

Some observations on multiple X

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Abstract: The point of departure for the present article is the question of whether adjunct free relatives and adjunct questions can or should be distinguished. It is suggested that there are no strong grounds for distinguishing them. Part of the discussion involves the issue of multiple wh structures. A link between wh-adjuncts and conditional clauses is suggested, raising the question whether multiple wh generalizes to multiple X, where X could include multiple targets in conditionals as well as multiple degree phrases in comparative and consecutive clauses. There is some evidence that the answer should be yes, but the jury is still out.

1. Multiple puzzles

The goal of this paper is a modest one, viz. to formulate a question that has bothered me for a considerable time and to place it in a somewhat wider context in the hope of thereby clarifying a few issues and, hopefully, improve the prospects for a solution that remains to be found. More specifically, I propose to explore, in section 2, the boundaries between indirect questions and adjunct free relatives (Van Riemsdijk, 2006:360f). In section 3, I discuss the absence of multiple wh in some languages and suggest that conjoined wh-constructions may constitute an alternative strategy to express multiple X. Section 4 explores the range of constructions in which multiple X appears to manifest itself, and section 5 adds yet another construction, comparative correlatives, to this inventory.

2. Free relative adjuncts or indirect questions?

Most discussions of free relative clauses (henceforth FRs) center around FRs in argument positions. Indeed, all the important questions surrounding FRs such as categorial and case matching arise in FRs of this kind. Observe, however, that in many cases what looks like a FR shows up in a non-argument, that is in an adjunct position:

- (1) Whatever you do, don't cross the road
- (2) Whenever you want to leave, just tell me

In both examples we appear to have the free choice interpretation typical of (the universal subtype of) FRs. The fact that the wh-word in these examples carries the suffix *-ever* reinforces this conclusion as *-ever* does not occur in questions, modulo some marginal exceptions such as *whatever are you talking about?* In contrast with *-ever* there are other wh-suffixes that are typically found with questions and not in FRs such as *the hell* and *the fuck*:

- (3) a. I wonder what the hell they will tell me
 b. Have you got any idea who the fuck this is?
- (4) a. *I tend to eat what the hell they serve me
 b. *I will talk to who the fuck I want
- (5) a. *What the hell you do, don't cross the road
 b. *When the fuck you want to leave, just tell me

The presumed adjunct free relatives in (5) pattern with the standard FRs in (4) and not with the embedded questions in (3).

Unfortunately, this is not all there is to say about this problem. There is another property that is generally attributed to questions and not to FRs: multiple *wh*. Indeed, it appears that presumed adjunct FRs such as those in (1/2) can be constructed with multiple *wh*:

- (6) Whatever book you buy in whatever store, you always end up paying too much
 (7) Whenever you want to buy whoever a birthday present, you never know what to get

The interpretations of such examples is very similar to the typical pair-list readings familiar from multiple *wh*-questions, except that here we have a pairing of free choices: it does not matter what book you buy, and it does not matter in what bookstore you buy it, you end up paying too much. That is, once you have made a choice out of the set of possible books, and once you have chosen a store from the set of possible stores, the resulting pairing will lead to your spending more than you should or want to spend.

There is, however, a quite plausible reason why multiple *wh* does not occur in standard FRs, as shown in the following examples:

- (8) a. I wonder who danced with whom
 b. *I met who danced with whom

It is generally agreed that in a simple standard FR the *wh*-word has a double function. On the one hand it plays a role in the semantics of the relative clause, as regular relative pronouns do, and on the other hand it plays a role in the matrix clause, as the head of a headed relative clause tends to do:

- (9) a. I met the girl who danced with Joe
 b. I met who Joe danced with

In (9a), *the girl* is the object of *met*, and *who* is the subject of *dance*. In (9b), however, *who* is both the object of *met* and the object of the preposition *with*. That is, it does double duty. This much is uncontroversial, though the proper treatment of such sharing phenomena remain somewhat controversial (cf. Van Riemsdijk, 2006 and references cited there).

Returning now to (8b), the problem is what the status of the second *wh*-word could possibly be. If it is only the first *who* that is shared with the matrix clause, then there is no conceivable way in which the second *wh*-word *whom* could be either interpreted as a question word or as a relative pronoun. The question word interpretation does not make any sense anyway, since we are looking at a FR. And we independently know that headed relative clauses with multiple *wh*-words do not exist. If we tried to force the issue, we would have to assume that the *wh*-word in situ could somehow undergo the absorption

process typical of multiple wh-questions (cf. Dayal, 2006 for extensive discussion). But then this would presuppose that absorption (normally thought of as covert movement or some other process in LF) results in a syntactic object that can be shared by the matrix structure. In the case of (8b) this would result in a meaning roughly corresponding to ‘I met the pair of persons *x* and *y* such that *x* danced with *y*. But both *x* and *y* would be represented by the single wh-word *who*. That would imply a kind of across-the-board movement of both the subject *who* and the prepositional *who* into the Spec,CP position of the relative clause, clearly an impossibility.

I conclude from these considerations that it is the absence of sharing and the absence of ATB-movement in examples like (6/7) that permits the multiple wh property. Hence we can still maintain the possibility that such examples are adjunct FRs and not indirect questions.

There are other problems for the adjunct FR analysis, however. Consider the fact that *whether* can also be used to introduce semantically similar adjuncts:

- (10) Whether you believe it or not, it’s going to rain
- (11) Whether or not he has enough money isn’t the issue

The difference between these two examples is that in (11) the wh-clause introduced by *whether* is the subject of the matrix clause while in (10) the *whether*-clause is an adjunct. Indeed the matrix predicate in (11) is one that typically takes an indirect question as a subject. A predicate that typically does not yields an ungrammatical result with a *whether*-clause, as shown in (12).

- (12) *Whether or not he has enough money is a dubious fact

In (10) on the other hand, there is no such sensitivity to the choice of the matrix predicate. Put differently, the matrix predicate must be saturated independently of the adjunct.

Suppose we take this to mean that (10) can still be an (adjunct) FR, we must then ask again why *whether* cannot show up in regular FRs. Or can it? Ostensibly it cannot. That is, every time a *whether*-clause is selected by some matrix predicate, we call it an indirect question. That makes sense to the extent that the interpretation of *whether*-questions differs from that of FRs in at least one crucial respect. FRs are either definite (*I ate what you prepared* – *what* is ‘the (food) thing(s) that you prepared’) or free choice universals (*I will eat whatever you prepare* – *whatever* means anything that you happen to prepare). *Whether (or not)* does not fit either of these two meanings in any obvious way.

Adjunct FRs belong to the free choice subcase of FRs. Might we not say, then, that *whether* is special because, being the element that introduces Yes/No questions, the choice is limited to two options but is otherwise as free as can be. So we again find ourselves in a position where it is not clear at all whether at the level of adjuncts there is any systematic distinction between questions and FRs. It is as if the distinction which, in selected positions, is clear enough, is neutralized in adjunct positions.

This suspicion is reinforced when we consider what type of adjuncts we are actually talking about. In many cases these adjuncts appear to be very close to conditionals. This is indeed suggested by the fact that the word *if* occurs both in conditionals and in questions. The generalization is stated explicitly in Bhatt and Pancheva (2006):

- (13) Interrogative adjunct clauses are interpreted as conditionals
(= Bhatt and Pancheva, 2006:(42))

Many authors have contributed to this generalization, see their article for references. To illustrate, take example (2) above. This example is easily paraphrasable as (13).

(14) If (at any time) you want to leave, just tell me

If this line of reasoning is on the right track, then it should not come as a surprise that conditional adjuncts of this type can also be ‘multiple’ in the sense that the computation to determine whether the condition is met involves more than one target. Take an example like the following.

- (15) a. If I come across any article on Lezgian in any linguistics journal, I get very excited
 b. If you want to drink any alcoholic beverage in any city of Pakistan, you had better do so in a private home with the curtains closed

Clearly what gets me excited in (15a) is not any old article on Lezgian, nor an arbitrary article in a linguistics journal, but the combination, that is, an article in a linguistics journal that discusses Lezgian. Similarly, the caution expressed in (15b) holds for the combination of alcoholic beverages and cities in Pakistan, not for non-alcoholic beverages, and not for cities in many other countries. Without venturing any thoughts on how to formalize this, it seems quite clear that combining two noun phrases in a conditional clause in this way is essentially the same thing as combining two (or more) wh-phrases by absorption in multiple questions.

If the above considerations are on the right track, they raise a number of questions about what does and what does not belong in the realm of what we may call ‘multiple X’, in other words constructions in which more than one phrase constitutes the target for the calculation of the values that must be obtained in order for some condition or question to hold in a significant way. These are predominantly semantic questions, which I should and will leave to semanticists to answer. My sole purpose here is to contribute a few syntactic observations that may be useful in drawing the lines of what does and what does not belong to the species ‘multiple X’ This is what I will take up in the next section.

3. Absence of multiple wh and alternative strategies

Some languages, such as Italian, lack the possibility of using the multiple wh strategy, see (2008) for discussion:

(16) *Non so qual libro ho comprato dove
 non I-know which book I-have bought where
 ‘I don’t know which book I bought where’

(17) *Quando lo hai trovato dove, questo anello?
 when it you-have found where, this ring
 ‘When did you find it where, this ring?’

There is, however, an alternative strategy that such languages can use to produce the same effect: conjoined *wh* (example from Haida and Repp (to appear)).

- (18) Quando e dove esci normalmente?
when and where you-get-out normally
'When and where do you normally get out?'
- (19) Quando e dove lo hai trovato, questo anello?
when and where it you-have found, this ring
'When and where did you find it, this ring?'

Note that the use of this strategy is not limited to languages that lack multiple *wh* constructions such as Italian. English also likes to use conjoined *wh*-phrases. Note further that Italian FRs differ in other ways from Germanic ones (cf. Caponigro, 2002, 2003):

- (20) C' è chi dice sempre sì
there is who says always yes
'There is someone/are people who always say(s) yes'
- (21) Non aveva dove nascondersi in caso di pericolo
not he-had where hide in case of danger
'He did not have anyplace to hide in case of danger'

The difference appears to be that these FRs have an essentially indefinite interpretation, as opposed to FRs of the Germanic kind, as discussed briefly in section 2 above. Other languages that are like Italian (according to Caponigro) include Spanish, Portuguese, French, Romanian, Russian, Serbo-Croatian, Bulgarian, Hungarian, Modern Greek, Modern Hebrew, and Yiddish. It is tempting to suppose that this property is somehow related to the (non-)occurrence of multiple questions. This issue must unfortunately be relegated to future research.

Turning back to the more central topic of this paper, is it possible to use the conjoined *wh* strategy also in adjunct FRs?

- (22) To whichever doctor you go in this country and with whatever type of ailment, you are likely to be wrongly diagnosed and ripped off
- (23) You will learn to become a food detective and control what and when you eat
(from Whitman, 2005:73 ex (87))

(23) is a typical FR adjunct, (24), however, is interesting because it appears to be at least in part a selected FR in that *what* is the object of *control*. And the *when* part may well be a selected FR as well to the extent that the meaning approximates *control at what time you eat / control the time at which you eat*. Or could this be a case of a conjoined adjunct question? The question may simply be the wrong question. As suggested at the end of section 2, there may not be any real difference between adjunct FRs and adjunct questions.

4. Towards multiple X

There are, of course, many constructions that the general term ‘multiple X’ could apply to. Take, for example, the fact that (headed) relative clauses can take multiple heads, as in:

- (24) We tend to team up boys_i with girls_j in our school [that have a high IQ]_{i+j}
 (25) Sports cars_i tend to go together well with handbags_i, generally, [that have been created by Italian designers]_{i+j}

Similarly, multiple superlatives can occasionally take a single PP adjunct.

- (26) [Of the icons on your display]_{i+j}, the most useful ones_i should be separated from the cutest ones_j

In both cases, it would appear that there is a set of items (pupils, objects designed by Italians, icons). The relative clause or adjunct roughly describes that set. The multiple heads to which those relative clauses or PP-adjuncts apply represent subsets that entertain a certain relation described in the main proposition (team up x with y, x goes together well with y, x should be separated from y).

These cases may very well be genuine instances of what I call multiple X. But in order to not be led too far astray, I will limit myself here to two cases involving degree words, comparative and consecutive clauses. Consider the following multiple comparatives with a single *than*-clause, and multiple *so*-phrases with a single consecutive *that*-clause.

- (27) More people_i do crazier things_j at higher speeds_k on the McGrath Highway [than they do other places]_{i+j+k} (example from Andrews, 1985, attributed to Mark Liberman)
 (28) John has more girl friends_i in more cities_j [than anyone else I know]_{i+j}
 (29) John has so many girl friends_i in so many cities_j [that he tends to forget which one is where]_{i+j}
 (30) Bill drank so many glasses of whisky_i in such a short time_j [that he died of alcohol poisoning]_{i+j}

Do these have anything in common with one another and with the previously discussed wh-adjuncts? It would appear that they do in the sense that a kind of absorption is involved in all these cases. That is the multiple comparatives must be computed in combination in order to evaluate whether the combined degree indeed exceeds the standard of comparison described in the *than*-clause. Similarly, the (elevated) number of girl friends and cities must together attain a certain value in order for the consequence described in the *that*-clause to ensue, and similarly it is the number of glasses of whisky combined with the relative shortness of the interval in which they got drunk that leads to the consequence of alcohol poisoning. For some relevant literature, see Corver (1993), Hendriks (1994) Meier (2001), Oda (2008), Von Stechow (1984).

Given this similarity, it should not come as a surprise that in many of these cases, an alternative with coordinated phrases is available:

- (31) More people do crazier things and at higher speeds on the McGrath Highway than they do other places (cf. (27))
 (32) Bill drank so many glasses of whisky and in such a short time that he died of alcohol poisoning (cf. (30))

Note also that, as in the case of conjoined wh-questions the coordinated Xs can sometimes be ‘adjacent’ or ‘distant’, which, depending on one’s analysis may correlate with phrasal vs. (reduced) clausal. In the case of resultative constructions, however, it appears that the phrasal (non-distant) conjoined variant is ungrammatical for reasons that remain obscure.¹

- (33) a. When and where did you find it, this ring?
b. When did you find it and where, this ring?
c. When did you find it, this ring, and where?
- (34) a. *So many glasses of whisky and in such a short time did Bill drink that he died of alcohol poisoning
b. So many glasses of whisky did Bill drink and in such a short time that he died of alcohol poisoning

At this point we should also ask whether we are not deluding ourselves that any kind of absorption is involved in such cases. What about multiple topicalization, for example. This is generally held to be impossible in English, as shown in (35).

- (35) *To John_j, that book_i, (Bill said that) Mary handed t_i t_j (Bošković, 2004:(16)p621)

And conjoining the two topicalized phrases does not help:

- (36) *That book and to John, (Bill said that) Mary handed

Essentially the same facts, though perhaps marginally better, are found with argument+adjunct and with two independent adjuncts:²

- (37) ?*On a sunny Saturday morning for no apparent reason (Bill said that) Mary handed him that book

Observe that conjoining the two topicalized phrases does not improve these examples either:

- (38) a. *That book and on a sunny Saturday morning (Bill said that) Mary handed him
b. ?*On a sunny Saturday morning and for no apparent reason (Bill said that) Mary handed him that book

It appears, then, that we are justified in singling out cases in which some kind of absorption needs to be assumed to apply for semantic reasons. It should be kept in mind, however, that many languages do allow multiple topicalization. German and Dutch, for example, frequently allow more than one phrase to “share” the first position, i.e. the position

¹ Thanks to Jonathan Bobaljik, Joe Emonds and Edwin Williams for providing the judgment on example (34).

² Note that the intended reading here is the one in which both adjuncts modify the most deeply embedded clause, i.e. Mary’s handing Bill that book.

preceding the finite verb in main clauses. See Müller (2003) for ample illustration in German:³

- (39) [Alle Träume] [gleichzeitig] lassen sich nur selten
 all dreams simultaneously let themselves only rarely
 ‘You rarely get to realize all dreams simultaneously’ (Müller’s (3b))

verwirklichen
 realize

- (40) [Die Kinder] [nach Stuttgart] sollst du bringen
 the children to Stuttgart should you bring
 ‘You should bring the children to Stuttgart’ (Müller’s (14f))

But even if these cases appear to have something in common with the constructions discussed under the heading absorption, it should be noted that they are absolutely ungrammatical when the two topicalized phrases are conjoined.

- (41) a. *Alle Träume und gleichzeitig lassen sich nur selten verwirklichen
 b. *Die Kinder und nach Stuttgart sollst du bringen

Therefore, I tentatively exclude multiple topicalization cases from the discussion.

To conclude, let us now turn to a last case of conditional adjuncts, comparative correlatives.

5. Comparative correlatives

A last construction that I propose to look at in the present context is that of comparative correlatives, often also referred to as comparative conditionals. For some selective literature on this construction, see Beck (1997), Den Dikken (2005), McCawley (1988). The issue of the construction’s name is discussed in some detail in cf. Brasoveanu (2008), and for a different view as well as data on Spanish and French, see Abeillé and Borsley (2008).

Comparative correlatives are exemplified in (42).

- (42) The faster you drive, the riskier it gets

As it happens, comparative correlatives in English are somewhat special in some ways, therefore it is good to start with a look at Dutch (43/44) and German (45/46).

- (43) Hoe vaker je vitamines neemt, hoe gezonder je wordt
 how oftener you vitamins take how healthier you get
 ‘The more frequently you take vitamins, the healthier you get’

³ Müller shows that many of the examples he cites can be analyzed in different ways and points out that some, such as (40), while attested, are not accepted widely.

(44) Hoe harder je rijdt, desto meer benzine gebruik je
how faster you drive the more gas use you
'The faster you drive, the more gas you use'

(45) Je öfter man in die Disko geht, desto schneller
the oftener one in the disco goes, the fast
'The more frequently you go to the disco, the faster you become deaf'

wird man taub
becomes one deaf

(46) Je weniger Bücher du liest, desto mehr Zeit du
the fewer books you read the more time you
'The fewer books you read, the more time you have for music'

hast für die Musik
have for the music

In view of the fact that comparative correlatives contain degree operators (cf. the discussion on multiple comparatives and consecutives in section 4 above), it is tempting to investigate whether they share the other properties that we have found: the semantics of conditional adjuncts, multiple X and a conjoined X alternative.

On the first property, we can be brief. A sentence like (42) is straightforwardly paraphraseable as (47).

(47) If you drive faster, it gets riskier

Similarly, a German example like (45) can be paraphrased as (48).

(48) If you go to the disco more frequently, you will become deaf more quickly

And indeed, it does not come as a surprise that there are multiple X comparative correlatives as shown in (49) for German.

(49) Je mehr Bücher weniger Seiten haben,
the more books fewer pages have
'The more books have fewer pages the better it is for the environment'

desto besser ist das für die Umwelt
the better is that for the environment

The meaning of this example, very roughly, is that given the total number of books, if the subset of books with a smaller number of pages (than average) is larger (than average), then it is better for the environment. And the more the combined numbers/extents deviate from the averages, the better.

(50/51) exemplify the same property in Dutch.

(50) Hoe meer taalkundigen lezen over uiteenlopendere talen
 how more linguists read about more-diverse languages
 ‘The more linguists read about more diverse languages, the better they will become’

deste beter zullen ze worden
 the better will they get

(51) Hoe meer taalkundigen over uiteenlopendere talen |lezen
 how more linguists about more-diverse languages |read
 ‘The more linguists read about more diverse languages than usual, the better they

dan gebruikelijk, deste beter zullen ze worden
 than usual, the better will they get
 will become’

Note that (51) is identical to (50), but with a (reduced) *than*-clause explicitly stating that the evaluation is in terms of the average. The meaning here amounts to saying that if the number of linguists reading about more languages than the average linguist reads about exceeds a certain average, then those that do will become better linguists. Again, we find that computing the meaning of such a sentence involves a quite complex process of absorption of the individual evaluations of the degree phrases.

Native speakers of English may well have noticed that the translations of (49-51) are not grammatical.⁴ Indeed, it appears to be the case that English lacks multiple comparative correlatives. In assessing this fact, we need to be cautious, for an example such as (52) does not appear to be bad.

(52) The more people read more books, the lower the crime rate

Note however that (52) is potentially ambiguous. The first *more* can either be a prasal modifier of the DP *people*. In that case it means something like ‘if it is the case that an above average number of people read an above average number of books, then the crime rate will be lower’. Alternatively it can be an independent DP signifying an above average number (or frequency) of events, i.e. ‘if it is more often the case that people read more books than average, then the crime rate will be lower.

Indeed, (52) is ungrammatical on the frequency of events reading but ungrammatical on the ‘number of people’ reading. That this is so is confirmed by the ungrammatical (53) because *fewer* cannot be interpreted as Degree Phrase denoting a (low) frequency of events.

(53) *The fewer people read fewer books, the higher the crime rate

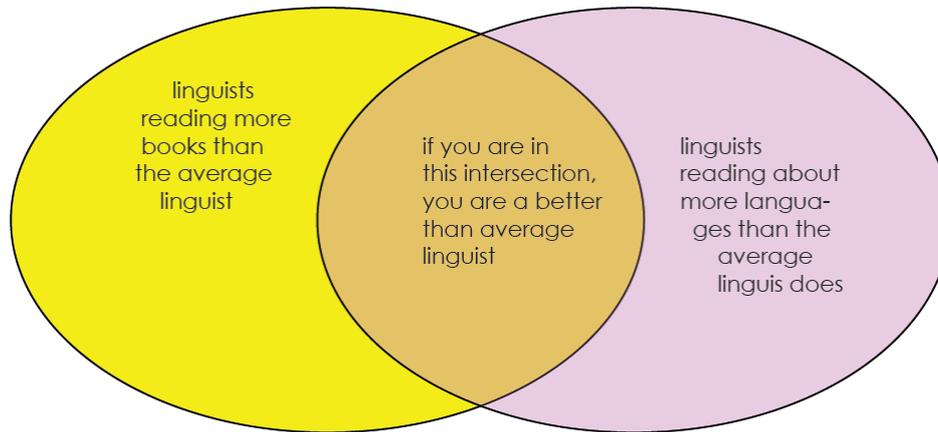
In Dutch and German, however, the independent degree phrase reading evaluating the frequency of events is not available, hence *meer/mehr* in (49-51) must be interpreted as a

⁴ Thanks to Edwin Williams for pointing this fact out to me, as well as the relevant observation regarding (52).

phrasal modifier of the head noun (i.e. ‘more books’, ‘more linguists’). Still, these examples are grammatical.

Clearly, computing the averages that are involved here is a far from trivial semantic issue which requires a higher degree of semantic sophistication than I am able to provide here. The intuitive idea seems fairly straightforward, though. The meaning of an example like (50) could be visualized as follows:

(54)



Turning back to the Dutch example in (51), it should be observed that relative clauses, consecutive clauses and comparative clauses can be multiply headed. Indeed, the (reduced) *dan*-clause in (51) may be taken to be multiply headed by the two comparative phrases. This type of multiple construal of the comparative clause can be seen as a kind of manifestation of absorption. Going one step further, we might say that it is the absorptive construal that licenses multiple heads of this kind. This way of thinking would be, if I understand correctly, compatible with the proposal of late merger of degree clauses advanced in Bhatt and Pancheva (2004).

The impossibility of multiple comparative correlatives in English remains as mysterious as does the absence of multiple questions in Italian. Whether or not it is legitimate to suspect there to be a connection between these two cases, it does raise the question as to whether the restriction in English can be circumvented by making use of conjoined comparative correlatives.

(55) The fewer people read books, and the fewer books *(they read), the higher the crime rate (cf. ex (52))

There is a constraint on multiple *wh* in English: the verb must be (pseudo-)intransitive, and at least one of the two conjuncts must be an adjunct (cf. Haida and Repp, to appear). While (55) does not appear to be impossible, (56) may well be somewhat better in that it meets the same constraint.

(56) The more articles you read, and the more quickly you do so, the better your chances of getting admitted at MIT

Be that as it may, it does appear that conjunction must take place at the clausal level and cannot be phrasal. Hence it is not clear that conjoined comparative correlatives can be assimilated to conjoined wh-questions or wh/FR-adjuncts.

6. Multiple puzzles

This short note raises a number of questions that deserve to be investigated in more detail. Rather than suggest possible solutions tying the various, apparently interrelated, properties together in some way, I have given priority here to outlining what the (potentially) relevant properties are, and how they are distributed in a number of languages. We first need to understand whether ‘multiple X’ is a genuine generalization or not. And if it is, we need to know more about the constructions it occurs in – e.g. does conditionality truly play a role. Third, we need to gather data on what the actual variability across languages is. Then, perhaps, we can start worrying about the best way to relate the variation to independent structural factors in the languages in question. This, in other words, was just a small beginning...

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