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## PERCEPTIONS OF DIFFERENT SYNTACTIC FORMS OF GENERICS: AN EXPERIMENTAL STUDY

### INTRODUCTION

English has a palette of resources for making generic statements (henceforth generics) such as e.g., *A tiger is striped*, *Mosquitoes carry the West Nile virus* or *The dinosaur is extinct*, which express generalizations about kinds rather than individuals. The aforementioned examples represent the three most common types of generic generalizations (i.e., indefinite singular with *a*, bare plural and definite singular with *the*). Unlike in English, Polish speakers have only two generic construals (if formal diversity of generics is taken into account) at their disposal for making reference to kinds: *Kot jest mięsożercą* 'A/The cat is a carnivore' (indefinite singular taking the 'zero quantifier') or *Koty są mięsożercami* 'Cats are carnivores' (bare plural).

### REVIEW OF LITERATURE

Genericity, which has traditionally been the domain of philosophers and logicians, has also attracted the attention of linguists, especially in

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formal semantic approaches (e.g., Krifka et al. 1995). Since the 1990s, there has been a growing interest among cognitive linguists concerning generics (Langacker 1996, 1997, 1999; Radden 2009). In Langacker's Cognitive Grammar (CG) model, generic statements are interpreted as statements which pertain to a 'structured world model' (Langacker 1991: 264). CG makes sense of generics in terms of the semantics of quantifiers and captures schematic characterizations of the generic construals. On the other hand, Radden's (2009) approach to generics – grounded in Langacker's CG – seeks to analyse generics in terms of metonymy and blending.

For the purpose of the present paper, a new and innovative theory of generics offered by Leslie (2007, 2008, 2012) will be discussed in greater detail. Leslie (2007: 379) puts forward the hypothesis that generics (1) are not quantificational even though their forms bear a resemblance to quantified statements and (2) express the conceptual system's default generalization. Thus, it seems valid to speculate that when we form general judgments, we are not concerned with *how many*, but we are rather preoccupied with the question of how striking and important the information is. Leslie's hypotheses form the backbone of the conceptually based approach developed by Prasada et al. (2013). The conceptually based approach, in contrast to e.g., Langacker's and Radden's approaches, seeks to examine connections between kinds and properties in generics. According to Prasada et al. (2013) there are three types of connections between kinds and properties, namely principled, statistical and causal, which underlie generic generalization. They argue that generics provide recourse to different types of connections between kinds and properties that our conceptual system represents and thereby, according to Prasada et al. (2013), they offer a window into our conceptual system.

Prasada et al. (2013), on the basis of Leslie's earlier classification (2007, 2008), divide generics into five categories: majority characteristic, minority characteristic, majority statistical, striking and quasi-definition. The first type of generalization – majority characteristic – involves generics such as, e.g., *Tigers are striped*, which express a property that is prevalent among members of the kind. It is important to note that such majority characteristic generics do not need to express exceptionless universal generalizations, since some tigers (i.e., albino tigers) may fail to possess the property. The second type – minority characteristic – involves generics such as, e.g., *Lions have manes*, which are only true about a minority of

the kind (i.e., mature, male lions). The third type of generalization – majority – includes generics such as, e.g., *Cars have radios*. In this type of generalization prevalence estimates play a crucial role in determining the truth of the generic statement. Thus, the generic *Cars have radios* is true because the majority of cars have radios. The fourth type of generalization – striking – includes generics such as, e.g., *Pit bulls maul children*, which involve striking, dangerous or damaging predication. Note that very few members of the category must possess the property for the generic of this type to be considered true. The last type of generalization – quasi-definition – involves generics such as, e.g., *Ants are insects*, which is true of all members of the kind without any exceptions.

Let us now return to the issue of the formal diversity of generics, raised in the introduction. The three most common forms seem to be bare plural (1a), indefinite singular (1b) and definite singular (1c). A number of linguists (e.g., Carlson 1980; Chesterman 1991; Krifka et al. 1995) have observed that some generics, as in (1) can assume the three forms while others, as in (2) and (3) seem only acceptable in the bare plural form<sup>1</sup>.

- (1) a. *Tigers are striped.*  
 b. *A tiger is striped.*  
 c. *The tiger is striped.*<sup>2</sup>
- (2) a. *Barns are red.*  
 b. *?A barn is red.*  
 c. *?The barn is red.*
- (3) a. *Sharks attack bathers.*  
 b. *?A shark attacks bathers.*  
 c. *?The shark attacks bathers.*

If we consider the statements with the question mark in (2–3), they would appear as instances of specific rather than generic reference. It has been argued (cf. Lawler 1973; Radden 2009) that the indefinite singular construal seems to be compatible provided that the relation between the subject and the predicate is of an “essential” nature. If we were to explain the latter claim in terms of the conceptually based approach, we

<sup>1</sup> Chesterman (1991) points out that there is a lack of agreement among native speakers pertaining to the acceptability of certain generics.

<sup>2</sup> The examples (1) to (3) are taken from Leslie et al. (2009).

might say that the connection between the kind and the property is principled<sup>3</sup>. Leslie et al. (2009) note that it would be of great theoretical significance if it could be determined whether people accept minority characteristic predications (e.g., *Lions have manes*) in the indefinite singular form<sup>4</sup>.

To determine this, two experimental studies were conducted (Leslie et al. 2009) to examine people's naturalness ratings of bare plural generics as compared to indefinite singular generics as well as to definite singular generics.

Generally speaking, bare plural generalizations were rated as more natural than indefinite singular generalizations. More specifically, if we consider majority characteristic (e.g., *Tigers are striped*) and minority characteristic (e.g., *Ducks lay eggs*) predications, these were rated as natural irrespective of the form they assumed (be that bare plural or indefinite singular). The majority statistical predications (e.g., *Cars have radios*) were judged as considerably more natural if presented as bare plurals than as indefinite singulars. The same conclusion applies to striking predications (e.g., *Pit bulls maul children*), however, the difference in the naturalness ratings between the two forms was marginal.

To sum up, the results seem to suggest that majority characteristic and minority characteristic generics were judged as natural despite the sentential form. The majority statistical predications, by contrast, were rated as less natural (the bare plural form being more natural than the indefinite singular form). The striking predications received lower naturalness ratings than the majority characteristic predications and the minority characteristic predications (with a slight preference for the bare plural form).

Let us now turn to the results of the experiment concerning the naturalness ratings of bare plurals versus definite singulars. Majority characteristic and minority characteristic predications were rated as natural in both forms (the bare plural form being slightly preferred). Overall, strik-

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<sup>3</sup> Principled connections are claimed to be formal connections which represent certain properties as aspects of being a given kind of thing.

<sup>4</sup> For the sake of clarity in the discussion concerning the two experimental studies conducted by Leslie et al. (2009), we shall follow terminology adopted by Prasada et al. (2013). It should be noted, however, that in Leslie et al. (2009), majority characteristic predications are referred to as principled predications, minority characteristic predications are referred to as characteristic predications while majority statistical predications are referred to as statistical predications.

ing predications tended to receive lower naturalness ratings than majority characteristic and minority characteristic predications (the bare plural form received significantly higher ratings of naturalness than the definite singular form). The fact that majority characteristic (e.g., *Dogs have tails*) and minority characteristic (e.g., *Lions have manes*) generalizations are naturally expressed in three different forms (with a slight preference for the bare plural forms), might indicate that the same type of connection exists between these two types of predication. It is important to note that in the case of the majority predication (e.g., having tails), this characterizes a majority (of e.g., dogs) group, whereas the characteristic (e.g., having manes) characterizes only a minority group, (here: mature male lions). It ought to be noted at this point that the data (Khemlani et al. 2009) seem to suggest that the minority characteristic generics (e.g., *Lions have manes*) express generalizations concerning the entire kind, despite the fact that they are only true of a minority group.

In brief, on the basis of the above study it is possible to conclude that the indefinite and definite singular form tends to be restricted to majority characteristic and minority characteristic predications. If we were to explain this claim in philosophical terms, we would say that the relation between the subject and the predicate is of an “essential” nature. Furthermore, the results of the study seem to reveal that, despite the obvious differences between majority characteristic and minority characteristic predications, they have some representational properties in common. Finally, let us also consider majority statistical and striking predications and their overall low ratings. Leslie et al. (2009) note that such results might be attributable to a formulation ‘characterizing Ks’ used in one of the questions in the instructions, which might have influenced participants’ decision-making processes. Furthermore, the expression ‘in general’ might be held responsible for the low ratings of striking generics since striking predications apply to only a miniscule group of a given kind and not across the board. Clearly, the results obtained for the majority statistical and striking generics are in need of further verification.

Cognitive research so far has revealed that different syntactic forms of generics in English are restricted to expressing only some types of generic generalizations and that generic assertions in the plural have more “generic power” than their singular equivalents. The aim of our experiment was to examine people’s perceptions of singular generics as compared to plural generics in Polish. We predicted that we would con-

firm findings from the American studies, that majority characteristic and minority characteristic generics would be judged as acceptable in singular forms and that the former would be rated the highest on the genericity measure. We also predicted that majority statistical generics in the singular form would receive lower ratings on the measure than majority and minority characteristic generics and that striking generics would be accepted only in the plural form.

#### EXPERIMENT: PLURAL VERSUS SINGULAR FORMS OF GENERIC PREDICATES IN POLISH

A sample of 40 volunteers were asked to judge whether the singular equivalents of Polish plural generic sentences may also be accepted as generic assertions.

#### METHOD

**Design.** Four different types of generic predication: majority characteristic, minority characteristic, majority statistical and striking were presented to the participants. Each category consisted of four pairs of sentences: one in the plural and correspondingly one in the singular form. The construction of the study formed a repeated measures design.

**Participants.** Forty first year students of the English Department at the University of Białystok in Poland volunteered to participate in the study. All were native speakers of Polish. None of them had participated in experiments concerning generics before. They had not been taught the concept of genericity on university courses prior to the experiment.

**Procedure and materials.** Participants were asked to fill in a 19-item paper-and-pencil questionnaire consisting of pairs of sentences in the plural and singular form (19 and 19 respectively). They were expected to judge whether the sentence in the singular refers to the whole kind in the same way as the sentence in plural does by indicating the following options: **no = 1, difficult to say = 2, yes = 3**. They also received 3 practice trials to familiarize themselves with the scale.

The sample of plural generic sentences used in the study consisted of Polish equivalents of English generics selected from the corpus of data taken from Appendix A in Prasada et al. (2013) and of Polish

generics collected by Karczewski (2013). Both natural and artifact kinds were included with the exception of minority characteristic generics, which only involve natural kinds. The following table presents general statements representing four predication types which were used in the experiment:

TABLE 1. Sample of generic sentences used in the study

Predicate type/ Item number	Majority characteristic	Minority characteristic	Majority statistical	Striking
1	Zebry są w paski. (Zebras are striped)	Żaby składają jaja w wodzie. (Frogs lay eggs in water)	Samochody strażackie są czerwone. (Fire engines are red)	Lisy przenoszą wściekliznę. (Foxes carry rabies)
2	Igły są ostre. (Needles are sharp)	Kangury mają torby. (Kangaroos have pouches)	Samochody mają radia. (Cars have radios)	Telefony komórkowe powodują bezpłodność. (Mobile phones cause infertility)
3	Samoloty mają skrzydła. (Airplanes have wings)	Lwy mają grzywy. (Lions have manes)	Psy szczekają na obcych. (Dogs bark at strangers)	Pitbule atakują ludzi. (Pit bulls maul people)
4	Cytryny mają kwaśny smak. (Lemons are sour)	Ssaki karmią młode mlekiem. (Mammals feed their young with milk)	Zimy są śnieżne. (Winters are snowy)	Szczepionki powodują autyzm. (Vaccines cause autism)

Additionally, three items representing quasi-definition generics were included as a manipulation check. They were as follows:

- Bobry są gryzoniami (Beavers are rodents)
- Konie są czworonogami (Horses are quadrupeds)
- Liczby parzyste dzielą się przez dwa (Even numbers are divisible by two)

## RESULTS AND DISCUSSION

The manipulation check measure yielded the expected response – participants identified quasi-definition predications in the singular form as generic on 100% of trials.

The differences among the four other types of generics were assessed via using a repeated measures ANOVA, which produced a significant main effect of predication type,  $F(3.117) = 118.689$ ,  $p < 0.001$ . Post hoc tests using the Bonferroni correction revealed statistically significant differences on the measure between singular forms of the following generic predications (with  $p < 0.001$  in all cases):

- majority characteristic and majority statistical
- majority characteristic and striking
- minority characteristics and majority statistical
- minority characteristics and striking
- majority statistical and striking.

No statistically significant differences were found between singular majority and minority characteristic predicates and between majority statistical and striking predicates. A positive correlation was established between majority and minority characteristic predications (Spearman's  $\rho = 0.408$ ,  $p < 0.01$ ). However, no correlation was found between majority statistical and striking generics (Spearman's  $\rho = -0.34$ ,  $p = 0.836$ ).

In general, a repeated measures ANOVA yielded the predicted significant effect of predication type. Singular majority characteristic and minority characteristic statements received significantly higher ratings of genericity than majority statistical and striking predicate types.

Since mean ratings of genericity power express a continuous measure which does not account for the semantic values of the scale, further analysis focuses on participants' responses for specific predication types and assertions belonging to four categories of predication. Figure 1 depicts categorical responses of respondents shown as a percent of total responses. Statements in singular forms which were judged by respondents as equivalent to their plural form in terms of their reference to the whole kind were identified as generic assertions. Singular statements which were not perceived as generics were categorized as individuating. The answer *Difficult to say* was interpreted as showing ambivalent perceptions of a given statement in the singular form.

These data suggest that there is a tendency for majority characteristic and minority characteristic generics in singular forms to be rated as naturally expressing generalizations. Minority characteristic predications are rated lower and there is a slight increase in the number of respondents who perceive such assertions in the singular form as specific or ambivalent in terms of genericity. The findings from the analysis of variance may

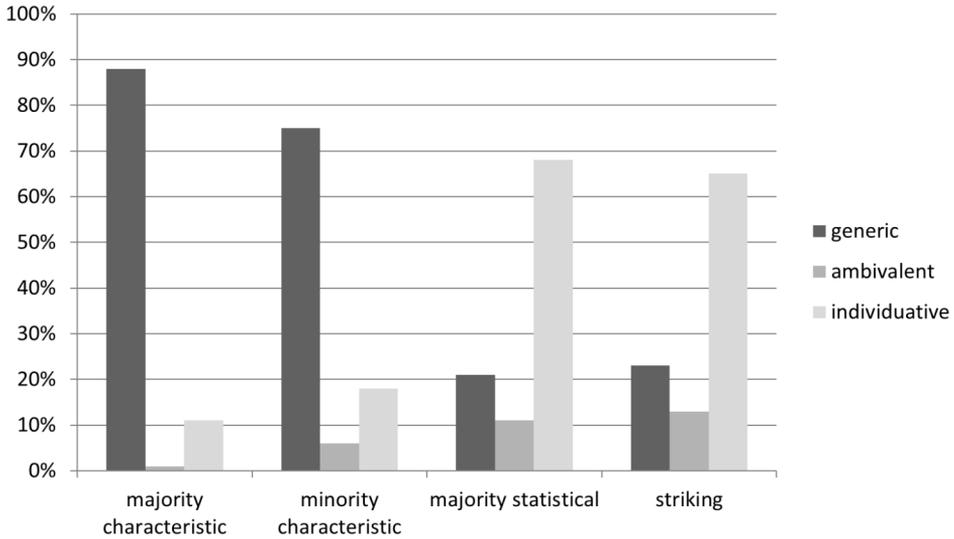


FIGURE 1. The distribution of responses as a function of predicate type

indicate that both types of predications, in contrast to the other two, involve a similar type of principled connection. On the other hand, majority statistical and striking generics in singular forms tend to be perceived as individuated and there seems to be a larger variance in participants' responses. To determine this, participants' ratings of specific items in each predicate category were considered. Table 2 presents the mean, median, mode and standard deviation values for the sample's responses to all items in the questionnaire.

TABLE 2. Statistical description of questionnaire items

Predicate category	Majority characteristic				Minority characteristic				Majority statistical				Striking			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mean	2.95	2.26	2.90	2.95	2.60	2.77	2.68	2.70	2.21	1.15	1.30	1.45	1.65	2.25	1.18	1.23
Median	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	3.00	1.00	1.00
Mode	3	3	3	3	3	3	3	3	3	1	1	1	1	3	1	1
Std. Deviation	.316	.966	.441	.316	.744	.627	.694	.687	.951	.427	.648	.749	.864	.870	.501	.577

An analysis of variance was conducted to examine the differences in the mean ratings of majority statistical and striking predications. A repeated measures ANOVA with a Greenhouse-Geisser correction determined that there were statistically significant differences among mean ratings within majority statistical and striking predicate categories ( $F(2.227, 84.636) = 25.749, p < 0.001$  and  $F(2.463, 96.062, p < 0.001)$  respectively). Pairwise comparisons with a Bonferroni correction showed that the mean ratings of item 1 in the majority statistical category *Wóz strażacki jest czerwony*/*The fire engine is red* differed significantly from other responses, which, in contrast, were not significantly different from each other. This may suggest that participants tended to perceive the attribute of redness as an essential feature of fire engines, i.e., interpret the connection between the kind and the property as principled rather than statistical. On the other hand, it may be argued that the estimate of the prevalence of the property (redness) is very high (all fire engines in Poland are red) and that might have affected respondents' choices. Post hoc tests conducted on mean ratings of responses belonging to the striking category did not yield results that could be interpreted in a meaningful way. The results of the study show that there is a need for further research concerning majority statistical and striking predications. Qualitative analysis involving socio-cultural factors may provide deeper insights into cognitive frameworks that navigate people's interpretations of such generalizations.

To sum up, our findings supported our predictions that native speakers of Polish accept singular forms of majority characteristic and minority characteristic predications as generalizations. The results of the study also indicated that the same type of connection may underlie both predicate types, despite the fact that minority characteristic predications involve properties whose estimates of prevalence are low (the property is characteristic of a minority of representatives of the kind). We also predicted that singular forms of majority statistical predications would be less acceptable as general statements and that striking predications would be accepted only in the plural form. It seems, however, that both types of predications select the plural form as generic in similar proportions. The results also show that the two categories are internally heterogeneous and there is a need to investigate what factors may cause this diversity. The overall interpretation of the results of the study is that in Polish, the singular form selects generic statements

which express principled information concerning the kind. Such an interpretation accords with conclusions drawn by Leslie et al. (2009) and Prasada et al. (2013).

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## PERCEPTIONS OF DIFFERENT SYNTACTIC FORMS OF GENERICS: AN EXPERIMENTAL STUDY

### Summary

Generics are statements that express generalizations about categories rather than individuals (e.g., "a tiger is striped," "mosquitoes carry the West Nile Virus," or "the dinosaur is extinct"). In English, some generics can assume more than one syntactic form, i.e., bare plural, definite singular, and indefinite singular, while others seem acceptable in the bare plural form only. Experimental findings (Karczewski 2015) speak in favour of a claim that plural generics represent a prototypical construction in English and Polish. Thus, we sought to explore – relying on a conceptually based approach to generics (Prasada et al. 2013) – the extent to which adult speakers of Polish accept various predication types (majority characteristic, minority characteristic, majority statistical, or striking) in the singular form. The primary goal of the article is to replicate Leslie et al.'s studies (2009), while introducing a different research method and using the data from Polish sources. Overall, the results of the study indicate that the singular form in Polish selects generic statements that express principled information concerning the kind and, as such, our results confirm the findings from Leslie et al. (2009) and Prasada et al. (2013).

**Key words:** generics, predication type, principled connection, syntactic form

## PERCEPCJA RÓŻNYCH FORM SKIADNIOWYCH ZDAŃ GENERYCZNYCH: BADANIE EKSPERYMENTALNE

### Streszczenie

Zdania generyczne to stwierdzenia, które wyrażają uogólnienia dotyczące całych kategorii, a nie ich konkretnych przedstawicieli (np. „tygrys jest w paski”,

„komary przenoszą malarię” czy „dinozaury wymarły”). W języku angielskim niektóre zdania generyczne mogą przyjąć więcej niż jedną formę składniową, wyrażoną w obrębie grupy nominalnej, to jest: liczby mnogiej bez przedimka, liczby pojedynczej z przedimkiem określonym i liczby pojedynczej z przedimkiem nieokreślonym. Wyniki badań eksperymentalnych (Karczewski 2015) przemawiają za twierdzeniem, że zdania generyczne wyrażone w liczbie mnogiej stanowią konstrukcję prototypową w języku angielskim i polskim. Dlatego też podjęliśmy próbę zbadania – opierając się na pojęciowym modelu opisu zdań generycznych (Prasada i in. 2013) – w jakim zakresie dorośli rodzimi użytkownicy języka polskiego przyjmują za poprawne użycie liczby pojedynczej w różnych rodzajach predykatów generycznych (takich jak cecha reprezentatywna przypisywana większości, cecha reprezentatywna przypisywana znacznej części, cecha statystycznie typowa, cecha uderzająca). Głównym celem prezentowanych badań jest replika badań Leslie i in. (2009), ale z zastosowaniem odmiennej metodologii i z użyciem polskich danych. Wyniki eksperymentu wskazują, że w języku polskim grupa nominalna w liczbie pojedynczej jest akceptowalna w tych zdaniach generycznych, które wyrażają powiązanie oparte na cesze regularnej. Obserwacja ta potwierdza wnioski wynikające z badań Leslie i in. (2009) i Prasady i in. (2013).

**Słowa kluczowe:** zdania generyczne, rodzaj predykatu, powiązanie oparte na cesze regularnej, forma składniowa