When can non-veridical preferential attitude predicates take questions?

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Abstract

A growing body of evidence suggests that whether or not attitude predicates may combine with question complements is determined at least in part by some of their semantic properties. Zooming in, non-veridical preferential predicates (NVPs) such as *hope* and *fear* have been claimed not to combine with questions but this empirical generalization as well as its proposed explanation have been challenged by a number of counterexamples, whose properties—beyond the fact that they feature embedded questions—remain ill understood. By taking a closer look at the combinatorial and semantic properties of different NVPs from English, Japanese, Mandarin Chinese, Spanish and Turkish, this work narrows down the semantic properties of attitude predicates that determine their combinatorial properties in a cross-linguistically informed and predictive way. We identify a class of *hope*-like predicates that are restricted both in the kinds of question complements that they may combine with and in their interpretation with them. Roughly, *hope whether p* is sometimes attested, and always means *hope that p*. We also identify other classes of NVPs that are freer to combine with different kinds of questions and give rise to a wider range of interpretations.

Keywords: clause embedding, attitude predicates, selectional restrictions, veridicality, preferentiality, clausal distributivity

1 Introduction

One of the long-standing questions in the semantics of attitude predicates concerns whether the selectional restrictions of attitude predicates are related to their lexical semantic properties, and if so, how. In the literature, several works have engaged with a particular instance of this question pertaining to the distinction between so-called RESPONSIVE PREDICATES, i.e., predicates that can take both declarative and interrogative clauses, and ANTI-ROGATIVE PREDICATES, i.e., predicates that can take declarative but not interrogative clauses (Zuber, 1982; White and Rawlins, 2018; Theiler et al., 2019; Uegaki and Sudo, 2019; Özyıldız, 2021; Roberts, 2021; Djärv, 2023).[1] Below are examples of responsive (1a) and anti-rogative (1b) predicates:

(1) a. Mary **knew/imagined/hated** {that Sue would call / who would call}.
b. Mary **believes/hopes** {that Sue will call / *who will call}.

These works posit correlations between the selectional (or combinatorial) restrictions of the relevant predicates and their semantic properties, such as veridicality, neg-raising, preferentiality and eventivity, and attempt to explain their selectional restrictions based on these semantic properties. In particular, Theiler et al. (2019), Mayr (2019) and Uegaki and Sudo (2019) provide a concrete account of the selectional restrictions of (some classes of) anti-rogative predicates based on the idea that combinations of certain semantic properties and interrogative complements result in logical triviality, which leads to unacceptability (following Gajewski 2002 and others' idea in terms of meaning-driven unacceptability). More specifically, Theiler et al. (2019)

[1]Following Dayal (2016), in this paper we use the terms *interrogative (clause)* and *question denotation* to unambiguously refer to the respective syntactic and semantic notions, and the term *question* as a cover term for both notions. This will allow us to use more natural terms in some cases, e.g., *alternative question* instead of *alternative interrogative* when talking about the syntactic object.

and Mayr (2019) posit that neg-raising predicates are anti-rogative, and explain this generalization based on the idea that when a neg-raising predicate is composed with interrogative complements, the excluded-middle property (argued by Bartsch 1973 to derive the neg-raising inference) results in semantic triviality. Similarly, Uegaki and Sudo (2019) posit that non-veridical preferential predicates are anti-rogative, and provide an account of the pattern based on the triviality that arises from the combination of non-veridicality and preferentiality. Definitions of these semantic properties will be discussed in Sect. 2.1.

Although these accounts provide interesting analytical possibilities and serve as important stepping stones to addressing the overarching question on selectional restrictions, issues still remain with respect to the empirical status of the (hypothesized) correlations between selectional restrictions and lexical semantics. Indeed, White (2021) presents attested counterexamples to both of the generalizations noted above, i.e., that neg-raising predicates are anti-rogative and that non-veridical preferential predicates are anti-rogative. Furthermore, data considered in the current literature mostly come from English while the cross-linguistic status of the relevant generalizations have not been systematically investigated. This is a crucial gap in the current empirical landscape, as the theoretical accounts of the selection-semantics correlations cited above predict that the same correlations should hold cross-linguistically because they rely on general compositional-semantic mechanisms which are not assumed to be language-specific.

The primary goal of this paper is to improve our understanding of the cross-linguistic empirical landscape concerning the correlations between attitude predicates' semantic and selectional properties. Our focus will be on non-veridical preferential predicates (NVPs), such as *hope*, *fear*, or *worry/be worried* in English and some of their cross-linguistic counterparts. As mentioned above and will be detailed shortly below, Uegaki and Sudo (2019) have proposed an analysis of NVPs which accounts for the generalization that they are anti-rogative, i.e., that they cannot take interrogative clauses. However, as White (2021) shows, there are counterexamples to this generalization, where English *hope* and *fear* take interrogative clauses. In the following sections, we will provide further counterexamples to Uegaki and Sudo's (2019) generalization from English, as well as from Japanese, Mandarin, Spanish, and Turkish. These counterexamples show that Uegaki and Sudo's (2019) account is not tenable in its original form, but they also reveal fine-grained variations in the lexical semantics of NVPs, which, to our knowledge, have not been documented in the previous literature. To preview, we will show that NVPs can be divided into at least four classes, varying across two factors: (i) *valence*, i.e., whether the predicate is evaluatively positive or negative and (ii) *C(lausal)-distributivity* (i.e., the validity of the biconditional: $\ulcorner x\ Vs\ Q \urcorner$ iff there is an answer p to Q such that $\ulcorner x\ Vs$ that $p \urcorner$; Spector and Egré 2015, Theiler et al. 2018). Among the four classes, only one class, i.e., C-distributive and positive NVPs, seem to exhibit the selectional behavior of anti-rogativity (with an important caveat about a repair mechanism called *highlighting* to be discussed below), while the other three classes—[C-dist, negative], [non-C-dist, positive] and [non-C-dist, negative]—are all compatible with interrogative complements. The empirical picture is summarized in Table 1.

	C-distributive	non-C-distributive
positive	$*V\ Q$ unless highlighting, §3.1	✓ $V\ Q$, §3.3.1
negative	✓ $V\ Q$, §3.2	✓ $V\ Q$, §3.3.2

Table 1: Summary of the selectional behaiviors of NVPs depending on C-distributivity and valence, i.e., evaluative positivity/negativity, with section numbers for relevant discussion.

We will argue that examining the assumptions in Uegaki and Sudo's (2019) analysis allows us to provide theoretical explanations for these empirical observations. Specifically, we will show that two assumptions are crucial in the derivation of triviality for NVP+Q in Uegaki and Sudo's (2019) analysis: C-distributivity and the Threshold Significance Presupposition, i.e., the presupposition that there is a proposition in the set of relevant alternatives that exceeds the threshold of the attitude. This straightforwardly accounts for the fact that the two classes of non-C-distributive NVPs are compatible with interrogative complements. Furthermore, we show that evaluatively negative predicates systematically lack the Threshold Significance Presupposition, explaining the compatibility of [C-dist, negative] NVPs with interrogative complements.[2]

[2]We presented this analysis at [venue redacted for anonymity] in 2022, and it was also independently developed by Klochowicz (2022).

Additionally, we will note that the [C-dist, positive] class can sometimes take polar questions, but with an interpretation that only targets the positive answer of the question. We will suggest that these cases result from an independently motivated mechanism of highlighting (Roelofsen and van Gool, 2009; Roelofsen and Farkas, 2015; Theiler, 2021) and speculate that the markedness and speaker/language variability in the relevant cases of NVP+*whether* may be due to the nature of highlighting as a last resort repair strategy.

Along the way, we will provide data from Japanese, Mandarin Chinese, Spanish, and Turkish that are consistent with the classification in Table 1. The main goal is to provide further support for existential claims about the four classes and their combinatorial patterns. That is, we provide concrete attested examples of a class that are predicted to be possible (e.g., $V + Q$ for [C-dist, negative] and [non-C-dist] NVPs), but will not be in a position to provide data that prove cross-linguistic absence of examples that are predicted to be impossible (e.g., V + constituent questions for [C-dist, positive] NVPs). However, our account is predictive in the sense that it maintains Uegaki and Sudo's (2019) restriction against interrogative complements for [C-dist, positive] NVPs in the absence of highlighting and it delineates the conditions under which interrogative complements will be possible with a given predicate.

The rest of the paper is structured as follows. In Sect. 2, we start off the discussion by surveying Uegaki and Sudo's (2019) analysis of the (putative) incompatibility between NVPs and interrogative clauses, and discuss empirical challenges for the analysis posed by White's (2021) counterexamples and Uegaki's (2022) experimental data. In Sect. 3 we propose our new classification of NVPs. In Sect. 3.1, we start by discussing cases where positive NVPs are compatible with polar questions and suggest an account in terms of highlighting. In Sect. 3.2, we turn to cases where negative NVPs are compatible with interrogative complements, and note that they systematically lack the Threshold Significance Presupposition, which explains their selectional patterns, as the presupposition is a crucial assumption in Uegaki and Sudo's (2019) derivation of triviality for NVP+Q. We then turn in Sect. 3.3 to the other assumption for Uegaki and Sudo's derivation, C-distributivity. We note that there exist non-C-distributive NVPs and, as predicted, they are compatible with interrogative complements, regardless of valence. In Sect. 4, we discuss the possibility for NVPs to co-occur with interrogative clauses without taking them as semantic arguments, but through an adjunction-like mode of composition. We note that such a possibility has been explicitly advocated for Turkish and Japanese, and speculate on a similar possibility in English. Sect. 5 concludes.

2 Baseline generalization about non-veridical preferentials

2.1 Uegaki and Sudo (2019)

Uegaki and Sudo (2019) (U&S) claim that non-veridical preferential attitude predicates in English are anti-rogative (i.e., they can take declarative clauses but not interrogative clauses), and offer a semantic analysis of this putative meaning-selection correlation. The relevant semantic notions, VERIDICALITY and PREFERENTIALITY, are defined in the following ways. First, veridicality concerns whether the predicate entails the truth of the embedded declarative clause, as in (2):

(2) **Veridicality**
A predicate V is VERIDICAL iff $\ulcorner x\ Vs\ that\ p \urcorner$ entails p

Preferentiality, on the other hand, is defined in terms of combination of FOCUS-SENSITIVITY and GRADABILITY. A predicate V is FOCUS-SENSITIVE if the truth conditions of $\ulcorner x\ V s\ that\ p \urcorner$ vary depending on the focus structure of the embedded declarative clause p. For instance, *hope* and *surprise* are focus-sensitive because of the following type of examples, where (3) is modelled after (4) from Romero (2015) (see also Villalta (2008)):

(3) Context: Natasha does not like to teach logic and prefers to teach syntax. She is not allowed to teach both. This year, it is likely that she needs to teach logic, and if so, she prefers to do so in the morning, as she prefers to do all her teaching in the morning.
   a. Natasha hopes that she'll teach logic in the MORning. true
   b. Natasha hopes that she'll teach LOgic in the morning. false[3]

[3]Uegaki & Sudo report this judgment as "false," whereas the corresponding judgment in Romero is given as "not true"

(4) Context: Lisa knew that syntax was going to be taught. She expected syntax to be taught by John, since he is the best syntactician around. Also, she expected syntax to be taught on Mondays, since that is the rule.

a. It surprised Lisa that John taught syntax on TUESdays. true
b. It surprised Lisa that JOHN taught syntax on Tuesdays. not true

(Romero, 2015, 228, (13–15))

In order to characterize the relevant class of preferential predicates, we furthermore need GRADABILITY on top of focus-sensitivity. An attitude predicate is gradable iff it is compatible with various degree constructions, such as comparatives and degree modification. Using this criterion, we see that *hope* and *surprise* are gradable (and thus fall into the category of preferential predicates) while *answer* is not:

(5) a. Ann hopes that it will be sunny tomorrow more than Bill does.
b. Ann was more surprised that John taught syntax than she was surprised that he taught semantics.

(6) a. ??Ann answered that it will be sunny tomorrow more than Bill did.
b. ??Ann answered that John taught syntax more than she answered that he taught semantics.

Thus, even though *answer* may turn out to be focus-sensitive, as claimed by Romero (2013) for the Spanish predicate *responder* 'answer,' it does not fall into the relevant class of preferential predicates.

Given these criteria, some paradigmatic examples of veridical preferential predicates include *be surprised*, *be annoyed*, *be glad*, *be happy*, *like*, *love*, *hate*.[4] Meanwhile, *hope*, *wish*, *expect*, *want*, *be eager*, *aspire*, *fear*, *desire*, and *prefer* are some examples of non-veridical preferentials. The contrast between these two clases in terms of their ability to take interrogative clauses can be illustrated in the following examples:

(7) a. Andy **is surprised** (at/by) which students are invited to the party.
b. Ben **is happy/glad** ?(about) which students are invited to the party.
c. Chris **liked/hated** which students were invited to the party.

(Uegaki and Sudo, 2019, 327, (7))

(8) a. *Ben **hopes/wishes** which students will be invited to the party.
b. *Chris **expects/fears** how many students will be invited to the party.

(Uegaki and Sudo, 2019, 327, (8))

U&S account for this pattern by combining a uniform semantics for clausal complementation (Theiler et al., 2018; Uegaki, 2019, 2023) and Romero's (2015) degree-based semantics for preferential predicates. A veridical preferential predicate like *be happy* is analyzed as follows:

(9) $[\![\textit{be happy}_C]\!]^w$
$= \lambda S_{\langle st,t\rangle}\lambda x_e\colon \underline{\exists p \in S[p(w) \wedge \mathbf{B}_w(x,p) \wedge p \in C]}.\ \exists p' \in S \left[\begin{array}{c} p'(w) \wedge \mathbf{B}_w(x,p') \wedge p' \in C \\ \mu_w(x,p') > \theta(\{\mu_w(x,p'') \mid p'' \in C\}) \end{array} \right]$

a. $\mathbf{B}_w(x,p) \overset{\text{def}}{\Leftrightarrow} x$ believes that p
b. $\mu_w(x,p) \overset{\text{def}}{=}$ the maximum degree to which x prefers p in w
c. $\theta(D) \overset{\text{def}}{=}$ the standard threshold given the comparison class D

In words, *be happy* takes a set S of propositions and an attitude holder x, presupposes that there is a true proposition in S which x believes, and returns true iff there is a true proposition in S which is more preferable

(which takes into account the possibility of the sentence being undefined). What matters is that there is a contrast.

[4]Such predicates are also known as *emotive factive* predicates. They are commonly taken to be not only veridical but also *factive*, i.e., when they take a declarative clause, the declarative clause is presupposed to be true. There is still an ongoing debate about whether these predicates are truly veridical/factive, or whether such properties are categorical (e.g., Klein, 1975; Egré, 2008; Anand and Hacquard, 2014; Djärv et al., 2018; Degen and Tonhauser, 2022). Nevertheless, everybody agrees that such predicates entail that the attitude holder believes the embedded declarative clause to be true. In this section, we report U&S's original analysis, which is based on the assumption that such predicates are veridical/factive. However, ultimately, for our purposes we only need the uncontroversial fact that such predicates entail that the attitude holder believes the embedded declarative clause to be true, as this entailment will be enough for such predicates to avoid logical triviality when they take interrogative clauses (see fn. 7).

to x than the standard determined by $\theta(D)$.[5] Here, the comparison class D is the set of (maximum) degrees to which x prefers the propositions in C—the set of focus alternatives. To obtain the value of C, note first that the internal argument slot S can be saturated by a singleton set of propositions $\{p\}$ denoted by a declarative clause *that p*, or a non-singleton set of propositions denoted by an interrogative clause Q. In the declarative case, the set C is determined by the focus-semantic value of the declarative, under the Roothian treatment of focus (Rooth, 1992). In the interrogative case, C is assumed to be equivalent to the proposition-set (ordinary-semantic) denotation of the interrogative Q (Beck, 2006).

Non-veridical preferential predicates are analyzed in a parallel fashion, but without the inferences associated with veridicality and the attitude holder's beliefs. Concretely, *hope* would be analyzed as in (10). Note that the lexical entry closely resembles (9) except for the removal of the inferences associated with veridicality and beliefs, i.e., $\exists p \in S[p(w) \wedge \mathbf{B}_w(x,p)]$.

(10) $$[\![hope_C]\!]^w = \lambda S_{\langle st,t\rangle} \lambda x_e \colon \underline{\exists p \in Q[p \in C]}.\ \exists p' \in S \left[\begin{array}{c} p' \in C \wedge \\ \mu_w(x,p') > \theta(\{\mu_w(x,p'') \mid p'' \in C\}) \end{array} \right]$$

With a declarative clause *that p*, this entry derives a non-trivial interpretation that the attitude holder prefers p to a degree that is greater than the standard. With an interrogative clause, in contrast, the entry predicts triviality, crucially assuming the Threshold Significance Presupposition stated as follows:

(11) **Threshold Significance Presupposition**
Degree constructions in general presuppose that there be an element in the comparison class whose degree along the relevant scale is higher than the threshold returned by θ.
(Uegaki and Sudo, 2019, 335)

Intuitively, the presupposition requires that the threshold should be 'significant' in the sense that it allows the use of a gradable predicate to make a non-trivial distinction among elements of the comparison class. If nothing in the comparison class exceeds the threshold, a gradable predicate would pick out no member of the class. Empirically, U&S motivate this presupposition using the following type of examples:

(12) Context: There is no student in particular John wants to sing in an upcoming school show. He is indifferent. John has learned that Mary will sing at the show.
#John {isn't happy about/doesn't like} which student will sing. (Uegaki and Sudo, 2019, 338, (41))

The infelicity of (12) suggests that the sentence presupposes that John is not indifferent about who will sing, i.e., there is a student such that their singing exceeds John's preference threshold. If it were not for this presupposition, the sentence would be (incorrectly) predicted to be true under the semantics in (9), as it is not the case that there is a student whose singing exceeds the threshold in the given context. We can further illustrate this point by considering polar questions (13).[6]

(13) Context: Same as (13).
Bo: Is John happy about which student will sing? / Does John like which student will sing?
Al: #No.

With the Threshold Significance Presupposition, the combination of a non-veridical preferential predicate and an interrogative clause is predicted to be trivial. This is so because the Threshold Significance Presupposition and the predicted asserted content of a non-veridical preferential + an interrogative Q (schematized below) are equivalent.

(14) $$\exists p' \in Q \left[\begin{array}{c} p' \in C \wedge \\ \mu_w(x,p') > \theta(\{\mu_w(x,p'') \mid p'' \in C\}) \end{array} \right]$$

On the one hand, the Threshold Significance Presupposition states that there is an element in the comparison class C that exceeds the threshold. On the other hand, (14) states that there is a proposition p' in C (as

[5] We need the presupposition $\exists p \in S[p \in C]$ to ensure that the relevant proposition targeted by belief/preference is a member of the comparison class determined by the focus structure. This is an instance of the presupposition existing in degree constructions in general, i.e., that the comparison class includes the comparison term.

[6] Note that Bo's questions should be read without placing focus on *happy* or *like* so that they are not interpreted as metalinguistic denials.

well as Q, but note that $C \subseteq Q$ given the Roothian focus semantics) that exceeds the threshold, which is equivalent to the Threshold Significance Presupposition.[7] In other words, a NVP taking an interrogative clause will systematically lead to a trivial meaning, where the asserted content is already presupposed and thus totally uninformative. Assuming that such systematic triviality leads to ungrammaticality (Gajewski, 2002, et seq.), U&S's account provides a semantic explanation of the selectional restriction of non-veridical preferential predicates. The reader is referred to Uegaki and Sudo (2019) for further technical details.

2.2 Empirical challenges

There have been empirical challenges to U&S's generalization that non-veridical preferentials are anti-rogative. White (2021) provides several naturally occurring counterexamples where *hope* and *fear* take *whether*-complements, given in (15) and (16):

(15) a. This Trump/Carson boom really has people like Bush, Walker, Rubio, and others wondering and **hoping whether** history will repeat itself and whether Republicans will return back to focusing on the establishment choices but it's all about outsider candidates right now.
b. I was **hoping whether** you are able to guide me [...]
c. I have done a quite a bit of research on using a Limited Co but was **hoping whether** someone with more experience could confirm my understanding of a few points [...]

(16) a. Interstellar space is so vast that there is no need to **fear whether** stars in the Andromeda galaxy will accidentally slam into the Sun.
b. I **fear whether** this test would run safely on the oxygen sensor as it has a lot of drawback when compared with the others.
c. [...] I **fear whether** I'll have use of my arms/hands by age 55 or 60.
d. I know parents who seriously **fear whether** their children will ever hold a meaningful job.

Prima facie, these data directly challenge U&S's generalization. At the same time, beyond being counterexamples to the generalization, they may reveal new systematic patterns in the complementation behavior of these predicates. In Sect. 3, we will examine the properties of these counterexamples and discuss new ways to approach the relationship between the semantics of preferential predicates and their selectional properties.

In addition to White's data, Uegaki (2022) also presents experimental results that partially challenge U&S's generalization. In this experiment, participants were presented with a set of 87 preferential predicates and rated their veridicality and compatibility with interrogative complements using a 7-point Likert scale. The experiment was done in two blocks: the veridicality block and the compatibility-with-interrogatives block. See Uegaki (2022) for details of the methodology including the procedure according to which the predicates included were selected.

The results of the experiment are plotted in Fig. 1. Even though there is a correlation between veridicality and compatibility with interrogative clauses, predicates in the upper left corner constitute potential counterexamples to the generalization, as these are predicates that are judged to be compatible with interrogative complements while having low veridicality scores.

Again, in addition to being counterexamples, the observations may reveal previously unexplored systematicity. Inspecting the upper left corner of the plot, we can already make an informal observation that many of the evaluatively negative predicates, such as *fear*, *dread* and *worry* appear to have the problematic behavior. In Sect. 3, we further investigate the role of evaluative valence in the complementation pattern of preferential predicates.

2.3 Taking stock

Uegaki & Sudo (2019) have proposed an empirical generalization that non-veridical preferential predicates are anti-rogative and provided an explanation for the generalization in terms of semantic triviality that results from combining non-veridical preferentials and interrogative clauses. Although a prediction of the

[7] Note that this equivalence does not hold in the veridical case, because the asserted content additionally conveys that that there is a *true* (relative to the actual world or the attitude holder's doxastic state, depending on how one analyzes veridical preferential/emotive factive predicates; see fn. 4) proposition in C which exceeds the threshold.

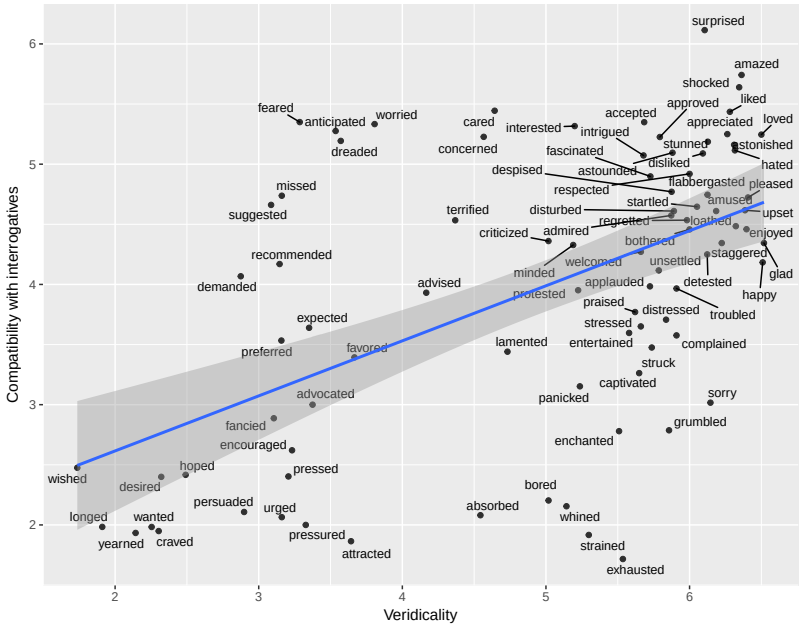

Figure 1: The plot of 87 preferential predicates in the experimental results by Uegaki (2022). The x-axis is the mean acceptability rating with interrogative complements while the y-axis is the mean veridicality rating. Mixed-effects logistic regression shows significant effect of Veridicality on Compatibility with interrogatives ($p = 0.00154$).

generalization—that there is a correlation between veridicality and compatibility with interrogative clauses among preferential predicates—is experimentally confirmed by Uegaki (2022), the generalization also faces empirical challenges. As White (2021) and Uegaki (2022) show there are examples of non-veridical preferential predicates taking interrogative clauses.

Thus, the generalization as proposed by Uegaki and Sudo (2019) does not seem to stand, at least in its original form. At this point, we are left with two choices: (i) to analyze properties of counterexamples and attempt to refine the original analysis by Uegaki and Sudo (2019) and (ii) to abandon U&S's project altogether. Although White (2021) proposes to take the latter option, we believe that it is worthwhile to explore the first one. As we emphasized already, although the counterexamples suggest that the original generalization is invalid, they also offer intriguing data points that may shed a new light on the nature of the relationship between the semantics of preferential predicates and their selection. In the following sections, we will show that examining the properties of the counterexamples reveals new ways in which interrogative clauses can be embedded under preferential predicates, and that they can be accounted for by an U&S-style analysis once we enrich it with independently motivated semantic mechanisms. Concomitantly, we will pursue a theory-driven investigation and scrutinize the assumption by U&S that preferential predicates obey the so-called C-distributivity property. This leads us to identify another class of counterexamples consisting of non-C-distributive predicates. Overall, we will show that a more fine-grained classification of preferential predicates than what has been assumed in this section is possible, and that a new generalization can be stated in term of this new classification.

The resulting generalization, of course, will be open for further empirical assessment and may turn out to be incorrect. However, this does not mean that the project as a whole is not worth pursuing. Through exploring potential semantics-selection correlations and examining the counterexamples, we will advance our understanding of the lexical semantics and selectional restrictions of clause-embedding predicates.

3 An updated classification of non-veridical preferentials

In this section, we discuss three classes of counterexamples to Uegaki and Sudo's (2019) generalization and propose ways to extend and revise their analysis. This leads to a new classification of non-veridical preferential predicates. We start by examining the corpus examples White (2021) uses to challenge the generalization that non-veridical preferential predicates are anti-rogative, and provide a novel class of counterexamples. Along the way we will use cross-linguistic data from Mandarin Chinese, Japanese, Spanish and Turkish to provide further support for the updated classification.[8]

3.1 Positive NVPs: highlighting

An interpretive constraint on *hope whether* We begin our discussion with positive NVPs, whose canonical example is the predicate *hope*. The sentences in (17), repeated from (15), are naturally occurring data presented by White (2021) that show that the predicate does indeed combine with polar question complements, contrary to Uegaki and Sudo's (2019) original empirical generalization and predictions.

(17) a. I was **hoping whether** you are able to guide me[. . .]
b. I have done quite a bit of research on using a Limited Co but was **hoping whether** someone with more experience could confirm my understanding of a few points[. . .]
c. This Trump/Carson boom really has people like Bush, Walker, Rubio, and others wondering and **hoping whether** history will repeat itself and whether Republicans will return back to focusing on the establishment choices but it's all about outsider candidates right now.

These, and other examples of *hope whether p* that we have come across all display an interesting interpretive pattern: To the extent that they are acceptable, they may all be paraphrased as *hope that p* but never as *hope that not p*. Sentence (17a), for example, entails (18a) and is incompatible with (18b).

(18) a. I was hoping that you're able to guide me.
b. I was hoping that you aren't able to guide me.

The *hope that not p* paraphrase remains absent even when we construct contexts rich enough to support that interpretation. Consider the following two contexts. The GoodFriend context motivates and attributes to John a positive preference for his neighbor to be home, and the NoiseHater context does the opposite.

(19) GoodFriend context: John and his neighbor are good friends. His neighbor is away on a business trip, which may be long or short. John wants to throw a party this weekend.

(20) NoiseHater context: John likes to invite his friends over to party, but his neighbor hates noise and they have had several heated quarrels. His neighbor is away on a business trip, which may be long or short. John wants to throw a party this weekend.

We find that a sentence like (21a) is only judged true in the GoodFriend context, and that it is judged false in the NoiseHater context. This is the same pair of judgments that the *hope that p* paraphrase in (21b) receives, and the opposite of what the *hope that not p* paraphrase in (21c) receives.

(21) a. John is hoping whether his neighbor will be home this weekend.
GoodFriend: True; NoiseHater: False.
b. John is hoping that his neighbor will be home this weekend.
GoodFriend: True; NoiseHater: False.
c. John is hoping that his neighbor won't be home this weekend.
GoodFriend: False; NoiseHater: True.

The pair in (22) provides additional support for the same point: While (22a) is an acceptable way of expressing one's desire to leave, (22b) is not.

[8]The new data we present were either attested online or constructed, and judged by two linguistically trained native speakers each. For Mandarin, Japanese, Spanish and Turkish, one of these speakers is an author of this paper.

(22) Alex and Sam are at a party together. Alex says to Sam:

a. I'm feeling tired. I was hoping whether we could leave.

b. I'm feeling tired. #I was hoping whether we have to stay.
Intended: I was hoping that we didn't have to stay/that we could leave.

These observations strongly suggest that a *hope that p* paraphrase is available for *hope whether p*, but that a *hope that not p* paraphrase is consistently unavailable. *If* alternative ways of interpreting *hope whether p* exist, be it as *hope that not p* or as a non-propositional relationship to the interrogative, e.g., see *be worried* in Section 3.3, we have not found evidence for them.

Highlighting Sentences of the form *x hope whether p* are counterexamples to Uegaki and Sudo's descriptive generalization that *hope* does not combine with interrogative complements. But because such sentences are consistently interpreted as *x hope that p*, they do not directly challenge Uegaki and Sudo's analysis. As shown in Sect. 2.1, U&S predict that *x hope whether p* gives rise to trivial truth conditions under the assumption that *hope* existentially quantifies over a *non-singleton* set of propositions Q. If, for reasons that we will sketch out shortly, Q is able to only make available a single alternative (p) despite being expressed by a polar question, U&S no longer predict that *x hope whether p* should be ungrammatical—just like they do not predict that *x hope that p* should be ungrammatical.

The question, of course, is how to reduce *x hope whether p* to *x hope that p*. As White (2021) also points out, it will not do to say that the complementizer *whether* is simply replaced by, or that it is sometimes the pronunciation of, the complementizer *that*. This is because examples like (17c) are attested, where *hope* can be conjoined with *wonder* and then combined with a *whether* clause. If that clause were a secretly a declarative, it would not be able to compose with *wonder*, as *wonder* does not take declarative complements.

We then propose that in sentences of the form *x hope whether p*, the predicate *hope* composes with the *highlighted content* of the polar question (Roelofsen and van Gool, 2009; Roelofsen and Farkas, 2015; Theiler, 2021). The assumption here is that interrogatives have two meaning dimensions: their ordinary and their highlighted content. For a polar interrogative *whether p*, its *ordinary* content $[\![\cdot]\!]^o$ is the familiar symmetric denotation $\{p, \neg p\}$, whereas its *highlighted content* $[\![\cdot]\!]^h$ is the singleton set $\{p\}$ containing the denotation of the radical, in (23).[9]

(23) $[\![whether\ p]\!] = \langle [\![whether\ p]\!]^o, [\![whether\ p]\!]^h \rangle = \langle \{p, \neg p\}, \{p\} \rangle$

Usually, clause embedding predicates compose with the ordinary content of interrogatives. The data from *hope whether*, however, are telling us that this predicate may at least sometimes compose with the highlighted content of interrogatives to give rise to truth conditions along the lines of (24). Here, assume that $hope_C^{+H}$ is defined just like $hope_C$, in (10), except that it requires its first argument to be provided by highlighted content.

(24) $$[\![hope_C^{+H}\ whether\ p]\!]^w = [\![hope_C^{+H}]\!]^w([\![whether\ p]\!]^h) = [\![hope_C^{+H}]\!]^w(\{p\}) =$$
$$= \lambda x_e \colon \underline{p \in C}. \begin{bmatrix} p \in C \wedge \\ \mu_w(x,p) > \theta(\{\mu_w(x,p') \mid p' \in C\}) \end{bmatrix}$$

These truth conditions presuppose and assert that the prejacent p of the polar interrogative is part of the comparison class C, and assert furthermore that x's degree of preference for p exceeds a standard threshold for the comparison class, provided by θ. If we had instead composed *hope* with the ordinary content of a polar interrogative, we would have obtained the trivial truth conditions reviewed in Sect. 2.1.

Finally, we would like to suggest that if a strategy is available for composing *hope* with the highlighted content introduced by polar interrogatives, it must be **a last resort strategy**. This would help explain the general markedness of *hope* with embedded interrogatives, at least for some speakers, and the fact that such constructions require support from context or the linguistic material present in the embedded clause to be acceptable. The underlying claim, here, is that speakers will, by default, try to compose *hope* with the ordinary content of interrogative clauses, and if the result should lead to ungrammaticality, they will resort to the highlighting strategy. We will not enter into the details of the variability (across speakers, languages,

[9] We set aside the question of whether a similar result could be obtained in monopolar approaches to polar interrogative denotations (Biezma and Rawlins, 2012).

and sentences for a given speaker in a given language) that might be involved in the ability to access this strategy, but show that highlighting and the assumption that it is a last resort strategy makes some welcome predictions that we discuss throughout the rest of this section.

***Hope whether* in other languages** The counterparts of the predicate *hope* in other languages vary in their acceptability with polar interrogatives. We illustrate with data from Mandarin, Spanish, Turkish and Japanese. Mandarin is the only language in the sample where we have found that such constructions are acceptable (by some but not all native speakers), and their interpretation is consistent with the main prediction of the highlighting strategy.[10]

In Mandarin, the lexical material inside a polar interrogative affects whether it can be embedded under *xiwang*, "hope." This is shown by the contrast between (25a) and (25b). We do not have a general characterization of what conditions such differences in acceptability, but note that the *whether x can help y*, adapted from ex. (17a), also leads to improvement in English. The acceptability of sentences like (25b), however, is subject to across speaker variation.[11]

(25) a. *Yuehan xiwang [(daoshihou) tade linju huibuhui zai jia].
John hope then his neighbor will.not.will at home
Intended: "John hopes whether his neighbor will be at home then."
b. %Yuehan xiwang [(daoshihou) tade linju nengbuneng bangbang ta].
John hope then his neighbor can.not.can help him
Intended: "John hopes whether his neighbor can help him." (Mandarin)

For the speakers for which examples like (25b) are acceptable, the sentence entails that Yuehan hopes that his neighbor can help him, and is incompatible with contexts in which he hopes that his neighbor can't help him. That is, the empirical facts and the proposal surrounding highlighting also extend to Mandarin.

Spanish has two strategies for finite interrogative embedding, illustrated in (26a) and (26b) with the verb *decir*, "say." A choice is available only for some clause-embedding predicates and it gives rise to an interpretive difference. Bare *si* interrogatives under *decir* require that the matrix subject tell an answer to the question, e.g., that the neighbor could help, in (26a). In contrast, *que si* interrogatives under the same predicate require that the matrix subject raise the issue expressed by the interrogative complement, i.e., that Juan *asks* whether the neighbor can help (Suñer, 1993).

(26) a. Juan les dijo [si el vecino podía ayudar].
Juan them-DAT said whether the neighbor could.IND help
"Juan told them whether the neighbor could help."
b. Juan les dijo [que si el vecino podía ayudar].
Juan them-DAT said QUE whether the neighbor could.IND help
"Juan asked them whether the neighbor could help." (Spanish)

The examples in (27a) and (27b) illustrate that both options give rise to ungrammaticality with *esperar*, "hope." Note that we are using an embedded interrogative which we know gives rise to acceptable results in English and Mandarin, and that we have not found evidence for across speaker variation here.

(27) a. *Espero [si el vecino me puede ayudar].
hope-1SG whether the neighbor me-ACC can.IND help
Intended: "I hope / was hoping whether the neighbor can help me."
b. *Espero [que si el vecino me puede ayudar].
hope-1SG QUE whether the neighbor me-ACC can.IND help
Intended: "I hope / was hoping whether the neighbor can help me." (Spanish)

[10]Some languages may allow for the same attitude verb to compose with embedded clauses that differ in their syntax, which in turn may give rise to differences in acceptability and interpretation. This point is not relevant for Mandarin *hope*, but discussed for Spanish here, and for Japanese and Turkish in section 4.

[11]The author of the paper who is a native speaker of Mandarin finds (25b) perfectly acceptable, but our consultant finds it highly marked. In addition, there have been about 10 native speakers of Mandarin at several presentations of earlier versions of this work. Some found (25b) perfectly acceptable, while others found it marked to various degrees.

Japanese and Turkish, which pattern similarly for the case at hand, also feature different types of embedded clauses. *Nominalized* embedded interrogatives are unacceptable under *nozomu* and *um-*, "hope," in Japanese and Turkish. Here, we see again that the choice of lexical material that led to improvement in English and Mandarin is not enough here.

(28) a. *Taro-wa [tomodati-ga sonotoki ie-ni iru-ka-o] nozon-deiru
Taro-TOP friend-NOM then home-LOC be-Q-ACC hope-ASP
Intended: "Taro hopes whether his friend will be at home then."
b. *Taro-wa [tomodati-ga mondai-o tokeru-ka-o] nozon-deiru
Taro-TOP friend-NOM problem-ACC solve.can-Q-ACC hope-ASP
Intended: "Taro hopes whether his friend can solve the problem." (Japanese)

(29) a. *[Bana yardımcı ol-up ol-ama-yacağ-ınız-ı] um-uyor-du-m.
1S.DAT helper be-COORD be-NEG.ABIL-FUT-2P-ACC hope-IPFV-PST-1S
Intended: "I was hoping whether you could help me."
b. *[Birisi-nin yazdıklarımı teyit ed-ip et-me-yeceğ-in-i] um-uyor-du-m.
someone-GEN what I wrote confirmation do-COORD do-NEG-FUT-3S-ACC hope-IPFV-PST-1S
Intended: "I was hoping whether someone could confirm what I wrote." (Turkish)

The second type of embedded questions that is relevant for both languages involves clauses that are not nominalized and that are introduced by the morphemes *to* (Japanese) and *diye* (Turkish). With *diye* and *to* clauses, it becomes possible to compose "hope" with embedded interrogatives. Because there is reason to think that such clauses have syntactic and semantic properties that set them apart from the embedded clauses that we have presented so far in English, Spanish and Mandarin, we present the relevant data and discussion in Section 4.

Predictions of the highlighting strategy We have said that *hope*, and possibly some of its counterparts in different languages, have the option of composing with the content that is highlighted by embedded interrogatives. Let us also, for now, commit to the possibility that highlighting is the only way of composing predicates like *hope* with interrogatives, and postpone the discussion of additions and alternatives until the end of this section and section 4.[12]

The first prediction that this makes is that *hope whether p* will be interpreted as *hope that p*, when it is interpretable at all. This is what the data reviewed up until now suggest, and we are not aware of any counterexamples to this prediction.[13]

Second, if the shift in meaning required for *hope* to combine with some interrogatives is located in the verb, and not in the syntax or semantics of the embedded clause, the proposal leads us to expect that coordinating *hope* with rogative predicates like *wonder* should be possible. One data point that suggests that this is indeed possible, from White (2021), is repeated here.

(17c) This Trump/Carson boom really has people like Bush, Walker, Rubio, and others **wondering and hoping whether** history will repeat itself and whether Republicans will return back to focusing on the establishment choices but it's all about outsider candidates right now.

An example like (17c) raises the general question of what predicates V can be coordinated with *hope* and composed with a common interrogative complement Q. To keep the discussion on track, we will simply note

[12]These predictions are made on the basis of the additional assumption that the predicates that we are considering are C-distributive. See the discussion of non-C-distributive positive preferential *care* in section 3.3.1. For concreteness, what we have evidence thus far is that if we find an arbitrary positive preferential predicate V in an arbitrary language that can take both declarative and interrogative clauses, it will exclude a reading of the form $\ulcorner x\ V\ Q \urcorner \Leftrightarrow \exists p \in Q : \ulcorner x\ V\ p \urcorner$.

[13]A related prediction could also be that sentences with embedded clausal negation that are of the form *S hope whether not p*, if attested, should be interpreted as *S hope that not p*. We were not able to test this prediction, as our consultants have rejected constructed examples of this form and we were not able to find any that were attested online. We would also like to raise a doubt about whether we make this prediction in the first place: Negative polar questions are biased polar questions—in terms of original epistemic bias (Romero and Han, 2004) and/or contextual evidence bias (Büring and Gunlogson, 2000). This gives rise to interrelated syntactic, semantic, and pragmatic considerations whose relationship with highlighting and interrogative embedding is not immediately clear or well understood.

that *V and hope Q* should be possible so long as *Q* is able to provide the right kind of highlighted content, and that there is no independent semantic incompatibility between *V Q* and *hope Q*.[14]

We have seen evidence that *hope* could combine with polar interrogatives. We now turn to what we expect should happen, given the highlighting strategy, with constituent and alternative questions. Roelofsen and Farkas (2015) and Theiler (2021) propose that alternative questions highlight each one of their alternatives, and that constituent questions do not highlight propositions, but n-place *properties* (with $n \geq 1$). This property is obtained by abstracting over the positions filled by the *wh*-words in the interrogative. The alternative question in (30a), then, introduces highlighted content identical to its ordinary content, namely the set of propositions corresponding to the two alternatives. In contrast, the constituent *wh*-interrogative in (30b) introduces the (singleton set containing the) property obtained by abstracting over the subject as its highlighted content, and the familiar set of propositional answers as its ordinary content.

(30) a. $[\![\text{whether they serve tea or coffee}]\!] =$
$\langle \{\lambda w.\text{they serve}_w \text{ tea}, \lambda w.\text{they serve}_w \text{ coffee}\}, \{\lambda w.\text{they serve}_w \text{ tea}, \lambda w.\text{they serve}_w \text{ coffee}\}\rangle$

b. $[\![\text{who might be able to help Alice}]\!] =$
$\langle \{\lambda w.x \text{ might be able to help}_w \text{ Alice} : x \in D_e\}, \{\lambda x.\lambda w.x \text{ might be able to help}_w \text{ Alice}\}\rangle$

Given the highlighting strategy, composing *hope* with an alternative question, like in (31), requires saturating *hope*'s clausal argument slot with the set {coffee, tea}. But we know, from the discussion above, that this will give rise to a trivial meaning: The Threshold Significance Presupposition will require that Alice prefer one of coffee or tea, and the sentence will assert the same thing, leading to unacceptability. This prediction seems to be borne out, as the sentence is unacceptable under the meaning paraphrased in (31a), which corresponds to the alternative question interpretation. To the extent that some speakers might make sense of the sentence, (31b) is the only available interpretation, where the embedded clause is interpreted as a polar interrogative.[15]

(31) *Alice was hoping whether they served tea or coffee.

a. Intended: Alice was hoping that they served tea or she was hoping that they served coffee.

b. Available: Alice was hoping that they serve tea or coffee.

In the alternative question case, then, both the ordinary and the highlighted meaning of the question will lead to unacceptability. As these two meanings are the same, highlighting is unable to save the sentence. This is an accurate prediction.

The examples in (32) illustrate the constituent *wh*-interrogative case, which are unacceptable under any reading.[16] Here, the ordinary semantic value of the interrogatives will (again) lead to a trivial meaning and cannot be used to generate meanings for the sentences. The highlighting strategy will not work either, but for a different reason: It will attempt to saturate *hope*'s clausal argument, which has to be a set of propositions, with the highlighted content made available by a constituent *wh*-interrogative, which is a 1-place property. This will result in a type mismatch, making *hope wh-* uninterpretable.[17]

[14]Selectional restrictions imposed on conjoined phrases are thought to be looser than when those phrases occur alone, as in *You can depend on my assistant and that he will be on time*, see, e.g., Sag et al. (1985) or the conversation between Patejuk and Przepiórkowski (2019) and Patejuk and Przepiórkowski (2023), and Bruening and Al Khalaf (2020) and Bruening (2023). To our knowledge, such mismatches have not been explored for the conjunction of predicates that impose such restrictions, e.g., for structures *X and Y ZP*, possibly like (17c), where one of *X* or *Y* doesn't select for *ZP*.

[15]The question arises as to whether the polar question interpretation given entails the alternative question interpretation. We will simply note that it is possible to bring out alternative question interpretations with the continuation *. . . but I don't know which*, as in *Alice knows whether they serve tea or coffee, but I don't know which*. This continuation does not improve the acceptability of (31).

[16]We provide the one that is expected from composing *hope* with the ordinary denotation of a *wh*-interrogative, if the Threshold Significance Presupposition were somehow suspended. We also leave aside delicate issues pertaining to whether the restrictor of the *which* phrase in (32a) is interpreted *de re* or *de dicto*. See, e.g., Heim (1994).

[17]It is technically possible to convert the highlighted property into a singleton set of propositions, e.g., by existentially closing the property, and to use that object to saturate *hope*'s clausal argument. This would lead to the expectation that the sentences in (32) should mean *Alice was hoping that there is a beverage that they serve* and *I was hoping that someone might be able to help me*. These readings are unavailable, suggesting that it is impossible in our case to recover a set of propositions from the highlighted property. We speculate that this has to do with the last-resort nature of the highlighting strategy. The coercion of a property into a set of proposition may be impossible due to the processing cost that is incurred on top of the cost associated with the last-resort highlighting strategy.

(32) a. *Alice was hoping which beverage they serve.
Intended: There is a beverage x s.t. Alice was hoping that they serve x.
b. *I was hoping who might be able to help me.
Intended: There is a person x s.t. I was hoping that x might be able to help me.

Consistent with these initial facts from English, the examples below show that *hope* doesn't appear to combine with *wh*-interrogatives in Japanese, Mandarin, Spanish and Turkish either.[18]

(33) *[Amerikan ekonomisinin tekrar ne zaman kalkınacağını] um-uyor-lar
American economy.GEN again when develop.NMZ hope-PRES-3P
Literally: "They are hoping when the US economy will start growing again." (Turkish)

(34) *Zhangsan xiwang [tamen tigong nazhong yinliao].
Zhangsan hope they serve which.CLF beverage
Literally: "Zhangsan hopes which kind of beverage they serve." (Mandarin)

(35) *Taro-wa [sono mise-ga donna nomimono-o dasu-ka-o] nozondeiru.
Taro-TOP the shop-NOM which beverage-ACC serve-Q-ACC hope.ASP
Literally: "Taro hopes which beverage the shop serves." (Japanese)

(36) *Alicia espera-ba [qué bebida le iban a servir].
Alicia hope-PST.IPFV.3S what beverage 3S go.PST.IPFV.3P to serve
Literally: "Alicia was hoping which beverage they were going to serve her." (Spanish)

We end the discussion of English *hope* with a challenge to the claim that the predicate is unacceptable with alternative and constituent questions. The challenge comes from the fact that data like (37), with these unexpected interrogative forms, are attested with *hope*.

(37) a. I guess Lisbon's **wondering and hoping whether or not** he ever will function again, and he's looking at her, thinking, 'She's going to walk away, and I can't fix myself. I've forgotten how to give of myself and surrender.'[19]
b. Businesses that sell to the U.S are **wondering and hoping when** the U.S. economy will get back into the game.[20]

While we are not entirely sure what makes these sentences acceptable, in contrast to the unacceptable examples in (31) and (32) above, it might indeed be the case that there are strategies for combining *hope* with interrogatives that either coexist with the highlighting strategy, or that subsume it.[21] In section 4, we will focus on Japanese and Turkish data that also display an unexpected distribution for embedded interrogatives, sketch out a clause-embedding strategy that these languages make available, and suggest that that strategy might subsume highlighting as well as covering the acceptability and interpretation of sentences like (37).

[18] *Wh*-phrases in Mandarin Chinese in some cases can be interpreted as *wh*-indefinites, e.g., in (i).

(i) Zhangsan xiwang [naming xuesheng neng yingde bisai].
Zhangsan hope which.CLF student can win match
"Zhangsan hopes some student can win the match." (Mandarin)

This possibility is restricted, and is not the relevant embedded question interpretation. For instance, (34) does not have the *wh*-indefinite interpretation *Zhangsan hopes that they serve some kind of beverage.*

[19] `https://jisbonaddict.tumblr.com/post/158972688651/i-guess-lisbons-wondering-and-hoping-whether-or`

[20] `https://toronto.citynews.ca/2020/08/11/business-highlights-450/`

[21] Note, for example, that at least for (37b), conjunction with *wondering* is not innocent and omitting this second predicate results in degradedness.

(i) ???Businesses that sell to the US are hoping when the US economy will get back into the game.

3.2 Negative NVPs: No Threshold Significance Presupposition

Our second class of question-embedding NVPs consists of *evaluatively negative* predicates such as *fear*. White (2021) provides the following corpus examples of *fear* taking interrogative complements (38), repeated from (16).

(38) a. Interstellar space is so vast that there is no need to **fear whether** stars in the Andromeda galaxy will accidentally slam into the Sun.
b. I **fear whether** this test would run safely on the oxygen sensor as it has a lot of drawback when compared with the others.
c. [. . .]I **fear whether** I'll have use of my arms/hands by age 55 or 60.
d. I know parents who seriously **fear whether** their children will ever hold a meaningful job.

Unlike *hope whether*, we can see that *fear whether p* is compatible with a scenario where the attitude holder fears that p, e.g., (38a), as well as scenarios where the attitude holder fears that $\neg p$, e.g., (38b)–(38d). The highlighting mechanism introduced in the previous section, according to which *V whether p* can only be interpreted as *V that p*, will not be able to account for the latter cases.

When we re-examine the assumptions Uegaki and Sudo (2019) make in their derivation, we note that their empirical motivation for the Threshold Significance Presupposition is based on *evaluatively positive* predicates such as *like* and *be happy*, e.g., (39).

(39) Context: It is common knowledge that John knows which student will sing. Al knows that there is no particular student John wants to sing (i.e., John is indifferent about which student will sing).
Bo asks Al: "How does John feel about which student will sing?"
a. Al: #John doesn't like which student will sing.
b. Al: #John isn't happy about which student will sing.

If there were no Threshold Significance Presupposition, Al's answers in (39) would simply mean it is not the case that John likes/is happy about which student will sing, and should be true in this context. However, empirically such answers seem to presuppose the existence of a student John preferred to sing and consequently they feel infelicitous in the context where John does not have any preference. This point is also illustrated by (40).

(40) Context: Same as (39).
Bo: Is John happy about which student will sing? / Does John like which student will sing?
Al: #No.

However, for evaluatively negative predicates such as *hate* and *be upset*, Al's answers in (41) and (42) seem fine in the corresponding context where the Threshold Significance Presupposition is not met.

(41) Context: It is common knowledge that John knows which student will sing. Al knows that there is no student such that John will hate it or be upset if they will sing.
Bo asks Al: "How does John feel about which student will sing?"
a. Al: John doesn't hate which student will sing.
b. Al: John isn't upset about which student will sing.

(42) Context: Same as (41).
Bo: Is John upset about which student will sing? / Does John hate which student will sing?
Al: No.

We take the contrast between evaluatively positive and negative predicates to suggest that evaluatively negative predicates in fact do not have a Threshold Significance Presupposition (see also Klochowicz 2022). Without this presupposition, U&S's formal analysis predicts that for an evaluatively negative NVP such as *fear*, *A fears Q* simply means *for some p in Q, A fears that p*, which is not a trivial meaning. Therefore, we no longer expect negative NVPs to be incompatible with embedded questions.

This is consistent with the fact that *A fears whether p* is compatible with scenarios where *A fears that p* as well as scenarios where *A fears that* $\neg p$, and the fact that *fear* can take consistuent questions. Below are

some naturally-occurring examples (43).

(43) a. Both women initially worried about taking the bus, fearing who else might be riding the bus. Both have been pleasantly surprised. Express bus seats recline, and have individual reading lights and air-conditioning vents.[22]
b. But if my party doesn't enter this city, I fear who else will.[23]

Cross-linguistically, there are further examples of evaluatively negative NVPs that can embed questions. For example, consider Turkish *kork-* "fear" (44).

(44) John [komşusunun haftasonu evde ol-up ol-ma-yacağ-ın-dan] korkuyor.
John his neighbor the weekend at home be-CONJ be-NEG-NMZ.FUT-3S.POSS-ABL fear
"John fears whether his neighbor will be home." (Turkish)

This sentence is felicitous in the GoodFriend context (19), where John fears that his neighbor will not be home, as well as the NoiseHater context (20), where John fears that his neighbor will be home. The predicate is also compatible with constituent questions (45).

(45) John [maçı hangi oyuncunun kazan-acağ-ın-dan] korkuyor
John the match which player win-NMZ.FUT-3S.POSS-ABL fear
"John fears which player will win the match." (Turkish)

The same patterns hold for Japanese *osore(ru)* "fear."

(46) John-wa [rinzin-ga konsyuumatu ie-ni iru ka-o] osore-teiru
John-TOP neightbor-NOM this.weekend home-LOC be Q-ACC fear-ASP
"John fears whether his neighbor will be home." (Japanese)

The sentence is felicitous in the GoodFriend context as well as the NoiseHater context. And the predicate is also compatible with constituent questions (47).

(47) John-wa [dono sensyu-ga sono siai-de katu-ka] osore-teiru
John-TOP which player-NOM the match-LOC win-Q fear-ASP
"John fears which player will win the match." (Japanese)

We emphasize that the revised U&S's analysis, which drops the Threshold Significance Presupposition for evaluatively negative NVPs, does not predict that they will always be compatible with interrogative clauses. It only says that, if they were to take interrogative clauses, the resulting meanings would not be trivial. However, there can be various other factors in a language that make such predicates incompatible with some or perhaps even all interrogative clauses.

For instance, while Spanish *temer* "fear" is compatible with constituent questions (48), it sounds quite bad with polar questions (49).

(48) Juan teme [qué puede pasar si su vecino está en casa].
Juan fears what can.IND happen if his neighbor is at home
"Juan fears what can happen if his neighbor is at home" (Spanish)

(49) ???Juan teme [si su vecino estará en casa].
Juan fears whether his neighbor will.be at home
"Juan fears whether his neighbor will be at home" (Spanish)

Mandarin *haipa* "fear" exhibits the opposite pattern. It is compatible with polar questions just like its English, Turkish and Japanese counterparts (50).

(50) Yuehan (hen) haipa [tade linju huibuhui zaijia].
John very fears his neighbor will.not.will at.home

[22] https://eu.heraldtribune.com/story/news/2012/11/11/on-scats-express-bus-its-life-in-the-fast-lane/29134294007/

[23] Martha Wells, 2016, *The Edge of Worlds* chapter 2; Start Publishing

"John fears (very much) whether his neighbor will be at home" (Mandarin)

In contrast, *haipa* cannot take a constituent question. The only available interpretation of (51) is one where the wh-phrase is interpreted as an indefinite. In this case, the embedded clause is a declarative clause rather than a constituent question.[24]

(51) Yuehan (hen) haipa [naming xuanshou hui yingde bisai].
John very fears which.CLF player will win match
Intended, unavailable: "John fears which player will win the match."
Available: "John fears that some player will win the match." (Mandarin)

Explaining why the Spanish and Mandarin counterparts of *fear* are incompatible with some types of interrogative clauses is beyond the scope of this paper. For our purposes here, the fact that these predicates are compatible with *some* interrogative clauses provide further evidence for the revised U&S's analysis, according to which evaluatively negative predicates taking interrogative clauses will not result in semantic triviality.

3.3 Non-C-distributive NVPs

Our last class of question-embedding NVPs consist of *non-C-distributive* predicates. A responsive predicate V is said to be *C(lausal)-distributive* iff the meanings of its interrogative- and declarative-embedding uses are related in the following way.

(52) **C-distributivity**
$\ulcorner x\ V\ Q \urcorner$ is true iff there is an answer p to Q such that $\ulcorner x\ V\ p \urcorner$ is true.

Most responsive predicates are C-distributive. For instance, *Al knows which player won the race* is true iff there is an answer to the embedded question, e.g., *x won the race*, such that *Al knows that x won the race*. Uegaki and Sudo (2019) assume in their formal derivation that NVPs are C-distributive (or they would be if they were able to take interrogative clauses). Crucially, because of this assumption, when a NVP takes an interrogative clause, the asserted content is identical to the Threshold Significance Presupposition (and hence the resulting meaning is trivial).

However, this assumption should be carefully examined, since in general not all responsive predicates are C-distributive. For instance, consider Elliott et al.'s (2017) argument that *predicates of relevance* such as *care* are non-C-distributive. When *care* takes a declarative clause φ, it presupposes that the attitude holder believes φ (53).[25]

(53) a. Mary cares that John left.
⇒ Mary believes that John left. (under veridical/emotive factive uses)
b. Mary does not care that John left.
⇒ Mary believes that John left. (under veridical/emotive factive uses)

In contrast, when *care* takes an interrogative clause, the sentence (54a) can be true even when there is no answer p such that the attitude holder believes p, i.e., when the attitude holder is totally ignorant. For instance, (54b) is coherent. Therefore, Q-to-P distributivity (52) does not hold for *care*.

(54) a. Mary cares which student left.
b. Mary cares which student left and wonders which student left.

[24] We can further illustrate the unavailability of the embedded question interpretation by considering sentences that do not have a wh-indefinite interpretation. For instance, (i) is totally unacceptable.

(i) *Yuehan haipa [tamen tigong nazhong yinliao].
John fears they serve which.kind beverage
*wh-Q: "John fears which kind of beverage they serve."
*wh-indefinite: "John fears that they serve some kind of beverage." (Mandarin)

[25] The complement clause is generally further presupposed to be true, and hence *care* may be classified as a veridical predicate.

Given that not all predicates are C-distributive, in principle there may be NVPs that are non-C-distributive. When such predicates take interrogative clauses, the asserted content will not be equivalent to the Threshold Significance Presupposition and hence the resulting meanings are not L-trivial. Therefore, we expect that there can be non-C-distributive NVPs that are compatible with interrogative clauses. We discuss attested English and cross-linguistic examples below.

3.3.1 Positive non-C-distributive NVPs

Elliott et al.'s (2017) argument reviewed above shows that *emotive factive* uses of *care* are non-C-distributive. We further suggest that English *care* also has uses that are not emotive factive (and we will call such uses non-veridical for short). Consider the following naturally-occurring example where a law firm partner talks about qualities they look for.

(55) "[. . .] I want people who will do what we ask them to do — not people who feel they have to be mentored and rewarded all the time, and who need to be patted on the head every time they do a brief."
"I don't care if you got an A in con law," she continued. "**I care that you will work hard**."[26]

Here, *care* is non-veridical in *I care that you will work hard*: It does not entail that the addressee will work hard or that the attitude holder (which is the speaker in this case) believes that the addressee will work hard.[27] The attitude holder merely wants it to be the case that the addressee will work hard.

One crucial difference between veridical and non-veridical uses of *care* is whether the attitude holder must have a preference for the embedded clause to be true. For veridical uses of *care*, it is possible that the attitude holder does not prefer that the embedded clause be true (56).

(56) Al cares that Bo left (without notifying him), which is why he is so mad at him.

In contrast, we observe that non-veridical uses of *care* entail that the attitude holder wants the declarative complement to be true (57). For instance, in context (58), given that Al (not knowing whether Bo left) wants it to be the case that Bo left, (58a) is true under a non-veridical use of *care* whereas (58b) is not.

(57) Al cares that x left
⇒ Al wants it to be the case that x left (under non-veridical use)

(58) Context: Al really dislikes Bo and wants to avoid him as much as possible. Al is invited to a party. He knows that Bo is also invited and he always comes to a party early and does not stay for long. Therefore Al decides to come to the party after Bo has left. After waiting for some time, Al calls his friend Charles, who is at the party, to check whether Bo is still there.
When Charles picks up the phone, he says: "Why aren't you here already? The beer is amazing!"
Al replies: "I don't care if they serve the best beer in the world there. **I care that Bo has left.**"
a. Al cares that Bo has left. (true under non-veridical use)
b. Al cares that Bo is still there. (not true under non-veridical use)

Based on this, we can show that non-veridical uses of *care* are also non-C-distributive: (59) can be true without there being a student x such that Al wants it to be the case that x left. For instance, (59) is true in context (60).

(59) Al cares which student left.

(60) Al's job is to record which student left and he definitely wants to do it right. However, Al does not have any preference about which student left. That is, it is not the case that there exists a student x s.t. Al prefers it to be true that x left.

The discussion above suggests that non-veridical uses of *care* are evaluatively positive and non-C-distributive. However, given that in most cases the salient reading of *care* is the veridical one, one may

[26] https://www.lawpracticetoday.org/article/right-kind-grit-succeed/

[27] Technically, in the original context (55), the speaker is using *you* in a generic way. But the sentence would also be felicitous if the speaker is talking to a new employee and intends *you* to specifically refer to the addressee.

still worry about whether *care* really has a separate non-veridical preferential reading. e.g., in (59). To avoid this caveat and further illustrate the existence of evaluatively positive NVPs that are non-C-distributive, below we discuss a different type of non-C-distributive predicates that are clearly non-veridical and evalutively positive.

The Mandarin Chinese predicate *qidai*, which can be roughly translated as *look forward to* in English, is a clear example of an evaluatively positive responsive NVP that is non-C-distributive.[28]

Consider the following naturally occurring examples produced by a single speaker.[29] When *qidai* takes an interrogative clause (61), there need not be an answer p to the embedded clause such that the attitude holder wants p to be true. Rather, the attitude holder simply wants to know what the true answer is. When *qidai* takes a declarative clause (62), it entails that the attitude holder wants the declarative clause to be true, but the declarative clause itself may or may not in fact be true, i.e., *qidai* is evaluatively positive and non-veridical. This means that *qidai(Q)* can be true without there being any answer p to Q such that *qidai(p)* is true. Therefore, *qidai* is non-C-distributive.

(61) Hen qidai [ta hui zenyang quanshi zhege xinde juese].
very QIDAI he will how interpret this new character
"I (very much) look forward to (seeing) how he will interpret/portray this new character."

(62) Ye qidai [ta neng tongguo zhege zuopin rang gengduode ren shuzhi ta].
also QIDAI he can through this.CLF work.of.art let more people know.well him
"I also look forward to him being able to let more people know him well through this piece of work" (Mandarin)

The same pattern holds for Japanese *tanosimi* ("look forward to"): (63a) and (64a) are naturally occurring examples of *tanosimi* taking questions and the resulting meanings are non-C-distributive.

(63) a. [Kotosi-wa dare-ga MVP-o toru-no-ka] tanosimi-desu-wa.
this.year-TOP who-NOM MVP-ACC win-NMZ-Q fun-COP.POL-PARTICLE
"I look forward to who will win the MVP this year."[30]

b. [Kotosi-wa Taro-ga MVP-o toru-no-ga] tanosimi-desu-wa.
this.year-TOP Taro-NOM MVP-ACC win-NMZ-NOM fun-COP.POL-PARTICLE
"I look forward to Taro winning the MVP this year." (Japanese)

(64) a. Watasi-wa [Pattinson-ga Batman-de nani-o suru-no-ka] tanosimi-desu.
I-TOP Pattinson-NOM Batman-LOC what-ACC do-NMZ-Q fun-COP.POL
"I look forward to what Pattinson will do in The Batman."[31]

b. Watasi-wa [Pattinson-ga Batman-de subarasii engi-o suru-no-ga] tanosimi-desu.
I-TOP Pattinson-NOM Batman-LOC wonderful acting-ACC do-NMZ-NOM fun-COP.POL
"I look forward to Pattinson acting wonderfully in The Batman." (Japanese)

3.3.2 Negative non-C-distributive NVPs

Finally, we suggest that there are also evaluatively negative NVPs that are responsive but not non-C-distributive.

Consider English *worry* (with an experiencer subject) and the non-veridical reading of *be worried*.[32]

[28] In this paper, we focus on clause-embedding predicates that take finite clauses. English *look forward to* does not take a finite declarative clause. Also, not all speakers are happy with it directly taking an interrogative clause: for such speakers it is necessary to use *look forward to seeing/finding out/learning Q*. Therefore, we remain agnostic about whether English *look forward to* counts as an example of evaluatively positive responsive NVP that is non-C-distributive.

[29] `https://www.ximalaya.com/ask/q8788545?source=m_jump`

[30] `https://www.smbc.co.jp/sponsorship/smbcnipponseries/column/article01/`

[31] `https://www.marvelvsdc.xyz/entry/dcfu_89`

[32] *Worry* with a clausal or expletive subject is veridical: both *that John didn't go to school yesterday worries Mary* and *it worries Mary that John didn't go to school* entail *John didn't go to school*. *Be worried that p* has both veridical and non-veridical readings (Hartman, 2012, pp. 25–26). For instance, *Mary is worried that John is drinking again* has a veridical reading, according to which Mary knows that John is drinking again and this fact causes Mary to be worried. It also has a non-veridical reading, according to which Mary is concerned about the prospect that John is drinking again.

When they take a declarative complement, they are non-veridical (65a). In addition, the attitude holder must consider the embedded clause an undesirable possibility (65b). That is, they are evaluatively negative.

(65) Mary worries/is worried that John didn't go to school yesterday.
   a. $\not\Rightarrow$ John didn't go to school yesterday.
   b. $\Rightarrow$ Mary considers John not going to school yesterday an undesirable possibility.

When *be worried* or *worry* takes an interrogative clause, there is a general preference to use the preposition *about*. However, the following naturally-occurring examples suggest that at least for some speakers *about* is not obligatory (66). Consequently, in the rest of this section, we will assume that *about* is semantically vacuous.

(66) a. So Jacob is worried what he should be doing these next couple of months.[33]
   b. I love Gerri (as we all do) but I don't think we need to be worried about her. If anything we should be worried what she could/will do to the Roy's.[34]
   c. There was the fellow who'd been a White House butler for many decades, and was now invited as a guest to a White House dinner. His wife worried what she could possibly discuss with the other honorees, and finally came up with: *so, tell me about your experience with high school.*[35]
   d. Meanwhile, Joyce privately worried what she could do to protect Buffy and anyone.[36]
   e. With the #MeToo movement, men have worried what they could do, if anything, to be forgiven for past sexual transgressions.[37]

The following examples (67) show that *be worried* and *worry* are non-C-distributive.

(67) a. My father is buying a new boat in July and is worried about where he can dock it.[38]
   b. The rising cost of living has created a sense of instability for many middle-class families in California. Many families are worried about how they will be able to afford to pay their bills and make ends meet.[39]
   c. A year ago he worried about how he could find experienced officers to replace the ones who were leaving to take better-paying jobs in other departments.[40]

For instance, for (67a) to be true, there need not be a place Y (e.g., Dock D) such that (68) is true. This is because (68) entails that the speaker's father considers being able to dock the boat at Y an undesirable possibility. However, (67a) can well be true in a scenario where the speaker's father would be happy to dock his boat anywhere but is worried because he does not know where he can dock his boat.

(68) My father is worried that he can dock the new boat at Y.
   $\Rightarrow$ My father considers him being able to dock the new boat at Y an undesirable possibility.

Cross-linguistically, Mandarin *danxin* (69), Japanese *sinpai-suru* (70), Spanish *preocupar* (71), Turkish *endişelen-* (72), which are close translations of English *worry/be worried*, all similarly exhibit non-C-distributivity: the (a)-sentences can be true without the (b)-sentences being true for any Y. [41] [42]

[33] https://medicalschoolhq.net/pmy-246-ask-dr-gray-premed-qa-lots-of-great-questions-answered/
[34] https://www.reddit.com/r/SuccessionTV/comments/raapam/gerri/
[35] https://judaism.stackexchange.com/questions/137123/what-s-the-source-of-not-asking-a-question-to-a-person-that-might-not-k
[36] https://buffy.fandom.com/wiki/Joyce_Summers_(2019)
[37] https://thehumanist.com/commentary/sorry-its-hard-forgiveness-in-the-metoo-era/
[38] https://www.onthewater.com/7-questions-to-ask-yourself-before-buying-a-boat
[39] https://original.newsbreak.com/@that-guy-from-california-1691771/3182892170598-claim-600m-inflation-relief-for-ca-middle-cl
[40] https://www.semissourian.com/story/156663.html
[41] Although some authors classify Spanish *preocupar* 'worry' as factive emotive (e.g., Villalta 2008), (71b) crucially allows for a non-veridical interpretation of the *that* -clause. The difference in embedded mood between (71a) and (71b) is due to the fact that embedded interrogative clauses obligatorily appear in the indicative while *that*-clauses under *preocupar* appear in the subjunctive per default —though see Falkner (2022) for special discourse effects triggered by the indicative.
[42] The Turkish translation (72) uses the future instead of a possibility modal in the embedded clause because (for reasons that we do not know) the latter sounds less natural. Despite this difference, our crucial point remains, i.e., the predicate is non-C-distributive because the (a) sentence can be true without the (b) sentence being true for any place Y.

(69) a. Wode baba hen danxin [ta neng zai nali ting tade chuan].
My father very worry he can at where dock his boat
"My father worries (very much) about where he can dock his boat."
b. Wode baba hen danxin [ta neng zai Y (nali) ting tade chuan].
My father very worry he can at Y there dock his boat
"My father worries (very much) that he can dock his boat at Y." (Mandarin)

(70) a. [Kare-wa doko-ni hune-o tome-rareru-ka-o] sinpai-siteiru
he-TOP where-LOC boat-ACC park-can-Q-ACC worry-do.ASP
"He worries about where he can dock his boat."
b. [Kare-wa Y-ni hune-o tome-rareru-no-o] sinpai-siteiru
he-TOP Y-LOC boat-ACC park-can-NMZ-ACC worry-do.ASP
"He worries that he can dock his boat at Y." (Japanese)

(71) a. A mi padre le preocupa [dónde puede / va a atracar Antonio el barco].
To my father CL worries where could.IND / goes.SUBJ to Antonio dock the boat
"My father worries about where Antonio can / is going to dock his boat."
b. A mi padre le preocupa [que Antonio pueda / vaya a atracar el barco en Y].
To my father CL worries that Antonio can.SUBJ / goes.SUBJ to dock the boat at Y
"My father worries that Antonio can / is going to dock the boat at Y." (Spanish)

(72) a. Babam [gemisini nereye park ed-eceğ-in-den] endişeleniyor.
my dad his boat where park do-NMZ.FUT-3S.POSS-ABL worry
"My dad is worrying/worried where he'll park his boat."
b. Babam [gemisini Y-ye park edeceğinden] endişeleniyor.
my dad his boat Y-LOC park do.NMZ.ABL worry
"My dad is worrying/worried that he'll park his boat in Y. (Turkish)

We can also show the non-C-distributivity of *worry/be worried* using the following context (73).

(73) Context: John is invited to an event. Not knowing much about the event, he does not know what type of clothes would be appropriate: casual, business casual or formal. He has all types of clothes and is happy to wear anything as long as it is appropriate for the occasion.

While (74) can be true in this context, given that John is happy to wear anything, (75) is false.

(74) John worries/is worried (about) what he should wear.

(75) John worries/is worried that he should wear casual/business casual/formal.

The same judgments hold for the cross-linguistic counterparts of English non-veridical *worry/be worried*: the following sentences with Mandarin *danxin* (76), Japanese *sinpai-suru* (77), Spanish *preocupar* (78), Turkish *endişelen-* (79) are all true in context (73).

(76) Yuehan hen danxin [ta yao chuan shenme].
John very worry he should wear what
"John worries (very much) what he should wear." (Mandarin)

(77) John-wa [nani-o kiru-beki-ka-o] sinpai-siteiru
John-TOP what-ACC wear-should-Q-ACC worry-ASP
"John worries what he should wear." (Japanese)

(78) A Juan le preocupa [qué debería ponerse].
to Juan CL worries what should.3SG wear
"It worries John what he should wear." (Spanish)

(79) John [ne giy-me-si gerek-tiğ-in-den] endişeleniyor.
John what wear-NMZ-3S.POSS MOD-COP.NMZ-3S.POSS-ABL worries
"John is worried what he should wear." (Turkish)

3.4 Summary of the updated classification of NVPs

In this section, we identified three relevant factors influencing a NVP's compatibility with embedded questions: the possibility of targeting the highlighted content as a last resort, the valence of the predicate (which correlates with whether the predicate has a Threshold Significance Presupposition), and whether the predicate is C-distributive. This leads to an updated classification of NVPs, summarized in Table 2, which contains three classes of responsive NVPs in addition to the class of anti-rogative NVPs predicted by Uegaki and Sudo (2019).

First, for positive NVPs that are C-distributive, U&S's original analysis predicts that they are incompatible with embedded questions due to the asserted content being equivalent to the Threshold Significance Presupposition.[43] We extended their analysis by allowing for the possibility that some predicates can target the highlighted content of the embedded question as a last resort to avoid triviality.[44] Examples of such predicates include English *hope* and its close translation *xiwang* in Mandarin Chinese.

Second, for NVPs that are evaluatively negative, we showed that they do not have a Threshold Significance Presupposition. As a result, such predicates taking interrogative clauses would not lead to trivial meanings. Therefore, U&S's original analysis does not apply to such predicates, and we expect to find a class of question-taking NVPs that are evaluatively negative and C-distributive. Examples of such predicates include English *fear* and its close translations in Japanese (*osore(ru)*) and Turkish (*kork-*).

Third, for NVPs that are non-C-distributive, even if they are evaluatively positive and have a Threshold Significance Presupposition, the asserted content is not equivalent to the Threshold Significance Presupposition when they take questions, i.e., no triviality arises. Once again, U&S's original analysis does not apply. Examples of evaluatively positive responsive NVPs that are non-C-distributive include English non-veridical *care*, as well as Mandarin *qidai* and Japanese *tanosimi*, which can be roughly translated as English *look forward to*. Examples of evaluatively negative responsive NVPs that are non-C-distributive include English non-veridical *worry/be worried* and its close translations in Japanese (*sinpai-suru*), Mandarin (*danxin*), Spanish (*preocupar*), and Turkish (*endişelen-*).

	Semantic properties		Combinatorial properties		Examples
Class	Valence	C-distr.	polarQ	non-polarQ	
0	positive	NA/yes	*	*	Japanese *nozomu*, Turkish *um-*, Spanish *esperar*
1	positive	no	%	*	English *hope*, Mandarin *xiwang*
2	negative	yes	✓	✓	English *fear*, Japanese *osore(ru)*, Turkish *kork-*
3a	positive	no	✓	✓	English non-veridical *care*, Mandarin *qidai*, Japanese *tanosimi*
3b	negative	no	✓	✓	English *worry/be worried*, Japanese *sinpai-suru*, Mandarin *danxin*, Spanish *preocupar*, Turkish *endişelen-*

Table 2: Summary of our updated classification of NVPs.

In sum, we extended U&S's original analysis with the highlighting strategy as a last resort to account for Class 1 predicates. In addition, we showed that their analysis does not apply to Class 2 and Class 3 predicates and restricted it to positive predicates that are C-distributive.

Note that our classification here only concerns cases where the predicate takes (the denotation of) its embedded question as its semantic argument. In the next section, we will discuss cases where an embedded question does not serve as the semantic argument of the embedding predicate. Such cases will suggest a

[43] Given that such predicates cannot take interrogative clauses, they are only presumed to be C-distributive according to U&S's original analysis based on the fact that most responsive predicates are C-distributive. This is why the C-distributivity of this class is marked as NA/yes in Table 2.

[44] Note that C-distributivity fails when the highlighting strategy is employed. Recall the definition of C-distributivity: $\ulcorner V\ Q \urcorner$ is true iff there is an answer p to Q such that $\ulcorner V\ that\ p \urcorner$ is true. When the highlighting strategy is employed, $\ulcorner V\ whether\ p \urcorner$ is only compatible with $\ulcorner V\ that\ p \urcorner$. That is, there are cases where $\ulcorner V\ that\ not\ p \urcorner$ is true but $\ulcorner V\ whether\ p \urcorner$ is not. This means that the right-to-left direction of C-distributivity does not hold: in such cases the right-hand side is true (since $\ulcorner not\ p \urcorner$ is an answer to $\ulcorner whether\ p \urcorner$) but the left-hand side is not.

plausible alternative analysis for Class 1 predicates which does not assume that such predicates obtain their arguments by directly targeting the highlighted content of the embedded question.

4 Embedded questions not as semantic arguments

Recent work on how clauses compose with attitude predicates, syntactically and semantically, reveals that some languages offer at least two distinct strategies. One usually involves attitude predicates taking clauses as their arguments. This strategy is what we believe is operative in most of the examples that we have seen thus far. The other strategy has clausal constituents *modify* phrases headed by attitude predicates.[45]

In this section, we outline how the modification strategy is argued to work in Turkish and Japanese. We then observe that whether a preferential predicate is evaluatively positive or negative gives rise to a difference in how it is interpreted *also* with embedded polar questions that are modifiers of the predicate: to the same highlighting contrast between *hope whether* and *fear whether* discussed in sections 3.1 and 3.2. Because the embedded questions are modifiers here, we argue that the lexical semantics of preferential predicates cannot be used to account for the effect of valency on highlighting, and that a pragmatic account is needed. We sketch one, based on general properties of bouletic speech acts and the inferences that they license, before speculating whether our account could be extended to English preferential reports, from sections 3.1 and 3.2, where embedded questions look like they might be arguments.

4.1 An adjunction strategy for composing clauses

Our starting point is Özyıldız and Uegaki's (2023) characterization of Turkish and Japanese, noting that at least Washo may display a similar pattern (Bochnak and Hanink, 2022) and that the facts that we report on have also been discussed by Yıldırım-Gündoğdu (2018) for Turkish, and Saito (2012, 2015), Shimamura (2018) and Goodhue and Shimoyama (2022) for Japanese. In these two languages, there are clauses introduced by the morphemes *diye* (Turkish) and *to* (Japanese), which very naturally allow for *hope* to combine with interrogatives, as seen in (80). As far as we can tell, the Turkish and Japanese data are parallel on the points relevant here, so we only illustrate with the former.

(80) a. John [komşu-su ev-de ol-acak mı diye] um-uyor
John neighbor-3S.POSS house-LOC be-FUT.3S Q DIYE hope-IPFV.PRES.3S
"John hopes whether his neighbor will be home."

b. [Bana birileri yardımcı ol-abil-ir mi diye] um-uyor-du-m.
1S.DAT someone helpful be-MOD-AOR.3S POLQ DIYE hope-IPFV-PST-1S
"I was hoping whether someone could help me."

c. [O sebeple Hitman'de de ol-ur mu diye] um-du-m ama hayal kırıklığı yaşa-dı-m.
that's why Hitman-LOC too be-AOR POLQ DIYE hope-PFV.PST-1S but disappointment live-PFV.PST-1S
Lit. "That's why I hoped whether it [=a Turkish translation] would be available in Hitman too, but I was disappointed."[46] (Turkish)

Examples (80a) and (80b) contrast with the ones in (81), where the interrogatives are realized as arguments of the same attitude predicate *um-* 'hope,' as suggested by the fact that they are nominalized and overtly case-marked.

(81) a. *[Bana birileri-nin yardımcı ol-up ol-ama-yacağ-ın-ı] um-uyor-du-m.
1S.DAT someone-GEN helpful be-COORD be-NEG.MOD-NMZ.FUT-3S-ACC hope-IPFV-PST-1S
Intended: "I was hoping whether someone could help me."

[45] This empirical and analytical picture is complicated by the fact that what we call the 'argument' strategy might not involve predicates taking clauses as syntactic or semantic arguments either (Stowell 1981; Moulton 2009; Elliott 2017; Bondarenko 2022; a.m.o.). We are open to any characterization of this first strategy, so long as it is able to mark a distinction with the second.

[46] https://www.technopat.net/sosyal/konu/hitman-2-neyin-devami.1236026/post-8635696

b. *[O sebeple Hitman'de de ol-up ol-ma-yacağ-ın-ı] um-du-m.
that's why Hitman-LOC too be-COORD be-NEG-NMZ.FUT-3S-ACC hope-PFV.PST-1S
Intended: "That's why I hoped whether it would be available in Hitman too." (Turkish)

The main empirical motivation for treating some *diye*-clauses as syntactic and semantic modifiers is their compatibility with (derived) intransitive predicates, like 'walk around' in (82a). This is not an available option for nominalized clauses, as shown by the unacceptability of (82b).

(82) a. [Bana birileri yardımcı ol-abil-ir mi diye] dolan-dı-m.
1S.DAT someone helpful BE-MOD-AOR.3S POLQ DIYE walk around-PFV.PST-1S
"I walked around wondering whether someone could help me."
b. *[Bana birileri-nin yardımcı ol-up ol-ama-yacağ-ın-ı]
1S.DAT someone-GEN helpful be-COORD be-NEG.MOD-NMZ.FUT-3S-ACC
dolan-dı-m.
walk around-IPFV-PST-1S
Intended: "I walked around wondering whether someone could help me." (Turkish)

Importantly, the *wondering* in the translation of (82a) does not correspond to any lexical predicate in the Turkish string, and its meaning is argued to be contributed by the morpheme *diye* together with its question complement. We follow Özyıldız & Uegaki in assuming that *diye* generally contributes a linguistic production inference, even with predicates like *um-* ('hope'), and model this inference with the predicate $\lambda e.utter(e)$ below. (Linguistic production is understood here in a very broad sense, and includes speech, thoughts, signs, etc.)

The grammaticality of (82a) suggests that a *diye*-clause can be integrated with any verb phrase as an adjunct, including the ones in (80). For the truth conditions of examples like (82a) and (80b), we simplify Özyıldız and Uegaki's (2023) proposal into (83).

(83) a. [I [[can someone help me? *diye*] [walk around]]]
Lit. I walked around wondering whether (*diye*) someone could help me. =(82a)

$$\exists e, e_1, e_2 : e = e_1 + e_2 \wedge \textit{walk-around}(e_1) \wedge \textit{utter}(e_2) \wedge \textit{content}(e_2) = \text{Will someone help me?} \wedge \textit{author}(e) = Sp$$

b. [I [[can someone help me? *diye*] [P hope]]]
I was hoping whether (*diye*) someone could help me. =(80b)

$$\exists e, e_1, e_2 : e = e_1 + e_2 \wedge \textit{hope}(e_1) \wedge \textit{utter}(e_2) \wedge \textit{content}(e_1) = P \wedge \textit{content}(e_2) = \text{Will someone help me?} \wedge \textit{author}(e) = Sp$$

Thus, attitude reports with *diye* clauses involve the summation of two events: One contributed by a main verb (*walk around* or *hope*) and one contributed by the morpheme *diye* (*utter*, here). The content of the latter is determined by the clause that *diye* introduces and the subject of the summed event is the same. Note that we understand the predicate *um-* ('hope') to be transitive here, and provide it with a silent pronoun P serving internal argument. This pronoun is left unbound, and is understood to be valued by context.

In view of the generalization concerning the selectional restrictions of non-veridical preferential predicates, the adjunction cases exemplified in (80) do not count as counterexamples to Uegaki and Sudo (2019), as they do not involve an interrogative complement serving as the internal argument of, in the case at hand, *hope*. The reason is that such sentences attribute to the subject a preference for a covertly expressed proposition P, while at the same time associating that preference with an utterance whose content is provided by the interrogative clause introduced by *diye*.[47]

4.2 The effect of valence on highlighting for adjunction structures

As it turns out, these adjunction cases reveal a fine-grained contrast that tracks the asymmetric highlighting pattern displayed by evaluatively positive NVPs in Sect. 3.1 and the symmetric pattern displayed by eval-

[47] We leave to the reader the task of showing that U&S's (amended) proposal for *hope* can be reformulated in the event based framework considered in this section.

uatively negative NVPs in Sect. 3.2. Let us now see how to relate the adjunction strategy to both of these cases.

We start with evaluatively positive NVPs. The crucial observation is that the Turkish *diye*-examples in (80) only allow interpretations where the relevant hope targets the positive answer to the question. To see this more closely, consider example (84a) (=(80a)) in the GoodFriend and NoiseHater contexts we introduced in Sect. 3.1. The example is judged true in the former context, but false in the latter, suggesting that it expresses John's hope for his neighbor to be home.

(84) a. John [komşu-su ev-de ol-acak mı diye] um-uyor.
John neighbor-3S.POSS house-LOC be-FUT.3S Q DIYE hope-IPFV.PRES.3S
"John hopes whether his neighbor will be home." (Turkish)
b. Truth value judgment in...
(i) the GoodFriend context: True;
(ii) the NoiseHater context: False.

The same pattern is observed in the interpretation of adverbs like *hopefully* in English, when they modify the predicate *wonder*, as exemplified in (85) and (86).

(85) a. Al wonders hopefully whether he will survive.
b. #Al wonders hopefully whether he will die. (assuming Al wants to live)

Thus, the Turkish *hope-diye-whether* cases in (80) and the English *wonder-hopefully-whether* cases above align with the asymmetric, highlighting pattern of *hope whether* discussed in Sect. 3.1.

We turn now to evaluatively negative NVPs. In Turkish, *fear-diye-whether* does not exhibit the highlighting asymmetry. A sentence like (86a) is grammatical and its truth is compatible with the GoodFriend context in which John wants his neighbor to be home (*fear that not p*), and with the NoiseHater context in which he doesn't want his neighbor to be home (*fear that p*).

(86) a. John [komşusu evde olacak mı diye] korkuyor.
John his neighbor at home be-FUT Q DIYE fears
"John fears whether his neighbor will be home." (Turkish)
b. Truth value judgment in...
(i) the GoodFriend context: True;
(ii) the NoiseHater context: True.

Similarly, in the adverb cases in English, if we replace *hopefully* with, *fearfully* in (85) the highlighting asymmetry disappears:

(87) a. Al wonders fearfully whether he will survive.
b. Al wonders fearfully whether he will die. (assuming Al wants to live)

Hence, the Turkish *fear-diye-whether* cases in (86a) and the English *wonder-fearfully-whether* cases above align with the symmetric pattern of *fear whether* discussed in Sect. 3.2.

Thus, we have seen that our adjunction structures track the valence contrast of the argumental structures from sections 3.1 and 3.2. However, based on the idea that predicates can't impose such interpretive differences on their modifiers, the semantic account developed for the argumental structures cannot apply to the adjunction cases. More concretely, in the adjunction structures, the interrogative clause is not integrated as the internal argument of *hope(fully)*/*fear(fully)*; that is, there is no direct compositional semantic relation between the preference described by *hope(fully)* / *fear(fully)* and the interrogative clause. This means that the account developed for the argumental cases—based on the triviality of *hope* taking a Q-argument plus the corresponding highlighting rescue strategy and on the non-triviality of *fear* taking a Q-argument—cannot apply here. In the following subsection, we entertain the hypothesis that the interpretive difference in the adjunction cases arises due to general pragmatic mechanisms.

4.3 A pragmatic analysis of the valence contrast

What pragmatics must deliver here is that *x hope diye ?p* relates *x*'s positive emotion to *p*, but that *x fear diye ?p* may relate *x*'s negative emotion either to *p* or to *not p*. In the following, we sketch one possible pragmatic strategy based on a paradigm by Bolinger (1978) and its extension.

Since Bolinger (1978), it has been noted that, even though a polar question *p*?, its negative version ¬*p*? and its AltQ version *p or not?* all intuitively raise the same issue, they differ in felicity conditions. More concretely, in terms of illocutionary speech acts, if a speaker utters a *yes/no*-question Q as a request, invitation or proposal for *p*, the proposition in the question radical of Q must (solely) be *p* (Bolinger, 1978; van Rooij and Šafářová, 2003; Tabatowski, 2022). The following paradigm—the extended Bolinger paradigm following Tabatowski 2022—illustrates this:

(88) Request for *p*:
- a. Do you have sparkling water?
- b. #Do you not have sparkling water?
- c. #Do you have sparkling water or not?

(89) Invitation to *p*:
- a. Would you like a glass of wine?
- b. #Would you not like a glass of wine?
- c. #Would you like a glass of wine or not?

Several formal semantic/pragmatic analyses have been proposed in the literature to account for this paradigm (van Rooij and Šafářová 2003, AnderBois 2011, Tabatowski 2022, a.o.). The core idea is that, when raising an issue $\{p, \neg p\}$, the speaker expresses in the sentence radical whichever one of the two propositions is more "useful" to her (or she uses an alternative question expressing both if they are equally useful). Formal analyses vary as to how the notion of "usefulness" is implemented. Here we will illustrate the idea using van Rooij and Šafářová's (2003) approach, which couches "usefulness" in terms of utility value in Decision Theory, as defined in (90):

(90) A proposition *p* has a higher utility value than its negation ¬*p* if:
- a. *p* being true brings the speaker closer to her goals than ¬*p* being true, or
- b. adding *p* to the speaker's belief state triggers a wider revision of it than adding ¬*p*.

For the illocutionary acts at hand, the crucial requirement is the goal-based condition (90a). Two consequences follow from this requirement.

First, evaluatively positive bouletic illocutionary acts such as invitations, requests and proposals can be carried out by polar questions as long as the highlighted proposition in the sentence radical aligns with the preferences of the speaker. Writing the pair consisting of the proffered content and the highlighted content of a polar question ?*p* as $\langle\{p, \neg p\}, \{p\}\rangle$, we schematically represent in (91) the inference resulting from the alignment required by (90a):

(91) **Available inference**

$$\exists e[\mathit{bouletic\_illocutionary\_act}(e) \wedge \mathit{author}(e) = Sp \wedge \mathit{content}(e) = \langle\{p, \neg p\}, \{p\}\rangle] \rightsquigarrow \exists e'[\mathit{prefer}(e') \wedge \mathit{author}(e') = Sp \wedge \mathit{content}(e') = \{p\}]$$

This alignment accounts for the data in (88)–(89). In the request (88), *p* (='that the addressee has sparkling water') but not ¬*p* is conducive to the speaker's goal of obtaining sparkling water; In the invitation (89), the speaker's goal is the well-being of the addressee and *p* ('that the addressee has a glass of wine') but not ¬*p* is taken to contribute to that goal. Hence, both the request and the invitation must be performed by a polar question with sentence radical *p*, not with sentence radical ¬*p* (nor by an alternative question */p or ¬p?/*).

Second, evaluatively negative, antibouletic illocutionary acts such as determents or prohibitions are predicted not to be available for polar questions. That is, antibouletic illocutionary acts conveying *dis*preference towards *p* are predicted to not be expressible by a polar question *p?* with *p* in the question radical, since this would directly violate condition (90a). This means that the inference schema in (92) is predicted to not be

available:

(92) **Not an available inference**
$\exists e[antibouletic\_illocutionary\_act(e) \wedge author(e) = Sp \wedge content(e) = \langle\{p, \neg p\}, \{p\}\rangle]$
$\rightsquigarrow \exists e'[dispref er(e') \wedge author(e') = Sp \wedge content(e') = \{p\}]$

The prediction seems to be borne out. While we have polar questions *p?* that standardly convey a request or invitation for p, there aren't—to the best of our knowledge—any polar questions *p?* that unambiguously convey a prohibition to p or a determent from p. If the speaker wants to deter the addressee from p (e.g., from continuing to talk), rather than uttering *p?* as a determent in (93a), she will use $\overline{p}$*?* or $\neg p$*?* as a request in (93b).[48] (This is not to say that wanting to prevent p is exactly equivalent to encouraging $\neg p$—see Copley and Mari (2021)).

(93) a. Determent from p (= 'that the addressee continues to talk'):
#Will you continue talking?

b. Request for $\overline{p}$ (= 'that the addressee keeps quiet')
or $\neg p$ (= 'that the addressee does not continue talking'):
Will you keep quiet? / Will you not continue talking?

In sum, the special pragmatic "usefulness" status of the highlighted proposition in the sentence radical derives two facts that are crucial for us: (i) all bouletic illocutionary acts carried out by polar questions must abide by the inference schema (91), and (ii) there are no antibouletic illocutionary acts carried out by polar questions and, thus, the corresponding inference (92) is not available. Equipped with these facts, we are ready to go back to Özyıldız and Uegaki's (2023) adjunction structures and to provide a pragmatic explanation for their asymmetric pattern with *hope* and their symmetric pattern with *fear*.

Hope Our claim is that the Turkish *hope-diye-whether* cases and the English *wonder-hopefully-whether* cases give rise to pragmatic inferences parallel to that in (91) for bouletic illocutionary acts, but this time with respect to a *reported* attitude/speech act. The preference inferences will now be anchored to subjects of attitude verbs as opposed to the actual speaker.

We start with the Turkish *hope-diye-whether* cases. Adapting Özyıldız and Uegaki's (2023) account, we take *hope-whether-diye* sentences to describe eventualities e that are the sum of a hoping eventuality e_1 and of an utterance eventuality e_2 that is introduced by the morpheme *diye*. The *whether* question describes the content of the utterance e_2. These truth conditions are sketched in (94).[49]

(94) [John [[his neighbor will be home *diye*] [P hope]]]
Lit. John hopes whether (*diye*) his neighbor will be home. =(84a)
$\exists e, e_1, e_2$ [$e = e_1 + e_2 \wedge author(e) = John \wedge hope(e_1) \wedge utter(e_2) \wedge$
$content(e_1) = P \wedge content(e_2) = \langle\{home, \neg home\}, \{home\}\rangle$]

Assuming that the complex event e of hoping-and-uttering is naturally understood as a bouletic illocutionary act, we must draw the inference that John would prefer for his neighbor to be home, as indicated in (95). Note that the inferences in (91) and (95) are the same, save for the fact that the former operates at the level of the actual utterance, and the latter at the level of a reported utterance:

[48] There are polar question forms that ambiguously carry evalutively positive and negative bouletic implications. For example, depending on voice quality and facial gestures a.o., (i) can be understood as deterring or encouraging the addressee to continue talking. The point in the text is about the lack of polar question forms *p?* expressing bouletic illocutionary acts that are *unambiguously* negative.

(i) Are you going to continue talking?
a. With a critical undertone and frowning face $\rightsquigarrow$ The speaker thinks the answer should be 'No'.
$\approx$ Speaker tries to deter Addressee from continuing to talk.
b. Without critical undertone and with happy face $\rightsquigarrow$ The speaker hopes the answer will be 'Yes'.
$\approx$ Speaker tries to encourage Addressee to continue talking.

[49] Note that the content function maps utterance and (dis)preference eventualities to different kinds of objects. A similar view is also assumed by Portner and Rubinstein (2020), whose concerns, however, are different from ours.

(95) (94) $\rightsquigarrow \exists e'$ [$prefer(e') \wedge author(e') = John \wedge content(e') = \{home\}$]

Because of the availability of this inference, we believe that the contextually valued proposition P, in (94), also gets valued to "that John's neighbor will be home."

A similar account applies to the English *wonder-hopefully whether* cases, whose target truth conditions are sketched out in (96):

(96) Al wonders hopefully whether he will survive.
$\exists e$ [$author(e) = Al \wedge wonder(e) \wedge hopeful(e) \wedge content(e) = \langle\{survive, \neg survive\}, \{survive\}\rangle$]

Again, assuming that the wonder-hopefully event e is naturally construed as a bouletic illocutionary act, we must draw the inference that the author prefers to survive, as in (97). This again follows the general structure of the original pragmatic inference in (91):

(97) (96) $\rightsquigarrow \exists e'$ [$author(e') = Al \wedge prefer(e') \wedge content(e') = \{survive\}$]

Thus, we suggest that the general pragmatic mechanism responsible for the extended Bolinger paradigm in (89) and (88) underlies the highlighting-like asymmetry observed in structures where *um-* ("hope") combines with polar questions introduced by *diye* and with *wonder hopefully whether*.

Fear We turn to the adjunct structures involving *fear*. According to Özyıldız and Uegaki (2023), the Turkish *fear-diye-whether* example (86a) has the truth conditions in (98).

(98) [John [[his neighbor will be home *diye*] [P fear]]]
Lit. John fears (*diye*) whether his neighbor will be home. =(86a)
$\exists e, e_1, e_2$ [$e = e_1 + e_2 \wedge author(e) = John \wedge fear(e_1) \wedge utter(e_2) \wedge$
$content(e_1) = P \wedge content(e_2) = \langle\{home, \neg home\}, \{home\}\rangle$]

Here we have again a complex event e, but this time e is a complex event of fearing-and-uttering. Since now the attitude involved is evaluatively negative and the corresponding antibouletic illocutionary acts are excluded, this complex event e cannot be construed as an illocutionary act from which a dispreference should be inferred. In other words, just like inference (92) is unavailable for matrix cases, so is the parallel inference (99) unavailable for embedded cases.

(99) Not an available inference for (98)
(98) $\rightsquigarrow \exists e'$ [$author(e') = John \wedge dispref er(e') \wedge content(e') = \{home\}$]

As this inference is not available, nothing other than context guides what the value of P should be, in (98). In some contexts, e.g., GoodNeighbor, this is the proposition that John's neighbor will be home, and in others, e.g., NoiseHater, its negation.

Extending Özyıldız and Uegaki's (2023) analysis to English *wonder-fearfully-whether* cases leads to similar truth conditions in (100). The same reasoning applies: As questions cannot serve to perform antibouletic illocutionary acts, see (93), the wonder-fearfully event e cannot be understood as an one and, thus, just like the inference (92) is unavailable at the matrix level, so is the inference (101) at the embedded level:

(100) Al wonders fearfully whether he'll survive.
$\exists e$ [$author(e) = Al \wedge wonder(e) \wedge fearful(e) \wedge content(e) = \langle\{survive, \neg survive\}, \{survive\}\rangle$]

(101) Not an available inference for (100)
(100) $\rightsquigarrow \exists e' : author(e') = Al \wedge dispref er(e') \wedge content(e') = \{survive\}$

In the absence of such inferences, Turkish *fear-diye-whether* cases and English *wonder-fearfully-whether* cases accompanied by a Q with content $\langle\{p, \neg p\}, \{p\}\rangle$ are compatible both with preference and with dispreference for p. This derives the symmetric pattern of the evaluatively negative cases (86a)–(87).

To sum up section 4.3, for evaluatively positive bouletic illocutionary acts and modification structures like English *wonder-hopefully-whether* and Turkish *hope-diye-whether*, the proposition preferred and the proposition in the question radical must align, whereas no such requirement is found in the corresponding

evaluatively negative cases. We derive this pattern by applying extant accounts of Bolinger's extended paradigm on matrix *yes/no*-questions to our embedded adjunct cases.

4.4 Back to sentences featuring the argument strategy (*hope Q*)

Now, the contrast between positive and negative valence in the adjunct cases is reminiscent of the pattern we discussed for the argumental structures from sections 3.1 and 3.1. This raises the possibility that the argumental *hope-whether* examples in (102), repeated from (17), can be accounted for by a similar pragmatic mechanism:

(102) a. I was **hoping whether** you are able to guide me[...]
b. I have done quite a bit of research on using a Limited Co but was **hoping whether** someone with more experience could confirm my understanding of a few points[...]
c. This Trump/Carson boom really has people like Bush, Walker, Rubio, and others wondering and **hoping whether** history will repeat itself and whether Republicans will return back to focusing on the establishment choices but it's all about outsider candidates right now.

In order for such an account to succeed, one would have to assume that the examples in (102) involve a quasi-adjunction interpretation parallel to that of (84a) and (85). The analysis would roughly run as follows. The question Q is syntactically an argument of *hope* in (102), but treating its content as the semantic argument of *hope* as in (103) leads to triviality and, thus, ungrammaticality, as originally predicted by Uegaki and Sudo (2019). However, a last resort repair strategy is available that rescues the ungrammatical structure *hope whether* by re-interpreting it as *hopefully wonder whether*: An implicit *wonder* event e is assumed, Q's content $\langle\{p, \neg p\}, \{p\}\rangle$ is integrated as a semantic argument of the *wonder* event e, and *hope* is treated as modifying this e without taking any propositional argument. This would lead to the adjunction-like truth conditions in (104), parallel to those in (96) for *wonder-hopefully-whether* cases like (85). The observed preference for the question radical p would automatically follow from the inference schema (91)/(97):[50]

(103) I was hoping whether you are able to guide me ($\approx$ I was wondering hopefully whether...)
$\exists e : author(e) = Sp \wedge wonder(e) \wedge hopeful(e) \wedge content(e) = \langle\{guide, \neg guide\}, \{guide\}\rangle$

(104) (103) $\rightsquigarrow \exists e' : author(e') = Sp \wedge prefer(e') \wedge content(e') = \{guide\}$

There are, we believe, two welcome consequences of this treatment. One is that sentences like (104) intuitively ascribe more than just a hope to the attitude holder. They also ascribe an inquisitive attitude, which the addition of *wonder* into their truth conditions is able to capture.

The second is that a similar interpretive mechanism may underlie the problematic examples involving coordination discussed at the end of Sect. 3.1, repeated below from (37). The embedded clause would function as argument of a (now explicit) *wonder* event e while *hope* would simply modify this e. This time, though, since no single proposition is highlighted, no concrete preference is in principle expected.[51]

[50] The motivation behind this repair strategy is the intuition, explicitly voiced by some native speakers, that *I was hoping whether p* is interpreted as 'I was wondering whether p' while expressing hope for p. While we do not provide a compositional procedure to re-analyse the (analytically trivial) meaning (103) into the intuited meaning in (104), we suspect that it might be possible to do so in a principled way in frameworks that treat embedded declaratives and interrogatives as modifiers even in languages like English (Elliott et al. 2017, a.o.), or that liken (some) conjunctions of attitude verbs to serial verb constructions (Major, 2021).

[51] While no particular preference is predicted, other pressures, like world knowledge, may militate for some specific preference. Additionally, the original approaches to Bolinger's extended paradigm may need to be fine-tuned when it comes to different sub-types of alternative questions: While complement alternative questions like (ia) and *or-not* alternative questions like (ib) are assumed to have the same highlighted content $\{p, \overline{p}\}$ (in addition to having the same question meaning), (ia) is neutral between ascribing a hope to live or a hope to die to the attitude holder whereas (ib) seems to obligatorily ascribe—even contra world knowledge—a hope to die. See Beltrama et al. (2020) for further differences between complement alternative questions and their *or not* counterparts.

(i) a. I was wondering and hoping whether I would live or die.
b. I was wondering and hoping whether or not I would die.

(105) a. I guess Lisbon's **wondering and hoping whether or not** he ever will function again, and he's looking at her, thinking, 'She's going to walk away, and I can't fix myself. I've forgotten how to give of myself and surrender.'

b. Businesses that sell to the U.S are **wondering and hoping when** the U.S. economy will get back into the game.

We will not pursue the full ramifications of these analytical options in this paper, but leave them open for future research.

5 General discussion and conclusion

In describing the distribution and the interpretation of embedded interrogatives with different preferential predicates, we find support for the view that the restrictions and freedom in the combinatorial properties of clause-embedding predicates are mostly, if not entirely, governed by their semantic properties. While this is a point of consensus in the semantic literature on clause-embedding, disagreements remain about which semantic properties are relevant (veridicality? preferentiality? neg-raising? eventivity? and so on), and about which generalizations are empirically motivated that relate clause-embedding predicates' semantic and combinatorial properties.

One point of tension is between Uegaki and Sudo (2019), who suggest that all non-veridical preferential predicates have to be anti-rogative, and White (2021), who produces examples where *hope* and *fear*, two paradigmatic non-veridical preferential predicates, *are* attested with embedded questions. This suggests that the original empirical generalization is false and leads to the natural conclusion that its explanation might be misguided, and that we should look for properties other than (non-)veridicality and preferentiality to explain the combinatorial properties of attitude predicates.

In this paper, we take this challenge seriously. In addition to spelling out the interpretive properties of *hope* and *fear* when they combine with embedded questions, we expand the repertoire of counter-examples to Uegaki and Sudo's (2019) empirical generalization and check the behavior of these predicates' counterparts in Japanese, Mandarin, Spanish and Turkish.

This empirical survey leads us to hypothesize that two lexical semantic properties govern the observed patterns in the distribution of embedded interrogatives, and the interpretations that they give rise to: Valence and C(lausal)-distributivity, that is, whether a preferential predicate V is evaluatively positive or negative, and whether the equivalence holds that $\ulcorner x\ Vs\ Q \urcorner$ iff there is an answer p to Q s.t. $\ulcorner x\ Vs\ that\ p \urcorner$.

We find that predicates that are both positive and C-distributive, i.e., ones like *hope* and its counterparts, are difficult to combine with embedded questions. When this is possible, it is generally with certain polar questions but not with alternative or constituent questions, and *hope whether p* is restricted to meaning *hope that p*. This leads us to maintain Uegaki and Sudo's (2019) original proposal for these predicates, which appeals to the Threshold Significance Presupposition to derive that they should be anti-rogative (see Section 2.1), and to argue that when we do observe "hope" combining with embedded questions, this happens through the last resort strategy of combining the predicate with their highlighted content.

Predicates that are either negative or non-C-distributive are generally free to combine with any form of embedded questions. We consider these to be genuine counter-examples to Uegaki and Sudo's (2019) empirical generalization but (*pace* the authors) suggest that they do not presuppose Threshold Significance. This accurately avoids the prediction that they should be anti-rogative. Among them, C-distributive predicates describe a relation between individuals and any possible answer to an interrogative (i.e., *fear whether p* may either be paraphrased as *fear that p* or *fear that not p*), and the non-C-distributive ones, a relation between individuals and questions that is not reducible to relation to any particular answer.

Our investigation ends with a discussion of the possibility that there might be different ways of composing attitude predicates with clauses, which shift our original expectations about the distribution and interpretation of embedded interrogatives. Japanese and Turkish, for example, are among languages that allow for clauses to combine with attitude predicates whose meanings are enriched with the inclusion of a speech event (=x is hopeful and says S). This allows us to return to cases that might challenge our initial characterization of the restrictions on predicates like *hope*, and to bring them into the fold by suggesting that strategies for combining clauses with enriched attitude meanings might be available in languages like English as well, which possibly present and diagnose differently.

To corroborate or call into question our current findings, it is crucial to expand our search space to more predicates, and to languages different from the ones surveyed here. If our findings here on the right track, the prediction is that predicates that trigger the Threshold Significance Presupposition and that are C-distributive will be restricted in their ability to combine with embedded questions—in line with Uegaki and Sudo's (2019) original observation. (We have only found evaluatively positive predicates with the Threshold Significance Presupposition, but do not exclude the possibility that there might be negative ones as well.) In contrast, predicates that lack either one of these properties are expected to be freer in their combinatorial properties. We highlight the importance of probing for the former in assessing the latter.

Equally important is the notion that languages might offer different strategies for combining attitude predicates with clauses. We have argued that these differences may have to do with whether a given strategy is part of the core grammar of a language or whether it is one of last resort, and whether combination proceeds through the basic lexical denotation of attitude predicates, or through an enriched one (e.g., enriched with the conjunction of a speech report). We leave a more refined investigation of (the effects of) these claims for further research.

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