Yasu Sudo

1 Classifier Languages: Basics

There's a class of languages called (obligatory) **classifier languages**, e.g. Mandarin Chinese, Vietnamese, Japanese, Korean, etc. Not every classifier language is a East Asian language, e.g. Yucatec Mayan. See World Atlas of Language Structures for more information.

Obligatory classifier languages are so called because numerals obligatorily appear with **classifiers** when they modify nouns (but see §**??** for some complications).

(1) Mandarin Chinese (Sino-Tibetan)

yì ***běn*** *shū*	* *yì* *shū*	*sān* ***běn*** *shū*
one CL book	one book	three CL book
'one book'		'three books'
yì ***zhī*** *māo*	* *yì* *māo*	*sān* ***zhī*** *māo*
one CL cat	one cat	three CL cat
'one cat'		'three cats'

(2) Japanese (Japonic)

*hana ichi-**rin***	* *hana ichi*	*hana san-**rin***
flower one-CL	flower one	flower three-CL
'one flower'		'three flowers'
*kuruma ichi-**dai***	* *kuruma ichi*	*kuruma san-**dai***
car one-CL	car one	car three-CL
'one car'		'three cars'

(3) Vietnamese (Austroasiatic)

một ***con*** *chó*	* *một chó*	*hai* ***con*** *chó*
one CL dog	one dog	two CL dog
'one dog'		'two dogs'

Mandarin, Cantonese, and Japanese are believed to have hundreds of classifiers (although not all of them are frequently used). Wikipedia has lists for Mandarin and Cantonese and Japanese. I don't know how many classifiers other classifier languages have.

Many classifiers have selectional restrictions that seem to be semantic in nature. For example, the classifier *-wa* in Japanese goes with any noun describing birds (or rabbits).

(4) Japanese

*karasu ichi-**wa***	*niwatori ichi-**wa***	*pengin ichi-**wa***
crow one-CL	chicken one-CL	penguin one-CL
'one crow'	'one chicken'	'one penguin'

This is an example of taxonomic restriction. Sometimes the selectional restriction is based on the function (e.g. *-dai* in Japanese for vehicles of various kinds such as cars, bikes, etc.),

and sometimes on the shape (*-mai* in Japanese for flat objects) of objects being described.

Some classifiers refer to multiple aspects, e.g. taxonomy and shape: e.g. *-hiki* for small animals (that are not birds), *-too* for big animals in Japanese.

(5) Japanese

*neko go-**hiki***	*tokage go-**hiki***	*kuzira go-**too***
cat five-CL	lizard one-CL	whale five-CL
'five cats'	'five lizards'	'five whales'

Some nouns are compatible with multiple classifiers. They often have semantic differences:

(6) Japanese

*inu yon-**hiki***	*inu yon-**too***
dog five-CL	dog five-CL
'five **small** dogs'	'five **big** dogs'

Both Mandarin and Japanese have 'general purpose classifiers':

- Mandarin *ge* can be used basically with any noun
- Japanese *-tsu* can be used with many inanimate noun.

When highly frequent classifiers are applicable, a use of the general purpose classifier is often judged infelicitous.

There's also a class of 'container classifiers' (alt.: 'massifiers') that denote particular ways of packaging things, and are similar in function to container nouns like *bottle* and *glass* in English. These are called classifiers too, because at least morphologically they seem to pattern with other classifiers.

(7) Japanese

*hon san-**hako***	*abura san-**teki***	*juusu san-**kan***
book three-CL.box	oil three-CL.drop	juice three-CL.can
'three boxes of books'	'three drops of oil'	'three cans of juice'

1.1 Sanches-Greenberg-Slobin Generalization

Classifier languages generally lack obligatory number marking (see the data above). This generalization is called the **Sanches-Greenberg-Slobin Generalization**, after Greenberg (1972) and Sanches & Slobin (1973) (Doetjes 2012 mentions some controversial counterexamples).

- The SGS generalization is about *obligatory* number marking. Optional number marking is allowed, in classifier languages and in fact attested, e.g. Chinese *men*, Japanese reduplication.
- It's a one-way implication: every classifier language lacks obligatory number marking, but not every language that lacks obligatory number marking is a classifier language.

1.2 No number-marking, but no classifiers

Dëne Sųłiné (a.k.a. Chipewyan; spoken in Canada) has no obligatory number marking (Wilhelm 2008).

(8)

Larry ʔįłághe **ʔejëre** nághé?ních.	Larry **ʔejëre** nádághéłních.
Larry one bovine PERF.buy.O	Larry bovine DISTR.PERF.buy.O
'Larry bought one cow.'	'Larry bought several cows.'

(Wilhelm 2008:45)

But it also lacks classifiers:

(9)

sǫlághe k'ásba	sǫlághe bek'eshích'elyį
five chicken	five table
'five chickens'	'five tables'

(Wilhelm 2008:46)

There are other languages like this, e.g. Tagalog, Ojibwe and Yudja (a.k.a. Juruna; spoken in Xingu, Brazil) (Doetjes 2012, Mathieu 2012, Lima 2014).

One difference between Dëne Sųłiné and Tagalog vs. Ojibwe and Yudja is that in the latter languages any noun can be directly modified by numerals.

(10) Dëne Sųłiné

* sǫlághe ʔejëretth'úé	* sǫlághe bër
five milk	five meat

(Wilhelm 2008:46)

(11) Yudja

a. Txabïu pïza dju wï.
Three canoe bring
'(Someone) brought three canoes.'

b. Txabïu apeta dju wï.
Three blood bring
'(Someone) brought three quantities of blood.' (Lima 2014:10)

1.3 Optional classifier languages

Western Armenian (Indo-European) is a famous example of optional classifier languages (Borer 2005, Khanjian 2009, Bale, Gagnon & Khanjian 2011, Bale & Barner 2012).

(12) *Yergu (**had**) hovanoc uni-m*.
two (CL) umbrella have-1sg
'I have two umbrellas.' (Borer 2005:94)

Interestingly, when a classifier is present, the noun must be **singular**.

(13) a. *Yergu hovanoc-**ner** uni-m*.
two umbrella-pl have-1sg
'I have two umbrellas.'

b. **Yergu had hovanoc-**ner** uni-m*.
two CL umbrella-pl have-1sg

(Borer 2005:94)

However, this requirement that nouns be singular with numerals might be independent from optional classifiers. It is observed in languages like Turkish and Hungarian as well.

2 Linguistic Relativism

Benjamin Whorf and and John A. Lucy, in particular, claim that nouns in classifier languages uniformly describe unindividuated and uncountable entities, and that speakers of these languages perceive the world differently from speakers of languages like English. In particular, see John A. Lucy's work on Yucatec, an obligatory classifier language (Lucy 1992a,b, 1997, Lucy & Gaskins 2001, Lucy 2004).

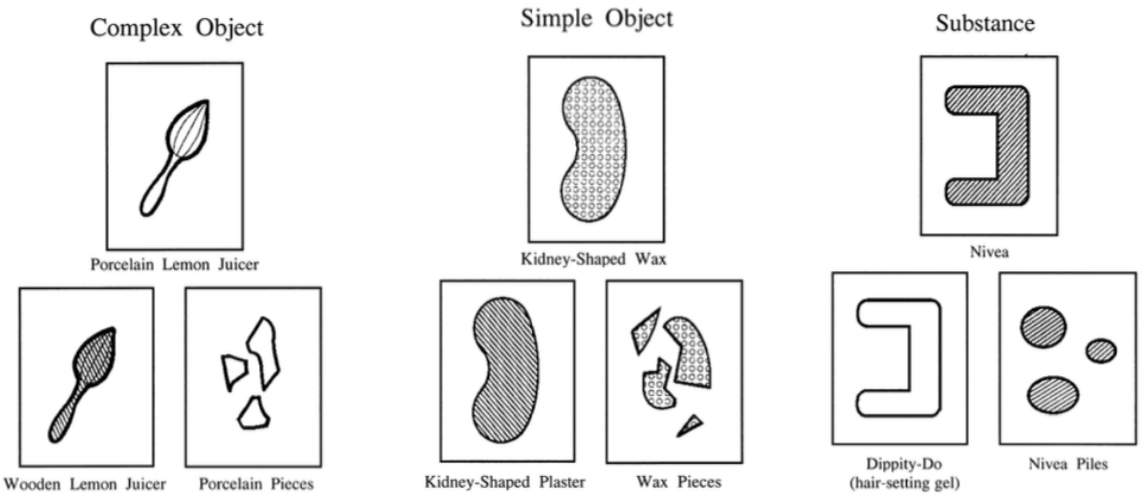
A strong version of this view (**linguistic determinism**; Whorf 1956, Quine 1960) holds that speakers of classifier languages (and other languages with no mass-count distinction) literally don't classify things into discrete entities vs. non-discrete substances. But this does not seem to be tenable:

- Obviously, speakers of classifier languages can count (with or without linguistic expressions).
- There are grammatical phenomena that require counting, e.g. *more*.
- The distinction between discrete vs. non-discrete entities seems to be fundamental to cognition. *Pre-linguistic* infants make this distinction and appears to employ it in word learning (Baillargeon, Spelke & Wasserman 1985, Soja, Carey & Spelke 1991, Wynn 1992, Spelke, Kestenbaum, Simons & Wein 1995, Xu & Carey 1996, Feigenson, Dehaene & Spelke 2004, Carey 2009).
- Some lexical items encode this and related ontological distinctions in some ways, e.g. many languages distinguish *eat* vs. *drink*.

A weaker version would be to say that whether you are a speaker of a classifier language or not has certain specific effects on your perception. Whether this is the case and if so what the effects actually are is actively researched (Imai & Gentner 1997, Lucy & Gaskins 2001, Imai & Mazuka 2007, Barner, Inagaki & Li 2009, Li, Dunham & Carey 2009). Here are some major findings.

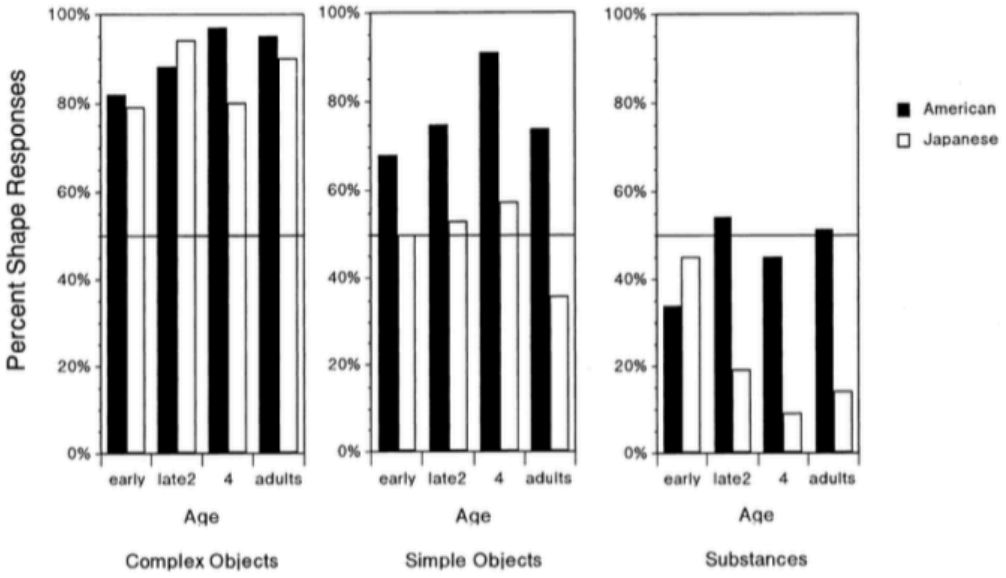
Imai & Gentner's (1997) paradigm (cf. Soja et al. 1991, Lucy 1992b): You are presented with a reference item with a nonse noun. Your task is to pick one of two objects that you think is describable by the same noun. One of the two objects has the same shape but is made of a different material, the other object has a different shape, but is made of the same material.

(14) Look at this *blicket*. Point to the tray that also has the *blicket* on it.



They tested Japanese and American children and adults. Four age categories:

	Japanese	**American**
Early 2-yo (mean 2;1)	1;10–2;5 (n=14)	2;1–2;5 (n=14)
Late 2-yo (mean 2;8)	2;7–3;2 (n=15)	2;6–3;0 (n=15)
4-yo (mean 4;2)	3;9–4;7 (n=14)	3;10–4;6 (n=14)
Adults	U. of Kyoto students (n=18)	Northwestern students (n=18)

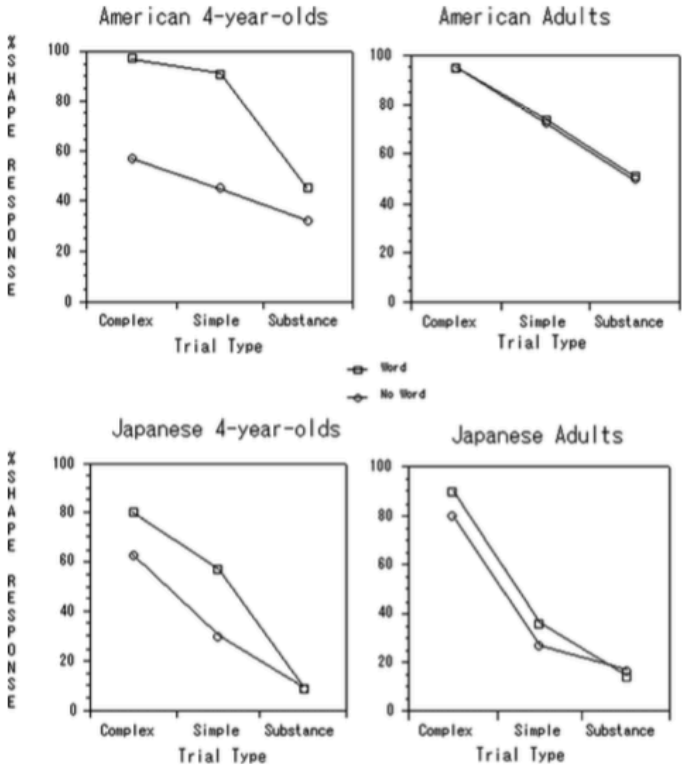


- Speakers of both languages, including 2 year-olds, distinguish concrete/discrete entities vs. substances.
- Japanese speakers gave material-based answers more often, especially in the Simple Objects and Substances conditions.

One might wonder if this has something to do with learning new words. Maybe English speakers tend to treat new nouns as count nouns for completely independent reasons, e.g. there are more count nouns in the English lexicon? To this end, Imai & Mazuka (2003, 2007) conducted variants of the above experiment involving no nouns.

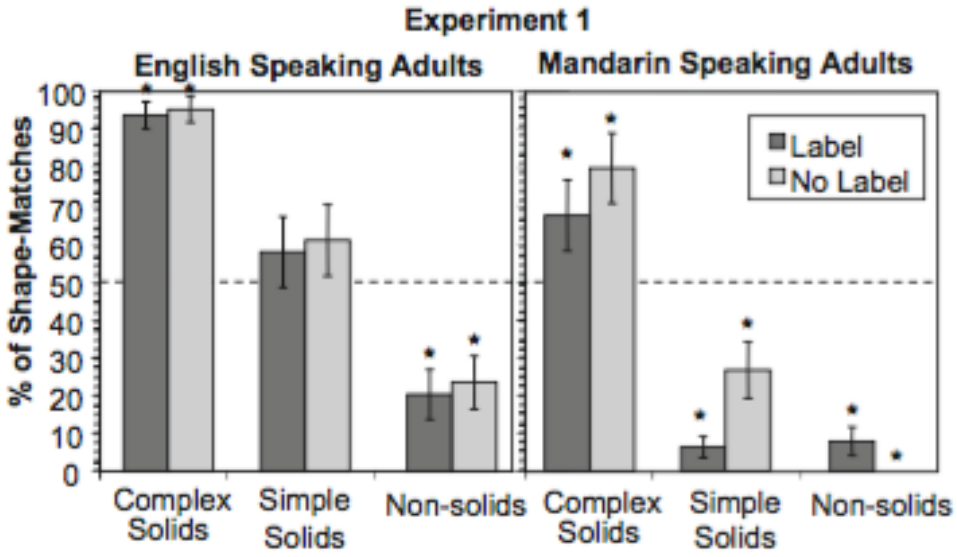
(15) Look at this. Which is the same as this?

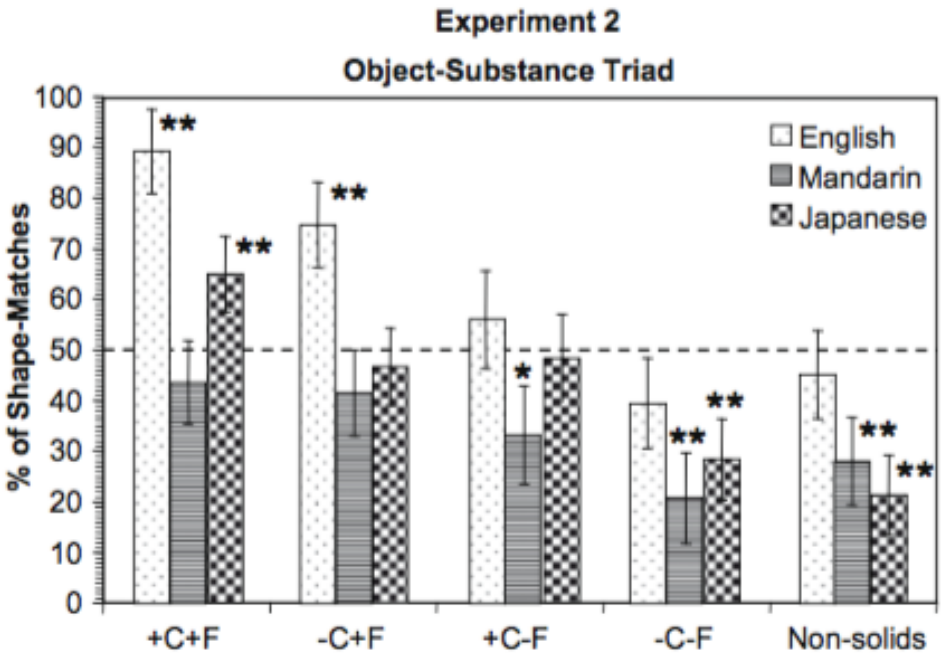
Imai & Mazuka (2007) observe similar language effects in this task:



However, some argue that the deictic pronoun *this* still requires speakers to postulate a hypothetical noun so the results might be just a matter of word learning and lexical statistics (Barner et al. 2009, Li et al. 2009).

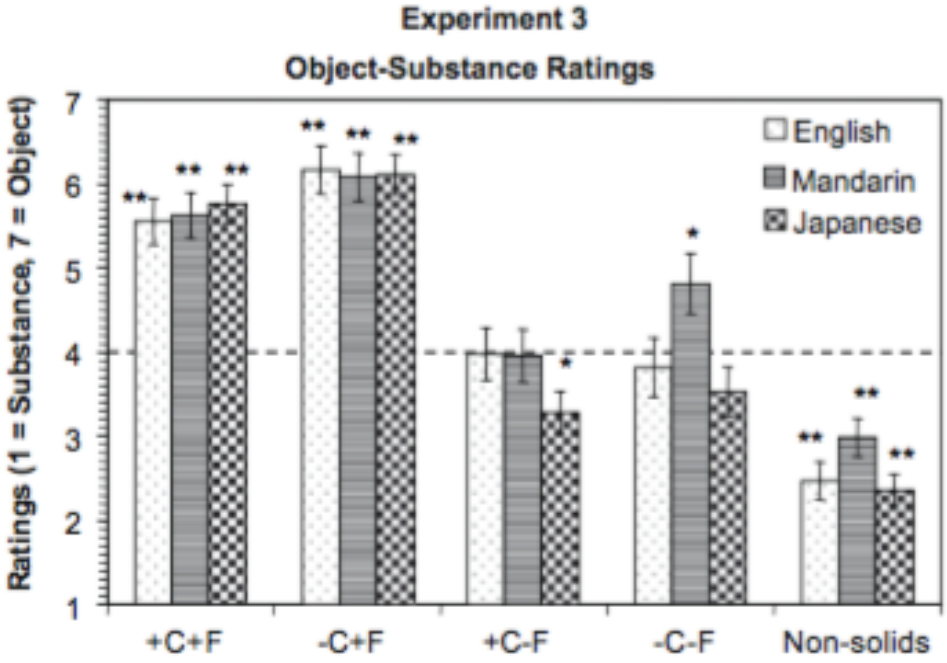
Li et al. (2009) conducted several similar experiments with Mandarin speakers, with or without nonse words, and observe similar effects of language ('*' means 'statistically significant'; Experiment 2 has more types of solid objects classified according to [±C(omplex)] and [±F(unctional)]):





However, when they explicitly asked whether the subjects see the same objects as Experiment 2 as a solid entity or a substance, the language effects disappeared.

(16) When we see something, we tend to think of it as either an object or a substance. [EXAMPLES]
We're interested in the factors that lead someone to think of something as either an object or a substance [...]. Look at each entity and rate your likelihood of seeing that entity as an object or a substance on the 7-point scale. Circle 1 if you would definitely think of it as an object and 7 if you would definitely think of it as a substance.



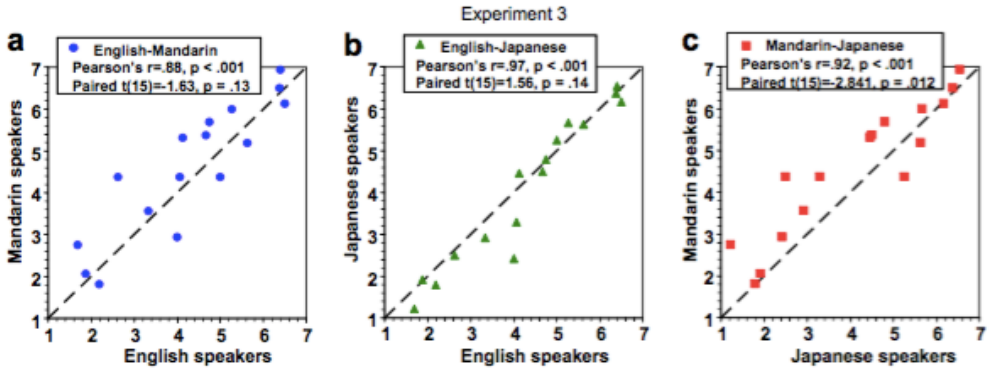
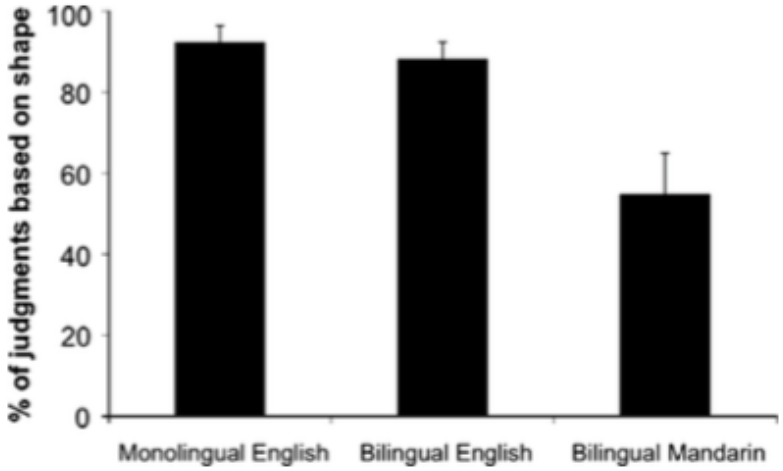


Fig. 4. By-item scatter plots for English, Mandarin, and Japanese speaking adults (Experiment 3). Pearson's *r*'s indicate the degree to which the two language groups' ratings correlate across items. Paired-*t*-tests indicate the degree to which English speakers gave higher object ratings than Mandarin and Japanese and Japanese speakers across items.

Barner et al. (2009) conducted basically the same experiment with English monolinguals and L2 speakers of English whose first language is Mandarin. The L2 speakers were divided into two groups; one group did the experiment in English, the other group in Mandarin. They observe more material-based choices when the experiment is done in Mandarin.



The difference between the two L2 group suggests that the effects are largely due to the language used, and not due to a difference in cognition/perception.

3 Mass/Count and the Semantics of Classifiers

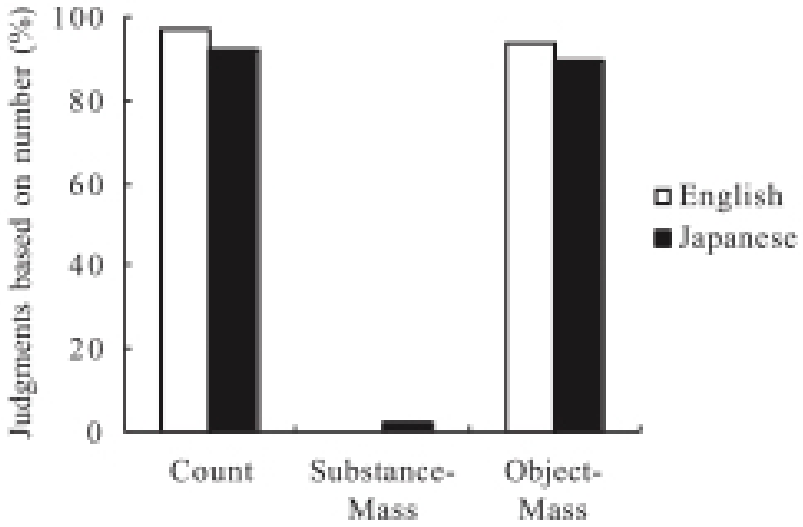
It is often hypothesized that nouns in classifier languages are all mass nouns (cf. Chierchia 1998a,b, Bale & Barner 2012, Borer 2005, Scontras 2013, 2014, Rothstein 2017). They are indeed similar:

- No (obligatory) number marking.
- Resist direct modification by numerals. With mass nouns in English, there must be a classifier-like element, when a numeral is used.

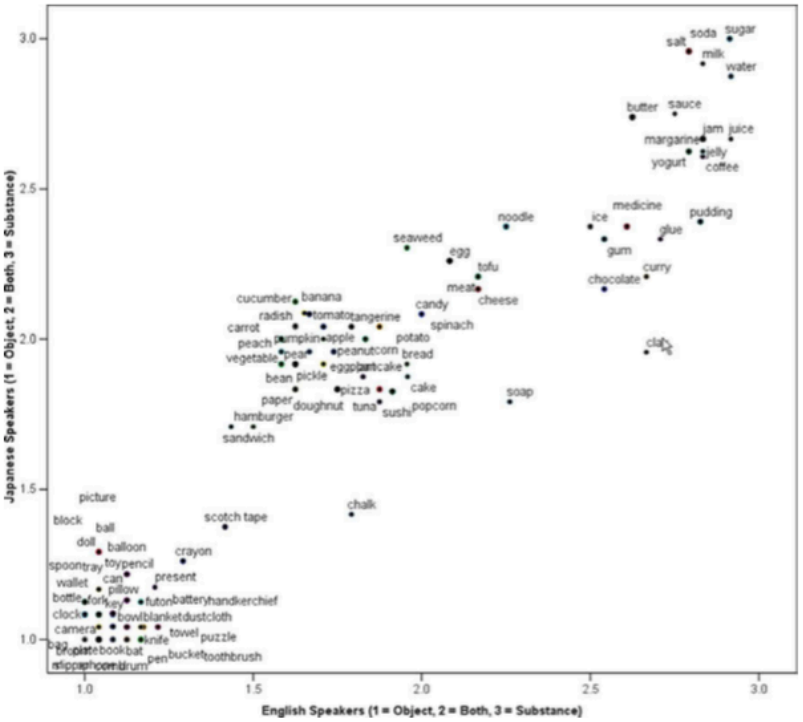
(17) a. *three information(s)
b. three **pieces** of information

Note that this hypothesis does not necessarily mean all nouns in classifier languages are about substances. Just like English has mass nouns describing object and substance, some nouns in classifier languages are perfectly capable of describing discrete, individuated entities (Rothstein 2017). This is clearly shown by the results of Inagaki & Barner's

(2009) experiment on Japanese, who conducted the same experiment as Barner & Snedeker's (2005) experiment on object mass nouns, except that it was in Japanese. (Barner et al. 2009 report similar results).



Barner et al. (2009) also asked English and Japanese speakers to rate 100 words as 'object', 'substance', 'both' or 'neither'. The speakers of the two languages have similar judgments:



3.1 A Semantic Theory of Classifiers

Adopting this hypothesis, some linguists explain the obligatory presence of classifiers with numerals in classifier languages in terms of the semantics of nouns (Chierchia 1998b, Borer 2005, Scontras 2013, 2014). Although differing in technical details, they share the core intuitions:

- In languages like English, count nouns have extensions that are countable, while mass nouns have extensions that are uncountable. Container nouns like *glass* and *box* make

them countable.

- All nouns in obligatory classifier languages have extensions that are uncountable that are similar to the extensions of mass nouns in English. So numerals cannot directly apply to them.
- Classifiers turn the uncountable extensions and turn them into countable semantic objects.

3.2 An Alternative Theory

Some propose an alternative analysis according to which classifiers are necessary because of the semantics of numerals, rather than because of the semantics of nouns (Krifka 1995, Bale & Coon 2014, Sudo 2016, to appear). Sudo (to appear) observes that there are constructions in Japanese that clearly involve counting but not classifiers, which implies that nouns themselves are compatible with counting.

- With high numerals, the classifier is optional.
  (18) sen-(choo)-no baiorin
  1000-(CL)-GEN violin
  'a thousand violins'
- There are counting modifiers that do not involve classifiers.
  (19) kinoo-no jiko-de-wa **tasuu**-no sisha-ga deta yooda
  yesterday-GEN accident-LOC-TOP many-GEN fatality-NOM came.out EVID
  'It seems that the accident yesterday resulted in many fatalities.'
  (20) **shoosuu**-no yuufukuna hito-nomi-ga yuuguusareteiru
  a.few-GEN wealthy person-only-GEN be.treated.well
  'Only a few wealthy people are treated well.'
  (21) sono tookoo-ni **nan-byaku-toiuu komento**-ga tsuita.
  that post-TO what-100-say comment-NOM provided
  'That post got hundreds of comments.'

  These modifiers are incompatible with mass-y nouns.
  (22) kinoo-no jiko-de-wa **takusan**(-no) sisha-ga deta yooda
  yesterday-GEN accident-LOC-TOP a.lot(-GEN) fatality-NOM came.out EVID
  'It seems that the accident yesterday resulted in a lot of fatalities.'
  (23) Taro-wa **takusan**(-no) ase-o kaita
  Taro-TOP a.lot(-GEN) sweat-ACC secreted
  'Taro sweated a lot.'
- Proportional quantifiers give rise to count-based interpretations that are truth-conditional distinct from quantity-based interpretations.
  (24) Taro-wa **hotondo**-no hon-o yonda.
  Taro-TOP most-GEN book-acc read
  'Taro read most of the books.'
  (25) There are 10 books, Book 1, Book 2, ..., Book 10. Book 1 is 500 pages long, Book 2 is 190 pages long, Book 3 is 100 pages long, and Books 4–10 are 30 pages long each.
    a. **Situation 1** (count-based): Taro read all the short books, namely Books 4–10 (So he only read 210 pages out of 1000 pages).

b. **Situation 2** (quantitiy-based): Taro read Books 1, 2, and 3. (So he read 790 pages out of 1000 pages)

Similarly for comparative constructions.

Based on these Sudo (2016) proposes that nominal semantics in Japanese makes an ontological mass-count distinction (if not a grammatical distinction), and the reason why numerals require classifiers in Japanese is because they do not have modificational/predicative meanings, unlike in languages like English.

Some of my recent MA students have made similar arguments for Korean and Mandarin Chinese.

4 Further Readings

The discussion on mass vs. count nouns has spawned a lot of work on cross-linguistic variation, especially since the seminal works by Krifka (1989, 1995) and Chierchia (1998a,b) where they discuss differences between European languages and so-called 'classifier languages' like Marndain Chinese, Korean, and Japanese. Doetjes (2012) is a very useful overview of cross-linguistic issues surrounding mass-count distinction.

Lisa Cheng and Rint Sybesma have a series of papers on this issue on languages of China (Cheng & Sybesma 1999, 2005, 2012, Cheng, Doetjes & Sybesma 2008, Cheng, Doetjes, Sybesma & Zamparelli 2012). They are particularly interested in the function of so-called 'classifiers' in the number system in Chinese languages. Chierchia (1998a,b) and Borer (2005) claim that in classifier languages like Mandarin and Cantonese, all nouns are in some sense mass, they are all 'pluralised', unlike in English, and numerals require classifiers to make the noun 'count' (see also Krifka 1989, Lucy 1992b, Cheng & Sybesma 1999). However, this has been questioned by several authors, based on experimental evidence that the noun meanings do not differ cross-linguistically in any essential ways (Barner et al. 2009, Cheng et al. 2008, Cheung, Li & Barner 2012, Li et al. 2009). In particular, Cheung et al. (2012) reports that Mandarin speakers behave the same as English speakers in counting tasks similar to Barner & Snedeker's (2005) (see Barner et al. 2009, Inagaki & Barner 2009 for similar observations on Japanese).

I myself have proposed an alternative analysis for classifier languages, according to which, numerals require classifiers in these languages, because of certain properties of numerals, rather than because of properties of nouns (Sudo 2016, to appear) (see also Krifka 1995, Bale & Coon 2014).

The cross-linguistic work on the semantics of nouns has gone beyond classifier languages. Mathieu (2012) discusses gender shift and its effects on the number and mass-count in Ojibwe, Breton, etc. (e.g. in Breton, the masculine noun *geot* is a mass noun meaning 'grass', but its feminine form *geot-enn* is a count noun meaning 'a blade of grass'). Lima (2014) investigate a native language of Brazil that has both singular-plural distinction and classifiers. Khanjian (2009) looks at (Western) Armenian, and Grimm (2012) at Welsh. See also papers in Massam (2012).

References

Baillargeon, Renée, Elizabeth Spelke & Stanley Wasserman. 1985. Object permanence in five-month-old infants. *Cognition* 20(3). 191–208. doi:10.1016/0010-0277(85)90008-3.

Bale, Alan & David Barner. 2012. Semantic triggers, linguistic variation and the mass-count distinction. In Diane Massam (ed.), *Count and Mass Across Languages*, 238–260. Oxford: Oxford University Press.

Bale, Alan & Jessica Coon. 2014. Classifiers are for numerals, not nouns: Consequences for the mass-count distinction. *Linguistic Inquiry* 45(4). 695–705. doi:10.1162/LING_a_00170.

Bale, Alan, Michaël Gagnon & Hrayr Khanjian. 2011. Cross-linguistic representations of numerals and number marking. In *Proceedings of SALT 20*, 582–598.

Barner, David, Shunji Inagaki & Peggy Li. 2009. Language, thought, and real nouns. *Cognition* 111(3). 329–344. doi:10.1016/j.cognition.2009.02.008.

Barner, David & Jesse Snedeker. 2005. Quantity judgments and individuation: evidence that mass nouns count. *Cognition* 97(1). 41–66. doi:10.1016/j.cognition.2004.06.009.

Borer, Hagit. 2005. *In Name Only*. Oxford: Oxford University Press.

Carey, Susan. 2009. *The Origin of Concepts*. Oxford: Oxford University Press.

Cheng, Lisa Lai-Shen, Jenny Doetjes & Rint Sybesma. 2008. How universal is the Universal Grinder? *Linguistics in the Netherlands* 12(1). 50–62. doi:10.1075/avt.25.08che.

Cheng, Lisa Lai-Shen, Jenny Doetjes, Rint Sybesma & Roberto Zamparelli. 2012. On the interpretation of number and classifiers. *Rivista di Linguistica* 24(2). 175–194.

Cheng, Lisa Lai-Shen & Rint Sybesma. 1999. Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30(4). 509–542. doi:10.1162/002438999554192.

Cheng, Lisa Lai-Shen & Rint Sybesma. 2005. Classifiers in four varieties of Chinese. In Guglielmo Cinque & Richard Kayne (eds.), *The Oxford Handbook of Comparative Syntax*, 259–292. Oxford: Oxford University Press.

Cheng, Lisa Lai-Shen & Rint Sybesma. 2012. Classifiers and DP. *Linguistic Inquiry* 43(4). 634–650. doi:10.1162/ling_a_00109.

Cheung, Pierina, Peggy Li & David Barner. 2012. What counts in Mandarin Chinese: A study of individuation and quantification. In *Proceedings of the 34th Annual Conference of the Cognitive Science Society*, 210–215.

Chierchia, Gennaro. 1998a. Plurality of mass nouns and the notion of 'semantic parameter'. In Susan Rothstein (ed.), *Events and Grammar*, 53–103. Dordrecht: Kluwer.

Chierchia, Gennaro. 1998b. Reference to kinds across languages. *Natural Language Semantics* 6(4). 339–405. doi:10.1023/A:1008324218506.

Doetjes, Jenny. 2012. Count/mass distinctions across languages. In Claudia Maienborn, Klaus von Heusinger & Paul Portner (eds.), *Semantics: An International Handbook of Meaning*, vol. 3, 2559–2580. Berlin: de Gruyter.

Feigenson, Lisa, Stanislas Dehaene & Elizabeth Spelke. 2004. Core systems of number. *Trends in Cognitive Sciences* 8(7). 307–314.

Greenberg, Joseph. 1972. Numeral classifiers and substantival number: Problems in the genesis of a linguistic type. *Stanford Papers on Language Universals* 9. 1–39.

Grimm, Scott. 2012. Degrees of countability: A mereotopological approach to the mass/count distinction. In *Proceedings of SALT 22*, 584–603.

Imai, Matsumi & Dedre Gentner. 1997. A cross-linguistic study of early word meaning: universal ontology and linguistic influence. *Cognition* 62(1). 169–200. doi:10.1016/S0010-0277(96)00784-6.

Imai, Matsumi & Reiko Mazuka. 2003. Re-evaluation of linguistic relativity: Language-specific categories and the role of universal ontological knowledge in the construal of individuation. In Dedre Gentner & Susan Goldin-Meadow (eds.), *Language in Mind: Advances in the Issues of Language and Thought*, 430–464. Cambridge, MA: MIT Press.

Imai, Mutsumi & Reiko Mazuka. 2007. Language-relative construal of individuation constrained by universal ontology: Revisiting language universals and linguistic relativity.

Cognitive Science 31(3). 385–413. doi:10.1080/15326900701326436.
Inagaki, Shunji & David Barner. 2009. Countability in absence of count syntax: Evidence from Japanese Quantity Judgments. In Shunji Inagaki, Makiko Hirakawa, Setsuko Arita, Yahiro Hirakawa, Hiromi Morikawa, Mineharu Nakayama, Hidetosi Sirai & Jessika Tsubakita (eds.), *Studies in Language Sciences 8: Papers from the 8th Annual Conference of the Japanese Society of Language Sciences*, 111–125. Tokyo: Kurosio.
Khanjian, Hrayr. 2009. Classifiers and number marking. In *Proceedings of SALT 18*, 73–89.
Krifka, Manfred. 1989. Nominal reference, temporal constitution and quantification in event semantics. In Johan van Benthem, Peter van Embde Boas & Renate Bartsch (eds.), *Semantics and Contextual Expression*, 75–115. Dordrecht: De Gruyter.
Krifka, Manfred. 1995. Common nouns: A contrastive analysis of English and Chinese. In Gregory N. Carlson & Francis Jeffry Pelletier (eds.), *The Generic Book*, 398–411. Chicago University Press.
Li, Peggy, Yarrow Dunham & Susan Carey. 2009. Of substance: The nature of language effects on entity construal. *Cognitive Psychology* 58(4). 487–524. doi:10.1016/j.cogpsych.2008.12.001.
Lima, Suzi. 2014. *The Gammar Of Individuation and Counting*: University of Massachusetts, Amherst dissertation.
Lucy, John A. 1992a. *Grammatical Categories and Cognition: A Case Study of the Linguistic Relativity Hypothesis*. Cambridge: Cambridge University Press.
Lucy, John A. 1992b. *Language Diversity and Thought: A Reformulation of the Linguistic Relativity Hypothesis*. Cambridge: Cambridge University Press.
Lucy, John A. 1997. Linguistic relativity. *Annual Review of Anthropology* 26(1). 291–312. doi:10.1146/annurev.anthro.26.1.291.
Lucy, John A. 2004. Language, culture, and mind in comparative perspective. In Michel Achard & Suzanne Kemmer (eds.), *Language, Culture and Mind*, 1–22. Stanford: CSLI.
Lucy, John A. & Suzanne Gaskins. 2001. Grammatical categories and the development of classification preferences: a comparative approach. In Melissa Bowerman & Stephen Levinson (eds.), *Language Acquisition and Conceptual Development*, 257–283. Cambridge: Cambridge University Press.
Massam, Diane (ed.). 2012. *Count and Mass Across Languages*. Oxford: Oxford University Press.
Mathieu, Éric. 2012. Flavors of division. *Linguistic Inquiry* 43(4). 650–679. doi:10.1162/ling_a_00110.
Quine, Willard Van Orman. 1960. *Word and Object*. Cambridge, MA: MIT Press.
Rothstein, Susan. 2017. *Semantics for Counting and Measuring*. Cambridge: Cambridge University Press.
Sanches, Mary & Linda Slobin. 1973. Numeral classifiers and plural marking: An implicational universal. *Working Papers in Language Universals* 11. 1–22.
Scontras, Gregory. 2013. Accounting for counting: A unified semantics for measure terms and classifiers. In *Proceedings of SALT 23*, 549–569.
Scontras, Gregory. 2014. *The Semantics of Measurement*: Harvard University dissertation.
Soja, Nancy N., Susan Carey & Elizabeth Spelke. 1991. Ontological categories guide young children's inductions of word meaning: Object terms and substance terms. *Cognition* 38(2). 179–211. doi:10.1016/0010-0277(91)90051-5.
Spelke, Elizabeth, Roberta Kestenbaum, Daniel J. Simons & Debra Wein. 1995. Spatiotemporal continuity, smoothness of motion and object identity in infancy. *Developmental Psychology* 13(2). 113–142. doi:10.1111/j.2044-835X.1995.tb00669.x.
Sudo, Yasutada. 2016. The semantic role of classifiers in Japanese. In Susan Rothstein & Jurģis Šķilters (eds.), *Number: Cognitive, Semantic and Crosslinguistic Approaches*

Baltic International Yearbook of Cognition, Logic and Communication, .
Sudo, Yasutada. to appear. Countable nouns in Japanese. In *Proceedings of WAFL 11*, MITWPL.
Whorf, Benjamin Lee. 1956. The relation of habitual thought and behavior to language. In John B. Carroll (ed.), *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf*, 134–159. Cambridge, MA: MIT Press.
Wilhelm, Andrea. 2008. Bare nouns and number in Dëne Sųłiné. *Natural Language Semantics* 16(1). 39–68. doi:10.1007/s11050-007-9024-9.
Wynn, Karen. 1992. Children's acquisition of the number words and the counting system. *Cognitive Psychology* 24(2). 220–251. doi:10.1016/0010-0285(92)90008-P.
Xu, Fei & Susan Carey. 1996. Infants' metaphysics: the case of numeral identity. *Cognitive Psychology* 30(2). 111–153. doi:10.1006/cogp.1996.0005.