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Experimental perspectives on genericity

Dimitra Lazaridou-Chatzigoga
Humboldt-Universität zu Berlin/University of Cambridge

1. Introduction

'Birds fly', 'The fox is a sly animal' and 'A cat lands on its feet' are all *generic generalisations* that allow speakers to talk about classes, types, or *kinds* of individuals - in this case, about the kinds *bird* (*Aves), fox* (*Vulpes vulpes*) and *cat* (*Felis catus*). They are used to convey characteristic properties of kinds, and/or to express knowledge about the world including beliefs, stereotypes and prejudices (e.g. 'Women talk more than men'). Generics can be seen as one of the building blocks of human cognition, as they allow us to conceptualise of properties of kinds and to organise our experience of the world, while they are ubiquitous in everyday communication and feature in run-of-the-mill conversation.

Generic generalisations have fascinating properties, especially when compared to other types of generalisations such as overtly quantificational generalisations. Quantificational generalisations are expressed in quantitative terms. Statements like 'all cats eat mice', 'some lions live in cages' and 'most tigers have yellow eyes' refer to the quantity that satisfies the relevant property. In a semantic theory, these generalisations can be relatively easily modelled in terms of set-inclusion relations (Barwise and Cooper, 1981). On the other hand, generic generalisations do not seem easily reducible to these terms, but seem to reflect richer and more complex relations between the kind and the property. Generics often refer to characteristic or essential properties of a kind; while 'most books are paperbacks' is true, the generic 'books are paperbacks' is not because publication format is not an essential property of books. Furthermore, unlike a comparable generalisation ('all birds fly'), generics ('birds fly') tolerate exceptions (e.g. penguins), a characteristic that has proved difficult to account for. Given their complex yet fundamental nature, it is not surprising that generics have attracted the interest of linguists and philosophers of language since the seventies, while they have also recently become the focus of concentrated interest by cognitive and developmental psychologists.

In this chapter I will review the phenomenon of genericity and I will argue that our understanding is enriched by research that integrates the tools and perspectives of theoretical and experimental approaches. In section 2 I first introduce some basic facts about genericity, then I discuss the main characteristics of generics and finally I illustrate the range of possible statements one could make when using generics. Section 3 presents how genericity has been treated within three different fields (linguistics, psychology and philosophy) and discusses at length two types of approach, the formal semantics and the psychological generics-as-default approach. In section 4 I present an overview of the experimental research on the topic in two different fields, experimental psychology and linguistics, focusing on adult data. Bilingual and second language adult acquisition as well as child language acquisition are also briefly discussed. Section 5 discusses whether and how the experimental investigation has advanced our understanding of the phenomenon of genericity and

considers other experimental methods that could be used in future research while pointing out some under-researched areas. In section 6 I present some conclusions.

2. What is genericity?

2.1 Main definitions and facts

Traditionally, two types of phenomena have been classified as *generic* (Krifka et al., 1995). The first one involves *kind-referring* noun phrases (NPs henceforth), as in (1), where the subject NP *the cat* does not state something about some particular cat, but rather about the kind *cat* (*Felis catus*) itself. In this instance 'the cat' does not refer to an ordinary individual or object, but instead is *kind-referring* (contrast this to 'the cat is sleeping on the mat' that refers to an ordinary object, a cat, where the NP here is *object-referring*). The second one involves propositions, called *characterising* or *habitual* sentences, which describe a general property or regularity that does not refer to a specific or isolated fact, but rather summarises groups of particular episodes or facts. (2) below does not describe an isolated fact, but a habit, some kind of characteristic event or behaviour (that refers to what Neko usually does after hunting mice). These two phenomena can co-occur, as in (3). Here, the subject NP can be analysed as a *kind-referring* NP and the sentence itself as expressing a generalisation that holds for the kind *cat.* Thus, (3) expresses a generalisation about the kind as a whole, as well as a regular event.

A *kind-referring* NP like *the cat* in (1) has been called a *D-generic* (Krifka, 1987), as these are commonly expressed with the definite singular in English, whereas a sentence that combines both, as in (3), has been called an *I-generic*, because these are commonly expressed with *indefinite* NPs like bare plurals. D-generics also include generalisations made with *kind-level predicates* (Carlson, 1977), such as 'be extinct', 'die out', 'be common', which predicate a property directly of the kind in question. For example, in uttering (4) one states something about the kind dodo (*Raphus cucullatus*), namely, that this kind of thing has ceased to exist.

(1) The cat was first domesticated in Cyprus.
(2) Neko takes a nap after hunting mice.
(3) Cats are fed with fresh fish or cat food.
(4) The dodo is extinct.

It is also important to note two linguistic facts about the expression of genericity: a) cross-linguistically, no language has a unique, unambiguous marker of genericity equivalent to a quantifier or determiner (Dahl, 1995:425) and, arguably as a consequence, b) within a language, we may find different kinds of NPs in a generic statement (see Krifka et al., 1995:19, where they state that "characterising sentences may contain virtually any NP"). Among them, the most common types of NPs that appear in characterising sentences are *bare plurals, indefinite singulars* and *definite singulars,* as we see below:[1]

(5) Cats have whiskers. *bare plural*
(6) A cat has whiskers. *indefinite singular*

[1] The differences between them are still a matter of controversy, but see Krifka et al. (1995), Greenberg (2007), Mari, Beyssade, and del Prete (2013) among others for insightful discussion.

(7) The cat has whiskers. *definite singular*

Despite the interesting fact that different languages employ different grammatical devices to express genericity (Chierchia, 1998; Longobardi, 1994), the cross-linguistic aspect of genericity has rarely been tackled systematically (see though Dahl, 1985; Behrens, 2000, 2005; Dayal, 2004).

2.2 Main characteristics of generics

The main characteristics of generics to be discussed in this section are the following: a) temporal unboundedness, b) law-like or nomic character, c) association with dispositions, d) resistance to contextual restriction, and e) exception tolerance.

2.2.1 Temporal unboundedness

As Mari, Beyssade, and del Prete (2013: 41-42) state, "a property of characterising sentences which has often been regarded as essential to their generic meaning is temporal unboundedness, namely the property by which such a sentence is not true relative to a time interval with definite bounds, but rather relative to an indefinitely large interval, or even in a timeless way". Thus, it has been argued that generics cannot be felicitously modified by adverbs that denote particular temporal locations such as 'today', as in (8), unlike sentences that talk about a singular episode, as in (9), where the time interval according to which the sentence is true is bound by the relevant time adverb, in this case 'today'. The temporal unboundedness of generics means that they are taken to be timeless statements akin to eternal truths. Crucially, someone evaluating a generic statement like (10) does not need to have any information about the context of utterance, as the truth or falsity of the generic statement does not rest upon any specific state of affairs, but on general knowledge about cats and their characteristics.

(8) ?Cats meow today.
(9) Cats are meowing today.
(10) Cats meow.

Even though all theories seem to recognise that unboundedness is a main characteristic of generics, it is not a well-defined property. For more discussion see Declerck (1988), Krifka et al. (1995), Mari et al. (2013).

2.2.2 Law-like or nomic character

Another property of generics, which seems to be linked to their unboundedness, is their law-like or nomic character. Generics express regular patterns of occurrence of certain kinds of events, rather than singular events (Dahl, 1975). As a consequence, they are not true with respect to a definite time interval, but they are eternal truths with a law-like nature as seen in (11). Nomic statements also concern possible, non-actual situations or cases, in contrast to accidental generalisations that concern only actual cases. Under this perspective, a sentence like (10) above is a nomic generalisation about cats that concerns cases in which a law or rule applies, restricting us to 'all normal cases', predicating the property of meowing of all normal cats both actual and future. This could be paraphrased as 'if something is a cat, it meows'. This

characteristic is related to exception tolerance, which will be discussed in section 2.2.5. Similarly, a sentence like (11) is a nomic generalisation that concerns sugar under normal circumstances or situations.

(11) Sugar dissolves in water.

2.2.3 Association with dispositions

The nomic character of generics is related to another characteristic property of theirs, namely the fact that they express dispositions and abilities, which do not depend on particular circumstances (Dahl, 1975; Krifka et al., 1995). A property might only show under certain conditions, which may never be actualised. So, we do not need any corroborating past instances of the property being actualised to be able to judge that (12) and (13) are true. (12) might be true even if the machine never has and never will have crushed a single orange and (13) can be paraphrased as in (14).

(12) This machine crushes oranges.
(13) A Rarámuri runs 200 miles in one session.
(14) A Rarámuri can run 200 miles in one session.

2.2.4 Resistance to contextual restriction

The last two characteristics have been used to highlight the differences between generics and universals. Standardly, Krifka (1987:7) argued that unlike sentences with explicit quantifiers like *every,* generics *cannot* be contextually restricted. Thus, in a discourse like the following, the nominal argument of 'every' ('lion' in (15)) can be interpreted as 'every lion in this cage', whereas 'lions' cannot be interpreted as 'lions in this cage'. Contextual restriction is proposed as the mechanism by which a quantified, but not a generic, statement can be interpreted with respect to specific individuals *explicitly* mentioned in the previous discourse.

(15) (Context: There are lions and tigers in this cage.)
   a. Every lion is dangerous.
   b. Lions are dangerous.

2.2.5 Exception tolerance

Finally, the most distinctive characteristic of generics is arguably the fact that they tolerate exceptions (Krifka et al., 1995). (16) can be truthfully uttered in the face of exceptions, such as flightless birds like penguins, ostriches, emus or birds with clipped wings, whereas the universally quantified generalisation in (17) is false given the existence of exceptions such as the above.

(16) Birds fly.
(17) Every bird flies.

Pelletier posed the following question recently (2010:9): "How many exceptions can a generic statement tolerate and still be true?" Using a "squish" of examples as Pelletier does in order to illustrate the issue, we see that we can speculate about the percentage of exceptions ranging from 0%, as in (18), to a few abnormal cases, as in (19), to

around 50%, as in (21)-(22), and even higher, as in (23), and even to 99%, as in (24), where the property is truthfully predicated of a tiny proportion of mosquitoes.

(18) Snakes are reptiles.
(19) Tigers have stripes.
(20) Telephone books are thick.
(21) Guppies give live birth.
(22) Lions have manes.
(23) Italians are good skiers.
(24) Mosquitoes carry the West Nile virus.

Here lies the difficulty when one tries to translate generics as quantified statements in an attempt to give a quantificational analysis of generics. Some generics might be better paraphrased with 'all', others with 'most' and others with 'some'. This challenge was identified by Carlson (1977:43), who used the term "fluctuating truth conditions" to refer to this property of generics.

As we will see in the next section, even though there is variation in the percentage of exceptions generics allow, this variation is not random, but it depends on the type of property predicated of the kind.

2.3 Genericity: a mixed bag or a single phenomenon?

As becomes obvious from the above discussion, the question of what type of properties can generics express is not trivial. For a statement to qualify as a *generic generalisation,* the property must bear a certain relationship to the kind. Generics can express generalisations about any type of kind, be it a natural kind, as in (25), an artefact kind as in (26), or a social kind as in (27). The majority of generics make claims about *characteristic* or *essential* properties, that is, properties that tend to have high prevalence for the kind in question, as well as being typically associated with it. These properties can be true of all the members of the kind, as in (28), of the vast majority of the members of the kind, as in (29), or of a minority of the members of the kind, as in (30). Moreover, as Leslie (2007) first discussed in detail, generics can furthermore express non-characteristic properties of kinds (that is, properties that are not prevalent), when they make claims about a property that is *noteworthy, dangerous* or *striking* even though it has low prevalence, as in (31). Lastly, there exist generalisations that resemble generic generalisations but concern accidental properties of kinds. These generalisations might be highly prevalent and seem (at least statistically) true, as in (32), while others are highly prevalent, but seem false, as in (33):

(25)	Squirrels eat nuts.	*natural kind*
(26)	Needles are sharp.	*artefact kind*
(27)	Artists are creative.	*social kind*
(28)	Foxes are animals.	
(29)	Robins fly.	
(30)	Deer have antlers.	
(31)	Sharks attack people.	
(32)	Cars have radios.	
(33)	Books are paperbacks.	

All these facts highlight the difficulty one faces when one tries to provide a *unified* account for all different types of generics. In the linguistics literature, different kinds of statements have been used to exemplify the wide range of statements one might express with generics, but it is in the psychology literature that we find the first attempt to classify different types of generics by giving them distinct names and discussing the conditions that would make them true or false in more detail. I have showcased the wide range of statements that can be made via generic generalisations and I will classify them following recent advances in the experimental literature in section 4.1.1.

3. Accounts of genericity

I turn now to discuss how generics have been treated in linguistics (in formal semantics) and psychology (cognitive and developmental work), and I will conclude with a brief presentation of related work in philosophy.

In formal semantics, generic generalisations have been studied since the seventies (see Lawler, 1972, 1973; Dahl, 1975; Carlson, 1977) and genericity is frequently viewed as a species of quantification. Nevertheless, how to characterise their semantic interpretation and how to model their truth conditions remains controversial (see recent discussion in Carlson, 2011; Mari et al., 2013).

Generics have also become of key interest to experimental psychologists. In contrast to the linguistic approach, the main psychological proposals treat generics as categorically different from quantifiers (see Leslie, 2007, 2008; Gelman, 2010). These proposals posit a generic bias and argue that generics are a cognitive *default*, because they have priority both in terms of ontogeny and in terms of cognitive complexity.

3.1 Formal semantics

3.1.1 Carlson's monadic generic operator

The first semantic theories of generics attributed generic meaning to a verb phrase operator that took as an argument an ordinary verbal predicate and yielded a characterising predicate. Carlson (1977) treated bare plurals as names for kinds and took the logical form of generic sentences to be that of a subject-predicate form, whereby there was a "generic operator" Gn that had the effect of mapping episodic predicates (in his analysis, "stage-level predicates") to their habitual counterparts. So, the generic statement below would have the following logical form:

(34) Cats have whiskers.
(35) Gn(have whiskers)(cats)

Heim (1982) and Farkas and Sugioka (1983) argued against Carlson's monadic operator *Gn* and proposed that generics should receive an analysis based on a tripartite structure.[2] Their proposal formed the basis of the received view of generics discussed in the next section.

[2] A major motivation for the tripartite structure implicit in quantification is that it readily accommodates intuitions of ambiguity, such as those associated with sentences like "typhoons arise in this part of the Pacific", which can be interpreted as either "typhoons in general have a common origin in this part of the Pacific", or as "there arise typhoons in this part of the Pacific" (see Krifka et al. 1995 for discussion).

3.1.2 The modal approach aka the received view: Krifka et al. (1995)

Krifka et al.'s (1995) version of the modal approach has become the received view of generics. This view treats generic sentences as modalised conditional statements that involve a universal quantifier. This proposal was an answer to the following puzzle: even though generics seem similar to universals, they are both more restrictive and less restrictive than universals. Generics are more restrictive, because they are law-like. This is why mere accidental generalizations like 'books are paperbacks', even though statistically true, do not qualify as true generics. But generics are also less restrictive than universals, given that they allow for exceptions.

Modal accounts assume a phonologically null Q-adverbial quantifier 'GEN' that is an unselective variable binding operator similar to adverbs of quantification like 'usually', 'typically', 'always', as analysed in Lewis (1975). This operator is sentential and is represented by a tripartite structure (Krifka et al. 1995:26). Thus, a sentence like (34) is represented as in (37) below:

(36) GEN [restrictor] [matrix]
(37) GEN x [cats(x)] [whiskers(x)]

Krifka et al. (1995) propose an intensional analysis of GEN, according to which a sentence with an indefinite singular is interpreted as a conditional sentence with the if-clause providing the restriction for GEN. GEN is interpreted as an intensional unselective universal quantifier meaning 'must'. On the assumption that indefinites contribute a free variable ranging over individuals (cf. Heim 1982), this variable can be bound by the available universal quantifier as well. As Mari et al. (2013:67) illustrate, Krifka et al. follow a classical modal framework, in which W is a set of worlds, D is a domain of entities, and ≤ an ordering source on worlds according to normality. Thus, a generic sentence like (38) is represented as follows:

(38) a. A dog barks.
b. If something is a dog, it barks.
c. $\forall$ w' $\leq$w, x [dog(x,w')] [barks(x,w')]
Paraphrase: in all worlds, which are 'normal', if something is a dog in those worlds, then it barks in those worlds.

As seen above, in the modal approach to generics a 'normality' condition is often implied. Thus, generics are argued to be true if it is *normal* for the members of the kind to have the property in question.

3.1.3 The probabilistic approach: Cohen

A probabilistic approach has been defended by Cohen (1999, 2004), according to which it is probability rather than modality that forms the basis of the semantics of generics, at least for "absolute generics" such as 'ravens are black'. This account holds that *As are B* is true just in case the probability of an arbitrary *A* being a *B* is greater than 0.5, that is, greater than chance. Cohen (2004:531) introduces a homogeneity condition, according to which "the generic **gen**(ψ,φ) presupposes that its domain, ψ, is homogeneous, in the following sense: for any psychologically salient criterion by which ψ may be partitioned into subsets, the conditional probability of φ

ought to be roughly the same given every such subset of ψ." Salient partitions are e.g. space, numerical scales, gender, subject matter and abstract domains. Illustrating Cohen's account (1999), who proposes that there is a covert generic quantifier GEN, the statement 'cats have whiskers' would get the following representation:

(39) Cats have whiskers.
GEN (cat(x), have.whiskers(x)) P(have.whiskers | cat) > 0.5 (the probability of an object having whiskers given that the object is a cat is greater than 0.5)

3.1.4 Recent proposals questioning the quantificational view

Carlson (2011:1172) summarises the received view for generics in the linguistics literature by arguing that "while the details of various analyses that have employed it [GEN] may be called into question, that there is *some* kind of operator akin to GEN in generics is a reasonably secure claim at this point". The exact semantics of GEN are nevertheless highly disputed - the following proposals are reviewed in Krifka et al. (1995: 43ff): a) relevant quantification (Declerck, 1991), b) prototypes (Nunberg and Pan, 1975), c) stereotypes (Geurts, 1985), d) modal interpretations (Krifka et al. 1995), e) situations (ter Meulen, 1986) and f) nonmonotonic inferences (Asher and Morreau, 1995).

Within formal semantics, the view that generics are not quantificational is either considered to have been surpassed by the modal account or has not yet been shaped into a fully spelled out account.

Recent discussion in Mari et al. (2013) and further references therein, though, point out that an account based on noun ambiguity à la Dayal (2004) could provide an account for genericity without assuming a generic operator. They do not provide the details of such an account though, thus such a proposal still remains to be evaluated. Furthermore, Deo and Madiman (2015) offer a Neo-Carlsonian account based on gradability and probability theory (cumulative distribution functions and stochastic comparison) and analyse generics as predicating a (non-)gradable property directly of a kind.

3.2 Psychology

As we have seen above, even though within formal semantics there seems to be a received view, the meaning of generics is still a matter of controversy. In psychology, in recent years, a different kind of approach to genericity emerged. The main view to which most psychologists ascribe to is the *Generics-as-Default* view (GaD view henceforth), which treats generics as an innate and default mechanism.

3.2.1 The generics-as-default view

In contrast to the quantificational analysis of generics, a growing body of experimental and developmental psychological work on the topic proposes that genericity is categorically different from (and significantly simpler than) quantification (Leslie, 2007; Gelman, 2010). The GaD view postulates that generics are an innate and default mode of thinking. This idea is linked to the view of cognition that assumes two different systems, argued for by Kahneman and Frederick (2002) among others, which includes a distinction between System 1, a fast,

automatic, effortless lower-level system and System 2, a slower, more effortful higher-level rule-governed system. According to this view, the reason there is no overt 'GEN' in any language is that generics do not, after all, involve any kind of overt quantifier or operator.

In the psychological GaD approach, because generic generalisations are understood to be a basic, pre-linguistic mode of thinking, some of the specific challenges for the quantificational analysis are avoided. For instance, according to this view, there is no overt generic operator in any known language because generics are the unmarked, System 1, case. On this view, only effortful, non-default quantificational generalisations require overt linguistic exponence. Leslie (2007, 2008) put forward an account that offered a treatment to what has been called "troublesome generics", like the following:

(40) Mosquitoes carry the West Nile virus.
(41) Books are paperbacks.
(42) Birds lay eggs.

These sentences pose a problem to the quantificational account of generics, because (40) is true despite the fact that only a tiny proportion of mosquitoes have that property, (41) is false in spite of the vast majority of books having that property and (42) is true even though the egg-laying property is held by less than half of birds (only fertile adult female birds might do so). Paraphrasing the above sentences would make them look similar to 'some' (40), 'all' (41) or 'most' (42), making their truth conditions look "quirky". What Leslie proposed was that in order to understand the meaning of generic sentences we should think of the kind of generalisations they express. Their *quirky* truth-conditions are not because of the semantics of generics (or GEN), but because generics are more cognitively primitive than quantificational generalisations. The quirkiness of generics is thus a consequence of cognition, not of generic sentences, which just "give voice our most primitive, default generalizations" (Leslie 2007:382). The default mechanism of generalisation employed by the cognitive system is further influenced by the 'strikingness' of a property along some characteristic dimension. Leslie (2008:43) proposes the following circumstances, under which *Ks are Fs* is true:

(43) …circumstances under which a generic of the form Ks are F is true are as follows:

> The counterinstances are negative, and:
> If F lies along a characteristic dimension for the Ks, then some Ks are F, unless K is an artifact or social kind, in which case F is the function or purpose of the kind K;
> If F is striking, then some Ks are F and the others are disposed to be F;
> Otherwise, almost all Ks are F.

Initial motivation for the GaD view was mainly conceptual and was relied on the following observations: a) the proposed 'unmarked' surface form of generics in the sense of Chomsky (2000), b) evidence from congenitally deaf children that employ gestures that can be understood as generic without any exposure to spoken or sign language (Goldin-Meadow, Gelman, and Mylander, 2005), c) the Pirahã language, which lacks universal quantifiers like 'all' yet features generics (Everett, 2005), and

d) results from reasoning studies (Jönsson and Hampton, 2006), which could be interpreted as errors with universal statements being treated as generics.

The GaD view argues that generics are a cognitive *default* and thus makes the following predictions: generics should have priority both in terms of ontogeny (children are expected to understand and produce generics before quantified statements) and in terms of cognitive complexity (quantified statements are misunderstood more often than generics in experimental tasks). The above predictions have been tested in a growing literature to be discussed in section 4. Building on the above proposal, Leslie and colleagues have focused on the adult processing of generics trying to find evidence that corroborates such a view, while Gelman and colleagues have sought to find evidence from a developmental perspective.

3.3 Philosophy

The discussion of whether quantificational approaches to generics are correct has had repercussions in recent work in philosophy too, which we cannot discuss in detail because of space limitations.

Within philosophy, the view that generics are not quantificational has been defended in various places: (a) generics are simple subject/predicate sentences that predicate properties of kinds (Liebesman, 2011), (b) genericity has a psychological, rather than a linguistic, basis (Collins, 2015) and (c) a sophisticated kind-predicate view à la Carlson (1977) needs to be revisited (Teichman, 2016). Sorensen (2012) has also argued that understanding generics can elucidate long-standing philosophical issues such as the sorites paradox. Sterken (2015) has emphasised the context-sensitive character of generics and has argued that GEN is not quantificational, but an indexical, composed of two free variables: one representing quantificational force and one representing lexical restriction. Nickel (2016) integrates semantics with metaphysics and stresses the relevance of an explanatory mechanism. Finally, there is interesting work related to how generics concerning social kinds like ‘women are submissive’ or ‘Muslims are terrorists’ are applied in stereotyping and prejudice (see for instance Haslanger, 2011; Saul, 2017; Leslie, forthcoming). The interested reader is referred to Nickel (forthcoming) for a recent overview of genericity through the perspective of philosophy of language.

3.4 Summary and some considerations

Summarising, we can divide theoretical accounts of genericity into two broad categories: the ones that treat generics as quantificational and those that do not. We see from the above overview that each kind of approach makes some predictions about how generics are interpreted or learned. Each kind of approach faces its own challenges; for instance, on the one hand for the formal semantics account the fact that GEN is never pronounced calls into question its explanatory power especially when one thinks of how a learner would come to postulate such a covert element, while on the other hand the psychological GaD view could be seen as exchanging one problem for another given that generics do not receive any special treatment but are given for free. In this latter respect, though, as soon as one looks at generics cross-linguistically, it becomes apparent that the acquisition of genericity needs to be studied alongside not only quantification, but also definiteness and specificity, as they all seem to play an important role. As we will see in the next section, some issues

have already been tested in experimental settings, while others remain for future research.

4. Experimental approaches to genericity

The recent surge in interest to provide new accounts on genericity has helped identify theory-neutral and theory-critical issues. The spate of theories that postulate modal operators in possible-world semantics has posited several different relevant factors. The apparent theoretical impasse might be partly due to the lack of reliable data, since usually the issues have been addressed through researchers' reflective intuition, which prohibits consensus even about the most fundamental facts about genericity. The *fluctuating* truth conditions I discussed earlier make generics particularly suited for experimental investigation. As Krifka et al. (1995:3) noted "much of our knowledge of the world, and many of our beliefs about the world, are couched in terms of characterising sentences. Such sentences, we take it, are either true or false – they are *not* "indeterminate" or "figurative" or "metaphorical" or "sloppy talk". After all, we certainly would want to count the classic *Snow is white* as literally having a truth value!" A convincing way to answer this is to start collecting truth value judgements. From this point of view, it is in fact surprising that the experimental investigation of generics did not start earlier.

4.1 Experimental psychology

4.1.1 Off-line methods: adult judgement data

The main bulk of experiments that has been done on generics falls under the umbrella of the generics-as-default view or is in general cognitively driven.

With respect to the methods used in the experimental investigation of genericity we observe the following variety: a) truth-value judgement task and agreement task, either binary or with a Likert scale (Khemlani, Leslie, Glucksberg, and Rubio-Fernandez, 2007; Cimpian, Brandone, and Gelman, 2010; Leslie, Khemlani, and Glucksberg, 2011; Meyer, Gelman, and Stilwell, 2011; Khemlani, Leslie, and Glucksberg, 2012; Prasada, Khemlani, Leslie, and Glucksberg, 2013), b) prevalence estimation task (Cimpian, Brandone, and Gelman 2010, Khemlani et al., 2012), c) confidence rating task (Khemlani, Leslie, and Glucksberg, 2009), d) paraphrase task (Leslie et al., 2011), e) cue validity task (Khemlani et al., 2012), f) memory/recall task (Leslie and Gelman, 2012), g) sentence-picture matching task (Cimpian, Gelman, and Brandone, 2010), h) naturalness evaluation task (Prasada et al., 2013) and i) default inference task (Khemlani et al., 2012).

These experiments have mainly studied genericity by contrasting it with overt quantifiers (universal such as 'all', proportional such as 'most' and existential such as 'some'). The main question they seek to answer is whether generics are a *default* mechanism and whether there exists a generic bias when it comes to generalisations. In the remainder of the section I will review some representative studies that use the methods mentioned above.

Leslie and colleagues

As we discussed in section 2, determining which properties can be generically predicated has proven very challenging. The degree of exceptionality seems to be one

of the defining parameters of the relevant categories. Based on Leslie (2007, 2008), Leslie and colleagues (Khemlani et al., 2007; Khemlani, et al., 2009; Leslie et al., 2011) started collecting judgement data on generics. Building on Khemlani et al. (2007; 2009), Leslie et al. (2011:19, table 1) offer the following more elaborate classification, where they define the following five distinct subtypes:

a) **quasi-definitional**: property must be universally true of all the members of the kind; no exceptions, e.g. 'triangles have three sides'
b) **majority characteristic**: property must be central, principled or essential (Gelman, 2003; Medin and Ortony, 1989) and directly related to the nature of the kind. It must be highly prevalent, while allowing some exceptions (e.g. albino tigers), e.g. 'tigers have stripes'
c) **minority characteristic**: property must be central, principled or essential, but only be held by a minority of the kind. Restricted to methods of gestation, methods of nourishing the very young, and characteristic physical traits exhibited only by one gender, e.g. 'lions have manes'
d) **striking**: property must only be exhibited by a small minority of the kind, and must signify something dangerous which is to be avoided, e.g. 'pit bulls maul children'

They further distinguish these types of generic generalisations from majority generalisations and false generalisations that superficially share the form of generics, but are either accidental or false, like the following:

a) **majority**: property must be prevalent among members of the kind, but must not be a principled connection (Prasada and Dillingham, 2006, 2009), e.g. 'cars have radios'
b) **false generalisation**: property must be prevalent among members of the kind and there must be a sufficiently salient alternative property (e.g. being left-handed), so that the generic form of the predication sounds false or mistaken, e.g. 'Canadians are right-handed'

Illustrating with data from Leslie et al. (2011)'s experiments 1 and 2, these different types of generics yield different acceptance rates, thus lending some support to the above classification. The acceptance rates in their experiment 1 vary as follows: quasi-definitional (90%), majority characteristic (96%), minority characteristic (85%), majority (82%), striking (77%), and false generalisations (38%). Thus, people judge different types of generalisation as true most of the time, unless they express something that is a false generalisation, which should be read as 'false as a generic generalisation'.

In their experiment 2a, they provided participants with information about population estimates presented before the truth value judgement. Compared to experiment 1, in experiment 2a, the acceptance rates were almost the same for quasi-definitional, majority characteristic and minority characteristic statements (± 5%), but they varied at a greater degree for striking (dropped from 77% to 70%) and for false generalisations (dropped from 38% to 25%) and to an even greater degree for majority statements (dropped from 82% to 60%).

In their experiment 2b, an additional second phase followed the truth value judgement task, where participants had to provide paraphrases of each statement they had judged in the first phase. Even though participants first evaluated the statements as in experiment 1, we do see some differences. Acceptance rates were almost the same for quasi-definitional, majority characteristic, minority characteristic and striking statements, but they varied at a slightly greater degree for false generalisations (dropped from 38% to 30%) and to a greater degree for majority (dropped from 82% to 65%).

Taken as a whole, these judgements concerning generics are not surprising; nevertheless, they are important since they are the first judgement data found on the topic and indicate that the task participants are asked to perform or the context against which a generic is evaluated might have an effect at least for some types of generics.

Collecting acceptance rates is only one way to make use of the above classification. which can also prove useful in order to identify whether specific phenomena are relevant for only some types of generalisations. It can further help to address generalisations that predicate a property of only a minority of the members of a kind, such as minority characteristic and striking generics, which pose a challenge to the quantificational accounts of genericity.

The Generic Overgeneralisation effect

One of the outcomes of the Leslie and colleagues' studies was that they argue to have evidence for a "generic bias", an effect they called the "Generic OverGeneralisation" effect (GOG henceforth). I will focus on Leslie et al. (2011) to illustrate it. Similar results have been reported in other experiments that used truth value judgement tasks (Khemlani et al., 2007; Khemlani et al., 2009, 2012; and Meyer et al., 2011) or recall tasks (Leslie and Gelman, 2012).

Leslie et al. (2011:17) use GOG to refer to "the tendency to overgeneralise the truth of a generic to the truth of the corresponding universal statement". As we discussed above, in their experiment 1, participants judged the truth or falsity of a list of generic as well as 'all'-quantified statements that were presented one after the other without any background context. In more than half of the trials when the 'all'-statements involved characteristic properties, participants judged these statements to be true: 78% for majority characteristic such as 'all tigers have stripes' and 51% for minority characteristic statements such as 'all ducks lay eggs'. By contrast, 'all'-statements, which did not involve characteristic properties, such as 'all cars have radios', were only judged true 13% of the time. The authors argue that these high acceptance rates for the characteristic-property 'all'-statements are due to participants interpreting the 'false' universally quantified statements as if they were their 'true' generic counterparts, and are thus a clear case of GOG.

As the authors acknowledge, however, these elevated acceptance rates might be due to alternative explanations, which they sought to address in subsequent experiments. They considered three possible explanations for why their participants were so prone to accept statements like 'all horses have four legs' as true: a) ignorance of the relevant facts, b) a subkind (taxonomic) interpretation of 'all', and c) quantifier domain restriction in the sense e.g. of Stanley and Szabó (2000). The authors discarded these alternative explanations on the basis of additional experiments they ran and argued that they had support for a strong generic bias, according to which people sometimes treat universally quantified statements as if they were generic.

It is important to note that the GOG data concern how universal quantifiers behave in a specific context, not how generics behave. Given that this view takes generics as a given, a default, which requires no further explanation, the GOG effect affects generics only *indirectly* in that quantifiers are *sometimes* interpreted as if they were generics.[3]

Prasada and colleagues

Prasada and Dillingham (2006, 2009) propose that our conceptual system distinguishes at least two types of connections between kinds and their properties, that is, principled and statistical connections. Principled connections concern properties (*k*-properties) that instances of a kind have *by virtue of* their being the kinds of things they are (e.g. we think that dogs, by virtue of being dogs, have four legs). Principled connections license formal explanations and include a normative, as well as a statistical dimension. Statistical connections on the other hand concern properties (*t*-properties) that that are merely prevalent, that is, properties that only bear a factual connection to the kind in question (e.g. being red for a barn). Statistical connections do not support formal explanations or give rise to normative expectations. By devising a series of experiments that asked participants to judge whether certain paraphrases were appropriate for statements that involved either a principled or a statistical connection, they were able to provide empirical support for the distinction drawn. To illustrate, participants judged that principled connections like 'dogs are four-legged' could be paraphrased as either 'dogs, by virtue of being the kinds of things they are, are four-legged' or 'dogs, in general, are four-legged', whereas statistical connections like 'barns are red' could only be paraphrased as 'barns, in general, are red' and not as 'barns, by virtue of being the kinds of things they are, are red'.

Prasada et al. (2013) elaborate on these conceptual distinctions. They used a truth value judgement task with a 7-point Likert scale in experiments 1 and 3 and a naturalness evaluation task in experiment 2 to investigate the conceptual foundations of generics as well as the role of prevalence, cue validity and normalcy in licensing generics, which have been proposed as licensors in formal semantic approaches to generics. Cue validity is seen as "the probability that an item is part of a category given a particular cue". In their experiment 1, looking only at bare plural generics, these are the ratings they obtained (on a scale from -3 to +3): quasi definitional (2.62), majority characteristic (2.48), minority characteristic (1.83), majority (1.23), striking (1.27), majority false generalisation like 'books are paperbacks' (-.06) and minority false generalisation like 'cars are yellow' (-.76). These rates are similar to the ones obtained by Leslie et al. (2011). Prasada et al. further focused on striking and minority characteristic generics that pose a challenge to quantificational approaches. They argue to have found support for the following: a) striking generics involve a *causal* connection between a kind and a property (and not a principled or a statistical connection), b) minority characteristic generics exhibit the characteristics of principled connections, and c) prevalence is dissociated from the acceptability of generics. They further argue that their data prove problematic for normalcy accounts and for the idea that cue validity is the licensor of low prevalence generics. The normalcy account, they argue, works only for majority characteristic generics like

[3] For a closer look at the 'Generic Overgeneralisation' effect and alternative explanations for the pattern of judgment data that have been claimed to support it, see Lazaridou-Chatzigoga, Stockall and Katsos (2017).

'tigers have stripes'. They conclude by pursuing a conceptually based approach to the semantics of generics building on Leslie (2007, 2008).[4]

Cimpian and colleagues

Cimpian and colleagues investigated the relation between genericity and prevalence, which put to the test intuitions that have been pervasive in the generics literature at least since Carlson (1995).

Cimpian, Brandone, and Gelman (2010) investigated an asymmetry in generic meaning, i.e. the fact that generic sentences have strong implications but require little evidence to be judged true. In order to do so, they devised 4 experiments with adult participants, who had to judge sentences involving novel kinds such as 'lorches have purple feathers'. Participants judged these sentences as referring to nearly all lorches, whereas they also judged them as true given low prevalence levels (e.g. even when only 10% or 30% of lorches had the relevant property). They also investigated whether generic sentences about dangerous ('30% of lorches have dangerous purple feathers. These feathers are as sharp as needles and can easily get lodged in you, causing massive bleeding') or distinctive properties ('30% of lorches have distinctive purple feathers. No other animals on this island have wide, smooth feathers like these') would be more acceptable than generic sentences without similar connotations, i.e. plain items ('30% of lorches have purple feathers'), and they found this to be the case for the sentences in question. Their results revealed that the proportion of "true" responses was higher for the dangerous (68%) and the distinctive (66%) items than for the plain items (55%), thus showing that both danger and distinctiveness have *independent* effects on generics' truth conditions. The danger and distinctiveness information had an effect on generics' acceptability mostly at the lower prevalence levels, particularly at the 30% level.

Cimpian, Gelman and Brandone (2010) investigated the hypothesis that generics are not only about prevalence or frequency, but their acceptance is influenced by naïve theories speakers have. They did three experiments in which they presented adult participants with novel categories with key features that concerned physical features characteristic of a biological kind. The participants preferred to map generic sentences (e.g., 'dontrets have long tails') onto novel categories for which the key feature (e.g., long tails) was absent in all the young but present in all the adults rather than onto novel categories for which the key feature was at least as prevalent but present in some of the young and in some of the adults. Furthermore, they were able to show that this mapping is specific to generics and does not hold for quantifiers like *some* or *most.*

In sum, Cimpian and colleagues provide empirical proof for the suggested asymmetry in generic meaning: the fact that generic sentences may be judged as true at low prevalence levels yet at the same time may be associated with implications of high prevalence. Furthermore, they show that generics are not only about prevalence/frequency, but are also influenced by how one conceptualises about different categories and how one uses causal and/or explanatory knowledge when thinking about the relation of properties and kinds.

4.1.2 Online methods: Real-time processing and processing in the brain

[4] For a study focusing on minority characteristic statements and their gender-specificity, which is not discussed here because of space limitations, see Passanini and Hampton (2015).

Within the GaD approach, generics are claimed to be part of System 1 of Kahneman's cognition system, which is fast and effortless, while quantified statements are part of System 2, which is slower and requires more cognitive effort. Therefore, generics are predicted to be faster to process than quantified statements. One experiment that manipulates task demands in the processing of generics is Meyer et al. (2011). The rationale behind their experiment was that if generics are default, it should be easier to judge that a property is characteristic of a generic (i.e. dogs) than of a quantified set (i.e. all dogs) and they expected this generic advantage to be particularly evident when participants were under time pressure. Meyer et al. recorded truth value judgements and judgement times in response to majority characteristic generic vs. 'all' quantified statements like '{all} dogs have four legs' and definitional statements like '{all} giraffes have long necks', and varied whether participants were told to answer as quickly as possible, or to take as much time as they wanted.

The main results were that a) participants in the speeded condition were more accurate at making a truth value judgement (90% for generics vs. 55% for quantified statements) and faster to respond to generics (~900ms) than to universals (~1100ms) and b) for definitional statements, participants were faster to respond to generics than universals in both the speeded (~900ms vs. ~1000ms) and the unspeeded (~1400ms vs. ~1800ms) condition. Both results seem to be consistent with the GaD hypothesis: participants were, indeed, more likely to say true to 'all dogs have four legs' in the speeded condition that in the non-speeded condition, and were slower to judge quantified than generic statements, which suggests quantification is effortful, and participants were more susceptible to a GOG error when they were under time pressure. In sum, Meyer et al. (2011) argue to have evidence that participants did sometimes judge universally quantified statements ('all dogs have four legs') as true when participants were instructed to respond as quickly as possible, but not when there was no time pressure, consistent with their predictions.

The single study that investigates the processing of generics in the brain is Prasada, Salajegheh, Bowles and Poeppel (2008), who used a combined behavioural and ERP study investigating the modulation of the N400 amplitude (an electrophysiological response that has been shown to reflect the processing of semantic information, i.e. the integration of a word in the context of a preceding word, sentence, and discourse) as a function of subtly different morphosyntactic environments that condition either a generic ('bananas are yellow') or a nongeneric ('this banana is green') readings.

In experiment 1, they measured whether the predictability of characteristic and uncharacteristic properties varies alongside constraints on generic/nongeneric interpretation. In order to do so, they used (a) a Cloze procedure (experiment 1A), where a participant has to fill in the blank of a sentence fragment such as 'bananas are ____ or this banana is ____', where the critical words were shown not to differ in predictability, and (b) a predictability rating task on a 7-point scale that showed that the predictability of (un)characteristic properties was in accordance with the constraints of (non)generic interpretation.

In experiment 2, they used the same set of stimuli and recorded the electrophysiological response of the critical word, e.g. 'yellow' or 'green'. They found a robust N400 effect. The N400 amplitude was shown to be sensitive to whether the critical word was interpreted as characterising a kind or an instance of that kind, with the generic interpretation showing a significantly larger N400. Additionally, the same words in the characteristic condition elicited a larger N400 in

the generic condition (‘bananas are yellow’) than in the nongeneric condition (‘the banana is yellow’).

In sum, both true and false generics elicited an increased N400 in comparison to the nongeneric statements, which led Prasada et al. to reject the possibility that the truth value of the statement had any effect. They then outlined some possible interpretations of their results that involve (a) the differential involvement of semantic memory, (b) the distinction between principled and statistical connections, and (c) semantic relatedness, and they conclude that it is still unclear which difference between the interpretation of generic and nongeneric sentences is reflected by N400 amplitude.

4.2 Experiments with generics in linguistically-driven research

Typical adult populations

Starting with work on English, Lazaridou-Chatzigoga and Stockall (2013) compared generic generalisations with universally quantified statements with ‘all’, ‘all the’ and ‘every’ in a timed Truth Value Judgement Task that measured statement reading time and truth value judgement time. Statements involved majority and minority characteristic statements read after a preceding context that made exceptions salient. The study sought to measure the relevance of quantifier domain restriction and context for the statements in question. With respect to the RT data, they found two effects. The first result is that the time to read the statements was significantly faster for the generic majority characteristic condition than any other condition. This might be taken as evidence that some generic statements are *easier* to process than the corresponding universally quantified statements, consistent with the GaD view. However, the background statement did not make the exceptions to the majority characteristic statements salient. Hence, it is not possible to determine whether this difference in reading times is due to the difference between majority vs. minority characteristic properties, or to the difference in the degree of relevance of the background context. The second result was that the time to make the TVJ for minority characteristic generic and ‘all’ statements was much *longer* than for the other two universal quantifiers (‘all the’, ‘every’), or for majority characteristic statements, contrary to the GaD, but consistent with participants engaging in a costly process of quantifier domain restriction. This result is also an indication that generics might be sensitive to context under certain circumstances, which is in line with recent work (Greenberg, 2007, Sterken, 2015) that claims that generics display some context sensitivity, but contrary to the received view that takes generics to strictly resist contextual restriction (Krifka et al., 1995). This study however did not manipulate enough features of the context to be conclusive.

Building on the above-mentioned study, Lazaridou-Chatzigoga, Katsos and Stockall (2017) addressed the relevance of quantifier domain restriction and context for generic and universally quantified statements in a truth value judgement task. They presented statements preceded by one of three levels of context: a) neutral, where the information in the context does not interact with the truth value of the critical statement; b) contradictory, where it presents an exception which should rule out a universally quantified statement; and c) supportive. In their study, context did not only affect acceptance rates for ‘all’ and other universal quantifiers (‘all the’, ‘each’), but it further predicted the levels of quantifier domain restriction depending on the level of context. The effect of context was greater for ‘all the’ and ‘each’, two

quantifiers that require quantifier domain restriction, while it was smaller for 'all', whose domain is only optionally restricted. Thus, Lazaridou-Chatzigoga et al. advanced the quantifier domain restriction view that predicts the attested differences, and argued that proponents of the GaD view ruled out context prematurely. Furthermore, they find that context matters for generics too. In sum, these results show that context is a viable alternative explanation for much of the so-called GOG effect.

Fuellenbach and Husband (2016) studied the role of determiners in generalising principled and statistical properties, focusing on how such information may be used to generalise about newly acquired properties of pseudo-words (similar to Cimpian, Brandone, and Gelman 2010). In their first study, they used bare plural generics and indefinite singular generics and in their second study bare plural generics and definite singular generics. Their results showed that indefinite singular generics are associated with increased expectations that a property is a principled connection to a kind, while definite singular generics are associated with decreased expectations that a property is a statistical connection to a kind.

Regarding English, Spanish and Brazilian Portuguese, Ionin, Montrul and Santos (2011) investigated genericity in characterising sentences (e.g. 'lions are dangerous') and with kind-level predicates (e.g. 'dodo birds are extinct') cross-linguistically in order to test the following issues, where disagreement in the theoretical literature exists: (i) the status of bare (without a determiner) NPs in generic environments in Brazilian Portuguese, and (ii) whether singular and/or plural generics are restricted to canonical kinds cross-linguistically. They used an acceptability judgement task, whose results provide support for Dayal's (2004) proposal that plural generics cross-linguistically denote kinds, whereas definite singular generics denote taxonomic entities. Regarding Brazilian Portuguese, the issue concerning bare nouns remains open, but see the discussion in Ionin et al. (2011) and references therein for more details.

Barton, Kolb and Kupisch (2015) investigated definite article use with generic reference given the claims in the literature that there is variation in article use in the expression of generics in German (*Tiger sind gefährlich* vs. *Die Tiger sind gefährlich* 'Tigers are dangerous'). Their results show that definite articles are optional with generic plural subjects and that bare subjects are preferred; definite plural subjects are accepted more often with kind-level predicates than with individual-level predicates. Age, regional background and educational level seem to influence the attested variation, but the study did not include enough participants to make it possible to determine the effect of each potential factor.

Bilingual and second language adult acquisition

In recent years, genericity has been also studied in bilingual speakers and/or second language learners. This literature mainly contrasts some Germanic language (English, German) with some Romance language (Spanish, Italian, French), which differ in the way they typically express genericity, either with a bare or a definite plural.

In a series of papers, Ionin, Montrul and colleagues investigate genericity and language transfer in bilinguals and second language learners of English and Spanish (Montrul & Ionin 2010, 2012; Ionin, Montrul, Kim, and Philippov, 2011; Ionin, Montrul, and Crivos, 2013). For instance, Ionin et al. (2013) examine the interpretation and judgements of both definite plural and bare plurals in L2 acquisition bidirectionally, with Spanish-speaking learners of English and English-speaking

learners of Spanish. First language transfer was found in both directions when proficiency was lower, while there was more target-like performance when proficiency was higher.

Kupisch and Barton investigate genericity in adult bilinguals and heritage speakers who speak German and some other language (see Kupisch and Barton, 2013; Kupisch, 2012; Barton, 2016). For instance, Kupisch (2012) studies definite articles in specific and generic subject nominals in Italian spoken by adult simultaneous bilinguals and second language learners and argues that there are clear differences between the two groups of individuals which depend on which language is dominant.

Slabakova (2006) examined the interpretation of bare plurals by L1-Italian L2-English and L1-English L2-Italian learners using a truth–value judgment task, finding evidence for L1 transfer as well as recovery from L1 transfer, and proposed a mechanism for this recovery.

4.3 Generics in child language acquisition studies

Related to first language acquisition, one of the questions that emerge from the overview of the theoretical accounts in section 3 is how children acquire generics given the absence of dedicated words or morphemes that encode genericity cross-linguistically. The formal semantics account posits the covert operator GEN, but how children come to posit such an operator is not explained. The GaD approach, on the other hand, argues that children do not face such a challenge because the unmarked and cognitively simpler generic is acquired by default and does not need to be learned. This picture set up a flourishing experimental agenda, which I will not discuss here in detail due to space limitations, but see Pérez-Leroux (2016) for a recent comprehensive overview, as well as Lazaridou-Chatzigoga, Katsos and Stockall (2015) for discussion and a useful appendix.

Summarising very briefly, related to production, there are claims that generics can be found in the speech of children at the earliest multi-word stages. Gelman, Goetz, Sarnecka, and Flukes (2008) examined data from the CHILDES project and argue that all children for whom there was data produced generics at age 2, and by age 4 children produced generics as frequently as adults. Regarding comprehension, Gelman (2010) argues that children by the age of 2 are sensitive to subtle morphological cues to distinguish generic from specific reference (e.g. ‘the Xs’ vs. ‘Xs’), by the age of 3 they appropriately read contextual cues to determine that an utterance may be generic (e.g., interpreting a plural NP in the context of a single instance as signalling a generic intent), and by age 4 they distinguish generics from the quantifiers ‘all’ and ‘some’ and have adult-like understanding of generics. Regarding second language acquisition and child bilingualism, the interested reader is referred to Pérez-Leroux, Munn, Schmitt, and DeIrish (2004), Kupisch (2006) and Serratrice, Sorace, Filiaci, and Baldo (2009) among others.

5. Reflection on the experimental literature on genericity

It should be evident from the preceding review that the recent concentrated interest in genericity has deepened our understanding of the phenomenon and that experimental data can be used in order to advance a theory of generics. For instance, the classification of generics discussed in section 4.1.1 seems particularly useful when one tries to decide whether different types of generics should be treated as a single phenomenon or whether we are dealing with several phenomena with a superficial

similarity. In the process of doing so, different frameworks can be proposed and validated against both theoretical and data-driven arguments.

The recent emergence of experimental studies on genericity is welcome, as these initial steps are crucial in order to point to some of the possible directions this research can follow. The majority of the studies reviewed here used off-line judgement data with only a few studies addressing the real-time processing of generics. On top of that, the majority of the truth value judgement tasks gave the participants a binary choice, whereas Likert-scale rather than binary-judgement tasks are essential for the study of subtler aspects of meaning (see Katsos and Bishop, 2011). This is because the less fine-grained binary judgement tasks (which require a 'yes'/ 'no' or 'accept'/ 'reject' type of response) are liable to misrepresent participants' competence by conflating mildly infelicitous and downright unacceptable statements (since both are lumped together as 'no' or rejections). Given recent analyses of generics that place them at the heart of human cognition, one would not only want to study conscious (i.e. judgement data) procedures, but also subconscious mechanisms. Consequently, other methods that could shed light to the phenomenon would include self-paced reading studies, priming, visual world paradigms, and brain-based methods including EEG, fMRI and MEG.

To illustrate just one potential study, a priming paradigm could be used in a study in order to evaluate the relevance of prototypes for exceptionality in generics. The participants would be asked to merely provide truth value judgements related to generic statements, but exceptions would be used as primes before the judgement. For instance, before judging 'tigers have stripes' the participants would see (a) a picture of a striped tiger (a prototypical instance), (b) a picture with an exceptional tiger, i.e. an albino tiger, or (c) an unrelated picture used as a control. This study would evaluate whether there are priming effects on people's judgement, as well as whether the different conditions influence the time-course of processing.

Furthermore, while research has started to emerge on the neural basis of quantifiers (see for instance Shetreet, Chierchia, and Gaab, 2014 and Troiani, Peelle, Clark, Grossman, 2009 using fMRI), there is only one study that investigates generics in the brain (Prasada et al., 2008, see above for discussion). It is important to study the basic composition of generic statements with neuroimaging techniques in order to lay the foundations of the phenomenon on the neural level. Only with that kind of work would we be in a position to increase our understanding of the neural bases of genericity and to subsequently compare the brain regions involved in genericity to the regions involved in quantification.

Before concluding, I would like to highlight four main outstanding issues. First, more research is needed on the relationship between genericity and quantification and the role of genericity in human cognition more broadly. Is there indeed a "generic bias" for interpreting quantificational statements as generic? If so, does this propensity originate in cognition, or in language, and in either case, what are the mechanisms of the bias? This investigation seems pressing given the prominence of generics as our major means to conceptualise about the world, the attention the generics-as-default approach has received recently, and the use of generics to express stereotypes. Second, despite the fact that this chapter did not review the child acquisition data, the question of how children learn generics seems to play an important role when one is to judge the explanatory power of one theory over another: the formal semantics approach cannot offer any clear explanation for the fact that generics seem to be early and easy to acquire, whereas the GaD view relies on acquisition data in order to advance the idea that generics are a default interpretation.

How adult-like children's interpretation is of generics and whether different aspects of genericity are acquired at different ages remain still open issues (see Lazaridou-Chatzigoga, Katsos and Stockall, forthcoming). Third, variation within a language and cross-linguistic variation need to be addressed more consistently and systematically. Although genericity is common in all languages, languages make use of different morphosyntactic means to express genericity. To illustrate, within languages that have articles, some languages like English may use a bare plural in the subject position to express a generic like 'tigers have stripes', while other languages like Greek cannot use a bare plural and express the relevant statement with a definite plural *i tighris ehun righes* '(the) tigers have stripes', which is furthermore ambiguous between a generic and a specific (definite) interpretation. Even though there is theoretical and descriptive work in several languages, the main bulk of experimental studies have been performed in English (with only a few exceptions). Much work needs to be done in order for one to evaluate claims about the relative (un)markedness and complexity of generic vs. quantified statements and to determine the language-specific and language-general features of generics. Fourth, another under-researched area that is amenable to experimental investigation is the study of the frequency of generics in everyday speech and other kinds of register. This is relevant both in order to appreciate the pervasiveness of generic language, but also in order to characterise the input that a child or an adult second language learner receives and how they can use it in order to figure out the intricacies of generic meaning. Related to that, we would not only want to establish the absolute frequency of generics, but also measure how frequent the different types of generics within a language are, as well as compare these frequency measures to the frequency of other kinds of generalisation (universal, existential, proportional etc.), as well as to specific or particular statements.

6. Conclusion

This chapter investigated recent experimental research on genericity, placing it within the context of the most prominent theories in different fields, mainly in formal semantics and experimental psychology. Both the theoretical and the experimental research on the topic have substantially provided further insight into what generics are and how they work. New questions emerge from the experiments reviewed here, which will hopefully be taken up by investigators across fields leading to an ever-larger explosion of research on the topic. I hope that this overview will stimulate further work and that more scholars will turn their attention to generics, especially in order to do interdisciplinary work that integrates the tools and perspectives of both strands of investigation.

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sparked and consolidated my interest in an interdisciplinary approach to the topic. All errors or misunderstandings are my own.

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