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The Syntactic Buoyancy Principle and English Reading¹⁾

Ichiro Yuhara

Abstract

The Syntactic Buoyancy Principle (Sadock 2000) is a grammatical property of English whereby a “lighter” constituent floats towards “the surface,” or the initial position of a sentence, or to put it the opposite way round, that a “heavier” constituent moves towards the “bottom,” or the end of a sentence.²⁾ Whereas some researchers look upon it as a mere statistical tendency and/or relegate it to a preferred style of English, the past ten years of research has seen linguists come to a certain agreement that it might constitute part of English grammar (e.g., Hawkins 2000; Wasow 2002). In this short article, I would like to suggest one way of teaching it as a guiding principle that regulates apparently local and idiosyncratic word order facts in English. This is only a portion of a larger work that attempts to more actively incorporate linguistic studies into language pedagogy (Yuhara 2010, 2011). The goal is no more than to list a permissible range of word order facts in written English, and I do not suggest that the Syntactic Buoyancy Principle alone is capable of accounting for all word ordering facts.

1. Weight of a constituent

In my experience of teaching English, students are able to grasp the concept of constituent weight by a handy rule of thumb: *the further to the left the less complex*. This allows learners a simpler route to understanding the relationship outlined below.

- (1) Syntactic Complexity Hierarchy³⁾
noun phrase [NP] < prepositional phrase [PP] < verb phrase [VP] < sentence [S]

Given (1), the NP *college students* is less complex than the PP *to college students* because a PP must necessarily include an NP (and not the opposite). Likewise, the VP *teach English to college students* is less complex than the S *The professor teaches English to college students* since an S must necessarily have a VP as a daughter phrase (and not the opposite). A common misconception is that word count is the delimiter of linguistic complexity, which it is not. Here is an example where a phrase with fewer words is in fact more complex than a longer one: *Many students doze off* is more complex than *in this apparently competitive college*. What is primarily intended by Syntactic Complexity Hierarchy (=1) is simply to appeal to students' intuition that as we move on the hierarchy rightwards, more categories are involved, so that there is a possibility that more words will be required in any resulting expression. An immediate implication is that an NP very commonly, if not always, occurs as a "lighter" constituent than a PP, VP, and S in this order.

The notion of constituent weight, or phrase weight, may become clearest when two constituents are compared within the same category: a phrase with fewer words is almost always lighter than a phrase of more words. Hence, within NPs, the following weight hierarchy results.

(2) Constituent Weight within NPs

one < *a language* < *a second language* < *a second language taught in college* < *a second language that many students register for*

The above hierarchy reads from the left: the leftmost constituent *one* is lighter than *a language*, which, in turn, weighs less than *a second language*, which, in turn, becomes lighter if compared with *a second language taught in college*. To put it in other words, the relativized NP *a second language that many students register for* is the heaviest constituent among the NPs on the complexity hierarchy scale in example (2).

Having emphasized the number of words or the length of a phrase, I should hasten to add that weight of a constituent is not a monolithic grammatical concept. If it is de-synthesized, it turns out that almost *all* the grammatical dimensions work together to determine the actual weight of a constituent. That is, not only are phrase internal complexity and number of words the deciding factors, but also number of syllables, amount of cognitive content, and given-new information. Each of these factors contribute *independently* to the actual weight of a phrase. In the example below, "<" should be read as "is lighter than."

(3) Contributing Factors for Weight

Phrasal Syntax: less complex constituent < more complex constituent (=1)

Morphology: fewer words (e.g., *one*) < more words (e.g., *a second language*)

Phonology: fewer syllables (e.g., /wʌn/) < more syllables (e.g., /læŋɡwɪdʒ/)

Semantics: less cognitive content < more cognitive content

Pragmatics: given (more familiar) information < new information

To decide which factor invokes a phrasal movement is a complicated matter -- pragmatic constraints are probably tightest compared to the other dimensions.⁴⁾ For pedagogical purposes (especially for reading), however, it suffices to point out close correlations in these distinct linguistic representations.

2. Relaxing the rigidity of school grammars

With this much explanation, students generally become capable of estimating weights of constituents fairly accurately. I then introduce the Syntactic Buoyancy Principle as a broad generalization to account for certain word order facts in English.

(4) the Syntactic Buoyancy Principle

A lighter constituent moves leftwards (towards the sentence initial position), while a heavier constituent moves rightwards (towards the sentence final position).

At this point, two remarks are in order. First, it is necessary to make it explicit that word order in English is actually more flexible than students believe on the basis of their school grammars. Consequently, second, it is an error to think that there is an absolute boundary between grammatical and ungrammatical sentences.

For example, I was once taught that a place adverbial precedes a time adverbial when both of them are needed to be expressed in a sentence. (The reader can easily confirm this kind of grammatical explanation on the internet.) While there is nothing generally wrong with this prescriptive statement, both phrases are in fact frequently interchangeable, and crucially, if a time adverbial is lighter than a place adverbial (i.e., having fewer words and/or shows less complexity), the reverse order may sound somewhat more natural than the prescribed phrasal order.

- (5) Many students study on Sundays in the new library with a cafeteria. = Many students study in the new library with a cafeteria on Sundays.

Thus, in order to elevate the Syntactic Buoyancy Principle to be part of learners' grammatical knowledge of English, it is indispensable for students to dispel the unwarranted assumption that word order in English is absolute. Learners must first learn that grammaticality is indeed a relative notion.

3. Examples of a lighter element floating, and a heavier element sinking

Japanese students have generally learned a great amount of facts about English grammar while preparing for college entrance exams. One of the tasks for college instructors of EFL is to integrate students' diffuse understandings of grammatical rules into a more coherent edifice of knowledge. It may be unnecessary for students to become capable of applying the Syntactic Buoyancy Principle to writing, but it would be highly useful for them to internalize how the principle works. Internalizing the principle would afford an understanding of word orders from apparently irregular constituent orderings. Learners encounter these regularly in extensive reading of English, and thus the principle can make certain texts more accessible. For this purpose, I suggest that it may be convenient to divide English syntax into two realms; one is the post-verbal positions, and the other extends to pre-verbal positions. The following subsections summarize a list of unmarked word orders in English and brief explanations for them.

3.1 Post-verbal constituent orderings

To have students recognize the Syntactic Buoyancy Principle, it is probably a good start to turn their attention to transitive phrasal verbs, which are made up of two or more parts that work together as a single word. Included in this class are expressions like *fill out* ('complete'), *get over* ('recover'), *look up* ('examine'), and *turn down* ('refuse') among many others. Strictly speaking, these post-verbal elements such as *over* and *up* are part of the main verb (thus called "particle").⁵⁾ The point here is to remind students of obligatorily separating a transitive phrasal verb into a verb and a particle when its direct object is a pronominal element. (Thus, this is called **Particle Shift** in literature.)

- (6a) The student looked up the English word.
- (6b) The student looked it up.
- (6c) *The student looked up it.

In this set of examples, the pronoun *it* is lighter than the full NP *the English word*. As such, it must move across the particle *up* (=6b). Leaving it after the particle breaks the Syntactic Buoyancy Principle, thereby ending up with an ungrammatical sentence (=6c).⁶⁾

Dative Shift is another locus to observe the same mechanism at work. Verbs like *give*, *teach*, and *bring* are subcategorized for an NP and an PP (in addition to two NPs).

- (7) The teacher gave a book to the student.

In (7), the post verbal positions of *a book* and *to the student* follow Syntactic Complexity Hierarchy (=1). However, as the weight of the NP increases, the dative nominal (i.e., *to the student*) may move leftwards, in simultaneously following the Syntactic Buoyancy Principle and overriding Syntactic Complexity Hierarchy. Consequently, the opposite order becomes more available and acceptable, as is shown in (8) below.⁷⁾

- (8) I gave to my brother a subscription to a magazine that he was already subscribing to. >> I gave to my brother a subscription to a magazine. >> I gave to my brother a magazine. >> I gave my brother one. [Sadock 2012: 214 (12)]

Similar phenomena are everywhere among verb phrases in English (often discussed as **Heavy Constituent Shift**): when verbs with a complement are modified by a prepositional phrase (e.g., *on several occasions*) or adverb (e.g., *carefully*), the lighter phrase may precede the sentential complement without changing meaning.

- (9) John said on several occasions that he wouldn't consider leaving the firm. [McCawley 1998: 93 (18d)]
- (10) I have read very carefully all the articles she has written. [Huddleston and Pullum 2002: 1384 (7i)]

The same logic holds true of (so-called) subject control verbs like *continue* and *serve*, which take a *to*-infinitive as its complement.

- (11) They continued for several months to occupy the house.

[McCawley 1998: 93 (18c)]

Likewise, the following example shows the PP *in the text* is raised to the middle of the heavy NP headed by the noun (*no*) *discussion* (partly because of the presence of the concession phrase led by *in spite of the fact*).

- (12) .. It is interesting to note, however, that there was no discussion in the texts of the possibility of accommodating the data with PS rules containing complex categories, in spite of the fact that they all assume complex categories.

[Borsley 1996: 19]

These examples may not produce much difference in acceptability in comparison to the unmarked word order but, to say the least, learners are supposed to recognize them as a permissible constituent order in English.

In a similar vein, sentences built by verbs such as *call* and *put* may constitute a place where the Syntactic Buoyancy Principle is in force. They are subcategorized for a direct object NP and a complement (NP and PP respectively). Despite the fact that a subject-predicate relation holds between them, and that a subject generally proceeds a predicate in standard English grammar, their positions are allowed to switch with each other, to the extent that the weight of the direct object is judged heavy enough.

- (13) Mary called John, the person who we saw at the bar yesterday.

- (14) Shoko put on the table Craig's dissertation, which he defended with distinction.

Again, the canonical orderings of NP (*the person who we saw at the bar yesterday*) + NP (*John*) for (13), and of NP (*Craig's dissertation, which he defended with distinction*) + PP (*on the table*) for (14), are by no means unavailable. These subcategorized grammatical alignments have a magnitude, but of importance here is they are nevertheless violable orderings.⁸⁾ Verbs like *find* and *consider* are analogous to *call* (=13) and *put* (=14) in that a predicative relation

also holds between a nominal and predicative adjective. Thus, for some speakers of English, post-nominal adjectives may float over the heavy NPs.⁹⁾

(15) Ruth considered stupid, everyone who supported her. [Postal 2010: 400]

(16) I found rather more promising the proposal that his sister had made.
[Huddleston and Pullum 2002: 1384 (7ii)]

For these verbs, pleonastic *it* -- the lightest element in English in light of (3) -- may alternatively be invoked, if what is predicated goes beyond an argument and involves a propositional content. It should be noted that the following example obeys both Syntactic Complexity Hierarchy and the Syntactic Buoyancy Principle, thereby forming an impeccable grammatical sentence.

(17) Craig found it impossible to maintain a teacher-student relationship with Shoko.

3.2 More global phenomena

Aside from what triggers a constituent shift in a given context, the domain where one can see the Syntactic Buoyancy Principle is not limited to the post-verbal positions. Its effect is actually observed globally in a sentence across the main verb. I will list three cases that can support students' confidence in building their English grammar when reading.

First, if a clausal subject (or heavy subject) is interpreted as non-factive, it must be moved after a verb so that we have to fill the subject position with pleonastic *it*.¹⁰⁾ This is known as **Extraposition**, and students are supposed to be familiar with it before their college entrance.

(18a) It seems that no college libraries are open during the holidays.

(18b) *That no college libraries are open during the holidays seems.

Given a predicative adjective like *be likely* does not require its clausal subject to move across itself (*That no college libraries are open during the holidays is likely*), the ungrammaticality of (18b) might be attributed to syntactic imbalance of the constituent weight between the pre-verbal element (*that no college libraries are open during the holidays*) and post-verbal element (*seem* in contrast to *be + likely*).

Second, the fundamental function of passive formations is to suppress the familiar agent

of an action regardless of differences in languages. Thus, when a demoted subject needs to be represented for some reasons, it usually contains more information (e.g., than 1st or 2nd person). The demoted subject figures in the passive sentence as a heavy *by*-phrasal constituent.

- (19) I have been harassed for a long time by my colleagues, who are friends of my ex-wife.

In the following example, the subject of passive is postposed, but the past participle *arrested* is also pre-posed over *were*, whereby the resulting sentence ends up in the reverse order of the unmarked order *Nathan Johnson and his brother were arrested*.

- (20) Arrested were Nathan Johnson, 23, of New York, and his brother, Victor Johnson, 32, a 15-year Army veteran. [Huddleston and Pullum 2002: 1385 (1iv)]

Another (somewhat marginal) example for post-posing is:

- (21) ?*A professor was appointed of linguistics. ≈ A professor of linguistics was appointed.

These examples, (20) and (21), are arguably derived intransitive sentences, but even in cases of pure intransitive sentences, we can occasionally see a Syntactic Buoyancy Principle at work; in what follows, the subject NP is split into two parts, and the modifier (a relative clause) is placed after the verb phrase *came in*.

- (22) A person came in who claimed that he was appointed as my ex-wife's attorney.

This kind of sentences may be peculiar to a certain genre of writing (e.g., newspaper headings), but nevertheless, it is part of English. Students are expected to “undo” the inverted examples into the unmarked orders.

Finally, various complements of verbs are also pre-posed over the main verb (including the copula *be*). Instructors need not detail conditions in which each inverted sentence is felicitously used. For English reading at college level, simply presenting the following range

of examples will usually suffice. Brief pedagogical guidance such as “A pre-posed element cannot be unfamiliar information” and “This type of inversion is to give a more emphatic or exclamatory reading to the whole sentence” can support learners’ understandings.

(23) Of interest here is that Audi has chosen this technology over batteries.

(24) So absurd is his manner that everyone laughed at him.

[Celce-Murcia and Larsen-Freeman 1999: 614]

(25) Watching the moonless night unfold were parents, black and white, many of whom had resisted the idea and had never been to an integrated prom.

[New York Times: see Belkin (2004) in References]

(26) That will partly depend on money, said Ms. Sabur, who drives an '86 Honda with 186,000 miles.

[New York Times: see Belkin (2004) in References]

4. Concluding remarks

English is generally regarded as having fixed word order, but actual sentences exhibit considerable variability in their possible orderings. This short paper reported one way of comprehending a number of distinct constructions, in which orderings between phrases are not tightly fixed. For those who use English as a second language, one way text and email may be the most common places to encounter such expressions, not the spoken word (e.g., telephone or face-to-face meetings). They thus need not construct such marked expressions, but they must understand and respond to them. I suggested that Syntactic Buoyancy Principle could be a highly reliable cue to help undo such phrasal shifts, so as to re-construct the canonical orders for accurate reading comprehension, despite constituent weight being just one factor to invoke various phrasal movements.¹¹⁾

Notes

- 1) This short article is dedicated to Professor Sumio Sakomura, former Director of Keio Research Center for Foreign Language Education and Past President of Keio Academy in New York, on the occasion of his retirement. Professor Sakomura's support and encouragement brought me an intellectually enriched life and a career in academe. A dedicated paper like this is a small token of appreciation for a mentor who provided such support. I am also very grateful to Craig D. Howard and three anonymous reviewers for their extensive comments on earlier versions of the present paper.
- 2) The term "Syntactic Buoyancy Principle" is originally credited to Jerrold M. Sadock. I appropriate his ideas here and have attempted to give credit wherever possible. However, the concept itself is his, not mine. The interested reader is referred to Sadock (2000, 2012).
- 3) An adjectival phrase [AP] may follow an NP and precede a PP, a suggestion made in Ueno (2012).
- 4) One factor that triggers various shifts is to avoid a structural ambiguity.

Pat saw a man in a funny hat with a telescope.

Pat saw with a telescope a man in a funny hat. [Wasow and Arnold 2003: 134 (7)]

Another factor is the pragmatic (or discoursal) status of NP. In English, less familiar information is placed towards the end of a sentence.

Jenkins walked back into the office and glanced out of the window. Turning around, he saw on the desk a gun. [Huddleston and Pullum 2002: 2383 (5)]

Thus, the NP *a gun* is postposed to the end of the sentence, although it is the "lighter" constituent than the PP *on the desk* in the light of (2).
- 5) Thus, while *The word was looked up* is a grammatical sentence, **Up what did she look?* and **She looked quickly up the word* are not.
- 6) Phrasal verbs such as *get through* ('convey') and *see through* ('survive') are exceptional in that a verb and a particle must always be separated despite weight differences in constituents. Phrasal verbs such as *come across* ('encounter'), *go over* ('review'), and *look into* ('investigate') are also exceptional in that they never allow a direct object to intervene between a verb and a particle.
- 7) Interestingly, when two NPs are subcategorized for a sentence (e.g., *The teacher gave the student a book*), there is no way of pre-posing the direct object (*the book*) over the indirect object despite constituent weight (**The teacher gave a book his favorite student who studied Japanese*).
- 8) Included in this class are verb phrases such as *take .. into account* (as in *The child takes into account multiple aspects of a problem to solve it*. [from the internet]) and *break ..into pieces* (as in *He breaks into pieces the bronze snake that Moses had made*. [from the internet])
- 9) I am unable to state factors with which some individuals explicitly reject sentences like (15) and (16).
- 10) If a verb is factive, a clausal subject is allowed to remain as in the following example (Sadock 2012; 37).

That all college libraries are closed during the holidays sucks.
- 11) Then, the rest of marked orders in English would be **Negative Inversion** such as *Not only did I see her but also I talked to her in person* and *Under no circumstances may you enter this house again*.

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