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Number meaning and number grammar in English and Spanish

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ABSTRACT

Grammatical agreement makes different demands on speakers of different languages. Being widespread in the languages of the world, the features of agreement systems offer valuable tests of how language affects deep-seated domains of human cognition and categorization. Number agreement is one such domain, with intriguing evidence that typological characteristics of number morphology are associated with differences in sensitivity to number distinctions. The evidence comes from research on language production that points to the morphological richness of languages as enhancing the expression of number distinctions. To critically test this hypothesis, native speakers of a sparse-morphology language (English) were compared with native speakers of a rich-morphology language (Spanish) in their use of semantically and grammatically motivated number agreement. With meaning-matched materials, speakers of both languages displayed significant variations in number agreement due to implicit nuances of number semantics, and the patterns and magnitudes of interaction with grammatical number were the same for both groups. In this important respect, speakers of English and Spanish appear to construe numerosity in similar ways, despite the substantial morphological and syntactic differences in their languages. The results challenge arguments that language variations can shape the apprehension of nonlinguistic number or promote differential expression of number meaning during the production of grammatical agreement.

Introduction

In English and many other languages, talking about almost anything requires a tacit evaluation of numerosity. Most English nouns come in different singular and plural forms. As a result, the use of nouns typically entails some commitment to quantity when designating a noun's referent, at least whether the referent is construed as one thing or more than one thing. So, nouns convey number meaning directly in a way that is familiar to every native English speaker. English and other languages also capitalize on number for a fundamental syntactic purpose. In grammatical number agreement, covariations in the forms of words serve the syntactic function of flagging which words or phrases modify one another: *The shape of the towers that was...* is going to say something about the shape; *The shape of the towers that were...* is going to say something about the towers. This syntactic function has nothing to do with shapes or towers or the actual topics of conversation. It nonetheless drives a need to evaluate numerosity that arises because the grammar of English demands it. The demand is unstoppable: Grammatical number variations can occur in any English sentence, requiring speakers and listeners to assess notional number (that is, the construed numerosity of an intended referent) at least once every few seconds in ordinary language use. The question we ask here is whether there are differences in how speak-

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ers use number notionally that parallel differences in how their languages use number grammatically in agreement.

The theoretical importance of this question stems in part from its connections to linguistic determinism and relativity. Whorf (1956) contended that "the grammar ... of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity" (1956, p. 212). Whorf's emphasis was on grammar, more so than single words (Lucy, 1992b), because the grammar of a language repeatedly and reliably forces speakers to use information in particular ways, and broad conceptualizations of information are likely to be shaped accordingly. Differences among grammars in how they package thoughts could cause speakers of different languages to categorize the same information differently. Likewise, speakers of dissimilar languages would be expected to vary in how adept they are in calling rapidly on concepts tailored to certain kinds of grammatical distinctions.

Take number agreement. Languages with number agreement systems force native speakers (and speakers who aspire to native-like fluency) to include information about numerosity in every nonverbal message they wish to communicate; speakers of languages without number-agreement systems face no such demand. Thus, English speakers have to represent notional numerosity virtually every time they talk, because the features associated with number agreement are essential for English utterances. There is number agreement between subjects and verbs, between nouns and determiners, and between pronouns and antecedents. In contrast, Chinese speakers are not confronted with this challenge, because number agreement is absent in their language.

Of course, along with notional number, speakers have to juggle other kinds of number information in order to implement number agreement. Linguistically, the most familiar is grammatical number, the number that covaries between linguistic elements in agreement. For example, the noun *scissors* is grammatically plural, the noun *news* is grammatically singular, the verb *were* is grammatically plural, and the verb *cuts* is grammatically singular. The usage of grammatical singulars and plurals in agreement can be independent of notional number, because the numerosity of a referent that a speaker has in mind does not always correspond to the grammatical number of a corresponding word in a referring expression. For instance, object tends to be construed as a single thing (Bock, Eberhard, Cutting, Meyer, & Schriefers, 2001), though the word that customarily refers to it (*scissors*) is grammatically plural. Conversely, what is commonly referred to as *news* tends to be evaluated as multiple things, though the word *news* is grammatically singular. Scissors *are* sometimes dull, and news *is* sometimes bad.

Languages use number grammar and number meaning in different ways and to varying degrees, making the apprehension of numerosity in the world a plausible locus of cross-linguistic, language-related variations. There is in fact tantalizing evidence that the number syntax of languages can predispose different ways of construing number notionally (Lucy, 1992a). Much of this evidence comes from research on mass and count nouns. In English, mass nouns (e.g. *toast*, *bread*) are typically treated as singulars in the grammar, despite variations in the notional-number properties of their referents. So, English speakers tend to use *toast* and *bread* to denote multiple, discrete pieces of toast and bread, even though reference to discrete objects is more often associated with nouns that alternate between singular and plural forms, count nouns like *pea* and *peas*. Yet neither mass nor count nouns have a simple link to notional number. *Pea* is a good example: In English, the fact that *pea* is a count noun (and *corn* is not) is more an accident of linguistic history than of notional number, an apparent mistaking of the old mass noun *pease* for a plural-count form.

The mass-count distinction has important syntactic and crosslinguistic implications. Syntactically, the classification of mass nouns as grammatically singular (with exceptions that convert mass to count nouns for denoting classes; e.g. *the breads of different countries*) systematically affects the grammatical number of verbs and other words that agree with mass nouns. The potential consequences of mass/count syntax for number cognition in adults and language-learning children are the focus of an extensive literature (Barner & Snedeker, 2005, 2006; Barner, Wagner, & Snedeker, 2008; McPherson, 1991; Middleton, Wisniewski, Trindel, & Imai, 2004; Soja, 1992; and many others). Cross-linguistically, the absence of mass/count syntax from some languages drives research on how speakers of such languages differ from English speakers in categorizing, individuating, and quantifying substances and objects (Barner, Inagaki, & Li, 2009; Imai & Gentner, 1997; Iwasaki, Vinson, & Vigliocco, 2010; Li, Dunham, & Carey, 2009; Lucy, 1992a). However, there are important differences between the grammatical challenges posed by mass and count nouns and the challenges posed by number agreement more broadly. The next section sketches some of these differences.

Mass/count syntax and number agreement

A principal reason for the crosslinguistic significance of mass/count syntax is that the distinction is in some ways semantically arbitrary (Quine, 1960). The grammatical treatment of mass and count nouns does not consistently capture a distinction between substances and objects, raising the possibility that the grammatical distinction on its own could affect whether referents are construed as substances or individuals. English speakers might construe a heap of small smoothish stones as gravel (an uncountable substance) or as pebbles (countable objects); the term *pea gravel* represents a compromise between these competing conceptions. The arbitrariness of grammatical number in these instances highlights the possibility that mass nouns, as a class, could be treated grammatically as invariantly