seldom, *most*-quantified sentences sometimes, and *all*-quantified a bit more frequently.

To recap: in the previous chapter, I argued that generics convey an I-implicature that the relation between Ks and F is robust. This implicature arises because generics are unmarked and the I-principle applies to unmarked forms. I further noticed that quantified sentences with strong quantifiers do sometimes convey the robustness proposition. I argued that the claim in this case is arrived at through abduction and is not an I-implicature. This is consistent with the fact that the I-principle does not apply to marked forms. Quantified sentences are marked and, therefore, the I-principle does not apply to them. Consequently, quantified sentences do not I-implicate the robustness proposition.

However, from the fact that quantified sentences are marked, it does not simply follow that they lack I-implicatures since the I-principle does not apply to them. Levinson's theory further predicts that marked forms convey an M-implicature, complementary to the I-implicature conveyed by their unmarked counterparts. In the following section, I will explore this issue and I'll point out that quantified sentences do not seem to convey the M-implicature predicted by Levinson. I will argue that they are not the only marked forms that lack it and I will consequently propose a revision of Levinson's theory that can account for this fact.

5.4 A complementary implicature?

In the previous section, I showed that quantified sentences, unlike generics, do not I-implicate that the relation between Ks and F is robust. I attributed this fact to their markedness: the I-principle only applies to unmarked forms. However, according to Levinson's theory, marked forms should not simply lack the I-implicature conveyed by their unmarked counterparts. Rather, they should convey a complementary M-implicature. That is, quantified sentences should M-implicate the complement of the I-implicature conveyed by generics. Indeed, according to Levinson "whatever an unmarked expression U would I-implicate, the marked alternative (denotational synonym) M will implicate the complement of U's denotation" (Levinson 2000: 137). In what follows, though, I will show that this prediction is not borne out.

Before going to the heart of the problem, we have to determine what exactly

quantified sentences should M-implicate. In doing this, we are confronted with a first difficulty. Indeed, Levinson's M-principle is formulated for expressions, yet quantified sentences and generics are linguistic constructions. Levinson characterizes the M-implicature of the marked expression in terms of the complement of the *denotation* of the corresponding unmarked expression, or, more precisely, of their I-implicature. But quantified statements and generics are sentences, and sentences do not have a denotation. First of all, then, I have to figure out what the M-implicature of a construction could be.

I propose that the M-implicature of a quantified sentence picks up the complement of the *proposition* I-implicated by generics. This is consistent with the spirit of the M-principle, according to which marked forms pick up the complement of the stereotypical interpretation suggested by their unmarked counterpart. Therefore, quantified sentences would M-implicate the complement of the robustness proposition. Therefore, according to this hypothesis, quantified sentences would M-implicate that the connection between Ks and F does *not* hold primarily by virtue of some important fact about Ks *as such*. This prediction, however, is not borne out:

(38) a. Some dogs are spotted.
b. #The connection between dogs and *being spotted* does *not* hold primarily by virtue of some important fact about dogs *as such*.

(39) a. All dogs are mammals.
b. #The connection between dogs and *being mammal* does *not* hold primarily by virtue of some important fact about dogs *as such*.

(40) a. Most dogs have four legs.
b. #The connection between dogs and *having four legs* does *not* hold primarily by virtue of some important fact about dogs *as such*.

(41) a. Many dogs live with humans.
b. #The connection between dogs and *living with humans* does *not* hold primarily by virtue of some important fact about dogs *as such*.

Sentences (38-a)-(41-a) do not M-implicate that the connection between Ks and F is *not* robust. As observed above, GCIs do not arise if inconsistent with the context. We might wonder, then, whether the sentences above lack the expected M-implicature because it would contradict the background knowledge concerning dogs. That is to say, we might bear a pre-existent belief that there is something deep (e.g., some gene) connecting a dog to a certain fur pattern, animal class,

number of legs, or behavior. The predicted M-implicature that the connection between dogs and these features does *not* hold primarily by virtue of some important fact about dogs *as such* would clash with our pre-existing beliefs. Quantified sentences might fail to convey the M-implicature due to this mismatch because GCIs that would be inconsistent with the context do not arise. However, this hypothesis does not account for (42):

(42) Most barns are red.
#The connection between barns and *being red* does *not* hold primarily by virtue of some important fact about barns *as such*.

We do not have strong beliefs that being a barn is strongly connected with being red. Thus, it seems that there is no background knowledge that prevents the M-implicature from arising. Still, (42) does not convey that the connection between being a barn and being red does *not* hold primarily by virtue of some important fact about barns as such. Hence, it seems that incompatibility with the context is not the reason why quantified sentences do not convey the predicted M-implicature.

All the quantified sentences considered do not convey the predicted M-implicature. This could depend on the formulation of the M-implicature: maybe quantified sentences convey an M-implicature complementary to generics' I-implicature, but what they convey is different from what I proposed. However, there is no alternative candidate to be the complement of the robustness proposition I can think of. Actually, (38-a)-(42) do not seem to convey any M-implicature. Sentence (39-a) does not seem to convey any generalized implicature at all. Sentences (38-a) and (40-a)-(42), instead, do convey a generalized implicature, namely that not all Ks (dogs/barns) are F (are spotted/have four legs/live with humans/are red). The latter is a scalar implicature, induced by the quantifiers occurring in the sentences ("some", "most", and "many"). But scalar implicatures are not M-implicatures: they are Q-implicatures. And there does not seem to be any other generalized conversational implicature conveyed by (38-a) and (40-a)-(42). So, sentences (38-a)-(42) do not seem to convey any M-implicature whatsoever. The problem, therefore, does not seem to rely on the formulation of the M-implicature.

The difficulty could be due, instead, to the impossibility of applying the notion of M-implicatures to sentences. After all, Levinson defines these implicatures for linguistic expressions, not for constructions. That quantified sentences do not convey the expected M-implicature might simply show that the M-principle cannot be extended to apply to sentences as I tried to do. This hypothesis,

though, faces two problems.

First, the I-principle can be extended to sentences successfully: it applies to generics, which are sentences. And there is no reason why the I-principle but not the M-principle should successfully apply to constructions. That is, given that the I-principle applies to generics, assuming that the M-principle cannot be extended to sentences seems unwarranted. To argue for this hypothesis, one should show what distinguishes the two principles so that the former, but not the latter, is eligible for the extension.

Second, quantified sentences do not seem alone in resisting Levinson's theory: other marked forms do not convey the predicted M-implicature. I take into account two instances of this phenomenon: technical terms and extended expressions. Crucially, technical terms and extended expressions are expressions and not sentences. Therefore, this hypothesis (that quantified sentences do not convey the M-implicature because the M-principle cannot apply to sentences) cannot account for the other cases considered, namely technical terms and extended expressions. Rather, as I will argue in the next section, there is a different reason why these marked forms do not convey the predicted M-implicature. This reason is the same for all three kinds of cases. But first, let's take into account technical terms and extended expressions.

5.4.1 Technical terms

Technical terms are expressions that have a specific meaning. A technical term is typically defined within a discipline to unambiguously identify a specific concept or object relevant to that field. For example, plants and animals are given a scientific name based on Linnaeus' classification. Each scientific name, unlike common ones, unambiguously identifies a certain element in the Linnaean taxonomy. For example, "aptenodytes patagonicus" is the scientific name for one species of penguins. While the common name "penguin" refers to many different species, the scientific name "aptenodytes patagonicus" only refers to one specific species. Hence, "penguin" is ambiguous between several species, but "aptenodytes patagonicus" has a univocal meaning, as it picks up a specific species.

Technical terms are the marked counterpart of common terms. To see this, recall Levinson's characterization of markedness:

> On the formal side, marked forms, in comparison to corresponding unmarked forms, are morphologically complex and less lexicalized, more prolix or periphrastic, less frequent or usual, and less neutral in register. On the meaning side, such forms suggest some additional

> meaning or connotation absent from the corresponding unmarked forms.
>
> (Levinson 2000: 137)

Technical terms, in comparison with common terms, are morphologically more complex and less lexicalized, more prolix or periphrastic, less frequent or usual, and less neutral in register. Going back to our example, scientific names of plants and animals are less frequent and less neutral in register than common names. For instance, "aves" is definitely less frequent than the common name "bird", and it clearly belongs to a specific, technical register. Hence, technical terms, like, e.g., "aves", are marked.

According to Levinson's theory, then, technical terms should M-implicate the complement of the denotation I-implicated by common terms. While the latter, being unmarked, I-implicate that the objects and concepts at issue are stereotypical, technical terms should instead M-implicate that they are non-stereotypical. For example, the technical term in (43) M-implicates that the recreational drugs at issue are not the stereotypical ones:

(43) Some *psychopharmaceuticals* are legal: nicotine, ethanol, and caffeine.

However, this is not always the case. In particular, technical terms referring to *stereotypical* objects and concepts do not seem to convey the predicted M-implicature. Consider, for example, "bird". This term, being unmarked, I-implicates that the animals at issue are stereotypical birds, e.g., flying ones. Thus, using "aves" should M-implicate that the relevant animals are non-stereotypical birds, e.g., non-flying ones. Similarly, using the scientific name for tigers, i.e., "panthera tigris", should M-implicate that the tigers at issue are non-stereotypical, e.g., they are albino. However, this does not seem to be the case. Compare the following examples:

(44) a. Mary's new animal is a bird.
b. [I-implicature:] Mary's new animal is a flying bird.

(45) a. Mary's new animal is an *aves*.
b. #[M-implicature:] Mary's new animal is a non-flying bird.

(46) a. Tigro is a tiger.
b. [I-implicature:] Tigro is a striped tiger.

(47) a. Tigro is a *panthera tigris*.
b. #[M-implicature:] Tigro is an albino tiger.

Sentence (45-a), although a bit unnatural, does not M-implicate that Mary's new animal is a non-flying bird. It does not implicate that the bird is flying either. This sentence seems to be neutral on whether the animal at issue is a stereotypical flying bird or not. A similar remark can be made for (the perfectly natural) sentence (47-a).

Technical terms, at least those for stereotypical objects and concepts, seem to lack both the I-implicature conveyed by their unmarked counterpart and the M-implicature predicted by Levinson. They behave like quantified sentences in this respect. Another example of marked expressions that does not convey the M-implicature predicted by Levinson are extended expressions. I discuss them in the next subsection.

5.4.2 Extended expressions

Certain expressions have an abbreviated or truncated corresponding form. For example, "climb up" can be truncated to "climb". I will refer to the complete expression, i.e., the one where no element has been cut off, as "extended expression".

Extended expressions are morphologically more complex, more prolix and periphrastic, and less frequent than their truncated counterparts. Therefore, according to Levinson's definition quoted above, extended expressions are marked and truncated expressions are unmarked. Given their unmarkedness, the I-principle applies to truncated expressions, giving rise to the implicature that they indicate a stereotypical object or situation. For example, "climb" I-implicates that the direction of climbing is the typical one, namely upward:

(48) a. Petra climbs the mountain.
b. [I-implicature:] Petra climbs *up* the mountain.

Extended expressions, being marked, should convey a complementary M-implicature. However, this is not always the case. Consider, for instance, (49-a):

(49) a. Petra climbs up the mountain.
b. #[M-implicature:] Petra climbs *down* the mountain.

"Climb up", by being marked, should convey the complement of the I-implicature of the truncated "climb". That is, "climb up" should M-implicate "climb *down*". This, however, is clearly incorrect. Hence, some instances of extended expressions do not convey the M-implicature predicted by Levinson's account, just like certain

technical terms.

One might argue that the M-implicature in the example above does not arise due to a clash with the context: sentence (49-a) explicitly expresses the climbing direction; it says that Petra climbs up. This information, thus, becomes part of the context and prevents a conflicting implicature from arising. This mechanism, however, does not occur just in this example: the same can be said for expressions like "in here", "alcoholic drink" and "medical doctor", that can be truncated, respectively, to "here", "drink" and to "doctor". Notice that, in all these cases, the extended expression does not change meaning when truncated. Hence, it seems that extended expressions that don't change meaning upon truncation do not M-implicate that their referent is non-stereotypical. That is, the absence of the predicted M-implicature for this kind of extended expressions is a systematic phenomenon. Therefore, I argue, it should be treated accordingly, in line with Levinson's project. Even more given that extended sentences are not the only class of cases that do not convey the expected M-implicature.

To recap, I identified three kinds of marked forms that do not convey the M-implicature predicted by Levinson. Such forms are: technical terms for stereotypical objects and concepts, extended expressions that don't change meaning upon truncation, and quantified sentences. In the next section, I will analyze these cases more in detail, to find why they depart from Levinson's prediction. As I will argue, the marked forms in question do not convey the expected M-implicature because they already detail the situation. I propose to revise Levinson's M-principle accordingly.

5.5 Revising Levinson's M-principle

In the previous section, I argued that (some) technical terms, (some) extended expressions, and quantified sentences do not M-implicate that the situation at issue is not stereotypical, contrary to Levinson's prediction. Hence, I claim, a revision of Levinson's M-principle is called for. In this section, I will try to identify the reason why these marked forms do not convey the predicted M-implicature. I will then propose a modified M-principle that incorporates this observation. The aim is to provide a formulation of the principle according to which technical terms, extended expressions, and quantified sentences do not M-implicate that the situation is not stereotypical. At the end of this section, I will show that the revised M-principle achieves this desideratum.

While technical terms define their extension precisely, common terms are va-

guer. Depending on the context, they can stand for partially different sets of objects. For example, "fish" in "I saw many fish in the aquarium" may refer to any animal living in water, including whales and dolphins. Or it may refer to the scientific class of *Pisces*, that does not include cetacean like whales and dolphins. For this reason, common terms need to be implemented with the I-implicature that helps determining which objects they refer to. An analogous specification is not needed with technical terms, where the meaning is precise enough.

The unmarked counterparts of extended expressions are truncated forms. The latter I-implicates that the concept or the object referred to is stereotypical. The marked form, i.e., the extended expression, specifies certain properties that belong to or depart from the stereotype. Thus, when the referent is stereotypical, the marked form specifies what the unmarked form I-implicates.

Quantified sentences are the marked counterpart of generics. The I-implicature of generics specifies what kind of connection relates the category K and the property F: one that holds primarily by virtue of some important fact about the Ks as such. Quantified sentences provide information concerning the relationship between the category and the property: they say how many members (or what proportion) of the category have the predicated property. Again, the marked form specifies a piece of information that its unmarked counterpart I-implicates.

In all these cases, the unmarked forms call for a specification, that is provided by the I-implicature. The marked forms, instead, are, so to speak, explicit enough. They do not need to be accompanied by a GCI. What should, in Levinson's theory, be specified by the M-implicature is expressed otherwise. Thus, technical terms identify the relevant objects precisely; extended expressions make clear what (stereotypical or counter-stereotypical) properties their referent has; and quantified sentences qualify the relationship between the category K and the property F.

I propose to modify Levinson's M-principle so as to incorporate these observations. The revised principle should not apply to those marked forms that do already characterize the situation at issue precisely enough. It should be formulated so as to make this exclusion explicit. The resulting principle is as follows, where my revisions are highlighted in bold:

(50) ***M-principle*** (revised)

> *Speaker's maxim:* Indicate an abnormal, non-stereotypical situation by using marked expressions that contrast with those you would use to describe the corresponding normal, stereotypical situation.

Recipient's corollary: What is said in an abnormal way indicates an abnormal situation or marked messages indicate marked situations, **unless the features of the situation are specified otherwise**. Specifically:

> Where S said "p" containing marked expression M, and there is an unmarked alternate expression U with the same denotation D which the speaker might have employed in the same sentence-frame instead, then where U would have I-implicated the stereotypical or more specific subset d of D, the marked expression M will implicate the complement of the denotation d, namely $\overline{d}$ of D, **unless a specification of D is provided otherwise**.

Now, let's see how the new definition works. In particular, let's see whether it allows us to handle the problematic examples correctly. Consider the case of technical terms. As observed above, (45-a) and (47-a) do not convey the M-implicature in b.:

(45-a) Mary's new animal is an *aves*.
b. #[M-implicature:] Mary's new animal is a non-flying bird.

(47-a) Tigro is a *panthera tigris*.
b. #[M-implicature:] Tigro is an albino tiger.

The revised M-principle gets this result. Indeed, (45-a) contains the marked expression "aves", and there is an unmarked alternate expression "bird" with the same denotation D which the speaker might have employed in the same sentence-frame instead and that would have I-implicated the stereotypical or more specific subset d of D, i.e., that of flying birds. "Aves" is a technical term, thus D is specified as being the scientific class of birds, containing both flying and non-flying individuals. The clause in bold warrants that, given that a specification of D is provided, the marked expression "aves" does not implicate the complement of the denotation of flying birds. Analogously, "panthera tigris" does not implicate that Tigro is a tiger with non-stereotypical properties, e.g., an albino tiger. Again, D is specified otherwise: "panthera tigris" refers to the biological species of tigers, that comprises both striped and albino exemplars.

Let's now consider (49-a):

(49-a) Petra climbs up the mountain.
#[M-implicature:] Petra climbs *down* the mountain.

Sentence (49-a) contains the marked expression "climb up", and there is an

unmarked alternate expression "climb" with the same denotation D which the speaker might have employed in the same sentence-frame instead and that would have I-implicated the stereotypical or more specific subset d of D, i.e., that of climbing up. "Climb up" specifies the direction of climbing. The clause in bold warrants that, given that a specification of D is provided, the marked expression "climb up" does not implicate the complement of the denotation of "climb up", namely "climb down".

Finally, let's look at our original case, that of quantified sentences:

(40-a) Most dogs have four legs.
#[M-implicature:] The connection between dogs and *having four legs* does *not* hold primarily by virtue of some important fact about dogs *as such*.

Here the explanation is slightly different since, as observed above, the M-principle is formulated for expressions but we are dealing with linguistic constructions. (40-a) is a quantified sentence and, therefore, it is marked. Its unmarked alternate is the generic below:

(51) Dogs have four legs.

Sentence (51) does not state what links the category of dogs and the property of *having four legs*. This gap is filled in by the I-implicature it conveys, namely that the connection between dogs and having four legs holds primarily by virtue of some important fact about dogs as such. The quantifier in (40-a), instead, directly specifies the relation, relevant to the context, linking the category and the property: four-legged individuals are statistically prevailing among dogs. This, of course, does not exclude that a deep fact is responsible for this statistical relation, as the M-implicature predicted by Levinson's original M-principle seems to suggest. Such an implicature, though, is not conveyed by (40-a), as observed above. This result is obtained with the revised principle. The clause in bold warrants that, given that a specification of D is provided, the marked form (i.e., the quantified sentence) does not implicate the complement of the I-implicature conveyed by the unmarked form (i.e., the generic). That is, it warrants that the quantified sentence does not implicate that the connection between dogs and *having four legs* does *not* hold primarily by virtue of some important fact about dogs *as such*.

It seems, thus, that the revised principle handles the problematic examples correctly: it does not predict technical terms, extended expressions, and quan-

tified sentences to M-implicate that the situation is atypical. Technical terms clearly identify their extension in a certain context; extended expressions explicitly indicate the properties of the situation; and quantified sentences specify the kind of connection holding between category and property, by saying how many members of the kind have the predicated property. That is, technical terms, extended expressions, and quantified sentences provide a specification of *D*. Hence, by the clause in bold, they are not predicted to M-implicate that the situation is atypical, as desired.

So far in this chapter, I argued that quantified sentences, unlike generics, do not I-implicate the robustness proposition. I argued that this is due to their markedness. By the same token, Levinson's theory predicts that they should induce an M-implicature complementary to the I-implicature conveyed by their unmarked counterparts (i.e., generics). However, as seen with examples (38-a)-(42), this is not the case. I further discussed two other cases where the marked form does not give rise to an M-implicature: technical terms and extended expressions. To account for these cases, I argued for a modified formulation of Levinson's M-principle: the marked forms do not convey the M-implicature if the specification of *D* is already provided. Finally, I showed how the revised principle works with the problematic cases, quantified sentences included. In the next section, I will explore a different possibility, namely that generics induce a *clausal* implicature rather than an I-implicature. I will rule this hypothesis out based on the observation that generics do not meet the requirements for clausal implicatures.

5.6 Excluding Clausal Implicatures

In this chapter, I investigated whether quantified sentences convey the same I-implicature as generics. I concluded that they do not because they are marked constructions and, therefore, the I-principle does not apply to them. Precisely because quantified sentences are marked, the M-principle should apply to them, inducing an M-implicature complementary to the I-implicature of generics. However, quantified sentences do not convey the predicted M-implicature. A revision of Levinson's M-principle was needed in order to account for this fact.

At this point one might wonder whether this situation is better accounted for in terms of clausal implicatures. Indeed, one clausal alternate conveys the clausal implicature, while the other does not. Hence, if generics and quantified sentences were clausal alternates, only one would convey the implicature and no comple-

mentary implicature is predicted for the other. So, unlike the I-/M-implicature proposal, the clausal implicature hypothesis directly accounts for quantified sentences' lack of a complementary implicature, without having to revise Levinson's theory. The absence of a complementary implicature perfectly fits with the features of clausal implicatures, and no revision is required. Therefore, the clausal implicature proposal seems prima facie preferable.

A further advantage of this proposal is that clausal implicatures are originally defined for constructions. I- and M-implicatures, instead, are defined for expressions and some changes were needed to apply them to generics and quantified sentences. Arguing for a clausal implicature seems, therefore, a more natural choice. In this section, I will explore this possibility. I will conclude that, despite the initial appeal, such an account is not feasible because generics and quantified sentences do not meet the requirements for clausal implicatures.

Let's first analyze clausal implicatures more closely. Gerald Gazdar, who proposed the notion, defines clausal implicatures as follows:

> **Clausal Implicature:** a compound sentence ϕ clausal quantity im-plicates that, for all the speaker knows, ψ, and, for all the speaker knows, *not* ψ, if and only if ψ is a part of ϕ, but neither ψ nor its negation is entailed by ϕ.[6]
>
> (Gazdar 1979: 60, emphasis in the original)

So, for example, (52) clausal implicates that the speaker does not know whether it rains or not:

(52) If it rains, Mary won't come.

"It rains" is part of (52), but neither "it rains" nor its negation ("it does not rain") is entailed by (52). But why does this implicature arise? According to Gazdar, the Gricean argument for clausal implicature is: if the speaker knows that ψ (or that $\neg\psi$) and utters ϕ, which does not entail neither ψ nor its negation, then they would be in breach of the Maxim of Quantity. Indeed, "one could have been more informative by producing a complex sentence having the constituent concerned, or its negation, as an entailment or a presupposition" (Gazdar 1979: 60). Hence, if a speaker knows that it rains, they should utter (53):

(53) Since it rains, Mary won't come.

Indeed, (53) entails "it rains". Therefore, uttering (53) is more informative than uttering (52). If the speaker knows that it rains, they are in a position to utter

[6] Gazdar uses "im-plicature" with the hyphen to refer to a potential implicature.

the more informative (53). Failing to do so would imply breaking the Maxim of Quantity. Hence, under the assumption that the speaker is cooperative, (52) implicates that the speaker does not know whether it rains or not.

Clearly, that (52) conveys this implicature crucially depends on the existence of a sentence, (53), entailing "it rains". If there was no such sentence, the Gricean reasoning would not take place and the conditional would not convey the implicature. As Gazdar puts it:

> This Gricean argument relies on the fact that natural languages provide their users with *pairs of sentences* of roughly equivalent brevity which differ only in that in one, one or more constituent clauses are not entailed.
>
> (Gazdar 1979: 60-61, emphasis added)

The requirement on sentence length ensures that using the more informative would not involve violating the Maxim of Manner. For, in such a case, the speaker might utter ϕ not because they don't know whether ψ is true or false, but to be brief, as prescribed by the Maxim of Manner.

So, the clausal implicature is generated provided the existence of a similar sentence σ of roughly the same brevity as ϕ that, unlike ϕ, entails ψ. That is, ϕ conveys a clausal implicature only if it forms a contrast set with a stronger sentence σ. Hence, the conditions for clausal implicatures are:

1. σ and ϕ are compound sentences;
2. both σ and ϕ embed ψ;
3. ϕ does not entail neither ψ nor $\neg\psi$;
4. σ entails ψ.

Sentences $\{\sigma, \phi\}$ form a contrast set, where σ is the strongest element and ϕ the weaker. Uttering the latter would convey that the speaker does not know whether ψ obtains or not. For, if the speaker knew that ψ is true, they should have uttered σ, which entails ψ.

Let's now go back to the clausal implicature hypothesis for generics and quantified sentences. The idea is that the robustness proposition is not an I-implicature, but rather a clausal implicature. The clausal alternate of a generic would be a quantified sentence. This would explain why quantified sentences do not convey any corresponding implicature, as the I-/M-implicature proposal predicts. For this hypothesis to be confirmed, generics and quantified sentences

should form a contrast set, where quantified sentences are the strongest element. Therefore, uttering a generic would convey the clausal implicature that the speaker does not know whether ψ obtains or not: if the speaker knew that ψ is true or false, they should have uttered the more informative clausal alternate, namely a quantified sentence. However, there are two major problems with this hypothesis: first, generics and quantified sentences are not compound sentences; second, generics and quantified sentences do not form a contrast set. I shall consider the two problems in turn.

First, as their logical forms reveals, neither generics nor quantified sentences embed any sentence:

Generics *gen*[K][F]

E.g.: the logical form of "tigers are striped" is *gen*[tiger][striped];

Quantified sentences *quantifier* x(Kx∧Fx)

E.g.: the logical form of "some tigers are striped" is $\exists x(tiger(x) \wedge striped(x))$.

Since generics and quantified sentences are not compound, they do not meet the first requirement for clausal implicatures. This results in failing all the conditions above since the remaining depend on the first one. If neither sentences are compound, there cannot be any sentence ψ that they both embed (condition 2.) and that is entailed by one compound sentence (condition 4.) but not by the other (condition 3.). Therefore, generics cannot convey a clausal implicature.

Second, generics and quantified sentences do not form a contrast set. As Levinson specifies, "[t]he essential concept behind the scalar and clausal implicatures is the notion of contrast set, of linguistic expressions in salient contrast, which differ in informativeness" (2000: 35-36). So, generics and quantified sentences, in order to form a contrast set, should be in salient contrast and differ in informativeness. However, it is not clear which construction, whether the generic or the quantified, is the most informative. The following observation by Greg Carlson seems to show that quantified sentences are more informative than generics:

> A quantifier is, in rough terms, a word that can answer the question *how much?* or *how many?*. It will not always tell you exactly how much or how many, but it will serve as an answer in any case. For example, the question *how many people eat squid?* can be answered variously as *three million people*, *all people*, *a few people*, *most people*,

some *people*, and so on. Note that one cannot answer the question with the simple statement *people* *eat squid*.

(Carlson 1977: 41, emphasis in the original)

Generics, unlike quantified sentences, do not provide information concerning *how many* members of a category possess a certain feature. When quantity is at issue, *quantified sentences* are more informative than generics. However, this is not the whole story: in this dissertation, I have extensively argued that generics, but not quantified sentences, convey that the connection between Ks and F is robust. That is, generics provide a piece of information, namely that the connection is robust, which quantified sentences lack. Hence, with respect to characterizing the connection, *generics* are more informative than quantified sentences.

In sum, quantified sentences are more informative because they provide information about quantities, while generics are more informative because they characterize the connection that links the kind and the property as robust. Consequently, it is not possible to arrange them according to informativeness. This, however, is required for them to form a contrast set. Quantifiers, for instance, can be ranked in a scale, where the most informative goes first: <*all*, *most*, *many*, *some*>. No such ordering can be given for generics and quantified sentences, precisely because none is more informative than the other: each provides some information that the other lacks. Therefore, generics and quantified sentences do not form a contrast set.

To recap: in this section, I took into account the hypothesis that the implicature of generics is not an I-implicature, but rather a clausal implicature. This is a *prima facie* appealing proposal because: first, clausal implicatures are originally defined for sentences, and, second, only one of the clausal alternates conveys the implicature. These are precisely the two problematic aspects for the I-/M-implicatures account. However, the clausal implicature proposal fails on two grounds. First, generics and quantified sentences are not compound sentences, hence they do not meet the requirements for clausal implicatures. Second, they do not form a contrast set because neither of the two is more informative than the other *simpliciter*: generics are more informative concerning the nature of the connection between Ks and F, while quantified sentences are more informative concerning the quantity of Ks having F.

These difficulties are much more substantial than those encountered by the I-/M-implicatures account. Hence, I rule out the clausal implicature proposal in favor of the I-/M-implicature one. My conclusion is that the implicature of

generics actually is an I-implicature and that quantified sentences do not convey the M-implicature predicted by Levinson's original theory because they already specify what relation links the kind and the property.

5.7 Conclusions

In the previous chapter, I argued that non-statistical generics I-implicate the *robustness proposition*, namely that the connection between Ks and F holds primarily by virtue of some important fact about the Ks *as such*. In this chapter, I considered an alternative explanation: that the implicature is actually induced by the kind terms occurring in generics and not by the generic construction itself. I provided some counterexamples to this hypothesis and I consequently ruled it out. However, as I observed, this is not sufficient to demonstrate that what induces the implicature is the generic itself. To prove this point, I took into account quantified sentences, which closely resemble generics. The examples I provided show that not all quantified sentences convey the robustness proposition. Specifically, it seems that *some*-quantified sentences never convey it, *many*-quantified sentences do seldom, *most*-quantified sentences do sometimes, and *all*-quantified do a bit more frequently.

I argued that the mechanism responsible for the robustness proposition conveyed by some quantified sentences is not an implicature. Rather, I argued, the claim is arrived at by an abductive reasoning. Such a reasoning is based on the assumption that, if a large proportion of Ks are F, then the connection between Ks and F has to be a strong one.

I further pointed out that Levinson's theory predicts quantified sentences, being marked, to give rise to an M-implicature complementary to the I-implicature of generics. However, this is not the case. I considered different explanations, concluding that quantified sentences constitute an exception to Levinson's M-principle. This move is justified by the presence of other counterexamples: technical terms and extended expressions. I analyzed these cases in detail to find the reason why they do not convey the predicted M-implicature. I concluded that these marked forms share a common feature: they all provide those aspects that the potential M-implicature should specify. Based on this observation, I proposed a revision of Levinson's M-principle according to which marked forms give rise to an M-implicature *unless* a relevant specification is already provided otherwise. As I showed, the revised principle works with the problematic cases: it does not predict that technical terms, extended expressions, and quantified sentences

M-implicate that the situation is atypical.

I concluded the chapter with a discussion concerning clausal implicatures. These implicatures are conveyed by only one of the sentences belonging to a clausal scale. As observed, generics but not quantified sentences convey the robustness proposition. Moreover, clausal implicatures are defined for sentences and generics are sentences. Therefore, it is natural to think that the implicature of generics is not an I-implicature but rather a clausal implicature. However, as I point out, generics and quantified sentences are not compound and do not satisfy the requirements to form a contrast set. Therefore, I conclude that the robustness proposition cannot be a clausal implicature.

Conclusions

In this dissertation, I investigated what linguistic property of generics explains why, as various studies show, they foster the essentialization of the categories they are about. As I argued in chapter 3, clarifying this point is also useful to conduct further empirical research. Understanding the mechanism underlying essentialization is crucial for different reasons, and identifying the proper sentences to test is one of them.

The tests for implicature I applied in chapter 4 show that generics convey, as predicted by Haslanger, that "the connection between Ks and F holds primarily by virtue of some important fact about the Ks *as such*" (Haslanger 2012: 450). I labeled this claim the *robustness proposition* and I argued that it is a *generalized conversational implicature* of type I in Levinson's taxonomy. The robustness proposition arises due to the unmarkedness of generics: the I-principle applies to generics qua unmarked forms and invites the recipient to assume the strongest connections.

Once this implicature becomes common ground, it licenses the inference to a claim of generic essence, namely the essence of a category. At this point, the speakers share the information that the category at issue has an essence and this amounts to essentializing the category. Hence, a generic sentence, via the robustness proposition, contributes to the conclusion that category K has an underlying nature, responsible for similarities among its members. As I showed in chapter 5, sentences similar to generics, such as quantified sentences, do not convey the robustness proposition or convey it through a different mechanism. This explains the empirical data showing that generics essentialize more than other sentences.

I further argued that generics convey an additional implicature, that I called the *explanatory implicature*. This depends on the context and it is a *particularized* conversational implicature, arising due to the flouting of the Maxim of Relevance. The explanatory implicature, indeed, specifies *what type* of connection holds between category K and property F, and this depends on the particular form of

explanation relevant for the context.

While the robustness proposition can explain the role of generics in essentialization, the explanatory implicature can be used to account for another phenomenon: the very same generic can convey different generalizations, and this can be due to the explanatory implicature. This implicature, indeed, varies according to the context and can influence the interpretation of the generic conveying it. As I showed, it is possible to cancel the explanatory implicature while leaving the robustness proposition intact. This, I argued, proves the two implicatures to be distinct.

The results here summarized have implications for semantic theories of generics. Specifically, that the robustness proposition is cancelable suggests that an adequate semantics should not involve reference to a robust connection between the category and the predicated property. If this information was part of the *semantics* of generics, it should not be possible to cancel it. That the robustness proposition is cancelable shows that it belongs to the *pragmatics* of generics instead. This observation motivates my choice of Cohen's semantics: this theory has the merit to account for some troublesome examples simply in terms of probability, without appealing to normality, stereotypicality or other strong connections between category and property.

The analysis I offered in this work opens up to further scrutiny and offers different directions for future research. On the one hand, it would be interesting to test my proposal empirically. In particular, an experimental pragmatic study could check whether the robustness proposition and the explanatory implicature are actually conveyed by generics. Speakers' intuitions could be analyzed to this end. My claim that the robustness proposition is arrived at through different mechanisms (I-implicature for generics and abduction for quantified sentences) can be put to the test too. As hypothesized in subsection 5.3.1.1, the two reasonings might require different processing times and this might appear when the robustness proposition is incompatible with world knowledge: an implicature would be derived and canceled afterwards, while an inductive reasoning would arguably be blocked right at the start. This difference may result in diverse processing times. The same claim could be tested by comparing a population that can run abductive but not default reasoning (or vice versa) with individuals that can perform both reasonings. If such a population actually exists and its members can derive the robustness proposition for universally quantified sentences but not for generics (or vice versa), then the results would favor my proposal. If, instead, the claim could be derived for the two types of sentences with comparable ease (or difficulty), then the evidence would indicate that the same mechanism is at

play in both cases.

On the other hand, my proposal could be refined from a theoretical point of view. In chapter 1, I motivated, following Nickel, my focus on characterizing generics with Bare Plural subject NPs by pointing out that other types of generics are subject to further restrictions and should be addressed afterward. How my theory extends to other types of generics could be a matter for future research. Such an extension would have to include the constraints that regulate the various types of generics. Another area that could be explored concerns the notion of common ground. Haslanger employs Stalnaker's (1970, 2002) definition of common ground, but it might be that other notions work better for the account proposed. In particular, Stalnaker's characterization involves high-level propositional attitudes: roughly, p is common ground if the participants in a conversation not only accept p, but also believe that the other participants believe that they accept p. However, the participants in a conversation might come to accept the robustness proposition conveyed by a generic and remain unaware as to whether the other participants accept it as well. If this is the case, the robustness proposition would belong to each participant's set of beliefs but not to the common ground. Exploring this issue would constitute an interesting topic for a future research.

Bibliography

Atlas, Jay D. and Stephen C. Levinson (1981). "*It*-clefts, Informativeness, and Logical Form: Radical Pragmatics (revised standard version)". In: *Radical Pragmatics*. Ed. by Peter Cole. Academic Press.

Burton-Roberts, Noel (1977). "Generic Sentences and Analyticity". *Studies in Language* 1, pp. 155–196.

— (1976). "On the Generic Indefinite Article". *Language* 52, pp. 427–448.

Carlson, Gregory N. (1989). "On the semantic composition of English generic sentences". In: *Properties, Types and Meanings*. Ed. by G. Chierchia, B. H. Partee, and R. Turner. Kluwer, pp. 167–192.

— (1979). "Generics and Atemporal 'When'". *Linguistics and Philosophy* 3, pp. 49–98.

— (1977). "Reference to kinds in English". Also published in 1980 by Garland, New York. PhD thesis. University of Massachusetts.

Carlson, Gregory N. and Francis J. Pelletier (1995). *The Generic Book*. Ed. by G. N. Carlson and F. J. Pelletier. The University of Chicago Press.

Chierchia, Gennaro and Sally McConnell-Ginet (1990). *Meaning and Grammar: An Introduction to Semantics*. The MIT Press.

Cohen, Ariel (1996). "Think Generic! The Meaning and the Use of Generic Sentences". PhD thesis. Carnegie Mellon University.

Dahl, Östen (1985). *Tense and Aspect Systems*. Blackwell.

— (1975). "On generics". In: *Formal Semantics of Natural Language*. Keenan, E. L., pp. 99–111.

Farkas, Donka and Yoko Sugioka (1983). "Restrictive If/When Clauses." *Linguistic and Philosophy* 6, pp. 225–258.

Felka, Katharina (2015). "On the presuppositions of number sentences". *Synthese* 192.5, pp. 1393–1412.

von Fintel, Kai (2004). "Would you believe it? The King of France is back! Presuppositions and truth-value intuitions". In: *Descriptions and Beyond*. Ed. by Marga Reimer and Anne Bezuidenhout. Oxford University Press, pp. 315–341.

Gazdar, Gerald (1979). *Pragmatics. Implicature, presupposition and logical form*. New York: Academic Press.

Gelman, Susan A. (2004). "Psychological essentialism in children". *Trends in Cognitive Sciences* 8.9.

Gelman, Susan A., Jon R. Star, and Jonathan E. Flukes (2002). "Children's use of generics in inductive inferences". *Journal of Cognition and Development* 3, pp. 179–199.

Gelman, Susan A., Elizabeth A. Ware, and Felicia Kleinberg (2010). "Effect of Generic Language on Category Content and Structure". *Cognitive Psychology* 61.3, pp. 273–301.

Goodman, Nelson (1955). *Fact, Fiction and Forecast*. Harvard University Press.

Graham, Susan A., Cari S. Kilbreath, and Andrea N. Welder (2004). "Thirteen-Month-Olds Rely on Shared Labels and Shape Similarity for Inductive Inferences". *Child Development* 75.2, pp. 409–427.

Grice, Paul (1989a). "Further Notes on Logic and Conversation". In: *Studies in the Way of Words*. Harvard University Press, pp. 41–57.

— (1989b). *Studies in the Way of Words*. Harvard University Press.

— (1975). "Logic and conversation". Reprinted in Grice (1989). *Studies in the Way of Words*. Harvard University Press, pp. 22-40.

Haslanger, Sally (2014). "The Normal, the Natural and the Good: Generics and Ideology". *Politica e società* 3, pp. 365–392.

— (2012). *Resisting Reality*. Oxford University Press.

Heim, Irene (1982). "The Semantics of Definite and Indefinite NPs". PhD thesis. University of Massachusetts at Amerst.

Hoeltje, Miguel (2017). "Generics and ways of being normal". *Linguistics and Philosophy* 40, pp. 101–118.

Kirkpatrick, James (2019). "Essays on Genericity". PhD thesis. Oxford University.

Krifka, Manfred (2013). "Definitional Generics". In: *Genericity*, pp. 372–389.

Krifka, Manfred et al. (1995). "Genericity: an Introduction". In: *The Generic Book*.

Lawler, John (1973). "Studies in English Generics". *University of Michigan Papers in Linguistics* 1.1.

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

— (2008). "Generics: Cognition and Acquisition". *The Philosophical Review* 117.1, pp. 1–47.

— (2007a). “Generic, Cognition, and Comprehension”. PhD thesis. Princeton University.
— (2007b). “Generics and the Structure of Mind”. *Philosophical Perspectives* 21, pp. 375–403.
Leslie, Sarah-Jane et al. (2009). “Conceptual and Linguistic Distinctions between Singular and Plural Generics”. In: *Proceedings of the 31st AnnualCognitive Science Society*. Amsterdam: Cognitive Science Society.
Levinson, Stephen C. (2000). *Presumptive Meanings. The Theory of Generalized Conversational Implicature*. The MIT Press.
— (1983). *Pragmatics*. Cambridge University Press.
Mari, Alda, Claire Beyssade, and Fabio Del Prete (2013). “Introduction”. In: *Genericity*. Ed. by A. Mari, C. Beyssade, and F. Del Prete. Oxford Linguistics, pp. 1–92.
Milsark, Gary (1974). “Existential Sentences in English”. PhD thesis. M.I.T.
Nickel, Bernhard (2016). *Between Logic and the World: An Integrated Theory of Generics*. Oxford University Press.
Nunberg, Geoff and Chiahua Pan (1975). “Inferring Quantification in Generic Sentences”. *Chicago Linguistic Society* (11), pp. 367–397.
Papadatou-Pastou, Marietta et al. (2019). *Human Handedness: A Meta-analysis*. Ed. by PsyArXiv. URL: doi:10.1037/bul0000229.
Rhodes, Marjorie, Sarah-Jane Leslie, and Christina M. Tworek (2012). “Cultural Transmission of Social Essentialism”. In: *Proceedings of the National Academy of Sciences*. Vol. 109. 34, pp. 13526–13531.
Rosola, Martina (2017). “Generics: from semantics to social cognition”. MA thesis. Università degli Studi di Milano.
Saul, Jennifer M. (2017). “Are Generics Especially Pernicious?” *Inquiry*.
Searle, John R. (1959). “On determinables and the notion of resemblance”. In: *Proceedings of the Aristotelian Society, supplementary volume 33*. London. Harrison and Sons. Chap. On determinables and the notion of resemblance. 141–158.
Shanon, Benny (1976). “On the Two Kinds of Presuppositions in Natural Language”. *Foundations of Language* 14, pp. 247–249.
Stalnaker, Robert (2002). “Common Ground”. *Linguistics and Philosophy* 25, 701–721.
— (1973). “Presuppositions”. *Journal of Philosophical Logic* 2, pp. 447–457.
— (1970). “Pragmatics”. *Synthese* 22, pp. 272–289.

Thomason, Richmond H. (1988). "Theories of nonmonotonicity and natural language generics". In: *Genericity in natural language: proceedings of the 1988 Tübingen conference.* Ed. by Manfred Krifka, pp. 395–406.

Vendler, Zeno (1967). *Linguistics in Philosophy.* Cornell University Press.

Wodak, Daniel, Sarah-Jane Leslie, and Marjorie Rhodes (2015). "What a Loaded Generalization: Generics and Social Cognition". *Philosophy Compass* 10.9, pp. 625–635.