What Counts in Mandarin Chinese: A Study of Individuation and Quantification

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Abstract

By some accounts, speakers of classifier languages such as Mandarin or Japanese, which lack count-mass syntax, require classifiers to specify individuated meanings of nouns. This paper examines this view by testing how Mandarin speakers interpret bare nouns and use classifier knowledge to guide quantification in four studies. Using a quantity judgment task, Study 1 found that Mandarin speakers interpret nouns like English speakers, regardless of their syntactic status as mass or count in English. Study 2 showed that Mandarin speakers quantified broken objects like English adults, again suggesting that Mandarin nouns specify criteria of individuation. Studies 3 and 4 together showed that classifiers are not typically required for individuation, except when the reference of nouns is semantically ambiguous (e.g., *rock, string*) and can denote either objects or substances. In sum, we argue that individuation can be specified lexically in classifier languages like Mandarin, and does not depend on classifier syntax.

Keywords: individuation; quantification; nouns; classifiers; word learning; Mandarin; mass-count syntax.

Introduction

Languages differ in how they express reference to kinds of things. In English and other Indo-European languages, countable things like dogs and cups are typically referred to using count syntax (e.g., *those are dogs*), whereas uncountable entities like milk and sand are expressed as mass nouns (e.g., *that is some milk*). However, other languages, like Mandarin Chinese, make no such syntactic distinction. Instead, nouns in Mandarin, and related classifier languages like Japanese and Tsotsil Mayan, act much like mass nouns in English (Allan, 1980; Chierchia, 1998). Nouns cannot co-occur directly with numerals (**san bi* 'three pen'), but instead require classifiers (CLs) for counting (*san CL-zhi bi* 'three pens', is literally translated to 'three CL-stick pen'). Based on this syntactic distinction, some researchers have argued that nouns in classifier languages may not specify individuation lexically. Instead, languages like Mandarin may rely on classifiers – i.e., words like "bit" and "piece" – to syntactically specify units of individuation, resulting in a fundamental difference in how nouns encode meaning cross-linguistically (e.g., Borer, 2005; Huang & Lee, 2009; Lucy, 1992).

For example, according to Lucy (1992), in classifier languages such as Yucatec Mayan, all lexical nouns "are unspecified as to unit since they all require supplementary marking (i.e., numeral classifiers) in the context of numeral modification" (p. 73). Similarly, in her discussion of Mandarin Chinese, Borer (2005) argues that, "the need for a classifier projection to license counting vs. the absence of

classifiers in the context of mass interpretation confirms the claim that in the absence of classifiers, [noun] predicates in Chinese are interpreted as mass" (p. 108). Under this account, classifiers do not merely reflect the meaning provided by the noun, but actually supply units of individuation and quantification, just as English mass nouns require unitizers like "piece" to specify the unit.

Several studies have provided evidence for the view that only count nouns in mass-count languages lexically specify units of individuation. In one study, using a word extension task, Lucy found that when presented with an entity (e.g., a cardboard box), and asked to judge which of two alternatives was more similar, English speakers preferred a shape-matched choice (e.g., a plastic box) whereas Yucatec Mayans divided their choices between the shape-matched choice and a substance-matched alternative (e.g, a piece of cardboard; see also Lucy & Gaskins, 2001). In a subsequent study, Imai and Gentner (1997) found a similar result in Japanese speakers who were more likely to extend novel words on the basis of substance than on the basis of object kind relative to English speakers.

In more recent work, Huang and colleagues (Huang & Lee, 2009; Huang, 2009) used familiar words to examine noun semantics in Mandarin-speaking adults and children. Using a picture verification task, they found that Mandarin-speaking adults judged sentences containing a bare noun (*yizi* 'chair') as acceptable when these nouns were used to refer to either a whole object or just a piece of an object (e.g., *yizi*, or 'chair', was acceptable for a whole chair or half of a chair). However, when a sortal classifier was added to the noun (*zhang yizi* 'a chair'), adults rejected pictures depicting object parts, while children continued to accept them. Based on this finding, they concluded that, first, learning sortal classifiers "initiates children into learning how individuals and non-individuals are encoded in the language" (Huang, 2009: 150), and second, nouns do not have individuated meanings independent of classifiers (see also Borer 2005). Thus, on their view, the combination of a classifier and noun specifies criteria for individuation.

Huang and Lee's interpretation of these findings is tempered, however, by the fact that many of the nouns they considered to be count in English were in fact syntactically flexible, and could be used as either count or mass in English. For example, the word 'apple' in English can refer to either individuals or nonindividuated stuff, depending on syntax (e.g., some apple vs. some apples). If we assume that noun meanings are the same cross-linguistically, Mandarin speakers might also be willing to accept whole and parts for the flexible nouns in a bare noun phrase because of the different meanings these nouns allow, just as English

speakers might be willing to accept either whole or parts depending on the syntax affixed to the flexible noun.[1]

In support of the view that noun meanings do not differ between mass-count and classifier languages, several recent studies show that count syntax is not necessary for individuation, and that both English mass nouns and bare nouns in classifier languages can specify individuation. First, several researchers have argued that English mass nouns are not limited to denoting non-individuals (e.g., Barner & Snedeker, 2005; Chierchia, 1998). Take, for example, the English mass noun 'furniture,' 'a piece of furniture' cannot refer to just a leg of a chair, but must denote a whole individual (e.g., a chair). Only 'a piece of a piece of furniture' can refer to the leg of a chair. This suggests that mass nouns like 'furniture' do provide natural atomic units for counting, namely anything that counts as a "piece" (Doetjes, 1997). This intuition has been supported by experimental studies that probe how mass-count syntax affects quantity judgments. When asked to decide which of two sets contains "more furniture," participants base quantity judgments on number (e.g., judging that six tiny pieces of furniture are more furniture than two large pieces), despite basing judgments on volume for other mass nouns that denote substances (Barner & Snedeker, 2005). These findings show that English mass nouns can specify individuation, despite lacking overt count syntax.

Moreover, recent studies have found evidence that many nouns in classifier languages also supply criteria for individuation (Barner, Inagaki & Li, 2009; Li, Chen, Barner, & Carey, under review). In the absence of classifiers, speakers of both Japanese and Tsotsil Mayan based quantity judgments on number to the same extent as English speakers for words like 'cup', 'furniture,' and 'ketchup'. For mass-count flexible nouns in English such as 'string' and 'apple,' English speakers quantified by number when the nouns were presented in count syntax (more apples) and by volume when in mass syntax (more apple). Japanese speakers, who received no syntactic cues, made quantity judgments in-between the count and mass groups of English speakers' judgments, sometimes judging by number and sometimes by volume. This is consistent with the hypothesis that both count and mass readings are available to Japanese and English speakers for flexible nouns, and that syntax selects from universally available lexical meanings.

Subsequent studies have also found that cross-linguistic differences may be much smaller than first reported, are present only when entities are physically ambiguous, and can be made to disappear depending on testing context (e.g., Li, Dunham, & Carey, 2009). Importantly, several studies have argued that cross-linguistic differences are more likely attributable to lexical statistics rather than to noun semantics. For example, English subjects may be more likely to infer that novel nouns denote object kinds because count nouns are more frequent than mass nouns in English. Speakers of classifier languages, however, need not make such syntactic inferences, and thus may rely more on the physical properties of novel referents to make their judgments, resulting in more variable responding for ambiguous entities (e.g., Imai & Mazuka, 2003; Colunga & Smith, 2006; Li & Gleitman, 2001; Barner et al., 2009).

In summary, a review of recent work on cross-linguistic individuation provides mixed evidence for the claim that, in absence of classifiers, nouns do not specify individuation in languages like Mandarin, Japanese, and Tsotsil Mayan. We believe, however, that the current body of evidence more strongly supports the position that noun semantics are not different cross-linguistically, and that some nouns in classifier languages do provide criteria for individuation just like nouns in mass-count languages. The current study provides even stronger evidence for this position. We assessed how speakers of Mandarin Chinese interpret familiar nouns (Study 1), whether they accept parts of broken objects as units for quantification (Study 2), and whether classifiers change how nouns are interpreted, or are instead semantically inert (Studies 3 and 4).

Study 1

Using a quantity judgment task (Gathercole, 1985; Barner & Snedeker, 2005), we tested the hypothesis that bare nouns in Mandarin do not individuate unless classifiers are present. We reasoned that, if bare nouns do not individuate in absence of classifier syntax, Mandarin speakers should quantify by volume rather than by number, or quantify randomly across different types of nouns. On the other hand, if nouns can lexically specify individuation, even in absence of classifiers, Mandarin speakers should quantify by number for nouns denoting object kinds (e.g., chair), and by volume for nouns denoting substance kinds (e.g., mustard). For nouns that are used flexibly as either mass or count in English (e.g., string, apple), Mandarin judgments should fall in-between the mass and count judgments, and should vary from one item to the next, depending on the degree to which each word favors an individuated meaning cross-linguistically. To explore this, we tested subjects with two kinds of flexible words – those that continue to apply to a referent in both mass and count forms after the thing has been cut into pieces (e.g., string) and those that can only be used in mass syntax to name the cut referent (e.g., apple).

Method

Participants Fifty-six participants were recruited from universities in Taiwan, with 14 participants assigned to one of the following four noun types (categorized according to their English syntax): count nouns, mass nouns, 'apple' type

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[1] Other issues such as object functionality arise with Huang and Lee's study. For example, subjects sometimes noted that the part of a depicted object could still potentially function as a whole individual of that kind (e.g., a torn pair of pants as *kuzi* 'pants' could still function as a pair of pants). Thus, it seems likely that results would have differed if they had tested subjects with only translations of English count nouns, using only pictures of clearly non-functional parts.

flexible nouns, and 'string' type flexible nouns.[2]

Procedure All participants completed a quantity judgment task. They were shown photographs of two characters: one had two large objects or two large portions of substances and the other had four small objects or four small portions of substances. The combined volume of the four small objects or portions was always less than that of the two large objects or portions. Participants were asked to choose which of the two had "more". Instructions were written in Chinese above the photographs, and all questions were presented without classifiers (*Shui you bijiao duo* [noun]?; Who has more [noun]?).

There were eight nouns for each of the four noun types. For example, the 'count' condition included nouns such as 'bag' and 'balloon,' and the 'mass' condition included nouns such as 'black pepper' and 'mustard.' The two flexible noun lists differed with respect to the salience of their individuated meanings, and in particular, whether their count forms could be used to name pieces of their referents (e.g., half a rock, or half an apple). Eight words satisfied this criterion (e.g., apple, donut), and the remaining eight did not (e.g., rock, string). We will henceforth refer to the first flexible list as 'Flexible A' and the second as 'Flexible B.'[3]

Results and Discussion

An ANOVA comparing noun types (Count, Flexible A, Flexible B, vs. Mass), with percentage of judgments by number as a dependent variable, found a significant difference across noun types ($F1(3, 52) = 24.88$, $p < .001$, $\eta_p^2 = 0.59$; $F2(3, 28) = 1444.76$, $p < .001$, $\eta_p^2 = 0.99$). Pairwise t-tests by subjects-analysis revealed that judgments based on number were most frequent for count nouns (100%), and least often for substance-mass nouns (0%): Count > Flexible A and Flexible B > Mass (Count vs. Flexible A: $t1(26) = 2.15$, $p < .05$; Flexible A vs. Flexible B: $t1(26) = .74$, *n.s.*; Flexible B vs. Mass: $t1(26) = 4.92$, $p < .001$). Replicating Barner et al. (2009)'s results with Japanese speakers, quantity judgments by number for mass-count flexible nouns were in-between count nouns and mass nouns (Flexible A: 75.0%; Flexible B: 62.5%). These results indicate that Mandarin speakers share the same conceptual distinction on the two kinds of flexible nouns as English speakers. Across languages, the referents of these flexible nouns can be represented either as objects or as the stuff that

forms them. English speakers rely on mass-count syntactic cues when making judgments; however, since Mandarin lacks such cues, speakers relied instead on each referent's physical properties.

Next, we conducted an items-analysis to examine whether adults responded differently to the two types of flexible nouns. Since participants were more likely to stick to one way of responding throughout the study for flexible nouns, item-analysis was more sensitive to detecting differences across noun types. We found a similar pattern of results (Count > Flexible A > Flexible B > Mass), but the items-analysis also revealed that participants quantified more by number for Flexible A than Flexible B nouns (Count vs. Flexible A: $t2(22) = 13.13$, $p < .001$; Flexible A vs. Flexible B: $t2(14) = 5.58$, $p < .001$; Flexible B vs. Mass: $t2(14) = 53.46$, $p < .001$). Mandarin speakers were slightly more likely to quantify by number for flexible nouns if their English count-noun equivalent only applied to whole referents (e.g., apple, donut), relative to flexible nouns whose English count-noun equivalents applied equally well to a whole object or its parts (e.g., string, rock).

Overall, this set of data suggests that Mandarin noun meanings do not differ fundamentally from nouns in English, and that semantic criteria which predict mass-count usage in English predict the judgments of subjects tested in Mandarin. These data suggest that semantic differences in nouns drive syntactic usage in English, rather than syntax driving the creation of new meanings.

Study 2

Study 1 provides one form of evidence against the claim that count syntax is necessary for individuation. In Study 2, we sought converging evidence for this claim using a different method. As noted by Huang and Lee (2009), if Mandarin nouns do not specify individuation, then Mandarin speakers should differ from English speakers with respect to how they refer to the parts of broken objects. Previous studies have shown that English-speaking children, unlike adults, often treat parts of objects as units for quantification (e.g., three pieces of a broken fork as being "more forks" than two whole forks; Brooks, Pogue, & Barner, 2011; Shipley & Shepperson, 1990). By some accounts, these failures suggest an inability to use the semantic criteria of nouns to guide quantification. Thus, if Mandarin nouns lack criteria of individuation, then adult speakers should resemble English-speaking children, and should treat pieces of broken objects as units of quantification.

In their study, Huang and Lee (2009) found that Mandarin adults often accepted bare nouns as labels for parts of broken objects. However, as mentioned above, their study included many flexible nouns, whose referents may also be construed as unindividuated by speakers of English when count syntax is not provided (e.g., some apple). In Study 2, we addressed this concern by using nouns that were unambiguously count in English. Also, we varied the syntactic framing of nouns by testing some subjects with

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[2] English language is part of the school curriculum in Taiwan, and thus participants in our study would have received training in English. Although proficiency with English can potentially influence participants' responses, our participants likely do not speak English fluently on a daily basis (see Yeh & Gentner, 2005).

[3] Most nouns were selected using the MacArthur Communicative Development Inventory (Fenson 1994). A group of 13 English speakers provided ratings that corroborated our categorization of whether the noun was a count noun, mass noun, or mass-count flexible noun. Another group of 12 English speakers verified the distinction between flexible A and flexible B nouns. They were asked to judge for each flexible noun whether cutting the thing in question would result in two ("Imagine one [noun]. Imagine that it is cut in half. Are there now two [noun]s?").

classifiers and some without. If Mandarin nouns do provide criteria of individuation, then Mandarin speakers should behave like their English counterparts and quantify by whole objects regardless of whether a classifier is present. However, if nouns do not provide criteria of individuation, Mandarin speakers should only reliably choose the side with whole objects when a classifier is present.

Method

Participants Twenty-one native Mandarin-speaking adults who had not participated in Study 1 were recruited from universities in Taiwan, and were assigned randomly to one of two conditions.

Procedure There were two tasks. In the quantity judgment task, one of the two characters always had two whole objects while the other character had one object cut into three pieces. The objects tested were named by count nouns in English (e.g., cup, ball, shoe), and were a subset of nouns from Study 1. In the counting task, participants saw either three or four objects, one of which was cut into three pieces. They were asked to count the set using a noun (e.g., How many [shoes] are there?) and to give a numerical response. The quantity judgment task was always presented before the counting task.

Participants were tested in Mandarin, and heard instructions containing either a bare noun phrase (n=10) or a sortal classifier-noun phrase (n=11). In the quantity judgment task, participants were asked, *Shui you bijiao duo* (CL) [noun]? (Who has more (CL) [noun]?). In the counting task, participants were asked, "*Zheli you duoshuo* (CL) [noun]? (Here have how-many (CL) [noun]?).

Results and Discussion

Participants overwhelmingly gave whole object responses in both tasks regardless of whether the sortal classifier was present. For both conditions, responses were near 100% on average for the quantity judgment task and at 100% for the counting task. For the quantity judgment task, there was no significant difference in how often participants gave whole object responses between the classifier (90.9%) and bare noun conditions (100%; $t(19) = .95$, $p = .35$).[4] The finding that adults counted and quantified whole objects in the bare noun condition suggests that judgments were guided by lexical criteria of individuation rather than by classifier syntax. This provides further evidence that nouns in Mandarin do provide criteria of individuation

Study 3

Studies 1 and 2 show that sortal classifiers are not required to specify individuation for nouns in Mandarin. However, just as English count syntax can disambiguate meanings for flexible nouns, one might expect that sortal classifiers can do the same in Mandarin. To explore this, Study 3 tested

subjects using the flexible nouns from Study 1, and manipulated whether the words were presented with classifiers using a quantity judgment task. We predicted that, with the addition of a sortal classifier, Mandarin speakers should unambiguously quantify by number, just as English speakers do when presented with flexible nouns in count syntax.

Method

Participants Sixty-four native Mandarin-speaking participants were recruited in Taiwan as in Study 1.

Procedure All participants completed a quantity judgment task. Half of the participants were tested on the Flexible A list, and half on the Flexible B list from Study 1; half of each group was assigned to the bare noun condition and half to the classifier condition, resulting in 16 subjects per group. In the classifier condition nouns were presented with a sortal classifier, whereas nouns in the bare noun condition were not. All else was identical to Study 1.

Results and Discussion

An ANOVA with Noun Type (Flexible A vs. Flexible B) and Syntactic Frame (Bare vs. Classifier) as between subjects factors found a significant effect of Syntactic Frame ($F1(1,60) = 8.19$, $p < 0.01$, $\eta_p^2 = .120$; $F2(1, 14) = 47.15$, $p < 0.001$, $\eta_p^2 = .771$). Participants quantified significantly more by number in the classifier condition (85.2%) than in the bare noun condition (62.9%; see Figure 1). For the items-analysis, but not the subjects-analysis, there was a main effect of Noun Type, $F2(1,14) = 12.62$, $p < 0.01$, $\eta_p^2 = 0.47$. Subjects quantified by number slightly more for the Flexible A list relative to the Flexible B list (80.8% vs. 67.3%). There was no interaction between Syntactic Frame and Noun Type.
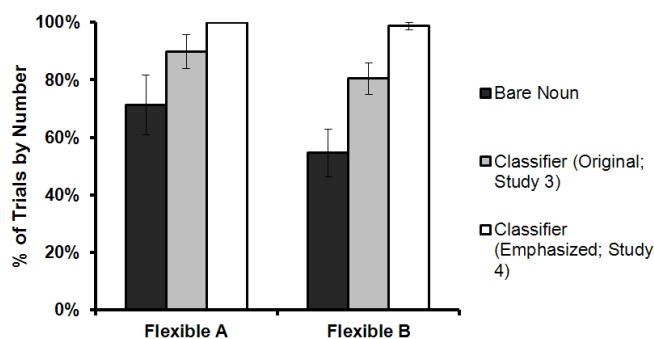

Figure 1. Percentage of judgments by number for flexible A and B nouns across the three conditions - the bare noun and original classifier conditions (from Study 3), and the classifier emphasized condition (from Study 4).

To conclude, we found that classifiers did affect quantity judgment for flexible nouns, leading to more judgments based on number relative to the bare noun condition. However, somewhat surprisingly, the presence of a sortal classifier did not lead participants to choose by number

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[4] Non-parametric tests using Mann-Whitney U revealed the same pattern of results and found no difference across the two conditions.

100% of the time, as one would expect if the classifier were the primary cue for specifying individuation in Mandarin. This finding also suggests that the possibility that adults in our study were implicitly adding the classifier they have come to associate with the noun when making quantity judgments in the bare noun condition seems unlikely.

Study 4

Although it is possible that participants in Study 3 were relatively insensitive to classifiers when interpreting ambiguous nouns, it is also possible that subjects simply failed to notice their presence when reading the study stimuli. In Study 4 we addressed this concern by underlining the classifiers to emphasize their presence. We expected that when the classifiers are salient to subjects, they should use them to disambiguate the interpretation of flexible nouns.

Method

Participants Twenty additional participants were recruited as in the previous studies.
Procedure Procedures were identical to Study 3, with the exception that classifiers were underlined in the written instructions.

Results and Discussion

With the classifier emphasized, participants now quantified by number 100% of the time for both Noun Types (Flexible A: 100%; Flexible B: 99%; see Figure 1). An ANOVA with Noun Type (Flexible A vs. Flexible B) and Classifier Presentation (Original, Emphasized) as between subjects factors found a significant effect of Classifier Presentation ($F1(1,48) = 7.70$, $p < 0.01$, $\eta_p^2 = .138$; $F2(1,14) = 65.92$, $p < 0.001$, $\eta_p^2 = .825$). Participants quantified by number significantly more often when the classifier was underscored (99.4%) than when it was not (85.2%; see Figure 1). No other effects were found by the subjects-analysis. The items-analysis again revealed an effect of Noun Type ($F2(1,14) = 12.62$, $p < .01$, $\eta_p^2 = .474$). Also, there was a significant interaction between Noun Type and Classifier Presentation in the items-analysis ($F2(1, 14) = 5.23$, $p < .05$, $\eta_p^2 = .272$). This was driven by the fact that Noun Type only mattered for the original presentation (Study 3) but did not matter for the new presentation (Study 4), since participants were at ceiling in quantifying by number.

Underlining the classifiers led our subjects to quantify by number 100% of the time, suggesting that classifiers can disambiguate between ambiguous noun meanings in Mandarin, much like mass-count syntax in English. However, unlike English subjects who rarely ignore mass-count information, subjects in Study 3 sometimes ignored classifiers when reading instructions. This suggests that classifiers may add little information that is not already provided by the head noun, and typically act mainly as syntactic agreement. In the case of flexible nouns, subjects may draw on their knowledge of the relative frequency of individuated and unindividuated usages – e.g., quickly assuming that 'apple' should get an individuated

interpretation because it does most of the time in ordinary speech. Consistent with this idea, recent work on online sentence comprehension in Mandarin suggests that mensural classifiers (i.e., measure words) has a stronger influence on referential selection than sortal classifiers (Klein, Carlson, Li, & Tenanhaus, in press).

General Discussion

Four studies investigated the claim that bare nouns in Mandarin Chinese do not specify criteria of individuation, and that individuation is introduced by sortal classifiers. Study 1 found that Mandarin speakers do not differ from speakers of English when making quantity judgments for familiar nouns. For example, Mandarin speakers based judgments almost exclusively on number for English count nouns. For mass-count flexible nouns such as 'apple' or 'rock', Mandarin speakers relied on lexical semantics to determine the units for counting, and made judgments that were roughly between those of English mass and count judgments, suggesting that across languages speakers can access both the individuated and unindividuated interpretations of flexible words. Overall, the current results were similar to those of English and Japanese speakers reported in Barner et al. (2009), and suggest that nouns in Mandarin individuate, despite lacking count syntax, and do so even when classifiers are not explicitly used.

Consistent with this, Study 2 found that Mandarin-speaking adults did not quantify parts of broken objects like English-speaking preschoolers (see Brooks et al., 2011; Shipley & Sheppersen, 1990), which provides evidence against the claim that Mandarin nouns lack criteria of individuation. Together, the findings in Studies 1 and 2 suggest that Mandarin noun meanings are no different than noun meanings in English - Mandarin nouns like *yizi* 'chair' or *pingguo* 'apple' denote kinds of countable individuals.

If individuation is not specified by classifier syntax, what is the role of sortal classifiers in noun phrases? Are classifiers completely inert semantically, or can they sometimes contribute to the compositional semantics of a noun phrase? Findings from Studies 3 and 4 shed light on these questions by testing mass-count flexible nouns. Here, we found an effect of classifier syntax on quantity judgments; participants were more likely to base judgments on number when classifiers were added to flexible nouns. However, adding a classifier did not always have this effect; instead, as shown by Study 4, subjects attended systematically to classifiers only when their presence was made highly salient to subjects. Our suggestion is that subjects typically ignore classifiers because nouns normally provide the relevant content themselves. For adults, lexical meanings supply criteria of individuation, and may be supplemented by knowledge of the relative frequency of different meanings in everyday speech (e.g., the fact that 'apple' is frequently used to refer to whole apples rather than to apple-stuff).

The view that lexical semantics can provide the criteria of individuation for nouns in classifier languages such as

Mandarin and Japanese corroborates previous studies in English where English-speaking adults quantify over individuals when nouns such as 'furniture' or 'jewelry' are used in mass syntax (Barner et al., 2009; Barner & Snedeker, 2005). This suggests that syntax is not the only means that supplies criteria of individuation. In English, the individuation can be expressed syntactically, if the word is used in count syntax (e.g., apples) or through the lexical concept itself (e.g., furniture).[5] In languages that lack count syntax such as Mandarin, however, the lexical concept alone can determine individuation.

To summarize, the current studies provide strong evidence that nouns have similar semantic content cross-linguistically, regardless of variation in their syntactic expression. Nouns in classifier languages such as Mandarin and Japanese encode individuation like nouns in English, and can express this content without requiring the overt use of classifiers. Not only are classifiers unnecessary for individuation in Mandarin, but they also appear to be relatively weak cues to meaning. Unless their presence in a sentence is explicitly highlighted, Mandarin speakers often overlook them, and rely instead on the nouns themselves to determine interpretation. This suggests that in Mandarin, when the meaning of a noun phrase is ambiguous, speakers may rely on other contextual and pragmatic information rather than syntactic cues to disambiguate reference. In contrast, in mass-count languages like English, mass-count syntax often performs this disambiguating function. Outside these ambiguous cases, like string, apple, rock, etc., speakers of classifiers languages converge on similar interpretations as speakers of mass-count languages, suggesting that nouns encode individuation in the same way across syntactically diverse languages.

Acknowledgments

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[5] Interestingly, object-mass nouns such as furniture are often used in count syntax in other languages (e.g., French). This suggests that in languages where nouns are obligatorily marked as mass or count, individuation must be syntactically licensed.