Comparative Standards and the Feasibility of Conceptual Expansion

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The problem

It is often pointed out that the targets of comparison in a comparative construction should conform to some form of parallel structure requirement. Accordingly, we find the following examples in which the pronoun “that” cannot be omitted:

(1) a. The freezing point of alcohol is much lower than*(that of) water.

b. The heart of a bird is more powerful than*(that of) a mammal of similar size.

However, in Japanese, the discrepancy in (1) is allowed. In other words, the second target of comparison (comparative standard) is allowed to expand its reference in Japanese to fit itself to the parallel element in the subject position.

(2) a. Arukoko-no hyoosten-va nitsu (-no hyōten) yori hikii. [Alcohol-GEN freezing-point-TOP water (-GEN freezing-point) than low]

b. Tori-no shinzoo-wa onaji ookisa-no honyuurui (no shinzoo) yori tsuyoi. [Bird-GEN heart-TOP similar size-GEN mammal (-GEN heart) than powerful]

In English, the comparative standard is simply adjunctional, and its semantic importance is estimated to be relatively small. As the semantic importance of the comparative standard is different between these two languages, it is not surprising that conceptual expansion is only admitted in Japanese. This is because the processing effort devoted to the proper interpretation of a noun phrase with a lot of semantic importance sounds more reasonable than the effort allotted to the same task for a noun phrase with little importance. The participant worthy of much attention deserves the processing effort of singling out the designation most suitable for the particular context in which it is employed. On the other hand, the distribution of effort to a participant in a peripheral status is not deemed effective. The conceptual expansion of comparative standards in Japanese is more motivated than the same conceptual operation allotted to the comparative standards in English. This is a realization of the general distinction between items profiled in conveying the intended message and those in the shadow. Of course, attention falls on the former items rather than the latter, and the processing effort should be distributed accordingly.

English-type and Japanese-type languages

Not only in English, but also in other languages (German, French, Spanish, Italian, Russian, Hungarian, Arabic and Esperanto) where the indispensable comparative morpheme is attached to the comparative predicate just as in English, the conceptual expansion of the standard expression is generally not attested.

French (Romance)

(3) a. La population du Japon est plus grande que celle de la Corée.

b. *La population du Japon est plus grande que la Corée.

In contrast to the English-type, there are some languages similar to Japanese in that the mandatory morpheme of comparison is realized as a concomitant of the comparative standard (Korean, Chinese, Hindi, Swahili, and Turkish). In addition, they seem to be more tolerant of the conceptual expansion of the standard expressions.

Hindi (Indo-Aryan)

(4) a. Japan ki jānsânkhya koriya ki jānsânkhya se zyada hai. [Japan-GEN population Korea-GEN population from/than large is]

b. Japan ki jānsânkhya koriya se zyada hai. [Japan-GEN population Korea from/than large is]
Comparative adverbial phrases

Another interesting fact concerning the observations developed thus far is that even in English-type languages, when the crucial morpheme designating comparison is directly attached to the standard just as in the Japanese-type, the conceptual expansion is carried out without difficulty. This is achieved by employing adverbial phrases designating comparison. The present observation holds with regard to all the English-type natural languages cited in this study.

(5) a. Compared with (In comparison to) Japan, the population of Korea is smaller. [English]
   b. Im Vergleich zu Japan ist die Bevölkerung von Korea kleiner. [German]

General cases of conceptual expansion

Turning our eyes to general cases of conceptual expansion, we find that arguments lexically selected by the predicate of a clause are to be ready targets of expansion, in contrast to adjectival phrases in the periphery of the clause. (6a) is an instance of metonymy, where “the kettle” refers to the water in the kettle. However, the parallel expansion does not obtain in (6b). As an adjunct, the water contained in the kettle is not likely to be designated by the container. The intended meaning is realized in (6c), where a specific reference is made to the content of the kettle.

(6) a. The kettle is boiling.
   (the kettle = the water in the kettle)
   b. I put out the fire with the kettle.
   (*the kettle = the water in the kettle)
   c. I put out the fire with the water in the kettle.

The soup in (7a) refers to the fire heating the soup. Even if we know that the soup is put on the cooking stove, on hearing (7b), we will not take it to mean that the speaker got burnt by the soup. Rather, the speaker got burnt by the soup itself. Thus, in the position of an adjunct, literal interpretations are readily selected.

(7) a. Turn off the soup. (the soup = the fire heating the soup)
   b. I got burnt by the soup.
   c. I put out the fire with the water in the kettle.

Through the observation of expansion in more general contexts, these statements are interpreted as a realization of the principle stated in (8). And the unexpected expansions found in (9) can be treated with the principle (10) dealing mainly with the irregularity of conventional cases.

Conventional cases

The comparative structure in English has been claimed to be a restricted context of comparative constructions.

(11) a. The conceptual expansion of the standard of comparison holds with regard to all the English-type natural languages cited in this study. These statements are interpreted as a realization of the principle stated in (8). And the unexpected expansions found in (9) can be treated with the principle (10) dealing mainly with the irregularity of conventional cases.

Summary

The discussion in the former part of the paper leads to the following generalizations which apply to the conceptual expansion in a restricted context of comparative constructions.

(11) a. The conceptual expansion of the standard of comparison holds with regard to all the English-type natural languages cited in this study. These statements are interpreted as a realization of the principle stated in (8). And the unexpected expansions found in (9) can be treated with the principle (10) dealing mainly with the irregularity of conventional cases.

References


X-ray Astronomy in the Laboratory with a Miniature Compact Object Produced by Laser-Driven Implosion

Paper in journals: this is the first page of a paper published in Nature Physics.


X-ray spectroscopy is an important tool for understanding the extreme photoionization processes that drive the behavior of non-thermal quasar plasmas in compact astrophysical objects such as black holes. Even so, the distance of these objects from the Earth and the inability to control or accurately ascertain the conditions that govern their behavior makes it difficult to study them. The origin of the features is astronomical X-ray measurements. Here, we describe an experiment that uses the ionization of X-rays from a pair of X-RAY spectra to probe the physics of a simulated black hole. The X-ray spectra emitted from photoionized silicon plasma resemble those observed from the binary star Cygnus X-3 (11a). We find that the X-ray spectra of the standard of comparison are subject to a measurable expansion. As well as demonstrating the ability to create extreme radiation fields in a laboratory plasma, our use of interferometric X-ray spectroscopy is a significant step forward in the development of X-ray spectroscopy.

X-ray spectroscopy with X-ray satellites is the main observational context in which the data are interpreted. X-ray astronomy relies on non-linear thermally-quantum-limited (LTE) astrophysics, which is only valid for a cold gas subject to an extreme radiation field, for which the gas-radiation temperature is of the order of 10^5 K. Theoretical models have been developed in the basis of the coherent spectra and complex computer programs. We have developed the observed X-ray spectrum, which is the underlying assumption. The observed spectrum is the sum of the spectra emitted from a photoionized plasma. In other words, the inverse radiation from the source of the background gas and generates a relatively low-temperature ionized non-LTE plasma. However, X-ray spectroscopy on near-LTE photoionized plasmas have not been possible, mainly owing to the lack of an intense source of X-ray continuum radiation. Only recently has X-ray astronomy provided the extreme conditions in the laboratory.

Here, we present a novel generation and spectroscopy of non-LTE photoionized plasma. The source of the present experiment is the test of a laser-driven implosion. At the time of the experiment, we used a 10-kJ femtosecond laser pulse to generate a plasma (300 – 500 nm) of non-LTE photoionized plasma. This is similar to that of the observations in the laboratory experiment originating from a large laser implosion experiment in the field of advanced laser technology. The observed laser pulse and the X-ray spectrum were measured from photoionized silicon plasma. In addition, the expansion has nothing to do with the conventional type of expansion. This expansion has nothing to do with the peripheral character of comparative standards in English.

Through the observation of expansion in more general contexts, these statements are interpreted as a realization of the principle stated in (8). And the unexpected expansions found in (9) can be treated with the principle (10) dealing mainly with the irregularity of conventional cases.