



## A Pragmatic Approach to Negated Predicate-Modifying *How*-Questions\*

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### ABSTRACT

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This study primarily aims to provide the felicity condition for predicate-modifying interpretation of negative *how*-questions by uncovering the reasons behind the distinction between negative *how*-questions that allow the interpretation of Predicate-Modifying How (PMH) and those that do not. The conditions enabling a PMH interpretation for negative *how*-questions are specified with two crucial elements: (i) the predicate to be eventive rather than stative and (ii) the negation of the predicate to convey the meaning of the predicate achieving a contextually desirable outcome, what can be called 'desirability condition'. A secondary goal is to suggest syntactic structures for negated *how*-questions with PMH interpretations, where *not* is analyzed as the 'low negation' proposed by Holmberg (2012). This structure can represent the PMH questions while ensuring compliance with the 'desirability condition'. The proposed structure, devoid of a negative island, facilitates movement of the vP-adjunct *how* to CP without encountering obstacles. Additionally, it is explored why negative *how*-questions with contracted negation *n't* are deemed unacceptable for both PMH and mirative interpretations by most speakers.

### KEYWORDS

predicate-modifying *how*, negative-island, scope of *how*, event predicate, stative predicate, low negation, high negation

## 1. Introduction

In English it is widely acknowledged that *how*-questions exhibit negative island effects as in (1) (e.g., Rizzi 2001, Shlonsky and Soare 2011, and van Gelderen 2015 among others).

- (1) A: #How did you not cut the pumpkin?  
B: #With a knife. / B: #Skillfully.
- (2) A: #How did they not complete the project on time?  
B: #Perfectly.

The unacceptability of *how*-questions in (1-2) is generally associated with a predicate modifying interpretation of *how*, which seeks the manner, method, or instrument, such as *skillfully*, *with a hammer* or *perfectly*, of the event described by the predicate. However, there exists another interpretation of *how*-question that is more acceptable, even when negated, as shown by responses in (3B) and (4B).

- (3) A: How did John not fix that chair?  
B: I know! It looked like such a simple job!
- (4) A: How did they not complete the project on time?  
B: Right! The project manager failed to allocate resources effectively.<sup>1</sup>

This use of *how*-question is regarded to convey surprise or unexpectedness about the described event, yielding the so-called ‘mirative’ interpretation (Cruschina 2011). A common response expected by this type of *how*-question is giving a plausible explanation or a reason of an unexpected course of event, which is not fixing the chair and not completing the project in these examples. The answer could be also an agreement on the speaker’s surprise as in (3B) or providing a background information that could have affected the result as in (4B).

The different acceptability between (1-2) and (3-4) is generally assumed to be due to different syntactic structures: In the former, *how* is merged as a vP adjunct and then moves to [Spec, CP], modifying a predicate (Katz 2000, Thomason and Stalnaker 1973), whereas *how* of the latter is assumed to be base-generated in a higher projection, modifying a proposition (Cruschina 2011, Tsai 2008), as shown in (5) and (6), respectively. The first use of *how* as in (1-2) is referred to as PMH (predicate modifying *how*) question and the second use as in (3-4) ‘mirative’ *how*-question, henceforth.

- (5) #PMH: [CP how<sub>i</sub> did [TP John [NegP not [vP fix that car t<sub>i</sub>]]]] NEG > HOW
- (6) Mirative: [CP how did [TP John [NegP not [vP fix that car]]]] HOW > NEG

Due to this structural difference, a PMH question is sensitive to negative-island effects, while a mirative question is not. However, Bross (2020) pointed out that negated PMH questions, despite negative islands, sometimes can occur, yielding an information-seeking interpretation of the method or instrument for the predicate event, as illustrated in (7).

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<sup>1</sup> As for *how*-questions with contracted negation such as *don't* or *won't*, we will discuss them later in 4.2.

- (7) a. A: How do I not get hacked (if my password has leaked)?  
 B: I can show you five easy steps how to not get hacked.  
 b. How do I not get caught without a ticket?  
 c. How will my paper not get rejected?

The negative *how*-question in (7a) can be interpreted as a non-mirative information-seeking question about the method of avoiding getting hacked, as demonstrated in the response in (7aB). In other words, these *how*-interrogatives are instances where PMH questions are acceptable despite the presence of the negation. The study aims to understand why *how*-interrogatives like those in (1-2) exhibit the negative island effect, whereas those in (7) do not.

The primary goal of this study is to discover the difference of the PMH questions that can have a method-seeking interpretation, not showing negative-island effect as in (7), and those that cannot as in (1-2), and to show that it is mainly a pragmatic contextual difference. Especially, I will propose that when the (negated) predicate of the proposition of a *how*-question is contextually interpreted as an intended or desirable result, a PMH interpretation becomes possible. Additionally, I will briefly suggest a possible syntactic structure that can accommodate the PMH interpretation of a *how*-question even when it occurs with negation.

In section 2, relevant data and analyses will be critically reviewed. In Section 3, I will provide a pragmatic account based on discourse contextual observations. In Section 4, syntactic structures of PMH questions and mirative *how*-questions will be suggested. Section 5 concludes the paper.

## 2. Two Interpretations of *How*-Questions

As noted in section 1, while typical *how* questions are believed to involve wh-movement of an adjunct indicating manner, method, or instrument as illustrated in (8a, b), they can also express mirativity, i.e., surprise or expectancy failure about the proposition following *how* as in (8c).

- (8) How did Mary cut the pumpkin?  
 a. Very carefully.  
 b. With a knife.  
 c. I know! I didn't think she could do anything!
- (9) How did John fall asleep?  
 a. By counting sheep. (PMH)  
 b. I know—he was so wired at bedtime! (Mirative) (from Pak 2017)

While many *how*-questions, like (8-9), can be understood as both PMH and mirative questions, *how*- questions with stative predicate as in (10) allow only mirative interpretations, as observed in Pak (2017). PMH questions are restricted to event predicates whereas mirative *how*-questions can occur with stative predicates as well as event predicates. The predicate *cut* or *fall asleep* in (8-9) are event predicates expressing change of state, while *be asleep* in (10) is a stative verb. So, the PMH interpretation is possible in (8-9) but not in (10).

- (10) How is the baby still awake?  
 a. #By opening her eyes. (#PMH)  
 b. I know—it's midnight already! (mirative)

As well-observed in various literature, e.g., Smith (1991) and Katz (2000) among others, manner or instrument adverbials are incompatible with non-event predicates, which explains the unacceptability of (10a). All the non-event predicates in (11) thus allow only mirative interpretations.

- (11) Non-event Predicates  
 a. How is Chili's still open? (It's 2:00a.m.)  
 b. How do you hate this song? (It's got such great lyrics!)  
 c. How does this book cost \$80? (It's only 30 pages long!) (from Pak 2017)

This fact is thus compatible with the syntactic analysis that *how* in a PMH question is moved from the predicate adjunct position, whereas *how* in a mirative question originates in a higher position and thus does not undergo movement, as seen in (5-6).

When the event predicate questions in (8-9) are converted to *negated* questions, however, only mirative readings are available as noted for (1-4), disallowing PMH readings due to negative islands. When negated, non-event predicates also allow mirative readings only, as in (12) (Abrusán 2008, Kuno and Takami 1997).

- (12) Negated non-event predicates  
 a. How is Chili's not open yet? (miratives only)  
 b. How do you not love this song?  
 c. How does this book not cost more?

All the negated *how*- questions examined so far allow mirative readings only, with exceptions in (7), where PMH readings are possible even when negated. (7a) asks about the methods of not getting hacked as shown by the provided response in (7a). Regarding the question of what the difference is between those that are affected by negative-island as in (1-2) and those that are not as in (7), there has not been a precise explanation to the extent of my knowledge. Bross (2020) claims that the negated *how*- questions like (3) is just pragmatically odd but not grammatically wrong. Since *how*-questions are “used to ask in what way the result came into existence, *how*-questions ask how a non-existing result came into being”, which makes no sense, according to him. Although Bross (2020)'s insight relying on pragmatic aspects seems to be on the right track, regarding why the examples in (7) are acceptable and how they are different from unacceptable PMH questions in (1-4), he does not provide any explanation.

Considering that precise pragmatic conditions that disallow PMH readings as in (1-4) and allow the ambiguous readings as shown by (7'B) and (7'B') has not been explored so far, I attempt to provide contextual pragmatic conditions that permit the PMH reading for negated *how*-questions in the following section.

- (7') A: How do I not get hacked (if my password has leaked)?  
 B: I can show you five easy steps how to not get hacked. (PMH)  
 B': I know. It's almost impossible. (mirative)

### 3. Pragmatic Condition for Predicate-Modifying *How*-Questions

The first observational generalization based on (7a-c) is that it is *passive* questions that allow PMH reading even when negated. But this is not a complete truth.

#### 3.1 Event Predicate with Non-Agent Subject

Consider more possible examples of negative *how*-questions that allow both PMH and mirative readings in (13) and those that do not allow PMH reading in (14).

(13) PMH and mirative readings

- a. How did you not get hacked?  
By using unique passwords and enabling two-factor authentication on your accounts. (PMH)  
I know. It was almost a miracle. (mirative)<sup>2</sup>
- b. How did they not die at the war?  
By following rigorous safety protocols and staying vigilant.
- c. How did John not drown in the lake?  
By wearing a life jacket and receiving prompt assistance from nearby swimmers.
- d. How did the old lady not fall on the slippery road?  
By walking cautiously, using a walking aid, and being mindful of her steps.
- e. How did the steak not burn when you were not present?  
By setting a timer, ensuring it was cooked to perfection even in my absence.

(14) Mirative readings only

- a. How did John not fix the chair? (I know. It was such an easy job.)
- b. How did they not build the house? (I know. It was such an easy job.)
- c. How did Mary not study at the library? (I know. She never studies anywhere.)
- d. How did they not dance at the party? (I know. They never dance.)

All the ambiguous negated *how*-questions in (13) allow an interpretation as a method-seeking PMH question as well as that of a mirative question. The common feature shared by all these examples is that they have non-agent subjects. However, we already observed that not all non-agent subjects are exempted from negative-island effect and allow a PMH interpretation, as shown by stative predicates in (12), repeated here.

(12) Negated Stative predicates (miratives only)

- a. How is Chili's not open yet?
- b. How do you not love this song?
- c. How does this book not cost more?

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<sup>2</sup> The same mirative response is possible for (13b-e) as well.

In (10-11), we already noted that even for positive questions manner or instrument adverbials are not compatible with non-event predicates, disallowing PMH interpretations. This is also valid for negated non-event predicates. So, it is not surprising that none of the questions in (12) cannot be interpreted as asking about manner or method of the predicate. Considering the data presented so far, we may be able to conclude that eventive predicates with non-agent subjects allow PMH reading when negated. These conditions are specified in (15).

(15) Condition for PMH reading of a negated *how*-question (preliminary)

- (i) The verb is an event predicate.
- (ii) The subject has a non-agent semantic role.

There are cases to the contrary, however. The next subsection discusses such cases.

### 3.2 Intended/Desirable Result of Event

Consider the *how*-questions with non-agent subjects and event predicates in (16).

(16) Negative *how*-questions with non-agent subject and event predicate (miratives only)

- a. After reading fairy tales for a long time, how did the baby still not fall asleep?  
B: # By being excited to hear captivating stories.  
B': Captivating stories kept the baby engaged and excited rather than inducing sleepiness.
- b. How did the teacher not get connected with her students?  
B: #By failing to create a warm and supportive learning environment.  
B': Yeah, I know. She failed to create a warm and supportive learning environment.
- c. How did the scientist's ideas not emerge even after making such a devoted effort?  
B: #By facing unexpected technical issues and surrendering to continuous challenges.  
B': Yeah, I know. He didn't overcome unexpected technical issues and continuous challenges.
- d. How did the immigrant not quickly adapt in such a welcoming city?  
B: #By not finding a sense of belonging in the diverse community.  
B': Yeah, I know. He didn't feel a sense of belonging in the diverse community.
- e. How did the joint project not evolve into an influential initiative?  
B: # By failing to collaborate seamlessly.  
B': Because the team failed to collaborate seamlessly.
- g. A: How did the actor not grow confident amidst the applause?  
B: #By attributing the applause to the collective success of the performance.  
B': Perhaps the actor attributed the applause to the collective success of the performance rather than solely to their individual contribution.

All the *how*-questions in (16) do not allow PMH reading, even though they have non-agent subjects with event predicates. How are these examples different from those in (13)? The common property shared by all the examples in (16) is that the predicate suggests a meaning of a desirable or intended goal and thus their negations end up expressing unwanted situations. That is, the clause expresses the situation where the desired result has not been achieved, and consequently it does not pragmatically make sense to ask about the method or instrument of not achieving the intended goal. This suggests that the PMH interpretation of a negated *how*-question cannot be explained by the semantics or the syntactic structure alone, but it also needs a pragmatic or discourse contextual consideration.

Even with the same verb, depending on the context and the pragmatic situation, a negated *how*-question can have different interpretations. Consider the apparently same *how*-question in (17a) and (18a) with different pragmatic expectations.

- (17) Negation of Undesirable meaning (PMH, Mirative): Desirable result
- a. A: How did he not fail the exam (after such a short time of preparation)?
  - b. B: By concentrating on solving the questions and managing his time effectively during the test.
  - c. B: Yeah, I know. Luckily, the questions are mostly from the part he intensively studied, and he managed his time effectively during the test.
- (18) Negation of Desirable meaning (Mirative only): Undesirable result
- Scenario: A wanted to deliberately fail the exam, because he was urged by his father to take the entrance exam to a school that he doesn't want to attend.
- a. A: How did you not fail the exam (even though you desperately wanted to fail)?
  - b. B: # By concentrating on solving the questions and managing my time effectively during the test.
  - c. B: Yeah, I don't know. I unintentionally concentrated on solving the questions forgetting my original intention.

When the original predicate is meant to be an undesirable event, which is a normal situation given that failing an exam is usually undesirable, the negated version can refer to the desirable situation where failing is avoided. Consequently, the question can be interpreted as asking about the method of it. In this context, therefore, the negative *how*-question can be ambiguous as shown in (17b and c). In contrast, when the original predicate, fail, is contextually meant to convey an intended situation as in (18), the negated *how*-question cannot have PMH reading, yielding only a mirative interpretation, which seeks a plausible explanation or reason of the unintended result.

By the same reasoning, it is predicted that positive *how*-questions would manifest the opposite behavior, and this is born out. The predicates implicating a contextually positive intention can have an ambiguous interpretation as in (19), while those contextually associated with a negative bias is unambiguous, yielding a mirative interpretation only as shown in (20).

- (19) Desirable predicate (PMH, Mirative)
- A: How did the negotiation end in such a(n) (favorable) outcome?
  - B: By employing skilled communication and compromise.
  - B': Some unexpected external factors favored the parties involved.

## (20) Undesirable predicate (Mirative only)

A: How did the negotiation end in such a(n) (disastrous) outcome??

B: # By breaking down communication and not reaching compromises.

B': Some unforeseen external factors worked against the parties involved, preventing a successful resolution.

The overall criterion for possible PMH interpretation is *desirability* of the result of the event expressed by the predicate, regardless of the polarity of the clause. When the original predicate is intended to convey a desirable outcome, the negated *how*-question is blocked from having a PMH interpretation as in (16). On the contrary, when an originally undesirable predicate is negated, it is converted into a desirable meaning and become ambiguous, allowing a PMH question as in (13). Positive-polarity *how*-questions, in contrast, behave in the opposite direction. Predicates that aim for desirable outcomes are ambiguous, allowing PMH readings, whereas those with meanings indicating undesirable outcomes unambiguously permit mirative interpretations only.

Then, how can the agent subject clauses, which occur with a predicate such as *fix the chair*, *build a house*, *study*, or *dance* as in (14), be accounted for? They are supposed to mean volition or intention of the agent subject for the results of the actions expressed by the verbs, inherently conveying the meanings of intended outcomes for the predicate meaning. Thus, the negated questions yield mirative interpretations only, seeking an explanation or reasons for the failure to achieve the intended/desired result.

Considering the above discussion, it is concluded that the PMH is possible when the following two conditions are met:

(21) Felicity Condition for PMH reading of a negated *how*-question (Revised)

- (i) The verb is an event predicate.
- (ii) The (negated) predicate is contextually interpreted as yielding an intended outcome.

The condition in (21ii) revises the content of (15ii). It does not maintain the condition that the subject must have a non-agent semantic role. The reason for this omission, as discussed concerning the questions in (14), is that when the subject of a clause with a predicate with an agentive semantic role is involved, the negation of such a predicate implies the failure of the subject's volition, limiting the interpretation to scenarios where the subject's volition is not fulfilled. In such cases, as these cannot satisfy the condition in (21ii), the PMH reading becomes automatically impossible. Therefore, there is no need to explicitly specify the condition that requires that subjects with agentive roles should be excluded. In other words, when the clause with an agentive subject is negated, the result of the event predicate necessarily ends up referring to unintended/undesirable situation from the perspective of the subject. Hence, even without specifying that the subject should not have an agentive semantic role, the negated *how*-questions with a subject of an agentive semantic role are necessarily ruled out.

It is once again confirmed that neither the syntactic structure nor the semantic interpretation alone can account for the possible interpretations of *how*-questions. Instead, a pragmatic and contextual factor plays a significant role in accurately predicting the potential interpretations associated with (negated) *how*-questions.

In the next section, I would like to suggest the syntactic structure that can represent the PMH interpretation of a negated *how*-question.



## 4. Syntax of Negative *How*-Questions

### 4.1 Structure of *How*-Question with PMH Interpretation

As we discussed in section 1, the generally assumed baseline syntax for a PMH question is as in (22) where *how* is merged as a vP adjunct, modifying a predicate, and then moves to [Spec, CP]. For the mirative interpretation, structure (23) is assumed, where *how* combines with a complete proposition, with no traces.

(22) PMH: [CP **how**<sub>i</sub> did [TP John<sub>2</sub> [vP t<sub>2</sub> fix that car t<sub>i</sub>]]]

(23) Mirative: [CP **how** is [TP Chili's [vP open yet]]]

For a negative PMH question, however, the structure should not be like (5) presented in section 1, which blocks *how*'s moving to [SPEC, CP] due to the negative island. Thus, the PMH interpretation of a negated *how*-question cannot be adequately explained with a structure like (5).

(5) #PMH: [CP **how**<sub>i</sub> did [TP John<sub>2</sub> [NegP not [vP t<sub>2</sub> fix that car t<sub>i</sub>]]]] NEG > HOW

There is not complete consensus among authors, however, regarding the syntactic position of negation *not* in English. Krifka (2013) claims that negation scopes over tense, considering that the typical interpretation of a negated clause does not express an event of not-happening but rather not-happening of an event. He points out that sentence (24), for instance, means that within the reference time, there was no stealing event, but not that there was an event that was not a stealing, and suggests a structure (25) for (24), where negation has scope over tense.

(24) Ede didn't steal the cookie.

(25) [NegP Ede<sub>i</sub> did-n't [TP t<sub>i</sub> t<sub>did</sub> [vP t<sub>i</sub> steal the cookie]]]

Along this line of reasoning, the structure (5) should not be expressing the occurrence of a not-fixing event but instead non-occurrence of a fixing event.

Now, recall that the acceptability of a negated PMH question depends on whether the negated predicate can be interpreted as an intended/desired result, as specified in (21). This suggests that for the acceptable PMH interpretation of a negated *how*-question, the structure must represent the reading where *how* modifies an event of not-doing something, which is the interpretation that Krifka objects for normal negative sentences. Hence, a structure where negation has scope under TP, unlike (25), is needed. While the generally assumed structure in (5) is such a structure, it does not allow movement of *how* due to the negative island, as already discussed. Therefore, negation *not* should be in a position that does not constitute a negative island. There are available arguments proposing such structures. Cormack and Smith (2002) suggest that English has two negations: one with sentential scope, exemplified by the first *nots* in (26a, b), and the other with vP-scope, the second *nots* therein.

(26) a. You **cannot not** go to Church, and still call yourself a good Christian.

b. You must **not** ever **not** address him as 'Sir'.

Holmberg (2012, 2016) argues that there are three structurally distinct and interpretable positions for the negation in English negative yes/no questions: The highest negation, when *n't* is interpreted outside IP, the middle negation, where *n't/not* is interpreted IP-internally, but with sentential scope, and finally the low negation, where *not* is interpreted with scope over vP only, as exemplified in (27a-c), respectively.

(27) Three different *nots* in English

(a) Highest negation (interpreted outside IP)

Q: Isn't John coming (too)? (Positive bias)

A: Yes. ('John is coming.')

A: No. ('John is not coming.')

(b) Middle negation (interpreted inside IP, but with sentential scope)

(i) Q: Isn't John coming (either)? (Negative bias; unacceptable for some speakers)

(ii) Q: Is John not coming?

A: #Yes. (indeterminate/uninterpretable in this context)

A: No. ('John is not coming.')

(c) Low negation (vP-scope)

Q: Is John not coming?

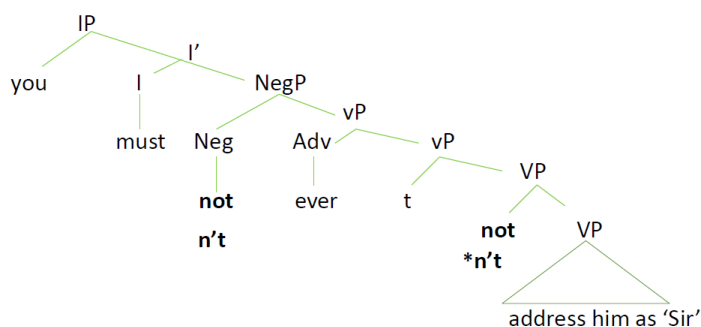
A: Yes. ('John is not coming.')

A: No. ('John is coming.')

(Holmberg 2012)

Among these, the low negation seems to conform to the interpretation of the *how*-questions at hand. The structure Holmberg proposes for (26b) is (28), which is interpreted as that an event of *not addressing him as 'Sir'* must not occur.

(28)



Given that, question (13b), then, should have structure in (29).

(13b) How did they not die at the war?

(29) [CP how<sub>i</sub> did [TP they<sub>2</sub> [vP [vP t<sub>2</sub> not die] t<sub>i</sub>] at the war]]]

This structure does not involve NegP and thus nothing hinders movement of a vP-adjunct *how* to CP, enabling the negated *how*-question to have PMH as well as mirative readings. To confirm this, compare the two *how*-questions in (30), in which adverb *usually* forces the low negation reading for (30a) but not for (30b).

- (30) a. How do the soldiers usually not die at a war? (PMH-Method seeking and Mirative)  
b. How do the soldiers not usually die at a war? (Mirative reading only)

Under Holmberg's analysis, *not* in (30a) is a low negation, having vP-scope, as in (27c), whereas that in (30b) is a middle negation, having sentential scope, as in (27b), which can be determined by the position of adverb *usually*. Then, (30a) should have structure (29). But the structure for (30b) should be as in (31) for PMH reading, which would be ruled out due to the negative island, just like (29).

- (31) \* [CP how<sub>i</sub> did [TP they<sub>2</sub> [NegP not [vP [vP t<sub>2</sub> die] t<sub>i</sub>] at the war]]]

In fact, (30a) can be interpreted as a method seeking question about how to usually not die, which is a kind of PMH reading. In contrast, (30b) cannot have a PMH reading and has a mirative interpretation only. My informants agree with this judgement. The different possible interpretations for (30a) and (30b) support the hypothesis that the negation should be Holmberg's low negation for PMH interpretation.<sup>3</sup>

Now, we may be able to conclude that all the positive and low negation questions have the same structure as (29), where no NegP is involved. The availability of the PMH reading depends on the pragmatic condition of expected, intended, or desirable resultative interpretation of the predicate, as far as *not*, if present, corresponds to the low negation.<sup>4</sup>

In the next subsection, I would like to discuss *how*-questions with contracted modals such as *don't* or *won't* as in (32-33). It is reported that most English speakers judge these *how*-questions with contracted negations unacceptable, neither for PMH readings nor for mirative readings (Pak 2017 and Bross 2020 among others).

- (32) ??How won't I get hacked? (from Bross 2020)

<sup>3</sup> Given this observation, there seems to be two alternative approaches available regarding the difference between the *how*-questions that allow PMH reading and those that do not: (i) The first option is that when the negated predicate has *undesirable* resultative interpretation, the structure has a negative island and thus disallows a PMH interpretation, saving a mirative reading only. (ii) The second option is that both *desirable* and *undesirable* resultative interpretations have the same syntactic structure without a negative-island and the pragmatic consideration is the only factor that can determine the cases that allow PMH reading and those that do not. Considering only negative cases, both options are possible, and the first option would be even nicer since each structure can neatly correspond to each interpretation. But considering positive cases as in (19) and (20), two different structures cannot be posited to distinguish the two cases. Given positive *how*-questions that are ambiguous and can only be distinguished based on a pragmatic consideration, option (i) does not seem to be a valid approach that can appropriately cover all the possible interpretations of both positive and negated *how*-questions. Thus, option (ii) should be the only available approach.

<sup>4</sup> Considering the discussion so far, it is possible to explicitly add a syntactic requirement to the semantic and pragmatic conditions for PMH reading of a negated *how*-question specified in (21) as follows:

Felicity Condition for PMH reading of a negated *how*-question (Final)

- (i) The verb is an event predicate. (Semantic)
- (ii) The (negated) predicate is contextually interpreted as yielding an intended outcome. (Pragmatic)
- (iii) *Not* is structurally a low negation. (Syntactic)

- (33) a. ?? How isn't Chili's open yet?  
 b. ?? How don't you love this song?  
 d. ?? How doesn't this book cost more? (from Pak 2017)

Then, the next question is why such questions with contracted negations do not have mirative reading, either. Although this study is primarily about negative *how*-questions that allow PMH reading, for a more comprehensive understanding of *how*-questions in general, I would like to suggest some approaches in the following subsection, adopting Holmberg's distinct analysis of contracted and non-contracted negation.

#### 4.2 How-Questions with Contracted Negation

For an analysis of contracted negation, let us consider a well-known distinction between the truth-based and the polarity-based answering systems for yes/no questions, exemplified in (27a) and (27b), respectively.

Holmberg (2012) suggests that English exhibits both systems. A negative question can be answered either *yes* or *no* to (dis)confirm the truth of the proposition as in (27c), following the truth-based system, as well as to (dis)agree with its polarity as in (27a) and (27b(i)), following the polarity-based system. Holmberg then proposes that what to choose between the two systems depends on the choice of negation in the question. He claims that *n't* is syntactically different from *not*, which affects the choice of the system as in (34).

- (34) *n't* : the polarity-based system  
*not* : the truth-based system

Adopting this distinction, I would like to attempt to explain the reason why the contracted modal form does not allow even a mirative reading in (32-33). As seen in (27), *n't*, inducing the polarity-based system, has two possible interpretations: (i) high negation as in (27a) and (ii) the first case of middle negation, as in (27b(i)).

It is widely accepted that high negation expresses a speaker's epistemic bias for a positive proposition *p*, as noted in (27a) (e.g., Ladd 1981, Romero and Han 2004). (32-33) may be ruled out due to a positive bias related to these questions. Due to this interpretation, the *how*-question with high negation may be unavailable due to the lack of a proper interpretation. The middle negation of *n't*, on the other hand, is reported in Holmberg to be unacceptable to some speakers. This fact may be an explanation for these speakers as to why the questions in (32-33) are not acceptable.

For the remaining speakers who judge this middle negation acceptable, which is supposed to convey a negative meaning, the question of why *how*-questions with *n't* are not acceptable awaits an explanation. Bross (2020) suggests that *how* base-generates in a position of  $t_i$ , between the original position of *will*,  $t_j$ , and NegP for a mirative *how*-question. After *how* moves to CP, its trace  $t_i$  intervenes between *will* and *not* in NegP and blocks negative contraction as represented in (35).

- (35) [CP How<sub>i</sub> will<sub>j</sub> [TP I t<sub>j</sub> t<sub>i</sub> [NegP not [VP get hacked?]]]] (mirative)

This might be the reason why *how*-questions with contracted negation are not acceptable for the speakers who judge middle negation *n't* acceptable. The fact that *how*-questions with *n't* are marginally acceptable to English speakers may partly reflect the variable judgements on the middle negation *n't*.

I conclude the discussion by proposing possible methodologies as above rather than engaging in a more detailed

and decisive examination at this point. In this subsection I have attempted to provide possible explanations of why *how*-questions with contracted negation are very marginally acceptable, dividing them into three cases of *n't*. A more rigorous exploration on this issue is deferred to future research.

In this section, I presented the possible syntactic structures for negated *how*-questions that have PMH readings. These structures involve low negation, avoiding negative islands, which thus can support my claim that the general impossibility of PMH interpretation of negated *how*-questions is not just due to syntactic reasons related to negative islands but also due to the contextual and pragmatic conditions not being met for the interpretation of a desirable resultative predicate.

## 5. Conclusion

In this study, our initial observation highlighted the existence of negative *how*-questions allowing a Predicate Modifying How (PMH) interpretation, contrary to the prevailing idea that they allow only mirative interpretations. Consequently, the primary objective was to unravel the reasons behind the distinctions between those negative *how*-questions allowing PMH reading and those that do not.

The conditions allowing a PMH interpretation for negative *how*-questions are specified in (21), which involves two key components, i.e., semantic and pragmatic conditions. These conditions necessitate (i) the predicate to be an eventive rather than a stative predicate and (ii) the negation of the predicate carrying the meaning of the event achieving a contextually desirable outcome.

A secondary goal is to propose plausible syntactic structures for negated *how*-questions representing the PMH interpretations. In the suggested syntactic structure, the negation *not* is analyzed as belonging to the low negation category, as proposed by Holmberg (2012). This analysis accommodates the PMH interpretation while the desirability condition specified in (21ii) is met. The proposed structure, devoid of a negative island, facilitates merging of *how* to the predicate adjunct position and subsequent movement to CP without encountering obstacles.

Additionally, we attempted to explain why negative *how*-questions with contracted negation *n't* are judged unacceptable for both PMH and mirative interpretations by most speakers. Based on Holmberg's (2012, 2016) theories on negation, we saw that *n't* as high negation is ruled out due to its positive bias interpretation. When *n't* is assumed to be the middle negation, on the other hand, Bross' proposal was suggested as a potential explanation. This proposal for mirative *how*-questions suggests that the trace, which was left between the auxiliary *will* and *not* in the NegP after *how* moved out to CP, interferes with the contraction of *not* onto *will*.

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Examples in: English

Applicable Languages: English

Applicable Level: Tertiary