Memory for generic and quantified sentences in Spanish-speaking children and adults

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ABSTRACT

Generic language (***Owls*** *eat at night*) expresses knowledge about categories and may represent a cognitively default mode of generalization. English-speaking children and adults more accurately recall generic than quantified sentences (***All owls*** *eat at night*) and tend to recall quantified sentences as generic. However, generics in English are shorter than quantified sentences, and may be better recalled for this reason. The present study provided a new test of the issue in Spanish, where generics are expressed with an additional linguistic element not found in certain quantified sentences (***Los búhos*** *comen de noche* 'Owls eat at night' [generic] vs. ***Muchos búhos*** *comen de noche* 'Many owls eat at night' [quantified]). Both preschoolers and adults recalled generics more accurately than quantified sentences, and quantified sentences were more often recalled as generic than the reverse. These findings provide strong additional evidence for generics as a cognitive default, in an understudied cultural context.

INTRODUCTION

A central task of early childhood is to learn broad generalizations about categories in the world: birds fly, milk builds strong bones, stoves are hot. Languages universally provide an important means of transmitting such knowledge via generic noun phrases (Gelman, 2003). Generics refer to kinds (birds as a category) rather than individuals (the birds at the park) and express generalizations about features that category members share (Carlson & Pelletier, 1995). Generics also convey core properties that are relatively enduring, timeless, and inherent (Prasada & Dillingham, 2006). They appear frequently in natural speech, including conversation with young children (Gelman, Goetz, Sarnecka & Flukes, 2008), and they play an important role in human reasoning (Cimpian, 2013; Gelman, Ware & Kleinberg, 2010).

Recently, some theorists have suggested that generics may express cognitively default generalizations (Csibra & Gergely, 2009; Gelman, 2010; Gelman & Brandone, 2010; Hollander, Gelman & Raman, 2009; Leslie, 2007, 2008; Leslie, Khemlani & Glucksberg, 2011). That is, in contrast to other forms of generalization such as those expressed by linguistic quantifiers (*all, some, most, every*), generics are learned earlier (Hollander, Gelman & Star, 2002), are faster to process (Meyer, Gelman & Stilwell, 2011), and are easier to remember (Cimpian & Erickson, 2012; Gülgöz & Gelman, 2015). This is striking, given that quantifiers have simple truth conditions that are rule-like and easily stated, whereas the truth conditions of generics are more subtle and require consideration of speakers' intuitive theories (e.g. Cimpian, Gelman & Brandone, 2010; Leslie, 2012).

Perhaps the most compelling evidence for the generics-as-default position is that both children and adults show an asymmetry in recall of generic vs. quantified statements, whereby quantified statements (*All bears climb trees, Most bears climb trees*) tend to be recalled as generic (*Bears climb trees*), but the reverse rarely occurs (Leslie & Gelman, 2012). This suggests that generics may correspond to cognitively more basic representations.

However, there is a crucial gap in the evidence regarding the generics-as-default position. Specifically, because prior studies of generics in memory have focused exclusively on speakers of English, it is unclear whether the asymmetry is due to generics being conceptually primary (consistent with generics as a default) or instead simply reflects that generic statements in English are shorter and simpler than quantified statements, as in (1) and (2) below:

(1) **Bears** climb trees. (generic)
(2) **Many bears** climb trees. ('many'-quantified)

The generic (*Bears climb trees*) has one fewer word than the quantified form (*Many bears climb trees*). Thus, the asymmetry noted above could simply reflect a tendency to shorten sentences in memory. In other words, when people recall a quantified sentence as a generic, perhaps it is because their linguistic representation has simply lost some detail. Prior work provided indirect evidence against this interpretation (Leslie & Gelman, 2012): participants did not show a tendency to shorten PREDICATE length (only subject NP length), and they did not recall sentences beginning with the negative quantifier *no* as positive generics (i.e. they did not drop the quantifier for sentences such as *No bears climb trees*, instead often recalling them as negative generics [*Bears don't climb trees*]). Nonetheless, because of the confound between subject-NP length and the quantifier/generic distinction in English, prior research was unable to test this alternative interpretation directly.

In contrast, the Spanish language provides an ideal opportunity for determining whether the asymmetry in generic vs. quantifier recall is due to the number of elements in the subject NP. In Spanish, unlike many non-Romance languages (including English, Quechua, and Mandarin; Mannheim, Gelman, Escalante, Huayhua & Puma, 2011; Tardif, Gelman, Fu & Zhu, 2012), generics can be expressed using plural noun phrases involving definite determiners (e.g. *Los osos* ...; literally translated as 'The bears ...') (Pérez-Leroux, Munn, Schmitt & DeIrish, 2004). In contrast, bare plural nouns are not attested in Spanish, unlike English:

(3)   ***Osos** trepan arboles. (*'Bears climb trees'; ungrammatical)

One consequence is that the semantics of these forms in Spanish versus English are subtly different: for example, some linguists have argued that, whereas English bare plurals denote kinds, Spanish definite plurals denote kinds and (in some contexts) objects (Chierchia, 1998; Pérez-Leroux *et al*., 2004). A second consequence with particular significance to the current discussion is that the generic form in Spanish includes a definite determiner (*los/las*) that is NOT found in certain quantified sentences, such as *muchos* 'many':

(4)   **Los osos** trepan arboles. ('Bears climb trees'; generic)
(5)   **Muchos osos** trepan arboles. ('Many bears climb trees'; 'many'-quantified)

If Spanish speakers tend to recall statements quantified with *muchos* as generic, this would, linguistically speaking, entail not only dropping the quantifier, but also inserting a determiner that had never been part of the original utterance (*los*). Put differently, if the previously established asymmetry in recall is due to a tendency to simplify sentences, rather than a robust preference for generics,

then it should not be found with the quantifier *muchos*. Thus, Spanish allows us to determine whether the source of memory asymmetries is conceptual or simply a consequence of sentence length.

The present study

This paper tests the generics-as-default hypothesis in Spanish speakers. We include two kinds of contrasts: *muchos* 'many' vs. generic, thus providing sentences in which the generic includes an extra element not found in the quantified sentence (as discussed above), and *todos* 'all' vs. generic, in which the quantifier has one more element than the quantified sentence, as in English (compare (6), below, to (4)):

(6)   **Todos los osos** trepan arboles. ('All bears climb trees'; 'all'-quantified)

Because prior research in English has not tested the quantifier *many*, we also examined English-speaking adults' memory for generics and *many*. In all cases, the present experimental set-up provided a discourse context that strongly suggested a 'kind' interpretation of Spanish definite plurals, rather than the alternative 'object' interpretation. This was accomplished by presenting just a single exemplar of each category (e.g. a single bear).

   A second goal of the research was to extend the study of generic memory to a cultural context other than that in which most previous research on this issue was conducted (i.e. college undergraduates and members of middle-class US communities; see Henrich, Heine & Norenzayan, 2010). In the present study, the sample was drawn from communities in Mexico in which educational opportunities are available but limited, and the economy is based mainly on agriculture and a couple of breweries in the urban center. Particularly given that generics are hypothesized to be an implicit expression of a pedagogical stance (Gelman, Ware, Manczak & Graham, 2013) and that pedagogical practices vary significantly across cultures (Rogoff, González, Quiacaín & Quiacaín, 2011), it is of value to study generic representations across these cultural contexts. An additional advantage of this community is that the influence of the English language on people's daily discourse is minimal or none, which is ideal for cross-linguistic comparisons with English speakers. In contrast, most large urban centers in Latin America, especially Mexico City, are influenced by the English language on TV, in schools, on signs in businesses, and by large numbers of English-speaking tourists and business people, etc.

METHOD

Participants

Participants were forty-eight Spanish-speaking children (22 girls, 26 boys; M_{age} = 5;0, SD = 0;7) and forty-eight Spanish-speaking adults (30 women,

18 men; $M_{age} = 19$, SD = 1;3) in Tequila and Orizaba, Mexico. Within each age group, participants were randomly assigned to either the Muchos/Generic condition or the Todos/Generic condition. One additional child was tested but not included because she was too shy to speak. We recruited the adult Spanish-speaking sample from the Universidad Veracruzana Intercultural (UVI), located in the municipality of Tequila, a 5-hour journey from Mexico City. Most students attending this university are seventeen to twenty-four years of age and come from the central mountain zone of the State of Veracruz, where approximately 60% of the population is bilingual in Spanish and Nahuatl. This region is mainly rural with small administrative centers dispersed over 300 square miles. The classes at UVI are taught in Spanish, and the only major available is 'intercultural broker'. Because the preschools in this area serve mostly students who speak Nahuatl at home, we recruited Spanish-speaking children from a preschool in Orizaba, the closest urban center to UVI, a 45- to 60-minute journey by car or bus. Most people in Orizaba speak only Spanish because indigenous people in this area migrated to the nearby highlands. The city has a population of approximately 120,000 in an area of 10·8 square miles.

An additional forty-eight English-speaking adults ($M_{age} = 19;7$; 19 women, 29 men) enrolled in a US university participated in an English version of the Muchos/Generic condition, for which they received partial course credit. Because prior research already tested and confirmed that English speakers hearing ALL default to generics (Leslie & Gelman, 2012), the current study did not include this condition. The US adults self-identified as 78% white, 20% Asian, and 1% Latino. Finally, twenty English-speaking adults ($M_{age} = 31;2$; 8 women, 12 men) were recruited to participate in a small validation study of the predicates, using Amazon's Mechanical Turk, a crowd-sourcing platform that allows people to complete on-line tasks for compensation. Of this sample, 90% reported having at least some college education.

Materials

There were sixteen sentences, each with a familiar category and novel property, and presented in either generic form (e.g. *Las jirafas tienen lengua morada* 'Giraffes have purple tongues') or with a quantifier, either *muchos* (for those in the Muchos/Generic condition; e.g. *Muchas jirafas tienen lengua morada* 'Many giraffes have purple tongues') or *todos* (for those in the Todos/Generic condition; e.g. *Todas las jirafas tienen lengua morada* 'All giraffes have purple tongues') (see Table 1). All sentences were in the animal domain, consistent with prior work (Leslie & Gelman, 2012), given that generics are more commonly expressed in the animal

TABLE 1. *Sentences used in the study, presented here in generic form*

English	Spanish
Ants have two stomachs.	Las hormigas tienen dos estómagos.
Bees have five eyes.	Las abejas tienen cinco ojos.
Cats sweat through their paws.	Los gatos sudan por las patas.
Elephants play with oil.	Los elefantes juegan con aceite.
Giraffes have purple tongues.	Las jirafas tienen lengua morada.
Gorillas can catch a cold.	Los gorilas pueden tener gripa.
Hippos have pink sweat.	Los hipopótamos tienen sudor rosado.
Horses sleep standing up.	Los caballos duermen de pie.
Octopuses have blue blood.	Los pulpos tienen sangre azul.
Owls eat at night.	Los búhos comen de noche.
Penguins drink salty water.	Los pingüinos toman agua salada.
Rabbits snore when sleeping.	Los conejos roncan cuando duermen.
Snails lay pink eggs.	Los caracoles ponen huevos rosados.
Snakes swallow whole animals.	Las serpientes tragan animales enteros.
Spiders shed their skin.	Las arañas cambian de piel.
Tigers swim in water.	Los tigres nadan en el agua.

domain by both children and adults (Brandone & Gelman, 2013). In order to verify that the predicates were unfamiliar and not commonly known, twenty English-speaking participants judged whether each sentence, in generic form, was true or false. The overall rate of judging the target sentences as 'true' was 52%, which did not differ from chance (50%) ($t(19) = 0.58$, $p > .57$). Materials also included sixteen photos, one for each of the animals referred to in the sentences, and each depicting a single instance of the relevant category (e.g. the giraffe item included a photo of a single giraffe). The photo did not depict the stated information (e.g. the giraffe's tongue was not visible).

Procedure

Participants were tested individually in a quiet room. Each received two blocks of trials. Participants viewed a series of photographs of animals (8 per block, one at a time), and learned a novel fact about each. Participants heard half of the facts as generic statements (e.g. *Bees have five eyes*), and the other half as statements that contain a particular quantifier (*muchos*; e.g. *Many bees have five eyes*). Sentences were counterbalanced across wording conditions and blocks (e.g. half the participants heard the statement about giraffes as generic, and half heard the statement about giraffes as quantified). Following the teaching phase, participants engaged in a 4-minute distractor task (for adults: Sudoku and a puzzle; for children: pattern blocks and magnetic building shapes) to prevent rehearsal of the novel facts.

TABLE 2. *English-speaking adults, mean number of sentences recalled as generic, 'many', other quantifier, or other, as a function of sentence type (SDs are in parentheses)*

	Generic	Many	Other-Quant.	Other
Generic sentences	6·73 (1·58)	0·77 (1·28)	0·23 (0·75)	0·27 (0·57)
'Many' sentences	3·54 (2·69)	3·42 (2·59)	0·79 (1·40)	0·25 (0·64)

In the testing phase, the experimenter said, "Te voy a mostrar las mismas fotos que te mostré antes. Veamos si recuerdas lo que te dije" 'I am going to show you the same pictures I showed you before. Let's see if you can remember what I said'). Then, the eight original pictures were presented again, one at a time, and the participant was asked to remember what the experimenter had said previously ("¿Puedes recordar lo que te dije sobre esta foto?" 'Can you remember what I said about this picture?'). No corrective feedback was provided. If the child gave a response, the experimenter said, "Muy bien" 'Great', then proceeded to the next item. If the child failed to provide any verbal response regarding the picture, the experimenter asked the question again and allowed waiting time. If the child still failed to provide verbal feedback, the experimenter said, "Bueno, veamos la siguiente" 'OK, let's look at the next one'. All responses were audio-recorded for later coding.

RESULTS

The generics-as-default model predicts that quantified statements will be recalled as generic more often than generic sentences are recalled as quantified, in both languages. In contrast, an alternative prediction is that the asymmetry will be found only when the quantified sentences are longer than the generics (therefore, for English speakers hearing any quantifier and for Spanish speakers hearing *todos*, but not for Spanish speakers hearing *muchos*). We first report the results with English-speaking adults, and then turn to the data from Spanish-speaking children and adults. See Tables 2 and 3 for all findings.

English-speaking adults

Responses were scored as generic, *many*, other quantifier (e.g. *some, all*), or other (see Leslie & Gelman, 2012, for details), based on the subject noun phrases that participants provided. The predicate did not need to be

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TABLE 3A. *Spanish-speaking participants, mean number of sentences recalled in the Todos/Generic Condition, as a function of age group, condition, and sentence wording (SDs are in parentheses)*

(a) TODOS/GENERIC CONDITION

	GENERIC SENTENCES		QUANTIFIED SENTENCES	
	Children	Adults	Children	Adults
RECALL TYPE:				
Generic – definite plural	4·83	5·08	5·08	4·12
	(2·99)	(2·14)	(2·72)	(2·42)
Generic – other	1·37	0·33	1·08	0·37
	(2·30)	(0·87)	(1·98)	(0·71)
'Todos'	0·75	1·37	0·75	2·54
	(1·65)	(2·10)	(1·54)	(2·78)
'Muchos'	0·00	0·00	0·00	0·08
	(0·00)	(0·00)	(0·00)	(0·41)
Other quantifier	0·00	0·04	0·00	0·04
	(0·00)	(0·20)	(0·00)	(0·20)
Other	1·12	1·25	1·29	1·12
	(1·75)	(1·89)	(1·76)	(1·96)

NOTE: Scores sum to more than 8, as participants occasionally provided more than one response.

stated. A second coder scored 10 of the 48 participants (21%), with 97% agreement (Cohen's kappa = ·94).

We summed the number of correct responses per wording condition (i.e. generic responses in the generic wording condition; *many* responses in the *many* wording condition), where scores could range from 0 to 8. Correct recall was higher for generic sentences than *many* sentences ($Ms = 6·73$, 3·42, respectively) (t-paired(47) = 6·58, $p < ·001$). We also conducted a more lenient test, in which participants in the *many* condition received credit for using any quantifier (even if not the one we provided – e.g. *all* or *some* instead of *many*), and on this analysis, generics were still more likely to be recalled correctly (quantifiers in *many* condition = 4·21) (t-paired(47) = 4·79, $p < ·001$).

An examination of 'opposite' errors (generic recalled as *many*; *many* recalled as generic) shows a greater tendency to recall *many* as generic than vice versa ($Ms = 3·54$, 0·77, respectively) (t-paired(47) = 5·54, $p < ·001$). The result is again obtained when using the more lenient test (i.e. generics recalled as containing any quantifier [e.g. *many, all, some*]; $M = 0·98$) (t-paired(47) = 4·83, $p < ·001$).

TABLE 3B. *Spanish-speaking participants, mean number of sentences recalled in the Muchos/Generic Condition, as a function of age group, condition, and sentence wording (SDs are in parentheses)*

(b) MUCHOS/GENERIC CONDITION

	GENERIC SENTENCES		QUANTIFIED SENTENCES	
	Children	Adults	Children	Adults
RECALL TYPE:				
Generic – definite plural	5·37	6·08	5·50	4·54
	(2·20)	(2·04)	(2·28)	(2·48)
Generic – other	0·92	0·08	0·92	0·12
	(1·38)	(0·28)	(1·93)	(0·45)
'Todos'	0·08	0·04	0·12	0·04
	(0·41)	(0·20)	(0·45)	(0·20)
'Muchos'	0·29	0·67	0·71	1·67
	(0·81)	(1·01)	(1·40)	(1·95)
Other quantifier	0·08	0·33	0·33	0·87
	(0·28)	(1·09)	(0·92)	(1·70)
Other	1·25	1·00	0·71	1·04
	(1·33)	(1·59)	(1·00)	(1·68)

NOTE: Scores sum to more than 8, as participants occasionally provided more than one response.

Spanish-speaking children and adults

Given our particular interest in how often generic sentences include the article, coding of the Spanish responses distinguished between generics expressed with a definite article plus plural noun (e.g. *Los gatos sudan por las patas* 'Cats sweat through their paws') and all other generics (including those expressed with a plural pronoun, or those expressed with a dropped subject but plural form of the verb, e.g. *Sudan por las patas* '[They] sweat through their paws', and those expressed with bare plural noun phrases, which are ungrammatical in Spanish but sometimes produced by the children, e.g. **Gatos sudan por las patas* 'Cats sweat through their paws'). Utterances in which the subject NP was a plural pronoun, or in which the subject NP was dropped but the verb was in plural form, were considered generic rather than specific, due to the mismatch between the plural form of the utterance and the singular instance of the relevant animal in the picture, indicating that the utterance did not refer to the animal in the context. The other coding categories included: *muchos* (e.g. *Muchos gatos sudan por las patas* 'Many cats sweat through their paws'), *todos* (e.g. *Todos los gatos sudan por las patas* 'All cats sweat through their paws'), other quantifier (e.g. *A algunos gatos les sudan las patas* 'Some cats sweat

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through their paws'), and other (e.g. *El gato suda por los pies*; ambiguous between generic 'Cats sweat through their feet' and specific 'The cat sweats through its feet'; *Roncando* 'Snoring'; *No me acuerdo* 'I don't remember'). The predicate did not need to be stated for any of these codes. A second coder scored 20 of the 96 participants (21%), with 94% agreement (Cohen's kappa = ·91).

For each participant, we summed the number of correct responses (here defined strictly as definite plural generics in recall of generic sentences, *muchos* responses in recall of muchos sentences, and *todos* responses in recall of todos sentences), each of which could range from 0 to 8. We conducted a 2 (age group: child, adult) × 2 (quantifier condition: Muchos/ Generic vs. Todos/Generic) × 2 (sentence type: generic, quantifier) ANOVA. There was a main effect of age group, indicating that adults recalled sentences more accurately than children ($Ms = 3·84$, $2·91$, respectively) ($F(1,92) = 11·37$, $p = ·001$, $\eta_p^2 = ·11$). There was also a significant effect of sentence type, indicating substantially greater accuracy in recall of generic than quantified sentences ($Ms = 5·34$, $1·41$, respectively) ($F(1,92) = 126·25$, $p < ·001$, $\eta_p^2 = ·58$). All other main effects and interactions were non-significant. A series of four planned comparisons revealed that the wording effect (i.e. higher correct recall of generic than quantified sentences) held up at both ages within each quantifier condition (Todos vs. Generic; Muchos vs. Generic) ($ps < ·001$).

We also conducted a more lenient test, in which recall of quantified sentences (either *muchos* or *todos*) was counted as correct when a participant produced any quantifier – even if not the one we provided. (Coding of generics remained the same as in the previous analyses, and included only generics expressed with definite plural NPs.) The result again shows a main effect of sentence type ($F(1,92) = 96·43$, $p < ·001$, $\eta_p^2 = ·51$), indicating that generics were more likely to be recalled correctly than quantifiers, even with this more lenient scoring. As with the prior analysis, there is also an age effect ($F(1,92) = 13·90$, $p < ·001$, $\eta_p^2 = ·13$), indicating overall greater accuracy for adults than children, and no other significant effects.

An examination of 'opposite' errors (generics recalled as the appropriate quantifier for that quantifier condition [*todos* or *muchos*]; quantifiers recalled as definite plural generics) shows a main effect of sentence type ($F(1,92) = 141·38$, $p < ·001$, $\eta_p^2 = ·61$). As predicted, participants are more likely to recall quantifiers as generic than vice versa ($Ms = 4·81$, $0·77$). There was no significant main effect of age ($F(1,92) = 0·90$, $p = ·34$, $\eta_p^2 = ·01$), but there was a significant age × sentence type interaction ($F(1,92) = 4·60$, $p = ·035$, $\eta_p^2 = ·048$), indicating a larger difference between generic and quantified sentences for children than for adults. Nonetheless, the sentence type difference was significant within each age group (ps

< ·001). All other main effects and interactions were non-significant. A series of four planned comparisons revealed that the sentence type effect held up at both ages within each quantifier condition (Todos/Generic vs. Muchos/Generic) (ps < ·001).

These same patterns were found when using the more lenient test regarding the quantifiers (i.e. when generic sentences were recalled as containing any quantifier). We obtained a main effect of sentence type ($F(1,92) = 123·75$, $p < ·001$, $\eta_p^2 = ·57$) and a sentence type × age group interaction ($F(1,92) = 5·11$, $p = ·026$, $\eta_p^2 = ·053$), but no significant main effect of age ($F(1,92) = 0·47$, $p > ·40$, $\eta_p^2 = ·005$), and no effects involving quantifier condition.

DISCUSSION

Generic language is fundamental to how people talk about categories and convey category-relevant information to children. The present study provides a critical test of distinct models of how generics are recalled, with predictions that follow from structural differences between English and Spanish. If generics are a cognitive default, then people should recall generic sentences more accurately than quantified sentences, and should more often recall quantified subject NPs as generic than the reverse. This should be true of both English, in which quantified sentences uniformly contain an extra element when compared to bare plural generics, and in Spanish, in which certain quantifiers (e.g. *muchos*) are equal in length to generics and are missing a linguistic element that is found in the generic. In contrast, if better recall of generics is due to participants tending to shorten subject NPs in recall, then we would expect the effect to disappear in Spanish speakers who hear the quantifier *muchos*. Moreover, this sentence-shortening explanation would predict that Spanish speakers would show more of a generic advantage for sentences quantified with *todos* (which is like English in including an extra element relative to the generic) than for sentences quantified with *muchos*.

The results reinforce the generics-as-default interpretation, and provide no evidence for the sentence-shortening interpretation. For both adult and preschool Spanish speakers, we obtained a strong generic advantage in recall. It is striking that this result was equivalent across quantifier condition (*todos* versus *muchos*). What this means is that speakers who heard sentences such as *Muchos gatos sudan por las patas* 'Many cats sweat through their paws' misremembered them as *Los gatos sudan por las patas* 'Cats sweat through their paws', thereby substituting one linguistic element (*muchos*) for another (*los*). It is also notable that quite similar effects were obtained for preschool children as well as adults, thus suggesting that generics may be a default throughout development.

Indeed, children showed a significantly stronger effect than did adults (as in English; Leslie & Gelman, 2012).

An important point to consider is whether the present results could be due to the content of the predicates rather than a generic default. Is it the case, for example, that participants believed that these properties were generally true of the corresponding categories, and, for this reason alone, were expressed in generic form? For example, it would be misleading to say "Many bees have five eyes" when one thinks that all bees have five eyes. However, several points argue against this possibility. First, the predicates were carefully selected to be unfamiliar, and thus participants did not have prior knowledge of their scope. Second, even if participants had believed that the predicates were true of all category members (and thus avoided saying *many*), this could not account for the higher frequency of GENERIC NPs. Recall that the lenient tests gave participants credit if they had produced ANY quantifier (including *all, most, many*, or *some*) – yet they rarely did so. Thus, even if participants had assumed that predicates were true of all, most, many, or some category members, they still defaulted to generics.

Third, if it were just the case that generic production was due to the semantics of the predicate, then we should find equal rates of generics regardless of which quantifier had been provided by the experimenter. Yet prior research indicates that the tendency to default to generics is governed by the quantifier that participants hear, even when predicate content is kept constant (Leslie & Gelman, 2012). Finally, prior research also indicates that the tendency to recall sentences as generic is just as high under cognitive load (Sutherland, Cimpian, Leslie & Gelman, in press). In contrast, if the process leading to generic production entailed determining the scope of the predicate and repairing the utterance, this would likely be REDUCED under cognitive load.

Nonetheless, although predicate content cannot account for the present patterns of results, it can play an important role in the phenomenon under investigation. Specifically, Sutherland *et al*. (in press) found that adults display a stronger tendency to default to generics when properties were potentially generalizable (e.g. "like to swim in the ocean", "eat fruit and vegetables") than when they were idiosyncratic (e.g. "have broken legs"). (All of the predicates that we used in the current studies were potentially generalizable.) Sutherland *et al*. interpret this result as providing evidence that people are biased to spontaneously generalize to categories, an interpretation that is consistent with the present data. It would be interesting in future research to vary the novel predicate in this task. We would predict that if the novel predicates were idiosyncratic (e.g. "have broken legs"), this would result in a weaker tendency to recall quantified NPs as generics, regardless of the language tested.

An additional result was that the generic advantage was stronger in the Spanish-speaking sample than the English-speaking sample. Although participants from both groups recalled generics more accurately than quantified sentences, the size of the effect was larger for the Spanish speakers. For the purposes of the question that motivated the research, this finding is important as it is consistent with the generics-as-default interpretation. Nonetheless, it is also puzzling. There are numerous differences between the two groups of participants (including not only language, nationality, and culture, but likely also familiarity with psychological research), thus making it impossible to tease apart why their performance differed. However, one possibility is that the English speakers, who were students at a highly selective university and very experienced with standardized testing, may have employed different (e.g. meta-cognitive) strategies during the distracter task, and/or viewed the goal of the task differently (e.g. to provide verbatim vs. gist recall). In any case, despite these differences, the magnitude of the effect in both cultural contexts supports the generality of the generic advantage in recall – and by extension, generics as a cognitive default.

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