

Research Article

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Accounting for Variation in Language

<https://doi.org/10.1515/opli-2019-0020>

Received May 15, 2018; accepted July 19, 2019

Abstract: In this paper, variation is defined as a type having more than one subtype. Using twelve examples from linguistics, two kinds of accounts are identified: eliminating variants and motivating them. Eliminating variants means a subtype is promoted to a type. Motivating variation in turn involves acknowledging the existence of the variants and explaining their existence either by reference to their differing meanings or by identifying the different contexts they occur in. The general applicability of these two ways of dealing with variation is shown by examples from other fields of study and from everyday life.

Keywords: variation; allophones; allomorphs; syntagmatic context; paradigmatic context; cultural context

1 Introduction: what is variation and why is it a problem?

As stated by the editors of this volume, “Variation is a universal phenomenon which permeates language, culture, and society.” Indeed, the concept is seminal to all aspects of human thought whether in science or in everyday life. This paper addresses variation in a specific domain: language, by analyzing two basic ways in which linguistic variation has been interpreted in the literature. Since the goal is to synthesize already existing analyses, no new data and new descriptions are presented. Because of the general applicability of the accounts of variation across fields, the paper is written with an audience in mind that includes readers outside the field of linguistics.

What is variation and why is it a problem? Figure 1 is a general diagram of variation applicable to all domains.

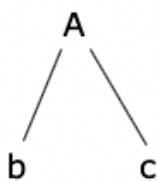


Figure 1: Variation

In the diagram, “A” stands for a type – say “apple” – and “b” and “c” stand for subtypes (e.g. “jonathan” and “honeycrisp”). As shown in the diagram, variation presents a paradox: b and c are different, yet they are the same.

From the observer’s point of view, variation may present itself in one of two ways. On the one hand, we may first encounter two distinct things and then discover that they are actually subtypes of the same type. For example, birds and dinosaurs were first viewed as unrelated animals until it was discovered that birds evolved from four-legged dinosaurs whose forelimbs turned into wings, which meant the two animals

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have been re-classified as variants of the same type. Similarly, Estonian and Hungarian have come to be identified as both Finno-Ugric in spite of their large differences. In this case, the direction of discovery would be shown by arrows pointing upwards from “b” and “c” to “A”.

On the other hand, we may start with what looks like a unitary object and then discover that it is manifested in variable forms. For example, skin cancer has come to be more and more differentiated into distinct kinds such as basal cell carcinoma, melanoma, and others. The same way, a language - say German - may first be thought of as a single language but on further inspection, it turns out to have various regional and social dialectal varieties. Here, the arrows would trace the discovery process by pointing down from “A” to “b” and “c”.

Given a general human preference for simplicity over complexity, the first discovery – unity emerging behind diversity – is satisfying: “one” is simpler than “more than one”. Thus, it was a welcome insight for astronomers to realize that our Milky Way and some other celestial constellations were all of the same kind: galaxies. In contrast, finding multiplicity behind unity creates a puzzle: why should a single kind of thing have variants and why are the variants the way they are? For example, why does the English “p” sound have different pronunciations in “spin” and “pin”? And why are the two variants what they are, with the “p” or “spin” plain but the “p” of “pin” aspirated (i.e. followed by a puff of air).

In what follows, I will take up cases of the second scenario by reviewing linguistic examples where something that appears to be one type is manifested as more than one subtype. Here are the two questions to be addressed:

1. How is variation analyzed by linguists?
2. Given that a linguistic type has subtypes, why are the subtypes what they are?

We will explore two types of accounts of variation. In one, data are re-analyzed so that the subtypes are **eliminated**. In the other approach, the existence of the subtypes is acknowledged and **motivated**.

To illustrate these two options by extralinguistic examples, take first the celestial body Pluto (an example cited by Cathal O'Madagain and Paul Egge in their paper “Why do concepts change?” given at the CEES conference on variation in December 2017). When discovered in 1930, Pluto was classified as the ninth planet. In 2006, the International Astronomical Union defined the concept of planet by three criteria:

- orbiting around the Sun,
- rounded by its own gravitational pull, and
- there being no other body of similar size in its gravitational sphere.

In trying to hold Pluto to these criteria, it was found that it met the first two but fell short of the third because other bodies of comparable size have been found in its vicinity. Thus, two classificational options opened up: keeping Pluto as a rogue subtype of planets or taking it out of the class of planets thereby eliminating an odd subtype. Astronomers thought keeping Pluto in the category of planets would stretch the boundaries of the category too far and thus they opted for the latter solution by declaring Pluto to be a dwarf planet. While the label sounds like Pluto is seen as a subtype of planets, the intent was to make it into a distinct type. Pluto has been emancipated: raised from a subtype to a type on a par with planets – an example of **eliminating** a subtype.

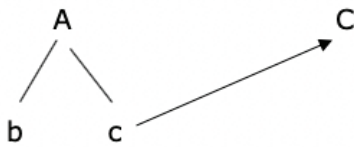
For an extralinguistic illustration of **motivating** subtypes, take the example of Easter and Passover. They are both religious holidays but are very different in their trappings. Why should they be different? The explanation comes from their distinct symbolic content: Christmas celebrates the birth of Jesus Christ, while Hanukkah commemorates the rededication of the Holy Temple in Jerusalem at the time of the Maccabean Revolt.

This example illustrates motivating subtypes **by their meanings**. In other cases, differences are in turn shed light on **by context**. Examples from outside language abound. Water can be liquid, solid, and vapor depending on the surrounding temperature. Variants of genetic human skin color are distributed geographically according to the amount of ultraviolet radiation. The color and appearance of tree foliage is correlated with the turn of seasons.

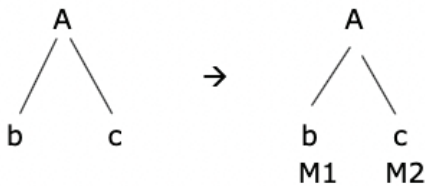
Figure 2 shows these kinds of accounts of variation. M1 and M2 stand for meanings, C1 and C2 stand for

contexts.

A/ Eliminating variants



B/ Motivating variants by meaning



C/ Motivating variants by context

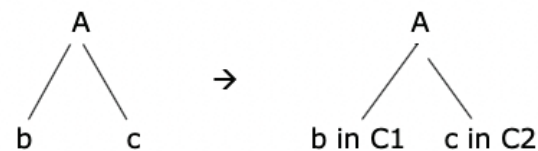


Figure 2: Accounts of variation

The balance of this paper will offer twelve examples of accounts of variation in linguistics. Section 2. cites two cases from the literature where a subtype is promoted to a type. Section 3 provides two instances of motivating variation by meaning (3.1) and eight examples of motivation by context (3.2), where the relevant context may be syntagmatic (3.2.1), paradigmatic (3.2.2), or cultural (3.2.3). Section 4 is a summary.

2 Eliminating variants

The first linguistic example of the emancipation of a rogue subtype comes from an analysis of English verbal particles, such as *up* (e.g. *look up*), *down* (*write down*) or *out* (*check out*). As (1) illustrates, these particles have two alternative positions: directly following the verb or separated from it.

- (1) (a) *I looked **up** the answer.*
 (b) *I looked the answer **up**.*

Question #1: Why do English verb particles have positional variants?

This problem has been dealt with in various ways in the literature. The proposal relevant here involves re-classifying one of the two occurrences of the particles as being something else: a prepositional phrase (Sag 1987: 329-333).

Answer #1: English verb particles do not have positional variants. The form directly following the verb is a particle but the one separated from it is not a particle but a prepositional phrase.

Evidence for this analysis comes from the modifiability of particles by adverbs such as *right*. The element separated from the verb can occur with *right* but the one next to the verb cannot.

- (2) (a) *I looked the answer **right up**.*
 (b) **I looked **right up** the answer.*

The clincher is the fact that, as shown in (3), the modifiability of the separated element is paralleled by the modifiability of prepositional phrases.

- (3) (a) *I looked the answer **right up**.*
 (b) *I went **right to the library**.*

The separated *up* is now taken out of the category of verb particles: it is raised from the taxonomic level of subtypes to the level of types. Figure 3 diagrams this.

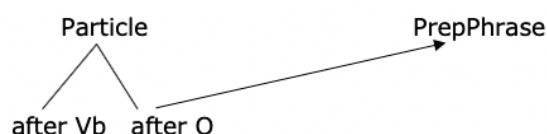


Figure 3: eliminating variants (English particles)

A second example of emancipating a subtype comes from the analysis of Singapore Malay reflexives by Cole and Harmon (1998). The sentence in (4) is about two individuals – *Ali* and *Fatimah* – and it includes a third person singular pronoun (*dirinya* ‘self’) that may be interpreted as referring either to Ali or to Fatimah.

- (4) *Ali memberitahu Fatimah yang kamu*
Ali told Fatimah that you
menyukai diri-nya
like self-3SG
 ‘Ali told Fatimah that you like him (i.e. Ali).’
 OR
 ‘Ali told Fatimah that you like her (i.e. Fatimah).’

In Cole and Harmon’s analysis, the reflexive pronoun *diri-nya* “self-3SG” is not a regular reflexive pronoun since it can take its antecedents across clause boundaries (either ‘Ali’ or ‘Fatimah’). It therefore seems to be a long-distance reflexive pronoun. However, there is a problem. In other languages, long-distance reflexives are monomorphemic and they must take a subject as their antecedent. An example is Mandarin Chinese *ziji* ‘self’, which is a single morpheme and can only refer back to a subject. As shown above, neither property holds for *dirinya*: the word is bi-morphemic: “self-3SG”, and it can refer not only to Ali but also to Fatimah.

Question #2: Why is the Singapore Malay long-distance reflexive not like other long-distance reflexives?

Cole and Harmon conclude that rather than an exceptional variant of long-distance reflexives, *dirinya* should be analyzed as forming a separate class: “a structure indeterminate between a reflexive (pronoun) and a (personal) pronoun” (46). Here is their answer to the question stated above:

Answer #2: The reason that what appears to be a long-distance reflexive in Singapore Malay is not like other long-distance reflexives is that it is not a subtype of long-distance reflexives but a separate type that falls between reflexives and pronouns.

As in the case of English verbal particles, a recalcitrant variant of a class is elevated to the level of a separate class. Figure 4 is the diagram.



Figure 4: Eliminating variants (Singapore Malay reflexives)

In addition to the re-classification of Pluto, extralinguistic examples of promoting rogue subtypes to separate types were also provided in two talks given at the CEES conference on variation in December 2017. In her paper titled “Adaptations, variations or a new proverb genre?”, Liisa Granbom-Herranen raised the question whether contemporary proverbs of novel content and form should be considered a subtype of traditional proverbs or rather a separate genre. Kurmo Konsa, in his paper “Alchemy and transhumanism: old ideas in new form” said that new technologies would change people so radically that they would not be human beings anymore but a new species: posthuman.

We next turn to analyses where subtypes are acknowledged rather than gotten rid of and their existence is shown to be motivated.

3 Motivating variants

3.1 Motivating variants by meaning

Let us consider another analysis of English verb particles (Dehé 2002: 279).

- (5) (a) I looked **up** the answer.
 (b) I looked the answer **up**.
 (c) I turned **down** the radio.
 (d) I turned the radio **down**.

The question is the same as in Q-1 above:

Question #3: Why do English verb particles have positional variants?

Dehé’s answer, however, takes a different route. Rather than eliminating the separated particle from the class of verbal particles, she acknowledges the taxonomic position of constituents like *up* or *down* as subtypes of verbal particles and she further supports their status by their meaning. She observes that if the particle directly follows the verb, the verb and the particle do not bear focus of attention but if it is separated from the verb, the verb and the particle are focal. Thus, in (5a), the focus is on the object *the answer* and *looked up* is backgrounded, while in (5b), *looked . . . up* is in the foreground and *the answer* is secondary.

Answer #3: English verb particles have positional variants because the two positions differ in focus.

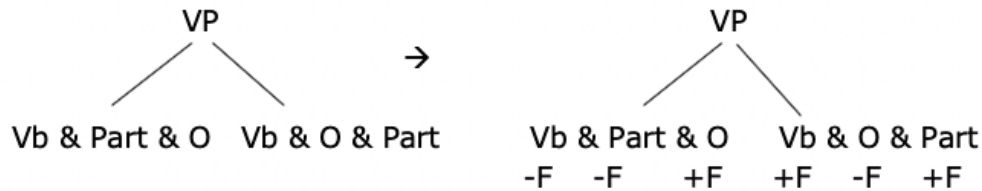


Figure 5: Motivating variants by meaning (English particles)

While this does not tell us why focus should be distributed between the two positions the way it is, it does provide a semantic correlate to the two variants and thus reduces their arbitrariness.

A second example of acknowledging variants and motivating them by meaning comes from the variable morphological structure of personal pronouns across languages. (6) shows that in English, the plural forms *we*, *you*, and *they* are not derived from singular forms *I*, *you*, and *he/she/it* by adding a suffix the way it is in the plural forms of noun; e.g. *apple-s*.

(6) English

<i>I</i>	<i>we</i>	* <i>I-s</i>
<i>you</i>	<i>you</i>	* <i>you-s</i>
<i>he, she, it</i>	<i>they</i>	* <i>he-s, she-s, it-s</i>

This is different in Turkish and Mandarin.

(7) Turkish

<i>ben</i>	<i>biz</i>	
<i>sen</i>	<i>siz</i>	
<i>o</i>	<i>on-lar</i>	(cf. <i>adam-lar</i> ‘men’)

(8) Mandarin Chinese

<i>wǒ</i>	<i>wǒ-men</i>	(cf. <i>péngyǒu-men</i> ‘friends’)
<i>nǐ</i>	<i>nǐ-men</i>	
<i>tā</i>	<i>tā-men</i>	

In Turkish, the third-person plural pronoun is derived from the singular (like it would be in English if we had *he-s*, *she-s*, and *it-s* for *they*); and in Mandarin, all three plural pronouns are formed from the singular. The suffixes used in both languages are those used for nominal plurals (in Mandarin, for a collective plural).

Many other languages conform to the three types seen above. German is like English, French is like Turkish, and Korean is like Mandarin. What is interesting is that no language has been found where the distribution of nominal plural marking across pronouns is the opposite of Turkish, with the first and second personal plural pronoun marked with a nominal plural but the third person not so marked. The non-occurring “counter-Turkish” pattern is shown in (9).

(9)	* <i>ben-lar</i>	(cf. <i>adam-lar</i> ‘men’)
	* <i>sen-lar</i>	
	* <i>on-iz</i>	

Question #4: Why are there no languages where the first- or second-person pronoun has nominally-marked plurals but the third-person pronoun does not?

Here the question is not why there **are** multiple variants but, rather, why a logically possible variant does **not** occur.

As in the case of Dehé's analysis of English verbal particles, the answer comes from semantic analysis. Note that the plural of the third-person pronoun is like the plural of a noun: 'they' means 'he and he and she...' just as 'apples' means 'apple and apple and apple...'. This is different for first- and second-person pronouns: 'we' is not 'I and I and I...' but rather 'I and you and he...'; and similarly, the second-person plural pronoun often refers to a person-wise mixed set: 'you and he...'. In other words, the plurality of third-person pronoun is additive, just as plural nouns, while first and second-person plural pronouns are what might be called associative: they refer to different persons forming a group.

Answer #4: The nominal plural marking of third-person pronouns is semantically motivated since third person plurals are additive just as noun plurals, but first- and second-person plural pronouns are, unlike nominal plurals, associative rather than additive.

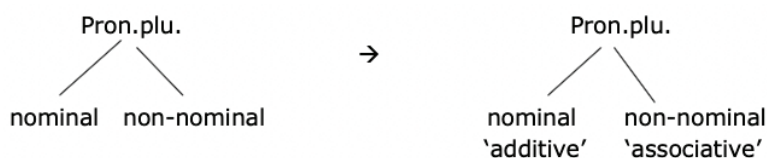


Figure 6: Motivating variants by meaning (pronouns across languages)

This semantic distinction makes sense of the occurrence of one type of language – where the third-person plural pronoun is nominally marked but the other persons are not – and of the non-existence of a logically possible system where first- and second-person plurals are nominally marked but the third person is not. Note, however, that at least two other facts about the morphological compositions of plural pronouns across languages remain unaccounted for. First, if the plurality of third-person pronouns is like the additive plurals of nouns, why are there languages like English where the form of third-person does not reflect this? In other words, why *they*, rather than *he-s*? Second, if the plurality of first- and second-person pronouns is unlike the additive plurals of nouns, why are there languages like Mandarin, where these pronouns also have nominal plural markers? Although there are possible answers to these queries, the point here is simply that, just as in the case of Dehé's account of the varying positions of English particles, semantic consideration strengthens the status of variants and thus motivates their existence.

In what follows, variation will be shown to be correlated not with meaning but with the conditions under which the variants occur. All of the following eight examples will instantiate Figure 2.C/ Motivating variants by context.

3.2 Motivating variants by context

3.2.1 Syntagmatic context

The Estonian alveolar fricative has two different pronunciations (Viitso 2003: 10). It is /z/ or /s/ depending on the environment. ("V" stands for vowel, "SON" is sonorant consonant, # indicates the end of a word)

- | | | | |
|------|-----|----------------|----------------------------------|
| (10) | (a) | [z]: V__V | e.g. in <i>kiisut</i> 'kitty' |
| | | V__# | e.g. in <i>naeris</i> 'turnip' |
| | | SON__ | e.g. in <i>naersin</i> 'I laugh' |
| | (b) | [s]: otherwise | e.g. in <i>söötsin</i> 'I feed' |

Question #5: Why does the Estonian alveolar fricative have different forms?

Answer #5: Its basic voiceless form takes on the voicing feature of the phonological environment under certain conditions.

Similar variation is shown by the English voiceless stops /p/, /t/, and /k/. As mentioned above, /p/ is pronounced slightly differently in words like *spot* and *pot* depending on the phonetic environment, with the /p/ aspirated – i.e. followed by a puff of air – when initial to a stressed syllable.

In these cases, a single sound having no meaning of its own has contextually determined variants (called allophones). The pronunciation of meaningful units – morphemes – may also depend on the environment. A well-known example of such allomorphic variation is shown by the English negative prefix *in*. It has three different pronunciations.

- (11) (a) *im-proper* /Im-/
 (b) *in-tolerant* /In-/
 (c) *in-congruous* /In-/

Question #6: Why does the English negative prefix have different pronunciations?

An answer emerges if we look at the conditions under which they occur.

The form is always a nasal but its place of articulation differs depending on context. If it precedes a bilabial consonant, such as /p/, the nasal is bilabial; preceding an alveolar consonant (e.g. /t/), the nasal is alveolar; and preceding a velar consonant (e.g. /k/), the nasal is velar.

Answer #6: The form of the English negative prefix assimilates in point of articulation to the following environment.

A further example of the variant pronunciations of a morpheme comes from Tagalog. Here it is not the phonetic form of the morpheme that varies due to context but its position in the word. The morpheme in question is *um-* expressing ‘actor focus’ – i.e. marking focus on the identity of the actor involved in the verb that the morpheme is added to. Positional variation is shown in (12). In (12a) and (12b), the morpheme is prefixed while in (12c) and (12d), it is infixated after the first consonant of the verb stem (Schachter & Otanes 1972: 292).

- (12) (a) *abot* ‘reach for’
um-abot ‘reach for (actor focus)’
 (b) *ibig* ‘love’
um-ibig ‘love (actor focus)’
 (c) *dalo* ‘attend’
**um-dalo*
d<um>alo ‘attend (actor focus)’
 (d) *hawak* ‘hold on’
**um-hawak*
h<um>awak ‘hold on (actor focus)’

Question #7: Why does the Tagalog actor focus affix have positional variants?

The reason has to do with a phonotactic constraint of Tagalog: unless it is word-final, a syllable cannot end in a consonant (cf. Kager 1999: 121-124, Yu 2007: 38-40). In (12a) and (12b), the verb stem begins with a vowel and there is no problem: the words are syllabified as *u-ma-bot* and *u-mi-big*, respectively, so that each syllable ends in a vowel. In (12c) and (12d), however, the verb stem starts with a consonant yielding the following syllable structure: *um-da-lo* and *um-ha-wak*. In each case, the prefix syllable ends in a consonant in violation of the constraint. While there are several imaginable way of resolving this conflict (e.g., the

prefix form *um-* could be shortened to *u-*; or the first consonant of the verb stem could be deleted), the actual solution is to shift the position of the offending prefix minimally by infixing it in after the first consonant of the verb stem. This results in allowable syllabification: instead of *um-da-lo*, we have *du-ma-lo* and instead of *um-ha-wak*, there is *hu-ma-wak*.

Answer #7: The Tagalog actor focus affix has positional variants to avoid violating the rule that bans consonant-final syllables inside the word.

In the case of allophones, the phonetic environment determines the shapes of phonemes. In the case of allomorphs, the phonetic environment determines the shapes or positions of morphemes. In the next two examples, syntactic environment determines the shapes of entire words.

Familiar instances of the contextual determination of word forms are grammatical agreement. In Finnish, adjectives such as ‘long’ have various different forms: *pitkä*, *pitkät*, *pitkänä*, *pitkinä*, among others. Why not just a single invariant form?

Question #8: Why do Finnish adjectives have different forms?

An answer emerges if we look at the context where the forms occur. The data in (13) show that the adjective “assimilates to” – or agrees with – the noun that it occurs with.

- | | | |
|------|------------------------------|------------------|
| (13) | (a) <i>pitk-ä ilt-a</i> | ‘long night’ |
| | (b) <i>pitk-ät ill-at</i> | ‘long nights’ |
| | (c) <i>pitk-änä ilt-ana</i> | ‘in long nights’ |
| | (d) <i>pitk-inä ilt-oina</i> | ‘in long night’ |

Answer #8: Finnish adjectives have different forms because the adjectives agree in number and case with the noun that they occur with.

While in this instance, the agreeing word’s suffix shows the same (or similar) phonological shapes as the noun it agrees with, this is not always so. Take verb forms in Russian. The verb ‘to read’ has variants such as *čitaju*, *čitaješ*, *čitajet*. As shown in (14), the different forms occur in different syntactic contexts – in particular, with different subjects – although the phonological shapes of the different forms do not mirror the phonological shape of the subject.

- | | | |
|------|-----------------------|-----------------|
| (14) | (a) <i>ja čitaju</i> | ‘I read.’ |
| | (b) <i>ty čitaješ</i> | ‘You(SG) read.’ |
| | (c) <i>on čitajet</i> | ‘He reads.’ |

Question #9: Why do Russian verbs have different forms?

Answer #9: Because the verb agrees with the subject in person.

In the next example, syntax is once again the determining context but it affects not the form of a word but its meaning.

- | | | |
|------|-----|---|
| (15) | (a) | <i>Use two eggs for the omelet.</i> |
| | (b) | <i>You have egg on your chin.</i> |
| | (c) | <i>Jill has drunk a cup of coffee.</i> |
| | (d) | <i>She ordered two more coffees.</i> |

In (15a), *egg* is a count noun but in (15b), it is used to designate a mass. Conversely, in (15c), *coffee* is a mass noun but in (15d), it is used as countable.

Question #10: Why do the words egg and coffee have two variant interpretations, one as count noun and the other, as mass noun?

Answer #10: Because the interpretation is conditioned by the syntactic environment.

In other words, in (15b) the use of the noun *egg* without an article coerces the mass interpretation of a count noun; cf. *You have honey on your chin*. In (15d) in turn, a mass noun is forced to be understood as countable because of the occurrence of the numeral *two*. The general rule stating the effect of the syntactic environment on the interpretation of words is known as the Override Principle (Michaelis 2003: 268):

“If a lexical item is semantically incompatible with its syntactic context, the meaning of the lexical item conforms to the meaning of the structure in which it is embedded.”

In the cases seen above, the context that determines variation is the most intuitively obvious kind: one item dictates a neighboring item’s form or meaning. However, there are instances of contextual determination where the conditions are not visibly present in the same word or sentence; instead, they are part of the overall grammatical system. This will be illustrated next.

3.2.2 Paradigmatic context

An extralinguistic example for systemic influence is analogous behavior. When a tennis player first tries to play ping-pong, his shots are likely to be too long. This is because his tennis habits may be transferred to the analogous domain of ping-pong. For a linguistic example of analogical behavior, take the past tense of English verbs. When people use the regular past tense *dreamed* rather than the irregular form *dreamt*, this is likely on the analogy of the majority of English verbs, which have regular past tense forms.

Here is an example of such paradigmatic context, or system constraints, taken from language typology. The data below show the different positioning of the question particle in Turkish and in Easter Island. Q stands for question particle.

(16) Turkish (Kuno 1973: 13):

- | | | | |
|-----|------------|------------------|-------------------------------|
| (a) | <i>Onu</i> | <i>gördünüz.</i> | |
| | him | you.saw | |
| (b) | <i>Onu</i> | <i>gördünüz</i> | mü? ‘Did you see him?’ |
| | him | you.saw | Q |

(17) Easter Island (Chapin 1978: 155):

- | | | | | | |
|-----|-------------|-------------|---------------|-----------------|---------------------------------------|
| (a) | <i>He</i> | <i>moni</i> | <i>marite</i> | <i>tokorua.</i> | ‘You have American money.’ |
| | exist | money | American | your | |
| (b) | Hoki | <i>he</i> | <i>moni</i> | <i>marite</i> | <i>tokorua?</i> ‘Do you have American |
| | Q | exist | money | American | your money?’ |

Question #11: Why is the question particle sentence-final in Turkish and sentence-initial in Easter Island?

There is nothing in the very sentences in which the question particles occur that would call for their alternative positions in the two languages. However, a correlate to the alternative positions has been found by considering the two grammatical systems. Languages like Turkish (or Japanese) that have sentence-final question words generally have postpositions, while languages like Easter Island (or Tagalog) that put question particles to the beginning tend to have prepositions (Greenberg 1963: 81; cf. Dryer 2005b). This is shown in (18) and (19).

- (18) Turkish
evin içinde ‘in the house’
evin önünde ‘in front of the house’
- (19) Easter Island
mai Tahiti ‘from Tahiti’
ki Tahiti ‘to Tahiti’

Answer #11 The question particle is sentence-final in Turkish because Turkish is a language with postpositions and postpositional languages generally have sentence-final question markers. In Easter Island in turn, the question particle is sentence-initial because this language has prepositions and prepositional languages tend to have sentence-initial question particles.

Why there should be this correlation between adpositional and question-particle order is not obvious. There is simply a correlation between the two that serves as a probabilistic predictor of the position of question particles.

3.2.3. Cultural context

In the example of question particles in Turkish and Easter Island, the motivating context was not present in the sentences where the particles occur; instead, it was part of the general grammatical systems of the languages. An even more remote and even less tangible conditioning factor may come from outside the grammatical system: something that is “in the air”.

Such extralinguistic cultural conditions are frequently invoked to account for vocabulary differences among languages. That languages like Japanese, Thai, or Nepali have elaborates systems of honorific pronouns as opposed to the simple English system is plausibly related to the more finely layered, hierarchically-organized societies in which those languages are spoken. The well-known differences among languages in how many basic color terms they have (Kay et al. 2009) are also distributed in terms of cultural factors: languages spoken in technologically less developed societies, such as in Papua New Guinea, use fewer color terms.

A particularly striking example of the correlation between the structure of vocabulary and cultural factors is provided by spatial orientation in different languages. Guy Deutscher summarizes Stephen Levinson’s and John Haviland’s findings about the Australian language Guugu Yimithirr (2010: 157-193).

In English and in most other well-known languages, directions are given relative to speaker’s body or some other object: we use terms like *left*, *right*, *in front* and *behind*. This seems natural to us but, as Deutscher warns, we often take something that is familiar to be natural (169). In addition to this egocentric orientation, English also uses a geographic one based on the points of the compass when we give directions as ‘East’ or ‘West’; but there are languages which use a geographic system exclusively.

Guugu Yimithirr is one of them. As Deutscher explains, if you want to tell somebody to move back from the table, you would say ‘move a bit to the west’. If you want to describe where you left something in the house, you would say ‘I left it on the southern edge of the western table’. And, when Stephen Levinson was trying to film a Guugu Yimithirr speaker telling him a story, the speaker abruptly told him to stop and said ‘look out for the big ant just north of your foot’. Describing pictures in a book, the speaker would identify locations on the picture depending on how the book is held. If the book is facing top side north, the woman on the picture would be said to be to the west of the tree but if it held top side south, the woman is said to be to the east of the tree. (166-167). Expressions for ‘right hand’ and ‘left hand’ are used only to describe inherent characteristics of the hands – such as the ability to lift something – but not for directions.

The origins of geographic orientation systems must have had to do with the environment where speakers lived. Whatever cues speakers originally resorted to were clearly visible in the surrounding natural setting. These may have been differences in the brightness of the sides of tree trunks, the orientation of termite

mounds, the alignment of sand dunes, and other landscape features (173). By now, however, the system is automatically employed: it is ingrained in speaker's mind and their way of viewing the world; as Deutscher puts it, people have "perfect pitch" for directions (172) even in dark and enclosed areas where no natural clues are available. Exactly how this ability has evolved, how it is transmitted, and how it is put to actual use is mind-boggling.

Question #12: Why does Guugu Yimithirr use compass directions for basic orientation but English does not?

Answer #12: Given that the Guugu Yimithirr people live in a more intimate contact with nature than most speakers of English, these life conditions must have provided necessary – although not sufficient – conditions for the development of the compass-based orientation system.

This example highlights two aspects of the complexity of the relationship between item and context. First, while the geographic orientation system of Guugu Yimithirr must have originated in a culture where people lived in a natural environment that provided clues for the direction of the compass, it is worth noting that not all languages whose speakers live in such environment have developed this mode of orientation. Similar geographically-based orientation systems have been described for many other languages in Australia and other parts of the world (169) but they are still infrequent. The natural environment must have been enabling but it did not call for this system by necessity or even by probability.

Some of the other examples discussed above also show that correlations, whether with meaning or with context, do not necessarily translate into absolute predictions. The focus distinction between adjacent and separate verbal particles in English (#3) did not necessarily call for the different word order patterns. Similarly, the additive versus associative meanings of plural pronouns did not result in noun-like versus non-noun-like plurals in all languages (#4); and the phonotactic conflict that would result in prefixing the Tagalog *-um* morpheme to consonant-initial stems could have been resolved in various ways other than by infixing (#7). Agreement and coercion also do not happen in all relevant contexts, only in some (##8, 9, 10) and the correlation between the position of question particles and adpositions is also probabilistic rather than absolute (#11).

A second feature of correlations that the Guugu Yimithirr example points up has to do with directionality. Children born into Guugu Yimithirr today do not re-create the system based on natural clues; they learn it by acquiring the language. While originally, natural context affected language, for today's children, language is the lead factor which in turn affects cognition. As Deutscher puts it,

"...in order to be able to speak such a language, you need to have a compass in your mind, one that operates all the time, day and night, without lunch breaks or weekends." (Deutscher 2010:17)

Daniel Slobin's concept of "thinking for speaking" is relevant here.

"In processes of thinking for speaking, speakers attend to dimensions of experience that are available for morphosyntactic and lexical coding." (Slobin 2016: 105)

In order to be able to speak Guugu Yimithirr, one has to be able to think in terms of geographic directions. But then the type of thinking needed for speaking may be generalized to an overall worldview. In Deutscher's words,

"...habits of speech can create habits of mind that affect more than merely the knowledge of language itself." (Deutscher 2010: 234)

Or, as Nicholas Evans has put it,

“What starts out as “thinking for speaking” - making sure we have the categories and information we will need to express ourselves in a given language – ends up creating habits of thought that shape what we remember and guide what we pay attention to, whether we are speaking or not.” (Evans 2010: 179).

For experimental evidence for how language affects cognition, see for example Boroditsky 2001; for a dissenting voice, see Pinker 1994: 58.

A similar reversibility of context and effect was shown by the examples of coercion (#10). Normally, *egg* is used as a count noun and *coffee* is used as a mass noun and these meanings call for the appropriate syntactic context. However, in some cases, the syntactic context has the upper hand: it forces *egg* to be interpreted as mass and *coffee* as count. An analogy is the relationship between a person and the clothing he wears. Normally, a person chooses the clothing but special costume can in turn affect the identity of the wearer.

The mutual interplay between context and effect is widely manifested in all aspects of life. For great artists or great scientists, such as Mozart or Einstein, the cultural environment in which they grew up was the context that enabled them to be what they became but they in turn changed this intellectual culture so that they became context and culture became the affected entity. Context and effect are not permanently fixed: the roles are interchangeable. All life forms exist and behave in part depending on their internal endowments and in part in accordance with their environment. They are affected by the environment and in turn they also change it.

4 Conclusions

The questions to be addressed in this paper as stated in the Introduction were the following:

1. How is variation analyzed by linguists?
2. Given that a linguistic type has subtypes, why are the subtypes what they are?

Here are the answers that have emerged for our survey.

1. Two basic approaches taken by linguists to the analysis of the subtypes of a type are (A) eliminating a subtype by promoting it to a type, and (B) acknowledging the subtype and motivating it.
2. Subtypes may be motivated by the meanings of the forms involved or by the context in which they occur. Context may be syntagmatic, paradigmatic, or cultural.

Motivating variants, however, does not really explain why linguistic objects have subtypes and what these subtypes are like. Meaning and context can serve as correlates that may enable variation but they do not necessitate it. True explanations of the causal kind must come from the study of historical changes that have given rise to variants; from the processes of language acquisition and language use that give rise to historical change; and from the human mind and body in which these processes are rooted.

Acknowledgments: I am grateful for the editorial comments I received and for the corrections and very helpful suggestions by Michael Daniel and an anonymous reviewer.

Abbreviations

C = context
 F = focus
 Long-dist. refl. = long-distance reflexive
 M = meaning
 O = object
 Part = particle
 plu = plural
 Pron = pronoun
 Q = question particle
 Refl/Pro = a category between reflexives and personal pronouns
 SG - singular
 SON = sonorant consonant
 V = vowel
 Vb = verb
 VP = verb phrase
 3SG = third person singular
 # = end of the word

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