Towards a Neg-Lowering Analysis of Neg-Raising in English

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Park, Myung-Kwan. "Towards a Neg-Lowering Analysis of Neg-Raising in English." *Studies in English Language & Literature* **49.4 (2023): 209-225.** This paper investigates the phenomenon of Neg-Raising (NR) in English. There are two approaches to this phenomenon. One is the traditional syntactic NR approach, where the negation is raised to the matrix NR-allowing predicate. The other is the semantico-pragmatic approach, where via the exclusive middle inference, the negation base-generated in the matrix predicate is construed in the lower clause. This paper departs from these two approaches, arguing that the negation generated in the matrix clause undergoes syntactic Neg-Lowering (NL) to the embedded clause at LF. This argument is based on the NL and negative polarity item (NPI) interaction under VP or TP ellipsis. We reinforce this argument by drawing on the fact that NL is sensitive to the type of quantifiers in embedded subject positions. We then provide an NL analysis for some issues that can pose challenges to the previous approaches to NR. (Dongguk Univeristy)

Key Words: Neg Raising, Neg Lowering, NPI, exclusive middle inference, quantifier types

I. Introduction

Neg-Raising (NR) refers to a phenomenon, where specific negated verbs (such as 'think', 'believe', 'expect') can lead to interpretations where the negation appears to originate from a subordinate clause. There are two approaches to studying NR: one is a syntactic approach (as discussed by Fillmore (1963), Horn (1978), and Collins

and Postal (2014), and the other is a semantico-pragmatic approach (explored by Bartsch (1973), Gajewski (2005, 2007), Homer (2015), Romoli (2012, 2013), and Zeijlstra (2018)).

Collins and Postal (2014) have resurrected the idea that NR arises via a syntactic process in which negation moves from a lower clause to a higher one. This concept has its origins in Fillmore (1963) and was also embraced by Horn (1972, among others). According to this theory, the syntactic structure of (1a) is represented as in (1b), and the interpretation of the sentence obtains from construing negation in its original position (where <NEG> is a lower copy or trace of the negation), while the higher copy of NEG is manifested phonologically.

(1) a. I don't think you're right.
    b. I do NEG think that you're <NEG> right.

In contrast, the semantico-pragmatic approach offers two variants: the presuppositional approach, as in Gajewski in (2005, 2007), posits that NR predicates inherently trigger an excluded middle (EM) presupposition. In other words, the speaker is assumed to hold a definite opinion about the truth or falsehood of the embedded proposition. The NR interpretation then naturally follows from this presupposition in conjunction with the literal meaning of the sentence, as in (2). In the implicature approach, on the other hand, the process is quite similar, with the exception that the excluded middle inference is not attributed to a presupposition but rather arises as an implicature. This means that it's not a presupposition but rather an inference drawn from the context.

(2) (i) Assertion: It's not the case that I think that you're right.
    (ii) Presupposition/Implicature: I think you're right or I think you're not right.
    (iii) EM-induced inference: I think you are not right.

In this paper, we re-assess the previous approaches to NR, seeking an alternative approach to it. To do so, this paper is organized as follows. Section 2 investigates the interaction of NR with a strong negative polarity item (NPI), showing that an alternative approach to NR than the conventional ones is in need. Section 3 reinforces the argument for the alternative Neg-Lowering approach to NR, by drawing on the fact that the lowering of the negation from the matrix clause in NR contexts is sensitive to the type of quantifiers in embedded subject positions. Section 4 addresses some potential problems that the proposed NL as well as the conventional approaches to NR may encounter in accounting for the empirical aspects of NR/NL. Section 5 wraps up with a conclusion.

II. NRP and NPI interaction under ellipsis

2.1 An NRP-internal NPI under VP Ellipsis

The elided verb phrase (VP) containing a Neg-Raising predicate (NRP) consistently retains a clausal polarity in the clause where VP ellipsis occurs, regardless of that in the antecedent clause, as follows:

(3) John doesn't think that it will rain, but Sue does.
(4) John think it will not rain, and Sue does, too.

If it fails to maintain this consistency and permits a shift in a clausal polarity, then the resulting structure is not allowed due to a violation of the identity in ellipsis, as in (5):

(5) John doesn't think it will rain, and *Sue also does [$_{VP}$ ~~think it would not rain~~].

This representation becomes a possibility when the negation in the antecedent clause is interpreted within the complement clause through an EM inference. The elided VP is then filled in with its antecedent VP, with the negation being interpreted within the complement clause as well. However, the ban on VP ellipsis changing a clausal polarity in relation to its antecedent implies that in elliptical NR environments, even when the embedded complement inside the elided VP can potentially recover the negation through an EM inference, it cannot be licensed. On this issue, Crowley (2019) notes that strong and weak negative polarity items (NPIs) display distinct behaviors: the former are unacceptable, while the latter are acceptable. The following examples illustrate this point.

(6) *John doesn't think it will rain **until tomorrow**, and Sue also does.

Crowley (2019: 17, (52))

(7) Mary didn't think that John had **ever** visited, but Sue did.

Crowley (2019: 16, (48))

It is worth noting that as can be found in (6) and (7), in addition to weak NPIs like 'any NP', 'ever', etc., strong NPIs like 'a damn thing', 'lift a finger', *punctual 'until' XP*, and 'in years,' that call for a negative licensor in the same clause are licensed in NR environments.

(8) John doesn't think it will rain until tomorrow.

(9) Mary didn't think that John had ever visited.

A similar contrast to the one observed between sentences (6) and (7) can be found in anti-additive contexts. In these contexts, where within the c-command domain of the main clause's negation, there exists an existential NP functioning as a relative head followed by a relative clause,[1] strong NPIs are prohibited, while

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[1] The downward-entailing inference in this environment is illustrated by the test in (i):

weak NPIs are permitted, as in (10) and (11). (see Chierchia (2004); Gajewski (2011); Collins and Postal (2014), a.o., for more discussion.)

(10) *John didn't know a person who had seen Bill in years.

(11) John didn't know a person who had ever met Bill.

The contrast between strong and weak NPIs arises due to their different licensing requirements. While strong NPIs necessitate a strict negative licensor, weak NPIs do not rely on such a licensor. At the same time, weak NPIs have the flexibility to employ alternative strategies for their licensing. In the anti-additive context of sentence (11), the weak NPI 'ever' can be licensed within a less stringent logical relation compared to the strong NPI 'in years' in sentence (10). It can also make use of its allomorphic counterpart 'once' instead of 'ever' in the ellipsis context of sentence (7), similar to how the weak NPI 'any' in sentence (12) can utilize 'some' in the same environment (Fiengo and May, 1994).

(12) Bill didn't take any lessons, but Sue did [$_{VP}$ ~~take some lessons~~].

Coming back to the contrast between (6) and (7), repeated below,

(6) *John doesn't think it will rain **until tomorrow**, and Sue also does [$_{VP}$ ~~think it will rain~~ **until tomorrow**].

(7) Mary didn't think that John had **ever** visited, but Sue did [$_{VP}$ ~~think that John had once visited~~].

It's important to note that sentence (8), which serves as the first conjunct of (6), is grammatically correct. Likewise, sentence (9), which is the first conjunct of (7),

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(i) John didn't see a student who played an instrument.
⇒ John didn't see a student who played the violin.

is also grammatical. If the elided VP in the second conjunct of (6) were to copy the matrix VP of the first conjunct, including the negation postulated within the complement clause through an EM inference, it would lead to rule in sentence (6) incorrectly. The fact that sentence (6) is ungrammatical strongly supports a deletion approach to VP ellipsis, rather than a copy approach.

In our proposed deletion analysis for VP ellipsis in sentences (6) and (7), there is no opportunity for the EM inference to come into play. These two sentences are polarity-wise positive clauses, meaning that the complement clauses within the elided VPs cannot be negated. This is because the elided VPs themselves have positive polarity within these positive clauses where VP deletion occurs. Consequently, the strong NPI within the deleted VP in (6) remains unlicensed, whereas the weak NPI within the deleted VP in (7) can transform into its allomorphic counterpart 'once,' thus offering an alternative licensing solution.

2.2 A complement clause-internal NPI under Sluicing/TP Ellipsis

Let's examine the interplay between an NPI and TP ellipsis/Sluicing. Firstly, it's worth noting that a strong NPI is permissible exclusively within the complement clause of Neg-Raising predicates (NRPs) such as 'think' and 'believe,' as in sentences (13a) and (14a). By contrast, it is not acceptable within the complement clause of non-NR predicates like 'claim,' as shown in (13b), nor within the negated complement clause inferred by the EM with the complex predicate 'not of the opinion,' as in (14b).

(13) a. John doesn't think [$_{CP}$ Mary will return until tomorrow].
     b. *John didn't claim [$_{CP}$ that Mary would return until tomorrow].

                                                              Gajewski (2007: 293)

(14) a. John doesn't believe [$_{CP}$ that Mary will arrive until Friday].
     b. *John is not of the opinion [$_{CP}$ that Mary will arrive until Friday].

                                                       Collins and Postal (2018: 13, (17a))

We can thus only use (13a) and (14a) to examine whether a strong NPI can be allowed in TP ellipsis contexts, since (13b) and (14b) are not permitted anyway before TP ellipsis applies.

The test sentences are of the following structures as in (15) and (16), and they are acceptable (the judgement being attributed to Michael Barrie (pers. commu.).

(15) John doesn't think [TP Mary will return until tomorrow], but John doesn't
       know exactly why [[Pol: Neg] Mary will return until tomorrow].

(16) John doesn't believe that [TP Mary will arrive until Friday], but John doesn't
       know exactly why [[Pol: Neg] Mary will arrive until Friday].

The grammaticality of these sentences aligns with the outcomes predicted by the analysis regarding the polarity reversal phenomenon in TP ellipsis (Park and Lee, 2023). In our proposed account, the initially unvalued polarity feature [Pol:__] located at the periphery of the elided TP receives a valuation of [Pol: Neg] within the construal component (i.e., the semantics-pragmatics interface) through an entailment relation originating from the EM-inferred embedded TP in the first conjunct to the elided TP in the second conjunct. This valued feature, [Pol: Neg], functions as a valid licenser for the strong NPI within the elided TP-internal structure in sentences (15) and (16).

A question arises regarding the licensing of a strong NPI within the non-elliptical complement clause of NRPs. To delve into this issue, let's revisit (13a-b) as (17a-b), and we'll also introduce (17c) from Collins and Postal (2018). Collins and Postal argue that, in the case of (17c), it's not a syntactic NR from the embedded to the matrix clause that provides the negative force, but rather the inference triggered by the EM that imparts the negative meaning to the embedded clause of (17c):

(17) a. John doesn't think [CP Mary will return until tomorrow].
       b. *John didn't claim [CP that Mary would return until tomorrow].

c. John is not of the opinion [$_{CP}$ that Mars can be colonized (*until 2030)].
Collins and Postal (2018: 14, (19))

When attempting to explain the contrast between (17a) and (17b) in terms of licensing a strong NPI, we cannot rely on the approach of valuing the [Pol:__] feature at the edge of the TP. As mentioned earlier, this approach only applies when transferring from the antecedent TP to the ellipsis TP. If the valuation strategy through an EM inference were applied from the matrix to the embedded clause, it would mistakenly license the strong NPI in (17b), contrary to fact. The distinction between (17a) and (17b) highlights that the EM inference proposed by Collins and Postal (2018) is not a viable method for licensing the strong NPI in (17b).

Note that the alternative syntactic approach to NR, which leaves behind the copy of the negation inside the embedded clause, could provide an explanation for the contrast between (17a) and (17b) in terms of licensing a strong NPI. However, remember that this approach would inaccurately predict that a copy theory of VP ellipsis permits a polarity reversal in the embedded clause of sentence (5), repeated here.

(5) John doesn't think it will rain, and *Sue also does [$_{VP}$ ~~think it would not rain~~].

The next available option for explaining the NR phenomenon is Krivochen's (2022) lowering approach, which posits that a negation initially generated in the matrix clause undergoes a lowering to the embedded clause. The following example provides additional evidence in favor of Krivochen's (2021) lowering approach to NR.[2]

(18) As Sally doesn't [$_{VP}$ Ø], John doesn't believe Mary will arrive until Friday,

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[2] Krivochen's (2022) Neg-Lowering analysis does not address the intricacies of complex predicates like 'not of the opinion,' which can lead to an EM-inferred interpretation of the negation within the embedded clause but fail to license a strong NPI within it. To uphold Krivochen's (2022) Neg-Lowering account for NR, we must posit that phrases like 'in the opinion' somehow prevent the lowering of the negation from the matrix clause to the embedded clause.

The example in (18) illustrates that the negation positioned immediately outside the elided verb phrase (VP) can indeed undergo a lowering into the embedded clause. This prediction aligns with the correct licensing of the strong NPI within the complement clause inside the elided VP in the adverbial clause of (18).

To wrap up this section, when considering the licensing of strong NPIs in NR environments, we have argued that it's not the copy of the negation left behind by NR nor an EM inference that plays a crucial role. Instead, it's the explicit placement of the negation in the matrix clause within these environments, coupled with its subsequent lowering into the embedded clause, that effectively licenses such NPIs. This suggests that the lowered negation in question represents a concrete syntactic instance of the negation capable of properly licensing strong NPIs, whereas the EM-inferred negation appears to be a pragma-semantically induced interpretation of the negation that lacks this ability, though it can fulfill this role in the context of TP ellipsis as in (15)-(16).[3]

III. Reinforcing NL rather than NR

In the previous section, the Neg-Raising predicate (NRP) and NPI interaction under ellipsis/non-ellipsis shows that the negation can be base-generated in the higher clause with an NRP, but it can undergo a lowering and be interpreted in the subordiate clause. On a ground independent of the NRP and NPI interpretation at hand, Krivochen (2022) advocates a lowering analysis of the negation in NR constructions. We rehearse his argument in this section and reinforce the analysis provided in the previous section.

Krivochen (2022) pays attention to the fact that when a certain quantifier like

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[3] We now entertain the Neg-Lowering instead of the EM inference used to account for the grammaticality of (15) and (16). The Neg-Lowering from the matrix to the embedded clause of the first conjunct clause in these examples feeds an elision of the embedded clause of the second conjunct clause.

'every' occurs in the embedded clause of an NRP, the matrix negation cannot allow for the negation of the embedded predicate, as follows.

(19) I don't think every Japanese likes sushi.   Krivochen (2022: 4, (5))
    (ⅰ) I think NEG every Japanese likes sushi.
    (ⅱ) *I think every Japanese NEG likes sushi.[4]

Since both the syntactic NR or the semantico-pragmatic approach assume that the negation as in (19) is by default construed with the embedded predicate, the unavailability of the reading in (19ii) indicates that these two approaches are not valid in accounting for the NR phenomenon. Krivochen (2022) seeks an alternative account for it, proposing that the negation in (19) undergoes a lowering, but the lowering of the negation in NR contexts is sensitive to the types of quantifiers in embedded subject positions. Krivochen (2022: 20) provides the following table showing whether the matrix negation is interpretively associated with the embedded subject quantifier and/or the embedded predicate:

(20) Availability of NEG-[embedded subject Q] and NEG-[embedded predicate] readings

Quantifier	NEG-Q	NEG-V	Examples
every	√	*	I don't think every Japanese likes sushi.
all	√	*	I don't think all the boys left.
several	√	*	I don't believe several senators are communists.
only	√	*	I don't think only John will fail the test.
the	*	√	I don't think the President likes sushi.
each	*	√	I don't think each of my friends likes sushi.
even	*	√	I don't think even John will pass the test.
most	√/*	√/*	I don't think most friends likes sushi.
a/an	√	√	I don't think a Japanese likes sushi.
some	√	√	?I don't think some Japanese likes sushi.
many	√	√	I don't think many linguists read Montague.
few	√	√	I don't think few linguists read Montague.

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[4] The symbol * here means that the reading of NEG negating the embedded predicate is not available.

The Neg-Lowering (NL) approach to NR needs to account for why there are different possibilities of NEG-Q/V depending on the types of quantifiers in embedded subject positions. Not just a single but multiple factors come into play. One factor involved concerns the de re vs. de dictor distinction. The quantifiers that allow for the NEG-V reading allow for the de re reading. Since the de re reading is generally known to arise via a quantifier taking wide scope over the negation or a modal, the NEG-V reading obtains in NR contexts when by taking wide scope over it, the embedded subject QP clears a way for the negation to lower to the embedded predicate. The existential quantifiers like 'some' or 'many' can take this strategy, the strongly distributive quantifiers like 'each' as well as the definite description with 'the' necessarily do, and the universal quantifiers like 'every' or 'all' cannot.

The second factor involved is scalability. Beghelli and Stowell (1997: 99) notes the impossibility to combine the negation and the quantifier 'each' directly, whereas 'not' can combine with a variety of proportional quantifiers, including 'more/less (than) n', 'many' as well as with 'every' and 'all', as follows.

(21) a. Not more than 10 boys ate an ice-cream cone.
 b. ?Not ten boys ate an ice-cream cone.
 c. Not many boys ate an ice-cream cone.
 d. Not all the boys ate an ice-cream cone.
 e. Not every boy ate and ice-cream cone.
 f. *Not each boy ate an ice-cream cone. Beghelli and Stowell (1997: 99)

Beghelli and Stowell (1997) suggest that 'all' and 'every' -- but not 'each' -- can designate the end point of a scale, here the full set of boys in (21). This suggests that the absence of a true descriptive nominal restriction in 'each' affects the possibility of licensing a conceptual domain for scalar reasoning.

The absence of the de re reading in the scope of the negation and the presence

of a descriptive nominal restriction for 'every' and 'all' make these quantifiers in the embedded subject of NR contexts necessarily take narrow scope below the negation, thereby giving rise to a constituent negation reading. In this connection, it is predicted that the strong NPIs such as 'lift a finger' or 'so much as' after them cannot be licensed. This prediction is achieved, as follows:

(22) a. I think every student didn't lifts a finger to help his neighbor.
      b. *I don't think every student lifted a finger to help his neighbor.
(23) a. I think all the girls didn't eat so much as a bite of trout.
      b. *I don't think all the girls ate so much as a bite of trout.

The contrast between (a) and (b) examples in (22) and (23) can be accounted for only by the NL analysis of NR. The syntactic NR or the semantico-pragmatic analyses for NR would incorrectly rule in the (b) examples of (22) and (23), since they incorrectly predict that just as in the (a) examples of (22) and (23), the negation is construed with the predicate in the embedded clause.

IV. Some consequences of the Neg lowering analysis

Not the NR but the proposed NL analysis for the traditional NR phenomenon posits that the negation is base-generated with the matrix predicate and undergoes a lowering into the embedded clause. This section investigates some consequences that this analysis entails, by examining some issues that can potentially pose challenges to the syntactic and the semantico-pragmatic analyses for NR.

The first consequence concerns composed quantifiers like 'nobody.' It is generally assumed that negative quantifiers like 'nobody' are a negated indefinite composed of the negation (NEG) and the existential quantifier ($\exists$-body). Thus, the syntactic NR approach assigns to (24) the structure in (25), in compliance with this assumption:

(24) Nobody supposes that nuclear war is winnable.

(25) NEG ∃-body supposes that nuclear war is <NEG> winnable.

In contrast, the pragma-semantic approach to NR predicts the EM-induced reading of (24) by positing that the presuppositions of quantificational structures are universal (Gajewski 2007). In other words, the example in (24) carries the presupposition that everyone holds an opinion regarding the winnability of nuclear war, though Mirazzi and Zeijlstra (2021: 301) note that the universal projection of an excluded middle presupposition from the scope of composed negative quantifiers does not always hold, but it can be context-dependent.

In our NL account for NR, what is at stake is where the negation is lowered from. As for the sentence containing the composed negative quantifier 'nobody' in (24), there are two positions from which the negation or the Neg feature undergoes a lowering, as in (26):

(26) a. [NEG ∃-body supposes that nuclear war is winnable].

　　　b. [Everybody [$_{NegP}$ NEG-Op Neg [supposes that nuclear war is winnable]]].[5]

The one position is in (26a), where the negation (NEG) that combines with the existential quantifier (∃-body) is lowered into the embedded clause. The other position is in (26b), where the NEG-Operator in Spec of NegP is lowered into the embedded clause. The NL account for NR is thus flexible enough to accommodate the available reading/presupposition contingent on the scope of the negation (NEG) on composed negative quantifiers.

The second consequence pertains to non-NR predicates that still allow for NR readings. It is generally argued that predicates selecting for non-factive propositional complements are NR predicates, whereas other factive or communicative predicates

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[5] The two variant structures in (26a) and (26b) of the sentence in (24) are based on the well-known De Morgan's Law: ¬∃ ⇔ ∀¬.

are not. But the latter type of predicates like 'know', 'be sure', and 'say' do allow
for an NR reading, when accompanied by the matrix negation, as follows:

(27) I don't know/am not sure that's constitutionally possible, sir.

(28) I cannot say I've cooked myself a full meal in weeks, if not months.

This poses a challenge for both the syntactic and the pragma-semantic approaches to
the NR phenomenon. Since verbs like 'know' and 'say' do not fall under the
category of NR predicates, these theories predict that they will never generate an
NR reading.

Advocating the NL account for NR, we suggest that now NL predicates are not
lexically determined, but they are syntactically determined. In other words, the
ability to trigger an NL reading is not a lexical property of predicates, but a
syntactic, compositional property of both the negation and such predicates. Since by
the hypothesis of the NL account for NR the negation is base-generated in the
matrix clause, it can interact with such predicates to give rise to an NL reading.

The third consequence relates to Horn Clauses discussed in Horn (2014). These
clauses are instances where subject-Aux inversion is licensed peculiarly by an NPI
in the Spec of the embedded lower CP, which in turn is licensed by the negation
on the matrix NL predicate, as follows:

(29) a. I don't suppose that under any circumstances would she help me.

    b. I don't think that anywhere did he mention my book.

Horn Clauses are only available with existential NPIs, but not with just any
existential nor with an universal, as shown in (30a-b):

(30) a. *I don't think that somewhere did he mention my book.

    b. *I don't think that everywhere did he mention my book.

The restriction on the type of quantifiers in the lower Spec of CP in Horn Clauses indicates that only existential NPIs carry the Neg feature, thereby triggering subject-Aux inversion in these clauses; the Neg feature is then licensed by the negation lowered from the matrix clause at LF.

The more thorny issue relating to Horn Clauses is that Horn Clauses are more restrictively distributed. Horn (2014) notes that, when accompanied by the negation, predicates like 'know', 'be aware', which he dubs "Cloud of Unknowing" predicates, license Horn Clauses, as in (31)-(32):

(31) I don't know that ever before had all three boys napped simultaneously.
(32) I didn't accept that any of those problems had she ever really solved.

But predicates like factive verb 'regret' or communicative verb 'say' do not, as in (33)-(34):

(33) *I don't regret that under any circumstances would she help me.
(34) *I don't say that ever before have the media played such a major role in a kidnapping.

The contrast between (31)-(32) and (33)-(34) indicates that the lowering of the negation from the matrix clause is contingent on the idiosyncratic property of the matrix predicate. Mirazzi and Zeijlstra (2021: 301) suggest that the lexical-semantic modal structure of the complement clause selected by a matrix predicate determines the lowering of the matrix negation into the complement clause.

V. Conclusion

In conclusion, this paper has delved into the intricacies of NR in English, first

examining the two well-established approaches to this phenomenon. The first approach, the traditional syntactic one, involves the raising of the negation to the matrix NR-permitting predicate. The second approach, the semantico-pragmatic perspective, relies on the exclusive middle inference to interpret the negation generated with the matrix predicate in the lower clause.

This paper takes a departure from these conventional analyses, advancing the argument that the negation generated within the matrix clause undergoes a process of syntactic lowering to reach the embedded clause at LF. This argument finds its basis in the observed interactions between NR and strong NPIs under VP or TP ellipsis. Furthermore, our position gains robust support from the observation that Neg Lowering (NL) exhibits sensitivity to the specific types of quantifiers occupying embedded subject positions. As a result, we have presented a comprehensive NL analysis that addresses certain challenges previously posed to conventional NR and semantico-pragmatic approaches, offering a renewed understanding of this linguistic phenomenon.

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