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The mirative demonstrative in Japanese

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Abstract

This paper investigates the mirative property of the Japanese adnominal demonstrative *ano* 'that'. Rett (2011) claimed that in English the meaning of mirativity (unexpectedness) in sentence exclamations (e.g., (*Wow*,) *John arrived early!*) and exclamatives (e.g., *How* (*very*) *early John arrived!*) is triggered by a speech act operator (Exclamative force (E-Force)) that takes a proposition to produce a speech act of exclamation. Although the E-Force-based approach can capture a wide range of mirative phenomena, we claim that mirativity in Japanese can be triggered by the demonstrative *ano*. We argue that the mirative *ano* takes a referring expression Q, which denotes a set of properties holding of a particular individual, and a predicate P and conventionally implies that Q has a remarkable property R that makes $Q(P)$ highly unlikely according to the speaker's knowledge of the referent of Q. It will be shown that the speaker's counter-expectational feeling regarding the utterance situation arises from the combination of the conventional implicature and the at-issue meaning of the given sentence.

The theoretical implication of this study is that there are multiple ways to express the meaning of mirativity. This paper proposes that there are at least two types of mirative expressions in natural language — a proposition-based type and a property-based type. The former expresses mirativity by signaling that the speaker had not expected that p (Rett, 2011), while the latter expresses mirativity by signaling that there is an inconsistency between the at-issue content and the speaker's knowledge of the property of a particular individual.

Keywords: demonstratives, mirativity, property, conventional implicature, typology of mirative expressions

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1 Introduction

In this paper, we consider the meaning and interpretation of the mirative adnominal demonstrative *ano* 'that' in Japanese. The concept of mirativity is relatively new in the field of linguistics.

However, especially since DeLancey (1997), there has been a growing body of research on mirativity. According to DeLancey (1997, 369-370), mirativity refers to "the linguistic marking of an utterance as conveying information which is new or unexpected to the speaker." Further, according to Aikhenvald (2012, 437), across languages, the 'mirative' encompasses the following values, each of which can be defined with respect to the speaker, the audience (or addressee), or the main character: (i) sudden discovery, sudden revelation or realization; (ii) surprise; (iii) unprepared mind; (iv) counter-expectation; and (v) new information. In the literature, mirativity has often been discussed in studies of evidentiality (e.g., Slobin and Aksu, 1982; Aksu-Koç and Slobin, 1986; DeLancey, 1997; Aikhenvald, 2004; de Haan, 2012). For example, in Mapudungun (an isolate from Chile), a sentence containing *rke* can have both evidential and mirative interpretations (Aikhenvald, 2004, p. 200):[1]

(1) (Mapudungun (isolate from Chile))

a. aku-rke-y
arrive-REP-IND
'S/he arrived, they say.'

b. Fey ti chi domo kalko-rke
that ART woman witch-MIR
'This woman turned out to be a witch (surprisingly).'
(Aikhenvald, 2004, p.200)

Rett and Murray (2013) propose a unified analysis of mirative evidentials where indirect evidentiality and mirativity involve a common epistemic component.

Although cross-linguistically there is a tendency for evidentiality and mirativity to be expressed based on the same lexical item, enough evidence has been accumulated for us to consider evidentiality and mirativity different categories, and thus we shall take mirativity to be an independent phenomenon. Across languages, this category is expressed in a variety of forms besides evidential forms (e.g., DeLancey, 1997, 2001, 2012; Aikhenvald, 2004, 2012; Rett, 2011; de Haan, 2012; Rett and Murray, 2013; AnderBois, 2018; Sawada and Sawada, 2019, 2021; Castroviejo, 2021; Trotzke and Giannakidou, 2024). For example, the sentence exclamation in (2a) and the exclamative in (2b) are not related to evidentiality but are specialized expressions that convey only the mirative meaning (Rett, 2011):

(2) a. (Wow,) John arrived early! (sentence exclamation) (Rett, 2011, p. 430)

b. How (very) early John arrived! (exclamative) (Rett, 2011, p. 430)

Over the past few decades, many studies have been conducted of mirativity from descriptive/typological perspectives. Recently, formal semantic/pragmatic studies of mirativity have been conducted as well; in particular, the relationship between mirativity and speech act has attracted considerable interest (e.g., Rett, 2011; Rett and Murray, 2013; AnderBois, 2018; Castroviejo, 2021; Trotzke and Giannakidou, 2024). Rett (2011) argued that sentence exclamations

[1]The following abbreviations are used for example glosses: ACC: accusative, AOR: aorist, ART: article, CLF: classifier, COMP: complementizer, CONC: concessive, COND: conditional, CONJCT: conjunct, CONT: contrastive, DAT: dative, DECL: declarative, EVI: evidential, GEN: genitive, HON: honorific, IMP: imperative, IND: indicative, LOC: locative; MIR: mirative, MP: mirative pronoun, NEG: negation, negative, NMLZ: nominalizer, NOM: nominative, Non.PST: non-past, PASS: passive, POLITE: polite, PPRON: personal pronoun, PRED: predicative, PROG: progressive, Prt: particle, PST: past, REL: relative, REP: reportative, SG: singular, STATE: state, stative, TNS: tense, TOP: topic.

like (2a) and exclamatives like (2b) form a natural class, as they both express that a particular proposition violates the speaker's expectations. More theoretically, she proposes that in the utterance of all exclamations, there is an Exclamative force (E-Force) operator (cf. Searle and Vanderveken, 1985; Vanderveken, 1990) that takes a proposition to produce the speech act of exclamation.

Rett's (2011) E-Force operator account seems to apply to a wide range of mirative phenomena and can be naturally extended to mirative phenomena in other languages. For example, as the following examples show, Japanese also has sentence exclamations and wh-exclamatives similar to the English sentence exclamation and wh-exclamative in (2), and these examples seem to fit Rett's (2011) E-Force approach:

(3) (Context: The speaker is watching a tennis match.)

a. (Uwa,) Taro-ga make-ta! (sentence exclamation)
wow Taro-NOM lose-PST
'(Wow,) Taro lost!'

b. Taro-wa nante tsuyoi-n-da! (exclamative)
Taro-TOP how strong-NMLZ-PRED
'How strong Taro is!'

However, looking at the phenomenon of mirativity from a broader perspective, in a cross-linguistic and language-internal fashion, we find cases in which the relationship between mirativity and speech acts becomes unclear. As the following example shows, in Japanese, the speaker's feeling of surprise can be conveyed by the adnominal demonstrative *ano* 'that' as well:

(4) (Context: The speaker is watching a tennis match.)

Ano Taro-ga make-ta. (mirative *ano*)
that Taro-NOM lose-PST

'lit. That Taro lost.'
(The meaning conveyed by the use of *ano*: Taro is a person who is highly unlikely to lose, according to the speaker's knowledge of Taro.)

(4) is natural in a situation where the speaker is watching a tennis match and is surprised that Taro lost. In (4), the speaker signals that Taro is a person who is highly unlikely to lose, and yet he lost (contrary to expectation (the speaker's knowledge)).[2] What is important here is that the hearer of (4) can grasp a mirative meaning even if the hearer does not know anything about the subject referent Taro. In hearing this sentence, by virtue of the use of *ano*, the hearer can automatically infer that 'the speaker thinks that Taro is a highly unlikely person to lose' without any contextual information. Note that the meaning of unlikelihood changes according to the meaning of the predicate. If *make-ta* 'lose-PST' in (4) is replaces with *kat-ta* 'win-PST', by virtue of the use of *ano*, the hearer can infer that 'the speaker thinks that Taro is a highly unlikely person to win' without any contextual information.

(5) (Context: The speaker is watching a tennis match.)

[2]Regarding the notion of speaker's knowledge, we assume that it is knowledge/information stored in the speaker's episodic memory (long-term memory) in the sense of Yoshimoto (1986) and Kinsui (1999). See Section 3.1.

Ano Taro-ga kat-ta. (mirative *ano*)
that Taro-NOM win-PST

'lit. That Taro won.'
(The meaning conveyed by the use of *ano*: Taro is a person who is highly unlikely to win, according to the speaker's knowledge of Taro.)

It is also important to note that intonation or focus is not necessary to derive a mirative meaning. The intonation of a sentence with *ano* can be exactly the same as that of a non-mirative sentence without *ano*. Furthermore, if we remove *ano* from the examples in (4) and (5), the sentences do not (necessarily) convey the meaning of mirativity. These facts clearly demonstrate that it is *ano* that triggers the meaning of mirativity.

What are the differences between mirative *ano* and other typical mirative expressions? Why is it that *ano* can express a speaker's sense of counter-expectation (surprise) in relation to the given utterance situation even though, syntactically speaking, it is located in the nominal domain? How does the sense of surprise/counter-expectation arise in the case of mirative *ano*?

In this study, we investigate the meaning and use of the Japanese mirative *ano*, and claim that the illocutionary force operator (E-Force or proposition-taking operator) (cf. Rett, 2011) is not the only way to express the speaker's counter-expectational feeling toward an utterance situation. We will claim that mirative *ano* is a "property-based" mirative expression that expresses a speaker's surprise (counter-expectational meaning) toward a given proposition by referring to the properties of a particular individual that is in the speaker's knowledge.

After introducing some background on mirativity in Section 2 and overvieiwing the semantic taxonomy of the adnominal *ano* in Section 3, in Sections 4 and 5 we will argue that the meaning triggered by mirative *ano* is a conventional implicature (CI) and will claim that mirative *ano* takes a referring expression Q (typically a proper name), which denotes a set of properties that hold of a particular individual, and a predicate P and conventionally implies that Q has a remarkable property that makes $Q(P)$ highly unlikely according to the speaker's knowledge of the referent of Q.[3] It will be shown that the inference that the at-issue proposition (= prejacent) violates the speaker's expectation arises from the combination of the CI and the asserted content. In discussing the meaning of mirative *ano*, we will also clarify the difference with the focus particles such as (*de*)*sae* 'even'.

Note that mirative *ano* can actually be combined with a noun other than a proper name. In Section 6, we will look at cases where mirative *ano* combines with a quantifier (numeral) and a common noun and claim that the mirative reading arises if they are interpreted like a proper name (being interpreted as a set of properties holding of a particular individual). In Section 7, we will examine the cases in which the mirative *ano* appears in a non-subject position (object or adjunct position) or in a negative sentence, and show that the proposed interpretation mechanism is naturally applicable to these cases as well.

Section 8 will compare the Japanese *ano* 'that' with the Korean *ku* 'that', the Japanese *kano* 'that', and the English *that*, and exmanine the cross-linguistic and language-internal variation of demonstratives in terms of the presence or absence of conventionalized mirative usage.

Finally, in Section 9, we will look at the phenomenon of mirativity from a broader perspective and propose that there are at least two types of mirative expressions in natural language — a "proposition-based type" and a "property-based type": the former expresses mirativity by

[3]By "referring expression," we assume that it is any expression used in an utterance to refer to something or someone (or a clearly delimited collection of things or people), i.e., used with a particular referent in mind (Hurford et al., 2007, p. 37). Referring expressions include proper names like *Mary* and definite DPs like *the dog*.

signaling that the speaker had not expected that p (Rett, 2011), while the latter expresses mirativity by signaling that there is an inconsistency between the at-issue content and the speaker's knowledge of the properties of a particular individual. Furthermore, we suggest that while proposition-based mirative expressions trigger mirativity as a main speech act, property-based mirative expressions express mirativity as a second-order speech act (or non-central speech act; Grice, 1989; Bach, 1999). This study provides a new perspective on the variety of mirativity in natural languages.

2 Some background on mirativity: The exclamative force (E-Force)-based approach

In this section, we provide some background on the formal analysis of mirativity. Specifically, we introduce Rett's (2011) exclamative force (E-Force)-based analysis of English sentence exclamations and exclamatives. Rett (2011) argued that sentence exclamations and the exclamatives form a natural class and have a speech act of exclamation, which is a type of expressive.[4,5] Rett (2011) defines an illocutionary force operator for exclamation that is a function from propositions to expressive speech acts. More specifically, Rett (2011) proposed that the illocutionary operator E-Force derives the meaning of mirativity (exclamativity). She defined the appropriate condition for E-Force as follows (see also Rett and Murray, 2013):

(6) E-Force (p), uttered by s_C, is appropriate in a context C if p is salient and true in w_C. When appropriate, E-Force (p) counts as an expression when s_C had not expected that p.[6] (Rett, 2011, p. 429)

Here, a context C includes information about a speaker (s_C) in that context as well as a world (w_C) and time (t_C) of utterance (Rett, 2011).

Let us consider the interpretation of a sentence exclamation as in (7):

(7) (Wow,) John won the race! (Rett, 2011, p. 430)

Rett (2011) claims that the utterance of an exclamation ((*wow*) *p!*) is felicitous only if the speaker had not expected that p immediately before the time of the utterance:

(8) a. $p = \lambda w.\ \text{won}_w\ (\text{john}, \iota x\ [\text{race}_w\ (x)])$

b. E-Force (p), uttered by s_C, is appropriate in a context C if p is salient and true in w_C. When appropriate, E-Force (p) counts as an expression when s_C had not expected that p.(Rett, 2011, p. 430)

With regard to exclamatives like (9), Rett (2011) assumes several steps in the semantic derivation. First, a context C provides an argument for the degree property denoted by the wh-clause as in (10a). The result is a proposition with an unbound variable as in (10b). This proposition $D(d')$ functions as the input to E-Force. Finally, the unbound variable is bound at the end of the utterance or discourse via existential closure, as in (10c):[7]

[4]This basic idea is compatible with the general formal framework of speech acts, such as Searle (1969) and Searle and Vanderveken (1985).

[5]Trotzke and Giannakidou (2024) propose an alternative view where sentence exclamations and wh-exclamatives are assertive and exclamativity surfaces as an attitude rather than a speech act.

[6]We assume that an expression corresponds to an expressive speech act.

[7]See Rett (2011) for the detailed compositional semantics of exclamatives.

(9) How tall John is! (Rett, 2011, p. 430)

(10) a. λd. tall (john, d)
b. tall(john, d')
c. E-Force (p) counts as an expression that $\exists d$' such that s_C had not expected that $D(d')$ (Rett, 2011, p. 431)

Rett's speech-act-based analysis of mirativity seems to be able to cover a wide range of mirative phenomena in natural languages. For example, as observed in (3), Japanese has sentence exclamation and exclamatives, and it seems that they can be analyzed based on the idea of E-Force. However, in this study, we show that there is a mirative phenomenon that cannot be analyzed in terms of the E-Force operator and that the Japanese mirative *ano* corresponds to this case.

3 The taxonomy of the Japanese adnominal demonstrative *ano*

Before considering the meaning and use of mirative *ano* in detail, we consider the difference between mirative *ano* and other types of *ano*.

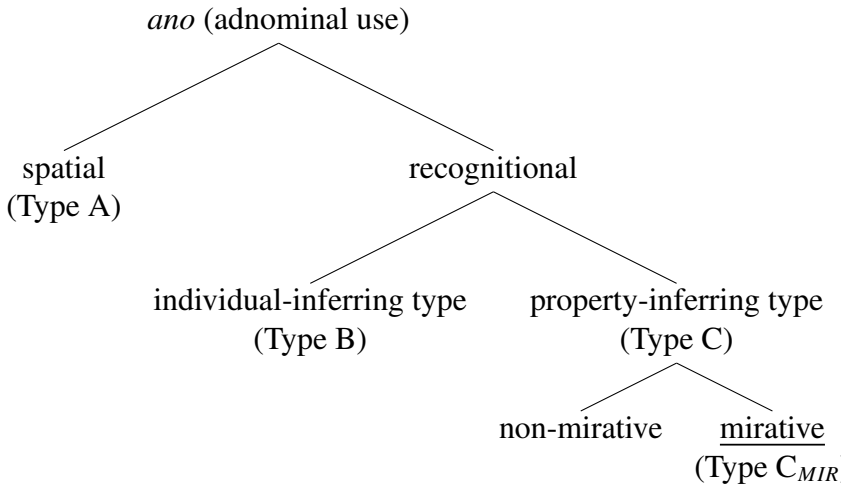
3.1 The four types of the Japanese adnominal demonstrative *ano*

In Japanese, there are three demonstrative prefixes: *ko-* (proximal), *so-* (medial), and *a-* (distal). In the "spatial" type, where the referent is visible in the speech location, *ko-* refers to a thing/place close to the speaker, *so-* refers to a thing/place close to the addressee or a place that is in the medial distance from the speaker and the addressee, and *a-* refers to a thing/place which is far from the speaker (and the addressee). *Ko-*, *so-*, and *a-* also have a "non-spatial" type, where the referent is not visible in the speech location. In this type, *ko-* refers to something functioning as a "discourse topic," *so-* neutrally refers to something introduced in the discourse context, and *a-* refers to something located in the speaker's knowledge (Kinsui, 1999).[8]

The phenomenon that we are focusing on is the adnominal demonstrative *ano* (distal), and we propose that it has the following four types:

(11) The semantic taxonomy of the Japanese adnominal demonstrative *ano*

[8]Some scholars assume that there is also an "anaphoric use" of *a-* (Kuno, 1973a,b; Oshima and McCready, 2017) similar to anaphoric *so-*. However, there is also a view that anaphoric *a-* is a type of recognitional *a-* (Kinsui, 1999, p. 72).



In this taxonomy, the adnominal *ano* can be broadly classified into the "spatial" and "recognitional" types. Recognitional demonstratives are demonstratives that refer to an entity that is located in the speaker's knowledge (or speaker's and hearer's shared knowledge) (Diessel, 1999). Within the recognitional use are the "individual-inferring" type and "property-inferring" type. The property-inferring type activates a particular property of the noun combined with *ano*. Furthermore, within the property-inferring type, there are "non-mirative" and "mirative" types. In the literature on Japanese demonstratives, the distinction between Type A (spatial use) and Type B (recognitional use) is often discussed (e.g., Kuroda, 1979; Yoshimoto, 1986; Kinsui and Takubo, 1992; Kinsui, 1999). However, little attention has been paid to property-inducing types (Sawada and Sawada, 2013; Sawada, 2016; Sawada and Sawada, 2017). This taxonomy is new, because it assumes that there is a specific type of the property-inferring *ano* (Type C_{MIR}). As a starting point for discussion, we informally define each type of *ano* as follows:

Type A refers to the spatial demonstrative *ano*. In the spatial type, *ano* combines with a non-referring expression and refers to an entity distal to the speaker (and addressee). We define the meaning of Type A *ano* descriptively as follows:

(12) Type A *ano* (= spatial) takes a non-referring expression (typically a common noun), which denotes a set of entities (of type $\langle e, t \rangle$), and physically refers to a particular individual (out of the set) that is far from the speaker.

A typical example of Type A is as follows:

(13) (Type A) (Context: Pointing to a person who is far from the speaker and the addressee.)

Ano {gakusei/*Taro}-o koko-ni tsureteki-nasai.
that student/Taro-ACC here-to bring-IMP

'lit. Bring that {student/Taro} here.'

Type B is a recognitional type. More specifically, among the recognitional uses, it belongs to the individual-inferring type. In this type, *ano* refers to a particular entity (of a set) in the speaker's knowledge (episodic or long-term memory). We define the meaning of Type B *ano* as follows:

(14) Type B *ano* (= recognitional, individual-inferring) takes a non-referring expression (typically a common noun), which denotes a set of entities (of type $\langle e, t \rangle$), and activates a particular entity (out of the set) that is in the speaker's knowledge.

Like Type A *ano*, Type B *ano* typically combines with a common noun but cannot combine with a proper name, such as *Taro*:

(15) (Type B)

Kinou at-ta ano {gakusei/*Taro}-o koko-ni tsureteki-nasai.
yesterday meet-PST that student/Taro-ACC here-to bring-IMP

'lit. Bring that {student/Taro} who we met yesterday here.'

Type C is a property-inferring recognitional type (the non-mirative type). Type C *ano* combines with a referring expression and signals that there is a remarkable property that the referring expression holds according to the speaker's knowledge. A descriptive definition of the meaning of Type C *ano* is as follows:

(16) Type C *ano* (= recognitional, property-inferring, non-mirative) takes a referring expression Q (typically a proper name), which denotes a set of properties holding of a particular individual (of type $\langle\langle e, t\rangle, t\rangle$), and signals that there is some remarkable property P such that $Q(P)$ is true according to the speaker's knowledge of the referent of Q.[9]

As the following example shows, unlike Types A *ano* and B *ano*, Type C *ano* typically combines with a referring expression like a proper name.

Typically, Type C *ano* can often signal that the target is "famous" (Kim, 2006, p. 108; Nakamata, 2010, p. 435; Sawada and Sawada, 2013, pp. 78-79):

(17) (Type C)

a. Kore-ga ano John Lennon-no shuki-desu.
this-NOM that John Lennon-GEN note-PRED.POLITE
'lit. This is that John Lennon's note.'

b. Kore-ga ano Tokugawa Ieyasu-no haka-desu.
this-NOM that Tokugawa Ieyasu-GEN tomb-PRED.POLITE
'lit. This is the tomb of that Ieyasu Tokugawa.'

The most remarkable property of John Lennon and Ieyasu Tokugawa would be that they are famous.[10]

Although fame is a default, if we assume a special context, "remarkable property" could be something other than "being famous." For example, the following sentence does not convey that Federer is famous, but that Federer is in his original state (i.e., being a great tennis player):

[9]Here tense information is ignored.

[10]One might think that Type C *ano* generate a sense of newsworthiness. Although this is true in some cases, Type C *ano* can be used in contexts in which no newsworthiness is involved.

(i) (Context: The famous Dr. Yamada is going to come to the seminar tomorrow.)

Ashita-wa yoteidoori ano Yamada-hakase-ga ko-rare-ru-node zehi takusan
tomorrow-TOP as.planned that Yamada-Dr.-NOM come-HON-Non.PST-because really many
shitsumon-shi-te kudasai.
question-do-CONJCT please

'lit. That Dr. Yamada is going to come tomorrow as scheduled, so please ask many questions.'
(Implication from *ano*: Dr. Yamada is famous.)

In this context, the plan that Prof. Yamada will come to the seminar has already been established, and there is no sense of newsworthiness. Thus, the newsworthiness of Type C *ano* is a conversational implicature.

(18) (Type C) (An utterance by a commentator at Australian Open Tennis semi-final.)

Hontouni ano Federer-ga modotteki-ta-na to-iu kanji
really that Federer-NOM come back-PST-Prt that-say impression
desu-ne.
PRED.POLITE-Prt

'lit. It is like that Federer really came back.'

Here, *ano* is used in the context of Federer's return and the utterance context and the asserted content provide a cue for determining what the salient property is.

Similarly, in the following example, *ano* does not signal that Sony is famous:

(19) (Type C)(Context: The global company Sony is in a management crisis situation.)

a. Ano Sony doko-e.
that Sony where-to
'lit. Where does that Sony go?'
(Asahi newspaper, headline, February 3rd, 2012)

b. Ano Sony-ga fukkatsu-shi-nai-wake-wa nai.
that Sony-NOM recover-do-NEG-reason-TOP NEG
'lit. There is no reason why that Sony does not recover.'
(`http://blog.livedoor.jp/sobata2005/archives/50045232.html`)

In these sentences, *ano* invokes properties such as "having produced many innovative hit products" and "having been a world-class electronics manufacturer," respectively.

Note that a remarkable property is not necessarily a positive property.

(20) ('I didn't do well at the golf competition yesterday...')

Maa, ano Suzuki-ni-wa sasugani kat-ta-kedo-ne.
well, that Suzuki-to-CONT.TOP of.course win-PST-but-Prt

'lit. Well, of course I did not lose to that Suzuki.' (Based on the example provided by the reviewer)

The remarkable property of Suzuki in this example is that he was not good at golf. As a reviewer pointed out, this sentence is used in a non-mirative context conveying a "matter of course". This property is easily understood from the meanings of the contrastive *wa* and the adverb *sasugani* 'of course/naturally'.

As we explain in detail below, this remarkable property can be related to mirativity; however, to obtain a mirative meaning via Type C *ano*, appropriate contextual information is necessary.

Finally, there is Type C_{MIR}, a property-inferring mirative *ano*. We assume that Type C_{MIR} is a special subtype of Type C *ano* and it evokes a remarkable property associated with the referring expression (typically, a proper name) that is inconsistent with the asserted content. We define the meaning of Type C_{MIR} *ano* as follows:

(21) Type C_{MIR} *ano* (= recognitional, property-inferring, mirative) takes a referring expression Q (typically a proper name), which denotes a set of properties holding of a particular individual (of type $\langle\langle e,t\rangle,t\rangle$), and a predicate P (of type $\langle e,t\rangle$) and signals that there is some remarkable property R such that *Q(R)* is true and R makes *Q(P)* highly unlikely to be true.[11]

[11] As we will see later, we will intensionalize the denotation/type of a predicate and a referring expression.

The following is a typical example of Type C_{MIR} *ano*:

(22) (Type C_{MIR})(Context: The speaker is watching a soccer match.)

Ano Brazil-ga make-ta. Dare-ni kii-temo yuushoo machigai-nashi-to
that Brazil-NOM lose-PST who-to ask-even championship doubt-NEG-that
iwa-re-ta Brazil-ga make-ru-towa...
say-PASS-PST Brazil-NOM lose-Non.PST-MIR

At-issue: Brazil lost. The Brazil team, which everyone said would win the championship without fail, lost...
Implication: Brazil has a remarkable property that makes the proposition that Brazil loses highly unlikely according to the speaker's knowledge of Brazil.
(`http://www.k4.dion.ne.jp/ neeskens/sakka22.html`)

(22) is natural in a situation where the speaker is watching a soccer match and is surprised that Brazil lost. In (22), the speaker signals that Brazil has a remarkable property that makes it highly unlikely to lose according to the speaker's knowledge (by virtue of the use of *ano*), and the hearer can obtain this meaning even if the hearer does not know the Brazil team.

Note that Type C_{MIR} involves the concept of remarkability. To address this issue, we consider a minimal pair. First observe the following example.

(23) (Context: Taro is an employee. Even when Taro is in the middle of work, he stops working and comes to the cafeteria at exactly 12:00 p.m. He is always the first to arrive at the cafeteria. Today, however, Taro is nowhere to be seen.)

Ano Taro-ga shokudoo-ni i-nai.
that Taro-NOM cafeteria-LOC be-NEG

'lit. That Taro is not in the cafeteria.'
Implication: It is highly unlikely that Taro is not in the cafeteria.

The remarkable property assumed here is that Taro comes to the cafeteria at exactly 12:00 every day, and from this property, it is taken to be highly unlikely that Taro will not come to the cafeteria.[12]

In contrast, as seen in the following example, if the property in question is an ordinary property that is also possessed by other members, then *ano* cannot be used, even if the property makes the proposition in question highly unlikely.

(24) (Context: Taro is an employee. Taro and all the employees always go to the cafeteria at exactly 12:00 p.m. It is now 12:00 p.m. but Taro is nowhere to be seen.)

Ano Taro-ga shokudoo-ni i-nai.
that Taro-NOM cafeteria-LOC be-NEG

'lit. That Taro is not in the cafeteria.'
Implication: It is highly unlikely that Taro is not in the cafeteria.

[12]Note that in this sentence, the proposition that is taken as unlikely is "Taro does not come to the diner" (i.e., the negation is contained within the proposition). We will discuss the analysis of Type C_{MIR} in negative sentences in Section 7.2.

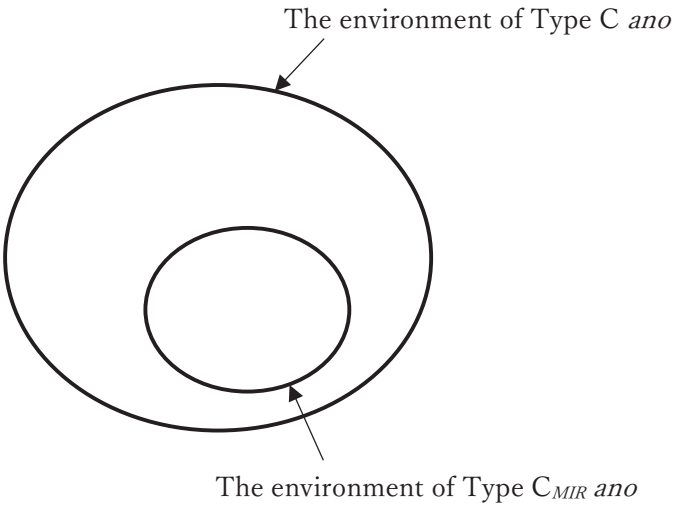
Here, "always coming to the cafeteria at exactly 12:00" is a property that other employees also possess, and it is not a salient property of Taro's. Therefore, even if this property makes the proposition "Taro does not come to the cafeteria" highly unlikely, it would be unnatural to use *ano*. This contrast suggests that Type C_{MIR} *ano* also involves the notion of remarkability.[13]

3.2 The empirical difference between the ordinary Type C *ano* and the mirative Type C *ano*

In the previous section, we introduced four types of *ano*. Particularly important for our study is the difference between Type C *ano* and Type C_{MIR} (mirative) *ano*.

Although Type C *ano* (typically signaling the meaning of fame) and Type C_{MIR} *ano* are similar in that they both induce a property of a particular individual from the speaker's knowledge, Type C *ano* and Type C_{MIR} *ano* are different with regard to the semantic characteristic and the environment in which they are used. Type C_{MIR} is semantically stronger/more specific than ordinary Type C, and the environment of Type C_{MIR} is smaller than that of Type C (the former is a subset of the latter), as shown in (25).

(25) The environments of Type C *ano* and Type C_{MIR} *ano*



Type C_{MIR} *ano* is more specific than Type C *ano* in that the former, but not the latter, takes a predicate as its argument to derive a mirative meaning. This idea implies that *ano* has developed a mirative-specific usage, but is there linguistic evidence to assume a mirative-specific lexical entry?

In considering this point, it is first necessary to clarify that a sentence with the property-inferring *ano* can be ambiguous between a mirative reading and non-mirative reading. Observe the following examples:[14]

(26) a. Ano Kamala Harris-ga kyoo chuutoujousei-nitsuite seimei-o
that Kamala Harris-NOM today Middle.East.situation-about statement-ACC
happyou-shi-ta.
issue-do-PST

[13] We thank a reviewer for a valuable comment regarding this point.
[14] We thank Mandy Simons for bringing the data to our attention.

'lit. That Kamala Harris issued a statement today about the situation in the Middle East.'
Type C (famous) reading: Kamala Harris is an important (famous) figure.
Type C (mirative) reading: Kamala Harris is highly unlikely to issue a statement about the situation in the Middle East. (= Kamala Harris has a remarkable property that makes the proposition 'Kamala Harris issues a statement about the situation in the Middle East' highly unlikely.)

b. Ano Joe Biden-ga kyoo kishakaiken-o hirai-ta.
that Joe Biden-NOM today press.conference-ACC hold-PST
'lit. That Joe Biden held a press conference today.'
Type C (famous) reading: Joe Biden is an important (famous) figure.
Type C (mirative) reading: Joe Biden is highly unlikely to hold a press conference. (= Joe Biden has a remarkable property that makes the proposition 'Joe Biden holds a press conference' highly unlikely.)

In the Type C reading, *ano* signals that Kamala Harris/Joe Biden is an important (famous) figure. By contrast, in the Type C_{MIR} reading, *ano* signals that "Kamala Harris has a remarkable property that makes her highly unlikely to issue a statement about the situation in the Middle East" in the case of (26a), and "Joe Biden has a remarkable property that makes him highly unlikely to hold a press conference" in the case of (26b). These implications contrast with the at-issue proposition, and thus a mirative/surprisal meaning emerges.

Crucially, the Type C (famous) reading of these sentences cannot have a mirative meaning. Given our common knowledge about things that Kamala Harris and Joe Biden do, the predications (i.e., issuing a statement, holding a press conference) are unsurprising. These examples clearly show that there are property-inferring uses of *ano* in which there is no expression of surprise regarding the predication.

The question is whether the mirative Type C_{MIR} reading is conventionalized as the lexical meaning of *ano*, and whether that meaning is drawn out by *ano* referring to a predicate as an argument. In this paper, we argue that Type C_{MIR} does make reference to a predicate (just like a generalized quantifier) to trigger a mirative/unlikelihood meaning. This predicts that if *ano* is used in an environment where predicate does not exist or where it is difficult for *ano* to take predicate as an argument, the surprisal meaning will not appear (unless there is additional contextual information that supports the surprisal meaning). We show that this prediction is correct based on the results of a questionnaire. More specifically, we will show that unless there is special contextual information that supports a mirative meaning, a surprise reading is ruled out in NP-*desu*, pseudo-clefts with respect to the first conjunct, and sentences with the topic *wa*. In such environments, *ano* cannot semantically take a predicate as its argument.

NP-*desu* First of all, Type C_{MIR} *ano* cannot appear in the sentence with NP-*desu* and a mirative reading is basically ruled out in this environment unless there is special context:

(27) Kore-ga ano Takuro-no tsukue-desu.
this-NOM that Takuro-GEN desk-PRED.POLITE
'lit. This is that Takuro's desk.'

From this sentence we can infer that Takuro is famous, but it is difficult to posit a mirative interpretation that it is surprising that it is Takuro's desk. We consider that this is because *desu* does not have a concrete predicative meaning; thus, the mirative *ano* cannot take a predicate as

its argument to derive its mirative meaning.[15]

However, a mirative reading can arise in the example with NP-*desu* if we posit a special context that supports a mirative interpretation, as in

(28) (Context: Takuro is not very good at keeping his desk tidy, but today his desk is very neat and tidy. The speaker takes a picture of the situation and tells his listeners about it.)

Kore-ga ano Takuro-no tsukue-desu.
this-NOM that Takuro-GEN desk-PRED.POLITE

'lit. This is that Takuro's desk.'

From this sentence, we can obtain a mirative flavor that the speaker is surprised that it is Takuro's desk.[16]

We consider that in this case *ano* should be considered a special case of Type C *ano* (rather than Type C_{MIR} *ano*). As claimed earlier, the remarkable property evoked by Type C *ano* is usually related to fame, but the remarkable property does not always need to be fame. In this case, the attribute "Takuro is not very tidy" can be taken as a remarkable property from the contextual information. A mirative meaning arises because of the mismatch between this property and the fact that Takuro's desk is very neat and tidy today. It is difficult for this type of mirative interpretation to arise if we do not posit this special context. In other words, any mirative reading that comes out of Type C *ano* is simply a conversational implicature and is different from Type C_{MIR} *ano*, whose mirativity is not concealable as we will discuss in Section

[15]In order to check the interpretation of this sentence, we administered a questionnaire survey to 23 undergraduate and graduate students at Kobe University on July 15 and 16, 2021, via Google form.

All participants were native Japanese speakers. In the questionnaire, we provided the following questions and asked the informants to rate the naturalness of this sentence as the intended reading (famous reading/mirative reading) based on a 7-point scale (where 1 = *completely odd* and 7 = *completely natural*).

(i) a. Question 1 for example (27): How natural is the sentence above as a sentence containing the nuance "Takuro is a famous person"?

b. Question 2 for example (27): How natural is the sentence above for expressing the speaker's feeling of surprise that it is Takuro's desk (i.e., the speaker's feeling that the desk is unlikely to be Takuro's desk)?

The following table shows the informants' judgements.

(ii) Native speakers' judgments

	1	2	3	4	5	6	7
NP-*desu* (=27, Q1) (famous, without context)	0 (0%)	1 (4.3%)	0 (0%)	2 (8.7%)	1 (4.3%)	8 (34.8%)	11 (47.8%)
NP-*desu* (=27, Q2) (mirative, without context)	4 (17.4%)	5 (21.7%)	6 (26.1%)	4 (17.4%)	2 (8.7%)	1 (4.3%)	1 (4.3%)

[16]In the same questionnaire, we asked the speakers how natural sentence (28) is as a statement of the speaker's surprise at the fact that it is Takuro's desk (i.e., the speaker's feeling that the desk is unlikely to be Takuro's desk) with the contextual information written in (28). As the following results show, the level of acceptability increased.

(i) Native speakers' judgments

	1	2	3	4	5	6	7
NP-*desu* (=28) (mirative, with context)	0 (0%)	1 (4.3%)	2 (8.7%)	0 (0%)	2 (8.7%)	6 (26.1%)	12 (52.2%)

4.1.[17]

Pseudo-cleft sentences The second diagnostic is concerned with pseudo-cleft sentences. As the following examples show, although the mirative reading is salient in a plain sentence as in (29), it is less salient in a pseudo-cleft sentence with *ano* as in (30):[18]

(29) Ano Tanaka-ga jugyoochuuni te-o age-ta.
that Tanaka-NOM in.class hand-ACC raise-PST
'lit. That Tanaka raised his hand in class.'

(30) Jugyoochuuni te-o age-ta-no-wa ano Tanaka-da.
in.class hand-ACC raise-PST-NMLZ-TOP that Tanaka-PRED
'lit. It is that Tanaka who raised his hand in class.'

However, mirative readings can also appear in pseudo-cleft environments if we posit a supporting context:[19]

[17]The following example also supports the idea that the mirative meaning appearing from the regular Type C *ano* is a conversational implicature:

(i) (Context: Takuro is notoriously messy. His teacher Yamada, who knows this, sees his desk that is messy as usual. Suzuki is a new teacher and has heard about Takuro but has never actually seen his desk before. Yamada shows Takuro's desk. Yamada says:)

Kore-ga ano Takuro-no tsukue-desu.
this-NOM that Takuro-GEN desk-PRED.POLITE

'lit. This is that Takuro's desk'

Unlike in (28), the mirative meaning does not emerge from this sentence. Namely, the meaning of mirativity is defeasible/cancellable by context.

[18]In the questionnaire, we checked how natural the sentences (29) (= simple sentence) and (30) (= pseudo-cleft sentence) are as sentences expressing the speaker's feeling of surprise that Tanaka raised his hand in class (i.e., the speaker's feeling that it is unlikely that Tanaka will raise his hand in class). As shown in the table below, there was a large difference between the simple sentence and the pseudo-cleft sentence in terms of the naturalness of a mirative reading. A certain number of native speakers considered that a mirative reading was not natural in the pseudo-cleft sentence:

(i) Native speakers' judgments

	1	2	3	4	5	6	7
plain (=29) (mirative, without context)	0 (0%)	0 (0%)	1 (4.3%)	0 (0%)	0 (0%)	5 (21.7%)	17 (73.9%)
pseudo-cleft (=30) (mirative, without context)	1 (4.3%)	2 (8.7%)	2 (8.7%)	2 (8.7%)	6 (26.1%)	5 (21.7%)	5 (21.7%)

[19]A reviewer pointed out that if we replace *wa* with *ga*, the mirative reading also naturally arises.

(i) Jugyoochuuni te-o age-ta-no-ga ano Tanaka-da-ta.
in.class hand-ACC raise-PST-NMLZ-NOM that Tanaka-PRED-PST
'lit. It was that Tanaka who raised his hand in class.'

However, in this case, even if there is no *ano*, an unexpected meaning appears.

(ii) Jugyoochuuni te-o age-ta-no-ga Tanaka-da-ta.
in.class hand-ACC raise-PST-NMLZ-NOM Tanaka-PRED-PST
'lit. It was that Tanaka who raised his hand in class.'

This suggest the pseudo-cleft construction with *ga* triggers a meaning of surprise/non-expectation. Clearly, there is a semantic difference between the pseudo-cleft sentence with *ga* and the normal *ga* sentence. At this point, we

(31) (Context: Tanaka is usually quiet and doesn't speak up at all in class.)

Jugyoochuuni te-o age-ta-no-wa ano Tanaka-da.
in.class hand-ACC raise-PST-NMLZ-TOP that Tanaka-PRED

'lit. It is that Tanaka who raised his hand in class.'

Similar to the example in (28), we consider that this is a case of Type C *ano*. Since there is contextual information about Tanaka's property that he is usually quiet and does not speak up at all in class, Type C *ano* can refer to this information (property) as a salient property of the referent.[20]

***Ano* with a first conjunct** Third, a mirative reading is ruled out if *ano* only modifies the first conjunct. In (32), where *ano* modifies the entire conjunctive expression, we can naturally receive the speaker's feeling of surprise that Taro and Hanako are shaking hands (i.e., the speaker's feeling that Taro and Hanako are unlikely to shake hands). However, in (33), where *ano* modifies only the first conjunct, it is difficult to receive the speaker's feeling that Taro has a remarkable property that makes him highly unlikely to shake hands with people):

(32) (Modification structure: *Ano* modifies "Taro and Hanako".)

[Ano Taro-to Hanako-ga], akushu-o shi-tei-ru.
that Taro-and Hanako-NOM shake.hands-ACC do-PROG-Non.PST

'lit. [That Taro and Hanako] are shaking hands.'

(33) (Modification structure: *Ano* modifies only Taro.)

[Ano Taro]-to Hanako-ga, akushu-o shi-tei-ru.
that Taro-and Hanako-NOM shake.hands-ACC do-PROG-Non.PST

'lit. [That Taro] and Hanako are shaking hands.'

In (33), the Type C (famous) reading is salient but the Type C_{MIR} (mirative) reading is not.[21,

do not have an exact analysis of the pragmatic effects of the pseudo-cleft sentence with *ga*. We thank a reviewer for bringing this point to our attention.

[20]In the questionnaire we provided the contextual information in (31) and asked the informants how natural the sentence (31) is as a sentence expressing the speaker's feeling of surprise that Tanaka raised his hand in class (i.e., the speaker's feeling that it is unlikely that Tanaka will raise his hand in class). As the following table shows, the number of informants who believe that the sentence conveyed surprise increased considerably.

(i) Native speakers' judgments

	1	2	3	4	5	6	7
pseudo-cleft (=31) (mirative, with context)	1 (4.3%)	1 (4.3%)	2 (8.7%)	2 (8.7 %)	2 (8.7%)	5 (21.7%)	10 (43.5%)

[21]Note that the following sentence is natural if we analyze *ano Taro-to* as an adverbial phrase meaning 'with that Taro':

(i) Ano Taro-to, Hanako-ga akushu-o shi-tei-ru. (mirative *ano*)
that Taro-with Hanako-NOM shake hands-ACC do-PROG-Non.PST
At-issue: Hanako is shaking hands with Taro.
Non-at-issue: Taro has a remarkable property that makes him highly unlikely to be shaking hands.

In (i) *ano Taro-to* and *Hanako* do not form a constituent. (Usually, there is a pause between *ano Taro-to* and *Hanako-ga*.) This example shows that mirative *ano* can appear in a VP adjunct (see Section 7.1).

[22] Note, however, that similar to the cases of pseudo-cleft and NP-*desu*, a mirative meaning can arise in the conjunctive environment if there is appropriate information, as shown in

(34) (Context: Taro is famous for his dislike of shaking hands.)

[Ano Taro]-to Hanako-ga, akushu-o shi-tei-ru.
that Taro-and Hanako-NOM shake.hands-ACC do-PROG-Non.PST

'lit. [That Taro] and Hanako are shaking hands.'

However, the crucial point is that a mirative meaning is unlikely to arise if there is no contextual information. We consider that *ano* in this sentence is Type C *ano*.

***Wa* (topic marker) vs. *ga* (nominative case marker)** Fourth, Type C_{MIR} *ano* is sensitive to the *wa-ga* distinction, and the mirative reading is also ruled out in the sentence with *wa* (i.e., *ano* PN-*wa* 'as for that PN')(where PN = a proper name)(see also Sawada and Sawada (2022)). In (35), where *wa* is attached to *ano Toyota*, a Type C (famous) reading is salient, while a Type C_{MIR} reading is not salient:[23]

(35) (With the topic marker *wa*, only Type C reading)

[22]To confirm this point, in the same questionnaire, we asked the native speakers the following questions regarding sentences (32) and (33).

(i) a. Question for (32): How natural is the sentence above as a sentence expressing the speaker's feeling of surprise that Taro and Hanako are shaking hands (i.e., the speaker's feeling that Taro and Hanako are unlikely to shake hands)?

b. Question for (33): How natural is the sentence above as a sentence expressing the speaker's feeling of surprise that Taro is shaking hands (the speaker's feeling that Taro is unlikely to shake hands with people)?

(ii) Native speakers' judgments

	1	2	3	4	5	6	7
mirative (=32) (*ano* [A and B])	0 (0%)	0 (0%)	0 (0%)	1 (4.3%)	4 (17.4%)	5 (21.7%)	13 (56.5%)
mirative (=33) (first conjunct, *ano* A)	1 (4.3%)	2 (8.7%)	7 (30.4%)	2 (8.7%)	6 (26.1%)	3 (13%)	2 (8.7%)

[23]In the questionnaire, we asked the following questions to the informants and had them rate the naturalness of (35) with *wa*:

(i) a. Question 1 for (35): How natural is the sentence above as a sentence containing the nuance "Toyota is a famous company"?

b. Question 2 for (35): How natural is the sentence above as a sentence expressing the speaker's feeling of surprise that Toyota has made some telecommuting permanent (i.e., the speaker's feeling that Toyota is not a company that is likely to make some telecommuting permanent)?

The results show that a sentence with *wa* tends to be natural in the famous reading, but unnatural in the mirative reading. Although 73.9% of the informants assigned 5-7 for the famous reading, only 39.1% of the informants assigned 5-7 for the mirative reading.

(ii) Native speakers' judgments

	1	2	3	4	5	6	7
With *wa* (=35, Q1) (famous)	2 (8.7%)	0 (0%)	1 (4.3%)	3 (13%)	4 (17.4%)	8 (34.8%)	5 (21.7%)
With *wa* (=35, Q2) (mirative)	3 (13%)	3 (13%)	3 (13%)	5 (21.7%)	3 (13%)	4 (17.4%)	2 (8.7%)

Ano Toyota-wa ichibu zaitaku kinmu-o koukyuuka-shi-ta.
that Toyota-TOP part stay.at.home work-ACC perpetuation-do-PST

'lit. As for that Toyota, it made some telecommuting permanent.'
Type C reading: Toyota is a famous car company.

This contrasts sharply with the sentence with the nominative case marker *ga*.[24]

(36) (With the nominative case marker *ga*, ambiguous between Type C and Type C_{MIR} readings)

Ano Toyota-ga ichibu zaitaku kinmu-o koukyuuka-shi-ta.
that Toyota-NOM part stay.at.home work-ACC perpetuation-do-PST

'lit. That Toyota made some telecommuting permanent.'
Type C reading: Toyota is a famous car company.
Type C_{MIR} reading: Toyota has a remarkable property that makes proposition 'Toyota makes some telecommuting permanent' highly unlikely, according to the speaker's knowledge of Toyota.

Why is it that mirative *ano* cannot co-occur with *wa*? We suggest that this is due to the incompatibility between mirative *ano*'s lexical meaning and the property of judgement in *wa*. According to Kuroda (1972), a sentence with *ga* has to do with thetic judgment (representing the perception of a situation) and consists of a single act. In contrast, a sentence with *wa* has to do with categorical judgment and consists of two separate acts (that is, recognizing the subject and affirming or denying what is expressed by the predicate about the subject). [25, 26]

[24]To make a comparison with (35) with *wa*, in the same questionnaire, we asked how natural sentence (36) with *ga* is when taking a famous reading ("Toyota is a famous company") versus taking a mirative reading ("Toyota is not a company that is likely to make some telecommuting permanent"). As the following results show, the number of informants who accepted the mirative reading significantly increases when *ga* is used:

(i) Native speakers' judgments

	1	2	3	4	5	6	7
With *ga* (=36) (famous)	0 (0%)	3 (13%)	3 (13%)	6 (26.1%)	6 (26.1%)	3 (13%)	2 (8.7%)
With *ga* (=36) (mirative)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (17.4%)	7 (30.4%)	12 (52.2%)

Note that only a few people considered the famous reading to be perfectly natural. This is probably because the information in the propositional content is very specific, and they find it difficult to convey the information that Toyota is simply a famous company.

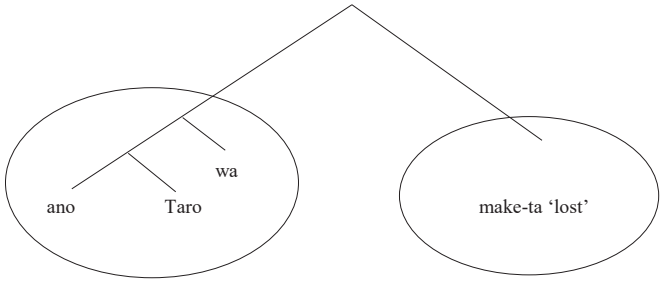
[25]Kuroda (1972) explains the difference between thetic and categorical judgements as follows:

(i) I am referring to the theory of judgment proposed by Franz Brentano, and followed and elaborated, in particular in connection with grammatical theory, by Anton Marty. This theory assumes, unlike either traditional or modern logic, that there are two different fundamental types of judgments, the categorical and the thetic. Of these, only the former conforms to the traditional paradigm of subject-predicate, while the latter represents simply the recognition or rejection of material of a judgment. Moreover, the categorical judgment is assumed to consist of two separate acts, one, the act of recognition of that which is to be made the subject, and the other, the act of affirming or denying what is expressed by the predicate about the subject. With this analysis in mind, the thetic and the categorical judgments are also called the simple and the double judgments (Einfache Urteil and Doppelurteil). (Kuroda, 1972, p. 154)

[26]Building on the discussion of *ga* in Kuroda (1965), Kuno (1973a,b) proposes that the descriptive *ga* is used for 'neutral description' (which corresponds to 'thetic judgment' in the sense of Kuroda, 1972). In contrast, exhaustive *ga* is used for 'exhaustive listing,' which means 'X and only X' (Kuno, 1973a,b).

We claim that only thetic judgment is compatible with the semantic derivation of mirative *ano*. Mirative *ano* must not only take a referring expression, but also a predicate in order to derive an unlikelihood meaning. However, if the judgment is categorical and *wa* "divides" the sentence into two parts, mirative *ano* cannot take a predicate as its argument, as shown in (37):

(37) Categorical judgment



There are various approaches to topic *wa* (see Heycock, 2007; Tomioka, 2016; Oshima, 2021 for a detailed overview), but many approaches seem to share Kuroda's idea of categorical judgment, such that a sentence with *wa* consists of two separate acts. For example, Heycock (1993) considers that topics are entities and that they serve as a link. The link points to a specific file card where the (new) information carried by a given sentence is to be entered. Portner (2007) takes a slightly different approach and considers that topics have expressive meanings that activate the speaker's mental representation of target *x*.

Although these approaches are theoretically different in detail, they all posit that *wa* divides one sentence into two parts, and we can consider that this is a kind of intervention effect. The presence of *wa* makes it difficult for mirative *ano* to take a predicate as its argument.

Based on these facts, it is safe to conclude that, at least in Modern Japanese, Type C_{MIR} *ano* makes reference to a predicate and should be treated differently from Type C, which does not make reference to a predicate. Both types are concerned with a property of a target, but Type C_{MIR} *ano* is specific/context-independent in that the meaning of mirativity (unlikely meaning) is derived lexically through compositionally combining with a predicate. In contrast, in Type C *ano*, its "remarkable" meaning is not specific and context-dependent. [27]

In this study, we assume that Japanese developed Type C_{MIR} *ano* dedicated to the mirative use through a process of semantic change from Type C *ano*. One may consider it undesirable

[27] One of the reviewers mentioned that it is possible to obtain a mirative interpretation when *ano* is embedded within a nominal modifier:

(i) [Ano Tanaka]-no e-ga ichiban-no takane-de ure-ta.
ano Tamaka-GEN picture-NOM the.most high.price-for sell-PST
''lit. [That Tanaka]'s painting sold for the highest price.'

As the reviewer mentioned, this is a configuration with a complex NP island and it would be theoretically challenging if we assumed that there is a movement of *ano*, but we think that in this case *ano* is Type C *ano* (rather than Type C_{MIR} *ano*). This is supported by the fact that the mirative meaning is highly context-dependent, and unless there is contextual information such as "Tanaka is a bad painter", a mirative meaning does not arise. For example, if we assume that Tanaka is a world-class artist, then a mirative meaning does not arise.

The following sentence has exactly the same syntactic structure (complex NP), and no sense of surprise emerges:

(ii) [Ano Ohtani]-no batto-ga ichiban-no takane-de ure-ta.
that Ohtani-GEN bat-NOM most-GEN high.price-for sell-PST
'lit. [That Ohtani]'s bat sold for the highest price.'

The most natural reading of (ii) is that Ohtani is famous.

to posit multiple lexical items for *ano*. Certainly, one should not assume multiple lexical items beyond necessity (if we consider the principle of parsimony (Occam's razor)). For example, it seems reasonable and economical to assume an alternative approach in where there is only one Type C *ano* that covers both fame and mirative readings:

(38) Alternative approach
   a. Type C *ano* (= recognitional, property-inferring) takes a referring expression Q (typically a proper name), which denotes a set of properties holding of a particular individual (of type $\langle\langle e,t\rangle,t\rangle$), and signals that there is some remarkable property R such that $Q(R)$ is true according to the speaker's knowledge of the referent of Q.[28]
   b. By default, R = (i) the property of being famous, or (ii) the property that makes the larger proposition highly unlikely to be true).[29]

In this view, both the mirative reading and the famous reading are derived by simply *ano* taking the proper name as its argument and the difference between them is the matter of what kind of remarkable property (R) *ano* chooses as a default meaning: (i) the property of being famous or (ii) the property that makes the larger proposition highly unlikely to be true. Although this approach may be simpler and more economical, it cannot naturally explain why a surprise reading is ruled out in NP-*desu*, pseudo-clefts with respect to a first conjunct, and sentences with the topic *wa*, unless there is additional contextual information that supports the mirative reading. These constructions also have a propositional meaning, and there is no theoretical reason why they cannot convey a mirative meaning. Furthermore, there is also a problem with the formalization. "The property that makes the larger proposition highly unlikely to be true" is very vague and provides no information about the internal structure of the proposition.

Intuitively, when mirative *ano* is used, the speaker introduces a predicate incompatible with the remarkable property that the target inherently has. The mirative *ano* is sensitive to compositionality (internal structure) of a given sentence (i.e., predicate/argument structure).

4 The meaning of mirative *ano*

4.1 Non-at-issue/CI property of mirative *ano*

Having clarified that Japanese has a mirative demonstrative, let us now investigate the meaning of mirative (Type C_{MIR}) *ano* in more detail. In this section we propose that mirative *ano* triggers the following CI meaning:

(39) Type C_{MIR} *ano* takes a referring expression Q (typically a proper name), which denotes a set of properties holding of a particular individual, and a predicate P and signals that there is some remarkable property R such that $Q(R)$ is true and R makes $Q(P)$ highly unlikely to be true.

In this analysis, a sentence with mirative *ano* has two components, an at-issue component and a CI component, as shown in (40):[30]

[28] Here tense information is ignored.

[29] We thank Ashwini Deo for the valuable comments related to this review.

[30] The mirative *ano* is different from the focus-sensitive operator *even* in that it does not trigger a set of alternatives related to the attached DP.

(40) Ano Taro-ga make-ta.(mirative *ano*)
that Taro-NOM lose-PST
'lit. That Taro lost.'
At-issue: Taro lost.
CI: Taro has a remarkable property that makes the proposition 'Taro loses' highly unlikely according to the speaker's knowledge of Taro.

The speaker's surprise is then triggered by the actual observation of the situation and the meaning triggered by Type C_{MIR} *ano*. Recall that, as mentioned in the Introduction, the mirative meaning is not derived from context or intonation. The hearer of (40) can grasp a mirative meaning even if they do not know anything about the subject referent Taro. In hearing this sentence (with no special intonation or focus), by virtue of the meaning of *ano*, the hearer can automatically obtain the information that "the speaker thinks that Taro has a remarkable property that makes him highly unlikely to lose."

We now discuss the properties of the CI in mirative *ano* in detail. In the Gricean theory of meaning, CIs are considered part of the meanings of words, but these meanings are independent of "what is said" (e.g., Grice, 1975; Potts, 2005, 2007; McCready, 2010; Sawada, 2010, 2017; Gutzmann, 2011, 2012). Potts (2005) defines a CI as follows:

(41) Potts's definition of CI (Potts, 2005, p. 11)
a. CIs are part of the conventional meaning of the words.
b. CIs are commitments, and thus give rise to entailments.
c. These commitments are made by the speaker of the utterance 'by virtue of the meaning of' the words he chooses.[31]
d. CIs are logically and compositionally independent of what is 'said (in the favored sense)', i.e. independent of the at-issue entailments.

There is room for modification of the above definition, as will be shown below, but basically, mirative *ano* fits the definition above. First, the meaning of unlikelihood is part of the meaning of *ano*, and thus gives rise to entailment (criteria (a) and (b)). This is supported by the fact that it is not cancellable.[32]

(42) (Mirative *ano*)

Ano Taro-ga make-ta. # Boku-wa hajime-kara Taro-ga
that Taro-NOM lose-PST I-TOP the beginning-from Taro-NOM
make-ru-to omo-ttei-ta-kedo-ne.
lose-Non.PST-COMP think-PROG-PST-although-Prt

[31] As we will discuss below, the speaker-orientedness is not the decisive factor for identifying the meaning of a CI.

[32] In contrast, Type C *ano* does not have the meaning of surprise at the lexical level. The following embedded sentence with Type C *ano* may convey the meaning of surprise, but it is contextual and can be cancelled.

(i) Ano Taro-ga shachoo-o shi-tei-ta kaisha-ga tsubure-ta. Taro-wa
That Taro-NOM president-ACC do-PROG-PST company-NOM go.bankrupt-PST Taro-TOP
keiei-no shirooto-nanode tokuni odoroku-yoona koto-de-wa nai-ga.
makagement-GEN amateur-because particularly surprised-like thing-PRED-TOP NEG-but
'The company of which that Taro was the CEO went bankrupt. That is not particularly surprising, though, since Taro is an amateur at running a business.'

See also footnote 17.

'lit. That Taro lost. # Although I was thinking from the beginning that he will lose.'

As mentioned in the previous section, even through Type C *ano*, the meaning of mirative can be derived as a conversational implicature if contextual information is available. However, in the above sentence, the implicature clearly cannot be canceled; therefore, it cannot be considered to be interpreted through Type C. We would like to consider that if *ano* can make a reference to predicate information to trigger the mirative meaning, we should use Type C_{MIR} *ano* (rather than Type C *ano*).[33] It seems that this can be explained based on Kennedy's (2007) Interpretive Economy (Maximize the contribution of the conventional meaning of the elements of a constituent to the computation of its meaning)(Kennedy, 2007). Since Type C_{MIR} can lexically trigger a mirative/unlikely meaning, it is more economical than Type C, which requires contextual information to derive a mirative meaning. Namely, if we can use Type C_{MIR}, which lexically triggers a mirative meaning, we should choose that option rather than using Type C *ano* and relying on contextual information to trigger a mirative meaning.

Second, mirative *ano* is *typically* speaker-oriented (criterion (c)). Even if mirative *ano* is embedded in the complement of an attitude predicate, it can still be anchored to the speaker.

(43) (Mirative *ano*)

Hanako-wa ano Taro-ga make-ru-to omo-ttei-ru.
Hanako-TOP that Taro-NOM lose-Non.PST-COMP think-STATE-Non.PST

At-issue: Hanako thinks that Taro will lose.
CI: Taro has a remarkable property that makes the proposition Taro loses highly unlikely according to the speaker's knowledge of Taro.

However, it appears that the idea that mirative *ano* is always speaker-oriented is too strong. Observe the following examples:

(44) a. (Speaker-oriented)

Minna-wa ano Federer-ga make-ta-koto-ni odoroi-tei-ru.
everyone-TOP that Federer-NOM lost-PST-fact-DAT surprised-STATE-Non.PST
Boku-mo kanari odoroi-tei-ru.
I-also quite surprised-STATE-Non.PST

'lit. Everyone is surprised by the fact that that Federer lost. I am also quite surprised.'

b. (Subject-oriented)

Minna-wa ano Federer-ga make-ta-koto-ni
everyone-TOP that Federer-NOM lose-PST-fact-DAT
odoroi-tei-ru-ga boku-wa chigau.
surprised-STATE-Non.PST-but I-TOP different

'lit. Everyone is surprised by the fact that that Federer lost, but I am not.'

For some native speakers, it seems that mirative *ano* can also be non-speaker-oriented if it is embedded under the complement of an attitude predicate.[34]

[33] We thank a reviewer for the valuable comment regarding this point.

[34] To check the naturalness of the possibility of non-speaker-orientation in mirative *ano*, we asked 22 native speakers to rate the naturalness of (44a) and (44b) scored on a scale of 1-7 (where 1 = *completely odd* and 7 = *completely natural*). (The questionnaire was distributed between December 10th and 11th, 2020, via Google form.

Note that, as several researchers have mentioned, CI expressions such as expressives can have a non-speaker orientation in an embedded context (e.g., Amaral et al., 2007, Harris and Potts, 2009), and that criterion (41c) is too strong. We consider that mirative *ano* may have the same tendency.

Third, the meaning triggered by mirative *ano* is logically and compositionally independent of "what is said" (criterion (d)). This is supported by the fact that its meaning cannot fall within the scope of logical operators. For example, in (45), mirative *ano* cannot appear in the semantic scope of the epistemic modal *kamoshirenai* 'may'.

(45) Ano Taro-ga make-ru-kamoshirenai. (mirative *ano*)
that Taro-NOM lose-Non.PST-may
At-issue: Taro may lose.
CI: Taro has a remarkable property that makes him highly unlikely to lose according to the speaker's knowledge of Taro.

Furthermore, the fact that the meaning triggered by mirative *ano* cannot be challenged by a denial also supports that it is independent of "what is said." For example, in the following dialogue, speaker B cannot target the CI part of A's utterance:

(46) A: Ano Taro-ga make-ta-yo. (mirative *ano*)
that Taro-NOM lose-PST-Prt
At-issue: Taro lost.
CI: Taro has a remarkable property that makes him highly unlikely to lose (= Taro is strong) according to the speaker's knowledge of Taro.
B: Iya, sonna hazu-wa nai. Kare-wa {kat-ta-yo / #yowai-yo}.
no that can-TOP NEG He-TOP win-PST-Prt / weak-Prt
'No, that can't be right! {He won! /#He is weak!}'

Here, B could naturally continue the utterance by saying, "He won!" However, B cannot continue this utterance by saying, "He is weak!"

Before closing this section, let us briefly consider the difference between a CI and a presupposition. One might consider that the meaning triggered by mirative *ano* is a presupposition rather than a CI. A presupposition is an inference or proposition whose truth is taken for granted in the utterance of a sentence. It is usually backgrounded and is part of the common ground of the conversational participants. Although there are various theoretical views concerning the distinction between a CI and a presupposition, in this study, we consider the meaning triggered by mirative *ano* to be a CI rather than a presupposition. One piece of evidence for this is that the meaning of *ano* cannot be backgrounded. Consider the following example:

The questionnaire also contained other similar examples of mirative *ano*). As the following results show for *ano*, although there is an asymmetry between sentence (44a) and (44b), some native speakers consider sentence (44b) natural or completely natural:

(i) Speaker-orientation/non-speaker-orientation

	1	2	3	4	5	6	7
(44a)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6 (27.3%)	16 (72.7%)
(44b)	0 (0%)	2(9.1%)	2 (9.1%)	1 (4.5%)	6 (27.3%)	5 (22.7%)	6 (27.3%)

This supports the idea that mirative *ano* is speaker-oriented by default, but subject-oriented (non-speaker-oriented) is possible, at least for some native speakers.

(47) Taro-wa totemo tsuyoi senshu-da. (Shikashi) {#ano / sono} Taro-ga make-ta.
Taro-TOP very strong player-PRED however that / that Taro-NOM lose-PST
'lit. Taro is a very strong player. However, that$_{\#ano/sono}$ Taro lost.'

The sentence with *ano* sounds odd because the CI meaning triggered by *ano* is given information. Namely, the remarkable property that makes Taro highly unlikely to lose corresponds to the property of being very strong. Usually (in the non-embedded context), the mirative *ano* refers to the speaker's knowledge and cannot refer to previous information. To make the series of utterances natural, we need to use the discourse anaphoric *sono* 'that'. In the case of (47) with *sono*, the surprisal meaning here arises from the discrepancy between the content of the utterance in the previous sentence and the fact in question. In contrast, in the case of mirative *ano*, a surprisal meaning arises from the discrepancy between the at-issue proposition (the given situation) and the speaker's knowledge. There is no relation with a previous utterance.

The question is whether the speaker's knowledge concerning the property of a particular individual is shared with the hearer. As the following example shows, it seems possible for the speaker to use mirative *ano* under the assumption that the hearer also has the same knowledge.

(48) (Mirative *ano*)
(Context: The speaker is reporting to the hearer.)

Oi, ano Taro-ga make-ta-zo.
hey, that Taro-NOM lose-PST-Prt

'lit. Hey, that Taro lost.'
(The meaning triggered by *ano*: Taro has a remarkable property that makes him highly unlikely to lose.)

In fact, these sentences require some sort of common understanding between the speaker and the hearer. Note that there are expressions like *oi* 'hey' and the discourse particles *zo* that draw the attention of a hearer in (48).

However, as the following example shows, it is also possible for the speaker to use mirative *ano* in a situation in which the speaker's knowledge concerning the property of a particular individual cannot be shared with the hearer:

(49) (Mirative *ano*)

Anata-wa itsumo ano Taro-ga 1-kaisen-de make-ru-to
you-TOP always that Taro-NOM 1-round-LOC lose-Non.PST-COMP
i-ttei-masu-ne.
say-PROG-POLITE.PRED-Prt

At-issue: You are always saying that Taro will lose in the first round.
CI: Taro has a remarkable property that makes him highly unlikely to lose in the first round according to the speaker's knowledge of Taro.

The fact that the hearer is always saying that Taro will lose in the first round and the hearer's belief that Taro has a remarkable property that makes him highly unlikely to lose in the first round are not compatible (unless the hearer is always lying).[35]

[35]Note that we are now considering whether the property concerning a particular individual is shared between a speaker and a hearer, and we are not considering whether the referent of a noun is known to the speaker and a hearer. When mirative *ano* combines with a proper name, an existential presupposition arises from the proper name. For example, the proper name *Taro* has a presupposition that there exists a unique person called Taro. This presupposition is independent of the meaning triggered by mirative *ano*.

In this paper, we would like to take the position that mirative *ano* (and also Types B and C *ano*) basically refers to something that is in the speaker's knowledge (experience), but can be shared with the hearer. This approach is similar to Kuroda's (1979) analysis of *ano* (Type B *ano*). Kuroda (1979) claims that when *ano* is used, the speaker needs to know the referent as his/her experience, but the addressee does not need to have direct knowledge of the referent.[36] As the following examples show, it is possible to use Type B *ano* even if the addressee does not have direct knowledge of the referent:

(50) Boku-wa Osaka-de Yamada Taro-to iu sensei-ni osowa-tta-nda-kedo,
I-TOP Osaka-LOC Yamada Taro-as say teacher-from taught-PST-*noda*-Prt
kimi-mo ano sensei-ni tsuku-to ii-yo.
you-also that teacher-to study.under-if good-Prt
'I learned from the teacher named Taro Yamada in Osaka. It will be nice if you also study under that teacher.' (Kuroda, 1979, p. 55)

The above data suggest that the speaker's knowledge concerning the properties of a referent can be shared between the speaker and hearer, but this is not obligatory. Because the main focus of our study is to investigate the mirative property of *ano*, we will not go into further detail regarding the theoretical difference between a CI and a presupposition, but we can at least confirm that the meaning triggered by mirative *ano* is not at-issue and it is not part of the propositional content of a given sentence.

4.2 Difference with the focus particle (*de*)*sae* 'even'

Thus far, we have demonstrated that mirative *ano* triggers a meaning of unlikelihood as a CI . One might now wonder what the difference is between mirative *ano* and the scalar focus particle (*de*)*sae* 'even'. (*De*)*sae* also posits a scale of unlikelihood. In this section, we will show that although mirative *ano* is similar to the scalar focus particle (*de*)*sae* 'even' in having a meaning of unlikelihood, mirative *ano* does not induce a set of alternatives. Let us consider this issue based on a comparison between (51a) and (51b):

(51) a. Federer-(de)sae make-ta. (scalar focus particle (*de*)*sae*)
Federer-even lose-PST
'Even Federer lost.'

b. Ano Federer-ga make-ta. (mirative *ano*)
That Federer-NOM lose-PST
At-issue: Federer lost.
CI: Federer is highly unlikely to win according to the speaker's knowledge of Federer.

In (51a), (*de*)*sae* triggers a scalar presupposition and an existential presupposition, similar to the case of English *even* (Karttunen and Peters, 1979):

(52) The meaning of (*de*)*sae* in (51a):
a. Existential presupposition: There are other individuals x under consideration besides Federer who lost.

[36]This approach is different from Kuno's (1973a) shared-knowledge-based analysis of *ano*, where he claims that "the *a*-series is used for referring to something (at a distance either in time and space) that the speaker knows both he and the hearer know personally or have shared experience in" (Kuno, 1973a, p. 290).

b. Scalar presupposition: For all x under consideration besides Federer, the likelihood that x loses is greater than the likelihood that Federer loses.

Conversely, mirative *ano* has neither an existential presupposition nor a scalar presupposition. Unlike (*de*)*sae*, mirative *ano* can be used in a situation in which there cannot be alternatives:

(53) (The speaker is talking about the cancellation of the summit between the two countries.)

a. (The speaker is talking about the cancellation of the summit between the two countries.)
Ano A shushoo-ga O daitooryoo-to-no ashita-no nichi-bei
That A prime.minister-NOM O president-with-GEN tomorrow-GEN Japan-US
shunoukaidan-o kyanseru-shi-ta. (mirative *ano*)
summit.meeting-ACC cancel-do-PST
'lit. That Prime Minister A canceled tomorrow's Japan-US summit meeting with President O.'
CI: Prime Minister A has a remarkable property that makes the proposition 'Prime Mister A cancels tomorrow's Japan-UP summit meeting with President O' highly unlikely according to the speaker's knowledge of Prime Minister A.

b. # A shushoo-desae O daitooryoo-to-no ashita-no nichi-bei
A prime.minister-even O president-with-GEN tomorrow-GEN Japan-US
shunoukaidan-o kyanseru-shi-ta. (scalar focus particle *desae*)
summit.meeting-ACC cancel-do-PST
'Even Prime Minister A canceled tomorrow's Japan-US summit meeting with President O.'

In this context, (53a) with mirative *ano* is natural, but (53b) with *desae* 'even' is odd. Sentence (53b) is odd because the sentence presupposes that there is a person other than Prime Minister A who could have cancelled tomorrow's Japan-US summit meeting. According to our world knowledge, the Japan-US summit is held between a prime minister (one person) and a president (one person) and there are no other persons who can participate in the meeting as Prime Minister/President.[37] On the other hand, (53a) is perfectly natural because mirative *ano* refers only to a particular individual in the speaker's knowledge and implies that the given proposition regarding the specific individual is highly unlikely. This suggests that mirative *ano* is not a focus-sensitive operators like (*de*)*sae* 'even'.

5 Analysis

Having clarified that mirative *ano* triggers a property of a CI, in this section we adopt a multidimensional approach to formalize the meaning of mirative *ano*. First, we introduce Potts' (2005) logic of conventional implicature and CI application and show that although it can analyze the meaning of Type C (non-mirative) *ano*, it cannot properly analyze the meaning of Type C_{MIR} *ano*. We then argue that the problem can be solved if we extend it to $\mathcal{L}_{CI}^{+S}$ (McCready, 2010) and consider mirative *ano* a special case of mixed content (McCready, 2010).

[37] Note that if we delete the adverb *ashita-no* 'tomorrows's' from (53b), the sentence becomes natural, but this is because the sentence without the adverb allows us to posit multiple former prime ministers.

5.1 Potts' (2005) logic of CIs and CI application

As a typical example of CI expression, let us examine Potts' analysis of *amazingly*. Potts (2005) argues that *amazingly* in (54) is speaker-oriented and conventionally implicates that the at-issue proposition (adjoined to *amazingly*) is amazing:

(54) Amazingly, the company said that it couldn't send a repairman out to help. (Potts, 2005, p. 104)

The meaning of *amazingly* is a CI in that its meaning cannot be challenged by saying "No, that's not true."

To account for this multidimensionality, building on Karttunen and Peter's (1979) two-dimensional theory of conventional implicatures, Potts (2005) proposed a new logic of conventional implicatures $\mathcal{L}_{CI}$, which distinguishes an at-issue type and a CI type:

(55) The logic $\mathcal{L}_{CI}$

a. e^a, t^a, s^a are basic at-issue types for $\mathcal{L}_{CI}$.

b. e^c, t^c, s^c are basic CI types for $\mathcal{L}_{CI}$.

c. If σ and τ are at-issue types for $\mathcal{L}_{CI}$, then $\langle \sigma, \tau \rangle$ is an at-issue type for $\mathcal{L}_{CI}$.

d. If σ is an at-issue type for $\mathcal{L}_{CI}$ and τ is a CI type for $\mathcal{L}_{CI}$, then $\langle \sigma, \tau \rangle$ is a CI type for $\mathcal{L}_{CI}$.

(Based on Potts (2005, 55))

Potts (2005) then proposes a compositional rule, called CI application (cf. Karttunen and Peters' (1979) two-dimensional semantic composition system for presupposition/conventional implicature):

(56) Potts' CI application

$$\begin{array}{c} \beta : \sigma^a \\ \bullet \\ \alpha(\beta) : \tau^c \\ \diagup \quad \diagdown \\ \alpha : \langle \sigma^a, \tau^c \rangle \quad \beta : \sigma^a \end{array}$$

(Potts, 2005, p. 64)

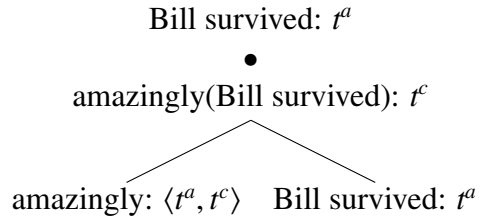
In the application above, an α that is of type $\langle \sigma^a, \tau^c \rangle$ takes a β of type σ^a and returns a conventional implicature τ^c. The important point is that this rule is resource-insensitive. β is taken by α, but at the same time it passes up to the level above the bullet. The bullet $\bullet$ is a metalogical device for separating independent lambda expressions.

Let us consider CI application based on the example of the sentence adverb *amazingly*. Based on Potts (2005), we posit the following lexical entry for the sentence adverb *amazingly* (I omit the world variable for simplicity).

(57) $[\![\text{amazingly}_{sentence}]\!]$: $\langle t^a, t^c \rangle = \lambda p.\ \text{amazing}(p)$

The following structure shows that the local structure of the sentence "Amazingly, Bill survived" (The information of tense and world are omitted):

(58)



Although the CI application works for the example with the sentence adverb *amazingly*, it does not work for the sentence with the mirative *ano*. The problem is that we cannot assume that mirative *ano* is a "pure CI" that has only a CI component. If we consider it as such, then the derivation crashes.

In order to see this, let us suppose that mirative *ano* has the following meaning (which only contains a CI meaning) ($\downarrow Q$ stands for the "lower" (Partee, 1986) of Q, which is an individual of type e. ">!!STAND$_{unlikely}$" stands for 'greater than a standard of "unlikely" by a large amount'; cf. *much* (Kennedy and McNally, 2005). i stands for a type for tense):[38,39]

(59) (To be revised)
$[\![\text{ano}_{TypeC.MIR}]\!]$:$\langle\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle, \langle\langle e^a, \langle i^a, t^a\rangle\rangle, t^c\rangle\rangle$
$\lambda Q_{\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle}\lambda P_{\langle e^a,\langle i^a,t^a\rangle\rangle}$. $\exists R[R$ = a remarkable property $\wedge\ Q(R)(t_0) = 1 \wedge$
Cause$(R, \text{unlikely}(Q(P))$ >!! STAND$_{unlikely}$)] according to *sp*'s knowledge of the specific individual $\downarrow Q$ (=the lower of Q)

Mirative *ano* takes a referring expression Q and a predicate P and conventionally implies that Q has the remarkable property R that causes $Q(P)$ to be highly unlikely according to the according to the speaker's knowledge of the specific individual, which is the lower of Q.[40,41] This creates a discrepancy between the at-issue component and the speaker's knowledge of the individual in question, triggering a meaning of mirativity. This analysis predicts that mirative *ano* is sensitive to the distinction between stage-level and individual-level predicates (Carlson, 1977; Carlson and Pelletier, 1995; Kratzer, 1995). Namely, while mirative *ano* can co-occur

[38]We think that *unlikely* is context-dependent. Similarly to *tall*, *unlikely* is a relative gradable predicate (Lassiter, 2017) and the judgment of the appropriateness of *ano* in a given sentence varies depending on a contextually set standard. For example, in a normal situation the following sentence is natural but if we posit a context where the speaker is very skeptical, the sentence sounds strange:

(i) (Context: I'm feeling very skeptical today. Today, it strikes me as unlikely even that the sun will rise tomorrow.)

?? Ano ABC resutoran-ga tousan-shi-ta.
that ABC restaurant-NOM bankrupt-do-PST

'lit. That ABC restaurant went bankrupt.'
CI: ABC restaurant has a remarkable property that makes the proposition ABC restaurant goes bankrupt highly unlikely.

In this situation, the standard of "unlikely" is lowered and everything is construed as unlikely; it is then odd to use mirative *ano*. The speaker is skeptical (i.e., thinking that everything is uncertain), and so would not use *ano* to convey that ABC restaurant is highly unlikely to go bankrupt. We thank Mandy Simons for the valuable discussions regarding this point.

[39]Regarding tense, we assume the referential theory of tense (e.g., Partee, 1973) in which tenses are treated as pronouns on par with individuals (cf. a quantificational theory of tense).

[40]As discussed in section 4.1, mirrative *ano* is basically speaker-oriented. We assume that knowledge about a specific individual is ascribed to the speaker (*sp*) by default.

[41]The operation $\downarrow$ (= lower) applies to a generalized quantifier and maps it onto its generating element in the e domain (Partee, 1986).

with a stage-level predicate, which represents an individual's temporary property, it cannot co-occur with an individual-level predicate, which represents a permanent property of an individual. This prediction is borne out:

(60) a. Ano Taro-ga make-ta.
that Taro-NOM lose-PST
At-issue: Taro lost. CI: Taro has a remarkable property that makes the proposition 'Taro loses' highly unlikely according to the speaker's knowledge of Taro.

b. ?? Ano Taro-ga yowai.
that Taro-NOM weak
At-issue: Taro is weak.
CI: Taro has a remarkable property that makes the proposition 'Taro is weak' highly unlikely according to the speaker's knowledge of Taro.

For example, *katsu* 'win' is a stage-level predicate, which denotes an individual's temporary property. Conversely, *yowai* 'weak' is an individual-level predicate, which represents a more permanent property and the state will continue to hold. It is odd to use mirative *ano* with *yowai* because a contradiction arises between the at-issue level and non-at-issue level. At the level of at-issue, the sentence describes the permanent/stable characteristic that Taro is weak. In contrast, at the CI level, the sentence conventionally implies that Taro has a salient property that makes the proposition that Taro is weak highly unlikely. It is contradictory to have two permanent properties X and Y that are not compatible.[42]

Let us consider how mirative *ano* is computed, based on example (60a). As for the meaning of a proper name like *Taro*, we assume that it denotes a set of properties and behaves like a generalized quantifier:[43]

(61) $[\![\text{Taro}]\!] : \langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle$
$= \lambda S \in D_{\langle e^a, \langle i^a, t^a\rangle\rangle} \lambda t.\ S(\text{Taro})(t)$

If *ano* is combined with *Taro* via the CI application, then the argument *Taro* is not only saturated by *ano*, it is also passed up to a higher level, as shown in (62):

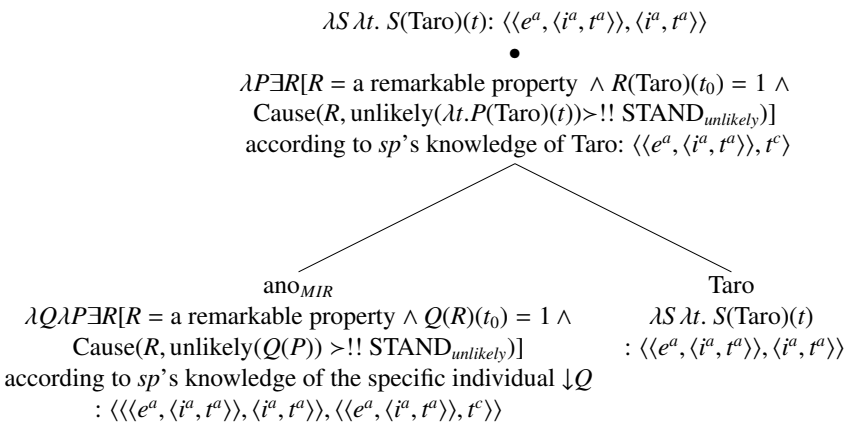
[42]Note that if we replace *yowai* 'weak' with *yowaku-mie-ru* 'look weak', then the sentence with mirative *ano* sounds natural:

(i) Ano Taro-ga yowaku mie-ru.
that Taro-NOM weak look-Non.PST
At-issue: Taro looks weak.
CI: Taro has a remarkable property that makes the proposition "Taro looks weak" highly unlikely according to the speaker's knowledge of Taro.

Yowaku mieru 'look weak' describes temporal appearance.

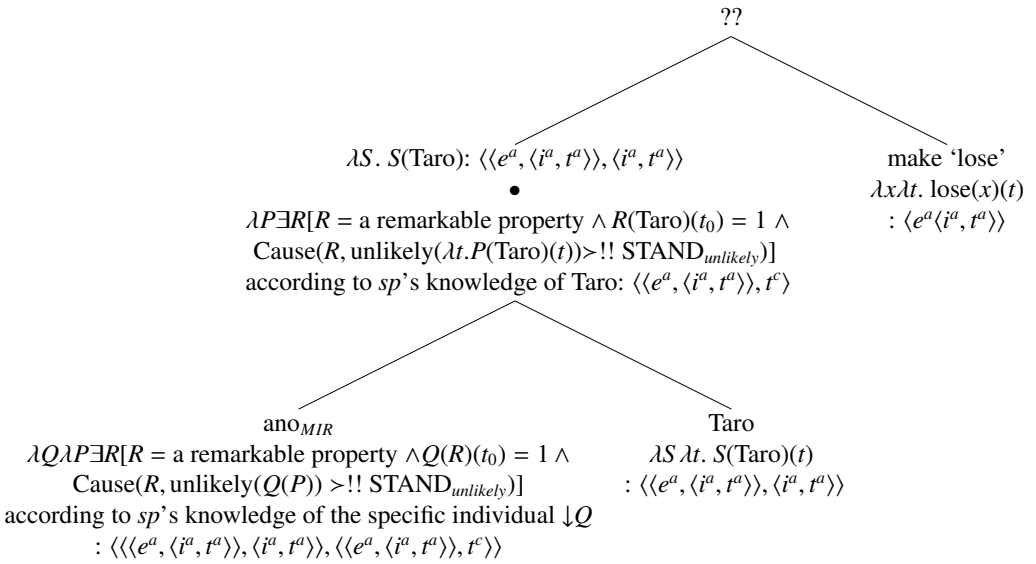
[43]Note that since *Taro* takes a predicate that contains an argument for tense, the information of tense (type i) is included in the denotation of *Taro*. Namely, *Taro* takes a predicate S and returns S(Taro), which is a function of type $\langle i^a, t^a\rangle$.

(62)



However, the problem arises in the next derivation:

(63)



This is problematic because we cannot construe the CI computation. *Taro* may be able to take *make-* 'lose' as its argument via the usual resource-sensitive function application. However, the CI of type $\langle\langle e^a, \langle i^a, t^a\rangle\rangle, t^c\rangle$ cannot take *make-* as its argument because *make-* is already taken by *Taro*. Even if we assume a special rule that *make-* can be an argument of *Taro* and the CI expression simultaneously, th problem still arises. Namely, since the CI component is to be combined with *make-* 'lose' via Potts' CI application, *make-* must pass up to the above node, which is clearly what we do not want.

Note that this type of problem does not arise in the case of Type C *ano* (non-mirative), as in (64):

(64) Ano John Lennon-ga gakuensai-ni ku-ru. (Type C reading)
that John Lennon-NOM school.festival-to come-Non.PST.
'lit. That John Lennon is coming to the school festival.'

As discussed earlier, Type C *ano* takes a referring expression Q (a set of properties) and conventionally implicates that Q has a remarkable property that can be formally defined as follows:[44]

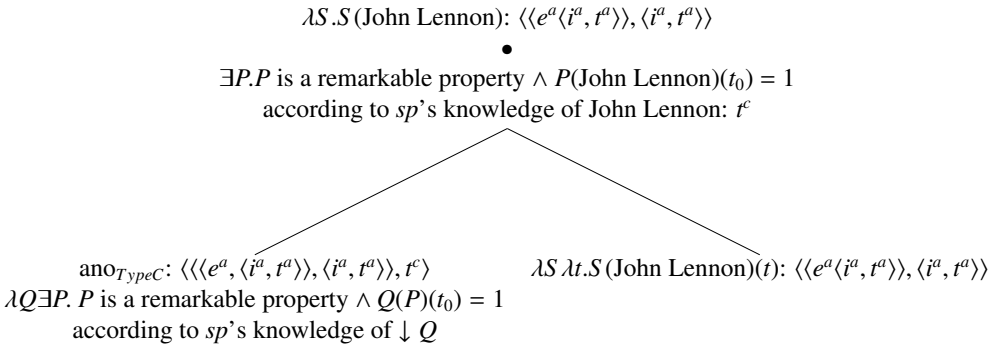
[44]Note that a remarkable property P has type $\langle e^a, \langle i^a, t^a\rangle\rangle$. For example, the property of "famous" has the following meaning (the notion of degree is ignored):

(i) $[\![\text{famous}]\!] = \lambda x\lambda t.\ \text{famous}(x)(t)$

(65) $[\![\text{ano}_{TypeC}]\!]$: $\langle\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle, t^c\rangle$
= $\lambda Q \exists P.$ P is a remarkable property $\wedge$ $Q(P)(t_0) = 1$ according to *sp*'s knowledge of $\downarrow Q$
(=the lower of Q)

As the following figure shows, the CI meaning of Type C *ano* in (64) can be analyzed naturally based on Potts' CI application as shown in the following figure:

(66) Logical structure of Type C *ano* (based on Potts' CI application)



Because the derivation of CI completes after the combination with a referring expression, no problem arises in the next semantic derivation.

5.2 Mirative *ano* is a mixed content expression

In the previous section, we showed that mirative *ano* cannot be analyzed as a sentential operator when using the Potts' CI application. How then can we analyze the meaning of mirative *ano* in a formal way? We claim that mirative *ano* should be considered a special type of "mixed content" (McCready, 2010; Gutzmann, 2011) (rather than a pure CI expression). Mixed content is standardly assumed for words or morphemes that have both at-issue and CI meanings within the same lexical entry. A good example of mixed content with both at-issue and CI meanings is the word *Kraut* (McCready, 2010; Gutzmann, 2011):

(67) Juan is a Kraut.
At-issue: Juan is a German.
CI: The speaker has a negative attitude toward German people.
(McCready, 2010, p. 22)

McCready (2010) argued that in order to explain the semantic derivations of mixed content and other kinds of CI expressions that provide the main (but not supplemental) meaning, it is necessary to add a shunting type (superscript *s*) to Potts' logic of CIs. McCready (2010) added the following type system to Potts' $\mathcal{L}_{CI}$:

(68) McCready's modified type system: $\mathcal{L}_{CI}^{+S}$
The type system itself is identical to that of $\mathcal{L}_{CI}$ except that:
a. e^s, t^s, s^s are basic shunting types for $\mathcal{L}_{CI}^{+S}$.
b. If σ is an at-issue type for $\mathcal{L}_{CI}^{+S}$ and τ is a shunting type for $\mathcal{L}_{CI}^{+S}$, then $\langle\sigma, \tau\rangle$ is a shunting type for $\mathcal{L}_{CI}^{+S}$.
c. If σ is a shunting type for $\mathcal{L}_{CI}^{+S}$ and τ is a shunting type for $\mathcal{L}_{CI}^{+S}$, then $\langle\sigma, \tau\rangle$ is a shunting type for $\mathcal{L}_{CI}^{+S}$.

(69) McCready's modified type system: The logic $\mathcal{L}^{+}_{CI}$
The following clauses are added to the type system of $\mathcal{L}^{+S}_{CI}$:
(i) If σ and τ are at-issue types for $\mathcal{L}^{+}_{CI}$, and ζ and υ are shunting types for $\mathcal{L}^{+}_{CI}$, then $\sigma \times \zeta$, $\langle \sigma, \tau \rangle \times \zeta$, $\sigma \times \langle \zeta, \upsilon \rangle$ are mixed types for $\mathcal{L}^{+}_{CI}$.
(ii) If σ, τ and ζ are at-issue types for $\mathcal{L}^{+}_{CI}$ and υ is a shunting type for $\mathcal{L}^{+}_{CI}$, then $\langle \sigma, \tau \rangle \times \langle \zeta, \upsilon \rangle$ is a mixed type for $\mathcal{L}^{+}_{CI}$.

McCready (2010) then introduced a new rule, called mixed application, for the interpretation of mixed content:

(70) Mixed application

$$\begin{array}{c} \alpha(\gamma)\blacklozenge\beta(\gamma) : \tau^{a} \times \upsilon^{s} \\ \diagup \quad \diagdown \\ \alpha\blacklozenge\beta : \langle \sigma^{a}, \tau^{a} \rangle \times \langle \sigma^{a}, \upsilon^{s} \rangle \quad \gamma : \sigma^{a} \end{array}$$

(Based on McCready (2010))

Mixed application is different from Potts' CI application in that it is a resource-sensitive application.[45,46]

Unlike Potts' CI application, the at-issue content is not passed up to the above level. McCready (2010, 20) further assumed that the following rule applies to the final interpretation of the CI part of mixed content in order to completely separate a completed CI from at-issue meaning by $\bullet$:

(71) Final interpretation rule: Interpret $\alpha\blacklozenge\beta : \sigma^{a} \times t^{s}$ as follows at the next derivation:
$\alpha : \sigma^{a} \bullet \beta : t^{s}$

According to this rule, the mixed-type terms involving the conjunction $\blacklozenge$ should be replaced with terms conjoined by a $\bullet$ when the CI part of the mixed content is propositional (of type *t*).

Let us now consider how the meaning of *Kraut* is computed. McCready (2010) proposed the following lexical entry for *Kraut*:

(72) $[\![\text{Kraut}]\!] = \lambda x.\text{German}(x)\blacklozenge\text{bad}(^{\cap}\text{German})$: $\langle e^{a}, t^{a} \rangle \times t^{s}$ (where $\cap$ is the kind formation operator (e.g., Chierchia, 1984))

(McCready, 2010, p. 21)

The following structure represents the logical structure of (67):

(73) The logical structure of the sentence with *Kraut*

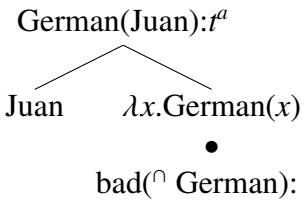
[45]McCready (2010) uses derivation proofs rather than derivation trees. I will assume that they yield essentially the same results. See also McCready (2010) on this point.

[46]McCready (2010) also introduced a shunting application, which is also a resource-sensitive application, more basic than mixed application:

(i) Shunting application

$$\begin{array}{c} \alpha(\beta) : \tau^{s} \\ \diagup \quad \diagdown \\ \alpha : \langle \sigma^{a}, \tau^{s} \rangle \quad \beta : \sigma^{a} \end{array}$$

(Based on McCready (2010))



(Based on McCready (2010))

The interpretation of the meaning of *Kraut* involves a shunting type because the argument of *Kraut* does not pass up to the above level.

Now let us consider the meaning of mirative *ano* based on the following example:

(74) Ano Taro-ga make-ta. (mirative *ano*)
that Taro-NON lose-PST
At-issue: Taro lost.
CI: Taro is highly unlikely to lose according to the speaker's knowledge of Taro.

We claim that just like *Kraut*, mirative *ano* is mixed content.

(75) (The mirative *ano*, final version)
$[\![\text{ano}_{TypeC.MIR}]\!]$:
$\langle\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle, \langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle\rangle \times \langle\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle, \langle\langle e^a, \langle i^a, t^a\rangle\rangle, t^s\rangle\rangle$
$= \lambda Q_{\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle} \lambda P_{\langle e^a,\langle i^a,t^a\rangle\rangle}.Q(P)\blacklozenge\lambda Q_{\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle} \lambda P_{\langle e^a,\langle i^a,t^a\rangle\rangle}.$ $\exists R[R =$ a remarkable property $\wedge\, Q(R)(t_0) = 1 \wedge \text{Cause}(R, \text{unlikely}(Q(P)) \succ!! \text{STAND}_{unlikely})]$ according to *sp*'s knowledge of the specific individual $\downarrow Q$ (=the lower of Q)

This ano_{MIR} is mixed content in that it has both at-issue and CI components. In the at-issue domain, there is no concrete meaning; *ano* just takes a referring expression Q and a predicate P and denotes $Q(P)$.[47]

The at-issue component of mirative *ano* (the left side of ⧫) is crucial because it enables us to simultaneously compute the at-issue part and the CI part of the entire sentence and avoid the compositional problem discussed in the previous section. The CI dimension (the right side of ⧫) is the same as the previous version in (59). That is, it takes a referring expression Q and a predicate P and conventionally implicates that Q has the remarkable property R that causes $Q(P)$ to be highly unlikely according to the speaker's knowledge of the referent of Q.[48]

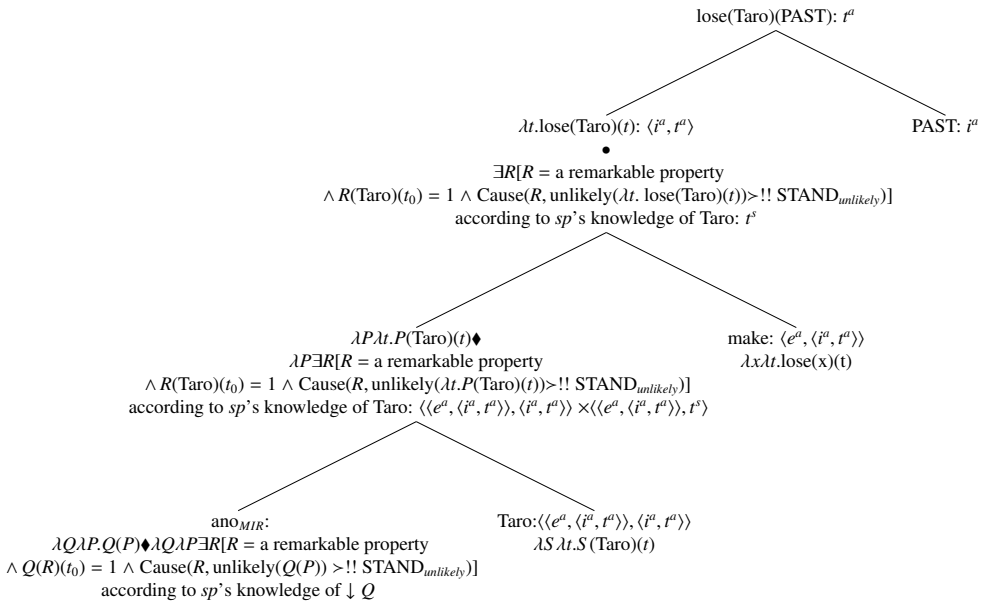
If we combine mirative *ano* and the other elements based on mixed application, we obtain the following logical structure:

(76) The logical structure of (74): revised

[47]Recall that in this paper we consider a referring expression like *Taro* as having a denotation as follows:

(i) $[\![\text{Taro}]\!] : \langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle$
$= \lambda S \in D_{\langle e^a,\langle i^a,t^a\rangle\rangle} \lambda t.\ S(\text{Taro})(t)$

[48]Usually, mixed content simultaneously has both a concrete at-issue meaning and a CI, as we observed of the pejorative word for Germans, *Kraut*. Although the at-issue component of mirative *ano* does not have a concrete at-issue meaning, it plays an important role in computing both at-issue and CI meanings simultaneously. We would like to call this type of mixed content "computational mixed content."



Mirative *ano* combines with a proper name and a predicate via a mixed application.[49] This analysis enables us to compute both the at-issue and the CI meaning simultaneously.[50]

5.3 Note on the individual-based approach

Before closing this section, we would like to point out an alternative approach in which the first argument of mirative *ano* is not a set of properties but an individual (Sawada and Sawada, 2010, 2014). As an alternative analysis, this approach would analyze the mirative *ano* as follows:

(77) (Alternative approach, individual-based approach)
$[\![\text{ano}_{MIR}]\!] : \langle e^a, \langle e^a, \langle i^a, t^a\rangle, t^a\rangle\rangle \times \langle e^a, \langle e^a, \langle i^a, t^a\rangle, t^s\rangle\rangle$

[49]Recall that in this paper we have assumed that the past tense form *ta* is interpreted on a par with individual-denoting pronouns. Here, we define the semantics of the past tense form as follows (see Ogihara and Kusumoto (2021) for an overview of the various approaches to the semantics of the past tense):

(i) $[\![\text{PAST}_i]\!]^{g,c}$ is defined only if $g_c(i)$ is before now. When defined, $[\![\text{PAST}]\!]^{g,c} = g_c(i)$.
g_c is a variable assignment function provided by the context.

[50]Note that the proposed analysis ensures that the CI meaning is not anchored to a particular event. In (74) the CI does not mean "Taro *was* highly unlikely to lose." This point is made clear in the following example:

(i) (Context A: Taro is known for being a night owl and hating mornings.)
(Context B: Taro isn't known to particularly hate mornings or anything. He typically comes to school on time. Taro texted you, saying that he was just leaving his house, which is 1km away from school, at 7:50 am. Even though he was coming by foot, he somehow managed to get to school by 7:57 am.)

Ano Taro-ga 8-ji-mae-ni (gakkou-ni) ki-ta.
that Taro-NOM 8-o'clock-before-at (school-to) come-PST

'lit. That Taro arrived at school before 8:00 am.'

Of the two contexts, A and B, only context A is appropriate. Our analysis can naturally explain this fact. In our analysis, mirative *ano* takes the proper name Q and a predicate P and conveys that Q holds the remarkable property R, which makes $Q(P)$ highly unlikely. The sentence in Context A is natural because in this context Taro is assumed to be a night owl who hates mornings, which makes the proposition "Taro comes to school before 8:00 am" highly unlikely. However, the sentence under Context B is odd because in this context Taro is not known to particularly hate mornings or anything and he typically comes to school on time. This property is not a remarkable property that makes Taro highly unlikely to come to school before 8:00 am.

$= \lambda x \lambda P_{\langle e^a, \langle i^a, t^a \rangle \rangle}.P(x)\blacklozenge\lambda x \lambda P_{\langle e^a, \langle i^a, t^a \rangle \rangle}.\text{unlikely}(P(x)) \succ!!\ \text{STAND}_{unlikely}$ according to *sp*'s knowledge of x

However, this analysis cannot theoretically capture our intuition that mirative *ano* is property-based. It basically only triggers a CI that $P(x)$ is highly unlikely.

By contrast, our revised analysis properly captures the intuition that mirative *ano* is concerned with a property of a referring expression. Mirative *ano* picks out the property of being highly unlikely to P from the set of properties that hold of a referring expression. Furthermore, we consider this analysis theoretically attractive in that, similar to other types of *ano*, we can consider that Type C_{MIR} *ano* also has a picking-out function.

6 The kinds of noun mirative *ano* can combine with

In this paper, we have only examined examples where mirative *ano* is combined with a proper name. In this section, we show that mirative *ano* can also be combined with a quantifier and common noun if they are interpreted as a referring expression.

6.1 Mirative *ano* with a quantifier

In our analysis, a referring expression behaves as a generalized quantifier. In this section we will discuss cases in which mirative *ano* combines with other generalized quantifiers. As the following examples show, mirative *ano* usually cannot be combined with generalized quantifiers.

(78) a. ?? Ano [subete-no gakusei]-ga make-ta. (mirative *ano*)
that all-GEN student-NOM lose-PST
At-issue: All students lost.
CI: All students are highly unlikely to lose according to the speaker's knowledge of all the students.

b. ?? Ano [gakusei 3-nin]-ga make-ta. (mirative *ano*)
that student 3-CLF.person-NOM lose-PST
At-issue: The three students lost.
CI: The three students are highly unlikely to lose according to the speaker's knowledge of the three students.

The above sentences are odd because mirative *ano* requires the first argument P to be a set of properties regarding a particular individual. As we claimed earlier, mirative *ano* requires that the first argument of *ano* should be the set of properties whose lower ($\downarrow$) corresponds to a particular property:

(79) (The mirative *ano*, final version)
$[\![\text{ano}_{TypeC.MIR}]\!]$:
$\langle\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle, \langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle\rangle\times \langle\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle, \langle\langle e^a, \langle i^a, t^a\rangle\rangle, t^s\rangle\rangle$
$= \lambda Q_{\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle} \lambda P_{\langle e^a, \langle i^a, t^a\rangle\rangle}.Q(P)\blacklozenge\lambda Q_{\langle\langle e^a, \langle i^a, t^a\rangle\rangle, \langle i^a, t^a\rangle\rangle} \lambda P_{\langle e^a, \langle i^a, t^a\rangle\rangle}.\ \exists R[R = \text{a remarkable property} \wedge Q(R)(t_0) = 1 \wedge \text{Cause}(R, \text{unlikely}(Q(P)) \succ!!\ \text{STAND}_{unlikely})]$ according to *sp*'s knowledge of the specific individual $\downarrow Q$ (=the lower of Q)

Neither of the phrases *subete-no gakusei* 'all students' in (78a) and *gakusei 3-nin* 'three students' in (78b) denotes a set of properties holding of a particular individual. Instead, they

denote a set of properties that {all/three} students share. These properties are not unique to each individual.[51]

However, note that mirative *ano* can actually combine with a numeral if it is interpreted as a unique group of which the speaker knows.

(80) (Mirative *ano*)

Ano 3-nin-ga (kotoshi-wa) hahaoya-ni purezento-o age-ta.
that 3-CLF.person-NOM this.year-TOP mother-DAT present-ACC give-PST

At-issue: The three people gave their mothers a present (this year).
CI: The three people are highly unlikely to give their mothers a present according to the speaker's knowledge of them.

In this case we can say that *3-nin* 'three persons' denotes a set of common properties that hold of the three persons, and the entire CI is concerned with the property of specific individuals. In this sense, *3-nin* and proper names are alike.

6.2 Mirative *ano* in combination with common nouns

In addition to quantifiers, mirative *ano* can also be combined with a common noun:

(81) (*Ano* with a common noun)

Ano {otoko / senshu}-ga make-ta.(mirative *ano*)
that man / player-NOM lose-PST

At-issue: The {man/player} lost.
CI: The {man/player} is highly unlikely to lose according to the speaker's knowledge of the {man/player}.

As the nouns in these sentences are common nouns, *ano* can easily be interpreted as Type A or Type B. However, it can also have a Type C_{MIR} reading if we understand that *otoko* 'man' and *senshu* 'player' are interpreted as a particular man and a particular player.[52] Therefore, this type of coercion should be considered. Because there is a requirement that mirative *ano* must combine with a set of properties holding of a particular individual, the common noun must be interpreted as such. However, it seems true that for native speakers, for these examples, it is more difficult to obtain the Type C_{MIR} reading immediately than in the case of an example with a proper name, presumably because a sentence with a common noun has more possible readings for Type A *ano* and Type B *ano*.

7 Mirative *ano* in other syntactic environments

In this study, we have only focused on the example where mirative *ano* arises in the subject position. This section considers cases where mirative *ano* arises in a non-subject position (object position and VP adjunct position) and negation.

[51] Partee (1986) also claims that in English, clearly "quantificational" noun phrases such as *no man*, *no men*, *at most one man*, and *few men* do not have an e-type reading via lower.

[52] In Japanese there are no determiners like *the* and *a*, so *otoko* 'man' or *senshu* 'player' can be ambiguous between the e (or $\langle\langle e,t\rangle,t\rangle$) and $\langle e,t\rangle$.

7.1 The mirative *ano* in the object and adjunct positions

First, let us consider the case in which the mirative *ano* occurs in the object position based on the following example:

(82) (Context: The speaker is watching a Sumo match.)

Mainoumi-ga ano Konishiki-o mochiage-ta. (mirative *ano*)
Mainoumi-NOM that Konishiki-ACC lift.up-PST

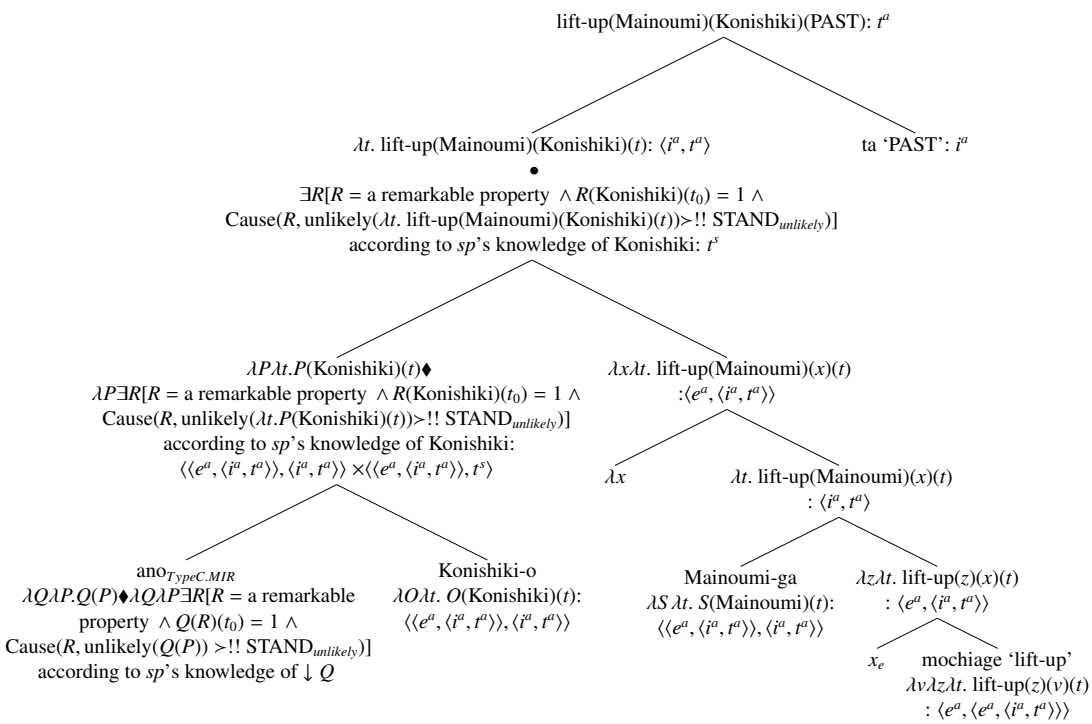
'lit. Mainoumi lifted that Konishiki.'
At-issue: Mainoumi lifted Konishiki.
CI: Konishiki has a remarkable property that makes it extremely unlikely that he will be lifted by Mainoumi according to the speaker's knowledge of Konishiki.

From this sentence, we can easily receive the unlikelihood meaning that Konishiki has a remarkale property that makes it extremely unlikely that he will be lifted by Mainoumi. We can analyze this meaning based on the same lexical item:

(83) (The mirative *ano*, final version)
$[\![\text{ano}_{TypeC.MIR}]\!]$:
$\langle\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle,\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle\rangle\times\langle\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle,\langle\langle e^a,\langle i^a,t^a\rangle\rangle,t^s\rangle\rangle$
$= \lambda Q_{\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle}\lambda P_{\langle e^a,\langle i^a,t^a\rangle\rangle}.Q(P)\blacklozenge\lambda Q_{\langle\langle e^a,\langle i^a,t^a\rangle\rangle,\langle i^a,t^a\rangle\rangle}\lambda P_{\langle e^a,\langle i^a,t^a\rangle\rangle}.\ \exists R[R = \text{a remarkable property} \wedge Q(R)(t_0) = 1 \wedge \text{Cause}(R, \text{unlikely}(Q(P)) >!!\ \text{STAND}_{unlikely})]$ according to *sp*'s knowledge of the specific individual $\downarrow Q$ (=the lower of Q)

We assume that in the case of (82), *ano Konishiki-o* 'that Konishiki-ACC' is moved to the left edge of the sentence at the semantic level, leaving a trace x (of type e). This variable is abstracted over by interting λx immediately below *ano Konishiki*. This makes it possible to analyze both ano in the subject position and the object position in a unified way:

(84)



In this study, we focused on cases where mirative *ano* occurs in argument position (i.e., the subject and object positions), but *ano* can also occur in a VP adjunct position:[53]

(85) (Type C_{MIR} reading)

Taro-wa ano Jiro-to karaoke-ni it-ta.
Taro-TOP that Jiro-with karaoke-to go-PST

At-issue: Taro went to karaoke with that Jiro.
CI: Jiro has a remarkable property that makes the proposition 'Taro goes to karaoke with Jiro' highly unlikely according to the speaker's knowledge of Jiro.

One important point for our analysis of Type C_{MIR} *ano* in the adjunct position is that although syntactically *ano* is in an adverbial position semantically, it takes a predicate as its argument.

As for the meaning of the verb *iku* 'go' in (85), we assume (following the idea of McConnell-Ginet (1982) that verb-related adverbials behave as arguments of the verbs) the denotation as in:

(86) $[\![\text{iku}]\!]$: $\langle e^a, \langle e^a, \langle e^a, \langle i^a, t^a \rangle \rangle \rangle \rangle$
$= \lambda x \lambda y \lambda z \lambda t.\text{go}(z)\ \text{TO}(x)\ \text{WITH}(y)$

By considering such an approach, we can analyze the mirative *ano* in the adverbial position in the same way as the mirative *ano* in the subject position:

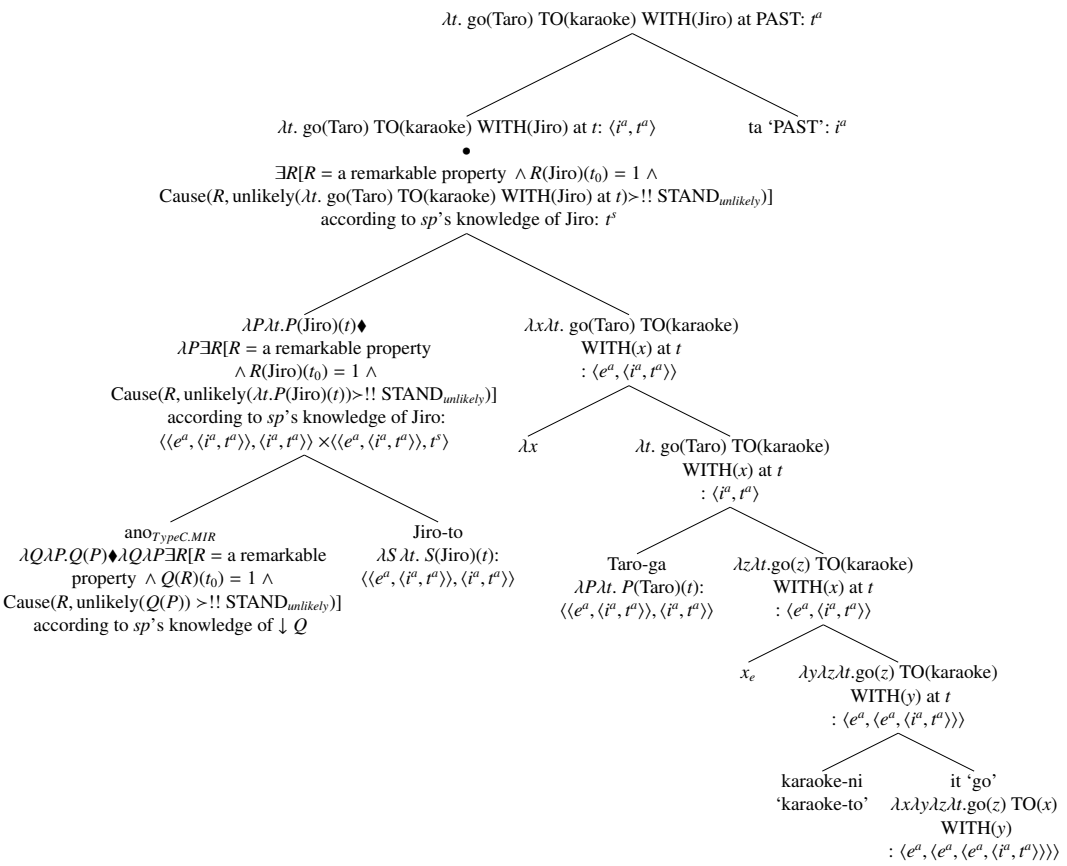
[53] Type C *ano* can also appear in a VP adjunct position:

(i) (Type C reading)

Taro-wa ano Jiro-to karaoke-ni it-ta.
Taro-TOP that Jiro-with karaoke-to go-PST

At-issue: Taro went to karaoke with that Jiro.
CI: Jiro is famous.

(87)



7.2 The mirative *ano* in negative sentences

To examine the CI property of mirative *ano* more deeply, let us consider the interpretation of mirative *ano* in a negative sentence. Normally, negation is considered a proposition-taking operator (that scopes over a proposition). However, when mirative *ano* occurs in a negative sentence, it takes a negative element (predicate plus a negative element) as its argument. Observe the following sentence:

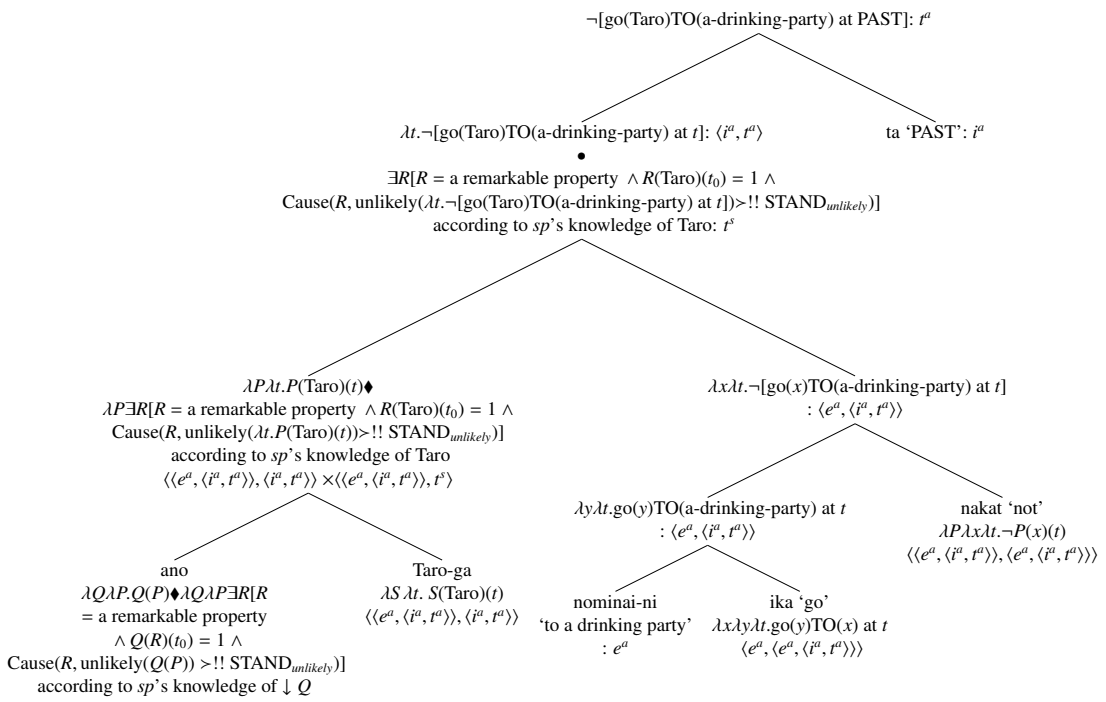
(88) (Possible reading)

Ano Taro-ga nomikai-ni ika-nakat-ta. (mirative *ano*)
that Taro-NOM drinking party-to go-NEG-PST

At-issue: Taro didn't go to a drinking party.
CI: It is highly unlikely that Taro would **not go to a drinking party** according to the speaker's knowledge of Taro.

Here mirative *ano* takes the constituent predicate *nomikai-ni ika-nai* 'not go to a drinking party' (= the underlined part) as its second argument, as shown in the following figure:

(89)



Thus, the sentence's conventional implicature is that it is highly unlikely that Taro would not go to a drinking party. Note that (88) cannot be interpreted like (90), where mirative *ano* only takes a positive (non-negative) verb as its argument:

(90) (Impossible reading)

Ano Taro-ga nomikai-ni ika-nakat-ta. (mirative *ano*)
that Taro-NOM drinking party-to go-NEG-PST

At-issue: Taro didn't go to a drinking party.
CI: It is highly unlikely that Taro would **go to a drinking party** according to the speaker's knowledge of Taro.

In this reading, mirative *ano* takes the constituent *nomikai-ni iku* 'go to a drinking party' (= the underlined part) as its second argument, but it does not take the constituent *nomikai-ni ika-nai* 'not go to a drinking party' as its argument.

Why is it that mirative *ano* has to take a negative verbal element as its argument? Theoretically, it should be possible to treat *nai* 'not' as a sentential negation and *ano* as only taking a positive constituent *nomikai-ni iku* 'go to a drinking party' as its second argument as in (90). However, this interpretation is not possible. We consider that in a negative sentence, mirative *ano* must take a negative verb as its argument because otherwise no mirative meaning arises. To trigger a speaker's counter-expectational feeling, it is obligatory to take a negative verbal predicate as its argument (in this case *nomikai-ni ika-nai* 'not go to a drinking party'). We think that the interpretation of mirative *ano* in the negative sentence supports the idea that mirative *ano* has a function of mirativity. Furthermore, the interpretation of the negative sentence with mirative *ano* supports the idea that mirative *ano* does not have a propositional operator (E-Force operator in Rett (2011)).

Note that when the negation is attached to a modal, *ano* cannot take scope over the negative modal element:

(91) (Context: The speaker is surprised to hear that Taro won.)

Ano Taro-ga katsu-hazu.ga-nai.
that Taro-NOM win-should-NEG

'lit. That Taro should not have won.'
CI: Taro has a remarkable property that makes the proposition 'Taro loses' highly unlikely according to the speaker's knowledge of Taro.

In this case, *hazu.ga nai* 'should not' form a constituent. *Ano* does not take the modal expression as its argument.

Finally, in the following sentence, the at-issue meaning seems almost the same as the unlikelihood CI meaning generated within the same embedded clause.

(92) a. [Ano Taro-ga katsu] kanoosei-wa nai.
that Taro-NOM win possibility-TOP NEG
'lit. There is no possibility that that Taro will win.'

b. [Ano Taro-ga katsu] kanoosei-wa hikui.
that Taro-NOM win possibility-TOP low
'lit. The possibility that that Taro will win is low.'

Theoretically, this sentence could be analyzed as Type C_{MIR} *ano*, but the meaning of mirative does not emerge from this sentence. Perhaps it could be interpreted by Type C *ano*.

8 Cross-linguistic/language internal variation of demonstratives

In this paper, we claim that the Japanese demonstrative *ano* has developed a mirative use as part of the lexical meaning of *ano*. In this section, we compare the Japanese *ano* 'that' with the Korean *ku* 'that', the Japanese *kano* 'that', and the English *that* to examine the cross-linguistic and language-internal variation of demonstratives in terms of the presence or absence of mirative usage.

8.1 Korean *ku* 'that'

Korean has a triadic system of demonstratives *i* 'this', *ku* 'that', and *ce* 'that'. In the spatial use, *i* refers to something close to the speaker (proximal), *ku* refers to something close to the addressee, and *ce* refers to something distant from the speaker (e.g., Kinsui et al., 2002, p. 235). Regarding *ku*, in addition to the spatial use (Type A in our taxonomy), it also has a recognitional use (Umeda, 1982, Sohn, 1994, Kinsui et al., 2002, Kim, 2006, etc.) (Type B in our taxonomy).[54] The following example shows Type A (spatial) and Type B (individual-inferring type):

(93) (Type A *ku*, spatial; proximal to the addressee) (Context: A speaker referrers to a book that is proximal to the addressee.)

ku chayk-un sensayngnim-uy kes-ita.
that book-TOP teacher-GEN thing-DECL

'That book is the teacher's book.'

[54] Korean *ku* also has an anaphoric use.

(94) (Type B *ku*, recognitional, individual-inferring type) (Context: A speaker is remembering the yesterday's event.)

ecey ka-ss-ten ku kakey umsik masiss-ess-nuntey.
yesterday go-PST-REL that store food delicious-PST-Prt

'The food of that restaurant that I went to yesterday was delicious.'

Now let us consider the Korean data which seems to correspond to the Japanese type C *ano*. We asked four informants regarding the naturalness of the following sentence that seem to correspond to the example of type C *ano* (Regarding judgments, we asked four informants to judge the naturalness of the sentence based on the five point scale [completely natural =√, (?), ?, ??, completely unnatural = *]. The judgments of the four speakers are represented as in A/B/C/D):

(95) (Type C *ku*, recognitional, property-inferring, non-mirative type) (Context: A tour guide talks to a tourist.)

√/??/(?)/(?) yelepwun, ikey ku seycong taywang-uy myo-ipnita.
everyone this-NOM that Sejong the.Great-GEN tomb-DECL

'lit. Everyone, this is the tomb of that Great Sejong.'
(Intended: The speaker is trying to signal that the Great Sejong is famous.)

Unlike the Japanese example, there is variation among speakers, but there are speakers who consider the sentence to be completely natural or relatively natural. Although we still need to conduct a larger investigation, it seems possible to consider that Korean speakers use *ku* as a type C (famous) use. Note that as the following example shows, if we insert the adjective *yumyenghan* 'famous' before King Sejong, then the sentence becomes very natural:

(96) (Type C *ku*, recognitional, property-inferring, non-mirative type) (Context: A tour guide talks to a tourist.)

√/√/√/√ yelepwun, ikey ku yumyenghan Seycong taywang-uy
everyone this-NOM that famous Sejong the.Great-GEN
myo-ipnita.
tomb-DECL

'lit. Everyone, this is the tomb of that famous Great Sejong.'

This suggests that, although Type C may not be fully developed, it is beginning to develop in Korean. For some speakers, Korean *ku* cannot be used to draw a salient property of a target implicitly (without an adjective). These speakers can draw the salient property of the target noun from their knowledge if these properties are explicitly stated.

Now, let us consider the example of the Korea direct translation of a sentence of the Japanese type C_{MIR} *ano*. As the following example suggests, the Korean *ku* is not allowed to be used as type C_{MIR} (we asked the same informants to judge the following examples).

(97) a. (Type C_{MIR} *ku*, recognitional, property-inferring, mirative type)
??/*/??/? ku Chelswu-ka cye-ss-ta.
that Cheolsu-NOM lose-PST-DECL

'lit. That Cheolsu lost.'

b. (Type C_{MIR} *ku*, recognitional, property-inferring, mirative type)
??/*/*/? ku Chelswu-ka yachay-lul mek-ko iss-ess-e.
that Cheolsu-NOM vegetables-ACC eat-CONJCT PROG-PST-Prt
'lit.That Cheolsu is eating vegetables.'

It is important to note that there is a clear contrast between the fame (Type C) reading and the mirative (Type C_{MIR}) reading in terms of judgment. All participants considered the fame (Type C) reading to be better than the mirative (Type C_{MIR}) reading. This suggests that Korean *ku* has developed (or has been developing the recognitional/property-inferring type to covey fame (Type C in our taxonomy), but it has not developed the recognitional/property-inferring type to convey the meaning of mirativity (type C_{MIR} in our taxonomy). If Korean *ku* had developed a mirative use, these sentence would have be judged perfectly natural, but our informants considered them odd. This situation is radically different from that of Japanese *ano*. The Japanese counterparts of the sentences above are perfectly natural as mirative sentences. We believe that the difference between Korean and Japanese indirectly supports the idea that Types C and C_{MIR} have distinct uses.

8.2 Japanese *kano* 'that'

Interestingly, we can find a similar phenomenon as the Korean *ku* 'that' in the Japanese *kano* 'that'. As discussed in Section 3, modern Japanese has a triadic system of demonstratives: *ko-* (proximal), *so-* (medial), and *a-* (distal), but there is another form *ka-* for distal.

The use of *ka* has been recognized in Old Japanese (around the Nara period (710-784)). The use of *a-* occurred later than that of *ka-* and can be found in early Middle Japanese (around the Heian period (794-1185)) (e.g., Kinsui et al., 2002; Okazaki, 2018). As a form of a distal demonstrative, *a-* gradually became more dominant than *ka-*. In modern Japanese, *ka-* has an archaic nuance and is used only in limited circumstances.

In Modern Japanese, the most natural usage of *kano* 'that' is the Type C usage, conveying the meaning of fame:

(98) a. (Type C)
(?) Kore-ga kano Tokugawa Ieyasu-no haka-desu.
this-NOM that Tokugawa Ieyasu-GEN tomb-PRED.POLITE
'lit. This is the tomb of that Ieyasu Tokugawa.'

b. (Type C, with *yuumeena* 'famous')
Kore-ga kano yuumeena Tokugawa Ieyasu-no haka-desu.
this-NOM that famous Tokugawa Ieyasu-GEN tomb-PRED.POLITE
'lit. This is the tomb of that famous Ieyasu Tokugawa.'

Similar to the case of Korean *ku*, *kano* usually co-occurs with the expression *yuumeina* 'famous' as in (98b). (98a) may sound slightly odd compared with (98b), but it is still acceptable.

More importantly, *kano* cannot be used in the mirative environment. Similar to the case of Korean *ku*, (99) sounds very odd:

(99) (Type C_{MIR})
?* Kano Taro-ga make-ta.
that Taro-NOM lose-PST

'lit. That Taro lost.'

These facts indirectly support the idea that the mirative meaning is not entirely a matter of context, but rather concerns the conventionality of the lexical meanings of the demonstratives and that there is a special mirative usage in Japanese *ano* that has become conventionalized inside the lexical meaning of *ano*.

8.3 English *that*

English demonstrative *that* also have uses that express emotive meanings. Lakoff (1974, 352) states that there is an emotional-deictic use of *that* which appear to "establish emotional solidarity between the two by implying that both participants in the conversation share the same views toward the subject of the discussion" as in (100):

(100) That Henry Kissinger sure knows his way around Hollywood! (Lakoff, 1974, p. 352)

Lakoff (1974, 352-353) notes that "if what is being attributed to Kissinger is emotionally colorless, that cannot be used in this sense" ("unless his being 5'8" tall is for some reason or other remarkable, admirable, or dreadful"), as in (101):

(101) * That Henry Kissinger is 5'8" tall. (Lakoff, 1974, p. 353)

This suggests that the English emotional-deictic *that* is (indirectly) related to exclamativity (See also Davis and Potts, 2010).[55,56]

However, the Japanese mirative *ano* and the English affective/emotive *that* do not seem to have exactly the same pragmatic functions. Unlike Japanese *ano* 'that', English demonstrative *that* often carry a negative attitudinal meaning as shown in:

(102) a. Damn. There's that inspector again! (Declerck, 1991, p. 279)
b. Have you heard what that president said yesterday?
c. Tell me more about that BILL. (Thomas Grano, personal communication)

Declerck (1991) observes that psychologically, *that/those* connote disapproval, dislike, contempt, or irritation. *That* in (102) seems to conventionally implicate disrespect or dismissiveness on the part of the speaker toward the referent.[57] This point is quite different from the

[55]Lakoff (1974, p. 353) also observes the following example:

(i) ?That Alexander the Great had some fantastic moustache! (Lakoff, 1974, p. 353)

According to Lakoff (1974), here "speaker and addressee are assumed to share a previously-built up reaction, so the subject must be one that is culturally (or idiosyncratically) assumable as well-known." Lakoff (1974, 353) also notes that this emotional use of *that* is "highly colloquial, and perhaps an Americanism." This example seems to be similar to the Japanese Type C *ano* (fame reading).

[56]Doran and Ward (2019) also observe the use of demonstratives with proper names, but they do not consider them under the category of emotional deixis. Doran and Ward (2019) assume that there are two distinct interpretations: the contrastive interpretation and the stereotypical interpretation. In the contrastive interpretation, the demonstrative receives a pitch accent to indicate that the referent is singled out from a set of alternatives. In the stereotypical interpretation, the proper name receives a pitch accent, and the demonstrative with a proper name indicates that "the speaker is making a claim about what is typical or expected of the referent" (Doran and Ward, 2019, p. 249). For example, they suggest that in the following sentence, the property of "getting into trouble" is characteristic of the referent, making the demonstrative felicitous:

(i) Oh, that Justin Bieber, getting into trouble again. [corpus] (Doran and Ward, 2019, p. 249)

[57]We thank Thomas Grano for the valuable comment on the negative use of English *that*.

Japanese mirative *ano* in that in the case of mirative *ano* it does not convey a negative attitude. Rather, it conveys surprise. Although both the English *that* and the Japanese *ano* can convey non-issue meanings, their meanings are different. It seems that Type C_{MIR} has not been conventionalized in the English *that*. In the following examples, there is no unlikelihood contribution of *that* (Thomas Grano, personal communication):

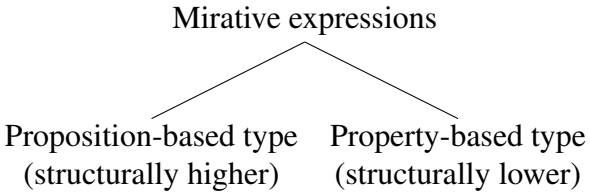
(103) a. That Taro won.
(No unlikelihood contribution of *that*. *That* does not convey that Taro is a highly unlikely person to win.)

b. That Bill ate pasta.
(No unlikelihood contribution of *that*. *That* does not convey that Bill is a highly unlikely person to eat pasta.)

9 A typology of mirativity-inducing expressions

Having discussed the meaning and interpretation of mirative *ano*, we consider mirativity from a broader perspective. The phenomenon of mirative *ano* suggests that there are at least two types of mirativity-triggering expressions in natural language — a proposition-based type and a property-based type:

(104) The typology of mirativity expressions



Although both the proposition-based and property-based types can convey a speaker's surprise, the way mirativity is derived is quite different. A proposition-based mirative expression takes a proposition directly and conveys that the given proposition is unexpected. Typical examples of proposition-based mirativity-indicating devices include sentence exclamations and exclamatives.

(105) a. (Wow,) John arrived early! (Rett, 2011, p. 430)

b. How (very) early John arrived! (Rett, 2011, p. 430)

(106) a. (Uwa,) Taro-ga make-ta!
wow Taro-NOM lose-PST
'(Wow,) Taro lost!'

b. Taro-wa nante tsuyoi-n-da!
Taro-TOP how strong-NMLZ-PRED
'How strong Taro is!'

In Section 2 we showed that Rett (2011)'s E-Force can analyze this kind of mirative expression:

(107) E-Force (p), uttered by s_C, is appropriate in a context C if p is salient and true in w_C. When appropriate, E-Force(p) counts as an expression when s_C had not expected that p. (Rett, 2011, p. 429)

It is worth pointing out here that there may be variations in the proposition-based type. Japanese has special mirative morphemes, *towa/nante*, that attach to a predicate and seem to take a non-tensed proposition to convey a past event (Sawada and Sawada, 2019, 2021). For example, the following sentence can be used to describe a past event, even though there is a non-past past tense form (*ru* form) in the sentence:

(108) The past reading of *towa/nante*
(Context: The speaker just noticed that Taro is at the party. The speaker knows that Taro does not like parties, so she/he didn't expect that Taro would come to the party.)

Taro-ga paatii-ni ku-ru-{towa/nante}.
Taro-NOM party-to come-Non.TNS-MIR/MIR

'Taro came to the party!'

Here the speaker conveys his/her surprise at the fact that Taro came to the party.[58]

Interestingly, the same sentence can be used to describe a future event if the context changes.

(109) The future reading of *towa/nante*
(Context: The speaker just heard that Taro will come to the party. The speaker knows that Taro does not like parties, so she/he didn't expect that Taro would come to the party.)

Taro-ga paatii-ni ku-ru-{towa/nante}.
Taro-NOM party-to come-Non.TNS-MIR/MIR

'Taro will come to the party!'

In this reading, the sentence conveys surprise that Taro will come to the party. Thus, although there may be variations among E-Force operators regarding tense specifications, they are the same in that they convey that the given proposition is unexpected.[59]

In contrast, the property-based mirative expression expresses mirativity by referring to the properties of a particular individual, and it cannot be analyzed based on E-Force. In property-based mirative expressions, the meaning of mirativity is derived through the incompatibility

[58]It is possible to add a past tense form (*ta*-form) in the sentence with *towa/nante*:

(i) Taro-ga paatii-ni ki-ta-{towa/nante}.
Taro-NOM party-to come-PST-MIR/MIR
'Taro came to the party!'

This sentence cannot be used in a situation where the speaker has just noticed the fact, but is rather used when the speaker heard about the fact and conveyed his/her surprise (see Sawada and Sawada (2019, 2021) for a detailed discussion).

[59]One possible way of analyzing the meaning/use of *towa/nante* in (108) and (109) is to posit a slightly different lexical meaning as in (i) (cf. Rett 2011):

(i) The semantic of *towa/nante*(p)
a. $p = \lambda t \lambda w$.come (Taro) at t in w
b. *towa/nante*(p), uttered by s_C, is appropriate in a context C if p is salient and true or predicted to be true at t_C in w_C. When appropriate, *towa/nante*(p) counts as an expression when s_C had not expected that p.

In this case, proposition p is of type $\langle s, \langle i, t \rangle \rangle$ and *towa/nante*(p) denotes that p is salient and true or predicted to be true at the current time t_C in the current world w_C.

between the current situation and the speaker's knowledge of the property of a particular individual.

Regarding the property-based type, this paper has only focused on the Japanese mirative demonstrative *ano*, but it seems that the phenomenon of "mirative pronouns" (Aikhenvald, 2012, pp. 455-457) also belongs to this type. For example, as Aikhenvald introduced, Storch (1999, 2009) descriptively observe that there is a mirative pronoun in Hone (a Jukunoid language of the Benue-Congo family) (see also Aikhenvald, 2004, p. 214, Aikhenvald, 2012, pp. 455-457). A series of pronouns in this language shows that "an action was performed unexpectedly, surprisingly or in an unusual manner" (Storch, 1999, pp. 136-137, Storch, 2009, pp. 133-134, Aikhenvald, 2012). More precisely, in this language mirativity is indicated by a pronoun that consists of the conjunction 'with' and the respective personal pronoun base.

(110) a. ku-ø-dáp bɔ́à
3.SG.-AOR-hit MP.3.SG.
'S/he hit unexpectedly.'

b. n-ø-shán bə̀mìì
1.SG.-AOR-cry MP.1.SG.
'I cried nevertheless.' (Storch, 2009, p. 134)

Storch (2009) claims that this construction should be analyzed as SVS, rather than SVO. Literally translated, the example means something like 'S/he hit with him/her', 'I cried with me'. According to Storch (2009, 134), this mirative construction indicates that a particular person is performing an action even though s/he was not supposed to do so, was not expected to be capable of it, or was not allowed to do it. Although a more explicit investigation is necessary, the phenomenon of mirative pronouns in Hone has an important similarity to mirative *ano* in that it conveys a property of the referent.

These discussions strongly show that although mirative *ano* and proposition-based mirative expressions can both convey that the propositional content is unexpected given the speaker's beliefs, they are fundamentally different in terms of how the meaning of mirativity is derived. The property-based type is more specific in that the speaker conveys his/her surprise based on his/her particular knowledge of the property of a particular individual.

The following question then arises: How can we theoretically treat the "mirative force" of mirative *ano*? Given that mirative *ano* is not a proposition-taking operator, it is also not an illocutionary force operator of expressiveness in the sense of Searle (1969) and Searle and Vanderveken (1985). We would like to consider that the mirative force in the sentence with mirative *ano* can correspond to a "non-central speech act" (Grice, 1989, p. 122) or to a "second-order speech act" in the sense of Bach (1999). Grice (1975) introduced the notion of conventional implicature (CI), but in Grice (1989) he considers the expression *moreover*, which can be considered a conventional implicature, as representing the performance of "noncentral" speech acts (Grice, 1989, p. 122). We consider that a similar analysis can be made for mirative *ano* as well. Mirative *ano* triggers CI, but from the perspective of speech acts, it can be viewed as performing an expressive speech act as a secondary/non-central speech act.

10 Conclusion

In this study, we investigated the meaning and use of mirative *ano*. We argued that mirative *ano* takes a referring expression Q (typically a proper name) (which denotes a set of properties of a particular individual) and a predicate P, and conventionally implies that Q has the property

of being highly unlikely to *P* according to the speaker's knowledge of the referent of *Q*. We have shown that the expression of the speaker's counter-expectational feeling is derived from the contrast between the CI and the at-issue proposition.

In the paper we also compared the Japanese *ano* with the Korean *ku* 'that', the Japanese *kano* 'that', and the English *that* to examine cross-linguistic/language internal variations as to the development/conventionality of mirative use. Of particular interest in relation to the conventionality of mirativity use is the fact that the Korean *ku* and the Japanese *kano* have Type C but have not developed Type C_{MIR}. This suggests that demonstratives with Type C_{MIR} necessarily also have Type C, while demonstratives with Type C do not necessarily have type C_{MIR}.[60]

The phenomenon of mirative demonstratives has important theoretical implications for the study of mirativity/expressives. It is theoretically important that mirative *ano* is situated inside the nominal domain (DP domain) but can convey the speaker's attitude toward an utterance situation. The phenomenon of mirative *ano* suggests that there are multiple ways to express a speaker's unexpected feeling toward an utterance situation (besides utilizing the E-Force operator (Rett, 2011; cf. Searle and Vanderveken, 1985; Vanderveken, 1990). We proposed that there are at least two types of mirative operators in natural language—a proposition-based type and a property-based type: The former expresses mirativity by signaling that the speaker had not expected that *p* (Rett, 2011), while the latter expresses mirativity by signaling that there is an inconsistency between the at-issue content and the speaker's knowledge of the property of a particular individual. We then suggest a new way of understanding the variation in expressives in natural language (which integrates both the expressive as a main speech act and a second-order speech act). We hope that the study of mirative *ano* will shed new light on theories of mirativity, expressives, and demonstratives.

Finally, we briefly consider how mirative *ano* developed. In this study, we claim that Types C *ano* and C_{MIR} *ano* are lexically different, but historically it seems possible to consider that Type C_{MIR} *ano* (mirative *ano*) developed via a semantic shift from Type C *ano*. We speculate that mirative *ano* developed as a result of a shift from "highlighting an individual" (marking an individual as remarkable) by invoking a property of a particular individual (= Type C *ano*)

[60] One of the reviewers asked if there were any linguistic phenomena similar to the lexical ambiguity of Type C *ano* and Type C_{MIR} *ano*. We consider that the Japanese particle *mo* is an analogous example. The particle *mo* is semantically ambiguous between an inclusive meaning 'also' and a scalar additive meaning 'even':

(i) a. Taro-mo ki-ta. (Non-scalar)
Taro-also come-PST
'Taro also came.'

b. Tooku-ni 500-nin-mo ki-ta. (Scalar)
Talk-to 500-CL-even come-PST
'{Even 500/as many as 500} people came to the talk.'

Formally, we can analyze this by saying that while additive *mo* has an existential presupposition that there exists a contextually determined proposition *q* that is distinct from the at-issue proposition *p*, scalar *mo* not only has this existential presupposition but also has the scalar presupposition that the at-issue proposition is the most unlikely among contextually determined alternative propositions (e.g., Sawada, 2007):

(ii) a. $[\![\text{mo}_{additive}]\!] = \lambda p.\exists q[C(q) \wedge q \neq p \wedge q]$

b. $[\![\text{mo}_{CT\,scalar}]\!] = \lambda p.\exists q[C(q) \wedge q \neq p \wedge q] \wedge \forall q[C(q) \wedge q \neq p \rightarrow p >_{unlikely} q]$

Crucially, scalar *mo* is stronger than additive *mo* and the former has to do with extremeness regarding the given proposition. This point is similar to the relationship between Type C *ano* and Type C_{MIR} *ano* (although they are not the same in terms of meaning and use).

to "highlighting a situation" (marking a situation as remarkable) by invoking a property of a particular individual (=Type C_{MIR} *ano*).

This paper leaves a number of questions for future research. First, it is worthwhile to consider to what extent the mirative demonstrative is pervasive. In this paper, we focused on the demonstrative *ano* 'that: distal', but there seems to be a similar mirative use in the other demonstrative series as well. For example, the adnominal demonstratives *kono* 'this: proximal' seems to be able to convey counter-expectational meanings:

(111) a. Kono ore-ga make-ta. (mirative *kono*)
this 1.PPRON-NOM lose-PST
At-issue: I lost.
CI: I am unlikely to lose.

b. Kono ore-ga kat-ta. (mirative *kono*)
this 1.PPRON-NOM win-PST
At-issue: I won.
CI: I am unlikely to win.

In (111) *kono* combines with the first person pronoun *ore* and conveys that the referent (i.e. the speaker) has a remarkable property that makes the proposition in question ('I lose' in the case of (111a) and 'I win' in the case of (111b)) highly unlikely according to the speaker's own knowledge. Because there seems to be a restriction that the target of *kono* must be in the speaker's domain (if the target is not first person, it must be located near the speaker), it seems to be related to the extended use of spatial *kono*.

Second, it is important to examine related phenomena in other languages. In Section 9, we suggest that the mirative pronoun in Hone (Storch, 2009, Aikhenvald, 2012) may also be a property-based mirative expression. It would be worthwhile to consider the similarities and differences between the Japanese mirative demonstrative and the mirative pronoun in Hone and consider whether the underlying semantic mechanism is the same. Further investigation is necessary for the existence of mirative demonstratives/pronouns, both theoretically and empirically.

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Conflict of interest
The authors declare that there are no conflict of interest associated with this manuscript.

References

Aikhenvald, Alexandra Y. 2004. *Evidentiality*. Oxford: Oxford University Press.

Aikhenvald, Alexandra Y. 2012. The essence of mirativity. *Linguistic Typology* 16:435–485. URL https://doi.org/10.1515/lity-2012-0017.

Aksu-Koç, Ayhan, and Dan I. Slobin. 1986. A psychological account of the development and use of evidentials in Turkish. In *Evidentiality: The linguistic coding of epistemology*, ed. Wallace Chafe and Johanna Nichols, 159–167. Norwood: Ablex Publishing Corporation.

Amaral, Patricia, Craige Roberts, and Allyn E. Smith. 2007. Review of the logic of conventional implicatures by Chris Potts. *Linguistics and Philosophy* 30(6):707–749. URL https://doi.org/10.1007/s10988-008-9025-2.

AnderBois, Scott. 2018. Illocutionary revelations: Yucatec Maya *bakáan* and the typology of miratives. *Journal of Semantics* 35 (1):171–206. URL https://doi.org/10.1093/jos/ffx019.

Bach, Kent. 1999. The myth of conventional implicature. *Linguistics and Philosophy* 22:367–421. URL https://doi.org/10.1023/A:1005466020243.

Carlson, Gregory N. 1977. Reference to kinds in English. Doctoral Dissertation, University of Massachusetts, Amherst.

Carlson, Gregory N., and Francis Jeffry Pelletier. 1995. *The generic book*. Chicago, IL: University of Chicago Press.

Castroviejo, Elena. 2021. Exclamatives. In *The Wiley Blackwell companion to semantics*, ed. Daniel Gutzmann, Lisa Matthewson, Cécile Meier, Hotze Rullmann, and Thomas E. Zimmerman, 861–891. Hoboken, NJ: Wiley Blackwell. URL https://doi.org/10.1002/9781118788516.sem020.

Chierchia, Gennaro. 1984. Topics in the syntax and semantics of infinitives and gerunds. Doctoral Dissertation, University of Massachusetts, Amherst.

Davis, Christopher, and Christopher Potts. 2010. Affective demonstratives and the division of pragmatic labor. In *Logic, Language and Meaning: 17th Amsterdam Colloquium, Amsterdam, The Netherlands, December 16-18, 2009, Revised Selected Papers*, 42–52. Springer.

Declerck, Renaat. 1991. *A comprehensive descriptive grammar of English*. Tokyo: Kaitakusha.

DeLancey, Scott. 1997. Mirativity: The grammatical marking of unexpected information. *Linguistic Typology* 1:33–52. URL https://doi.org/10.1515/lity.1997.1.1.33.

DeLancey, Scott. 2001. The mirative and evidentiality. *Journal of Pragmatics* 33:369–382. URL https://doi.org/10.1016/S0378-2166(01)80001-1.

DeLancey, Scott. 2012. Still mirative after all these years. *Linguistic Typology* 16:529–564.

Diessel, Holger. 1999. *Demonstratives: Form, function, and grammaticalization*. Amsterdam: John Benjamins Publishing Company.

Doran, Ryan B, and Gregory Ward. 2019. A taxonomy of uses of demonstratives. In *The Oxford handbook of reference*, ed. Jeanette Gundel and Barbara Abbott, 236–258. Oxford: Oxford University Press.

Grice, Paul H. 1975. Logic and conversation. In *Syntax and semantics III: Speech acts*, ed. Peter Cole and Jerry L. Morgan, 43–58. New York: Academic Press.

Grice, Paul. H. 1989. *Studies in the way of words*. Cambridge, Mass.: Harvard University Press.

Gutzmann, Daniel. 2011. Expressive modifiers & mixed expressives. In *Empirical Issues in Syntax and Semantics 8*, ed. Olivier Bonami and Patricia Cabredo Hofherr, 123–141.

Gutzmann, Daniel. 2012. Use-conditional meaning. Doctoral Dissertation, University of Frankfurt.

de Haan, Ferdinand. 2012. Evidentiality and mirativity. In *The Oxford handbook of tense and aspect*, ed. Robert I. Binnick, 1020–1046. Oxford: Oxford University Press.

Harris, Jesee. A., and Christopher Potts. 2009. Perspective-shifting with appositives and expressive. *Linguistics and Philosophy* 32 (6):523–552. URL `https://doi.org/10.1007/s10988-010-9070-5`.

Heycock, Caroline. 1993. Focus projection in Japanese. In *Proceedings of North East Linguistic Society 24*, 159–187.

Heycock, Caroline. 2007. Japanese *wa*, *ga*, and information structure. In *Handbook of japanese linguistics*, ed. Shigeru Miyagawa and Mamoru Saito, 54–83. Oxford: Oxford University Press.

Hurford, James R, Brendan Heasley, and Michael B. Smith. 2007. *Semantics: A coursebook*. Cambridge: Cambridge University Press.

Karttunen, Lauri, and Stanley Peters. 1979. Conventional implicature. In *Syntax and semantics. vol. 11. presupposition*, ed. Choon-Kyu Oh and David A. Dinneen, 1–56. New York: Academic Press.

Kennedy, Christopher. 2007. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30(1):1–45. URL `https://doi.org/10.1007/s10988-006-9008-0`.

Kennedy, Christopher, and Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 81:345–381. URL `10.1353/lan.2005.0071`.

Kim, Sunmi. 2006. *Kankokugo to nihongo no shijishi no chokuji yoohoo to hichokuji yoohoo [The deictic and non-deictic uses of Korean and Japanese demonstratives]*. Tokyo: Kazamasyobo.

Kinsui, Satoshi. 1999. Nihongo no shijishi niokeru chokuji yoohoo to hichokuji yoohoo no kankei nitsuite [On the relation between the deictic use and the non-deictic use of the Japanese demonstratives]. *Journal of Natural Language Processing* 6(4):67–91.

Kinsui, Satoshi, and Yukinori Takubo. 1992. Nihongo shijishi kenkyushi kara/e [From/toward a history of research on Japanese demonstratives]. In *Shijishi [Demonstratives]*, ed. Satoshi Kinsui and Yukinori Takubo, 151–192. Tokyo: Hitsuji Shobo.

Kinsui, Satoshi, Okazaki Tomoko, and Jo Migyon. 2002. Shijishi no rekishi teki, taisho gengogaku teki kenkyu: Nihongo, kankokugo, torukogo [A historical and contrastive linguistic study on demonstratives: In the case of Japanese, Korean, and Turkish]. In *Shirizu gengokagaku 4, Taisho gengogaku [Series on language science 4, Contrastive linguistics]*, ed. Naoki Ogoshi, 217–247. Tokyo: University of Tokyo Press.

Kratzer, Angelika. 1995. Stage-level and individual-level predicates. In *The generic book*, ed. Gregory N. Carlson and Francis Jeffry Pelletier, 125–175. Chicago: University of Chicago Press.

Kuno, Susumu. 1973a. *The structure of the Japanese language*. Cambridge: The MIT Press.

Kuno, Susumu. 1973b. *Nihon bunpoo kenkyu [The studies of Japanese grammar]*. Tokyo: Taishukan Shoten.

Kuroda, S.-Y. 1965. Generative grammatical studies in the Japanese language. Doctoral Dissertation, Massachusetts Institute of Technology.

Kuroda, S.-Y. 1972. The categorical and the thetic judgment. *Foundations of Language* 9:153–185.

Kuroda, S.-Y. 1979. (*Ko*), *so*, *a* nitsuite [On (*ko*), *so* and *a*]. In *Eigo to nihongo to [English and Japanese]*, 41–59. Tokyo: Kuroshio Shuppan.

Lakoff, Robin. 1974. Remarks on 'this' and 'that'. In *Papers from the Tenth Regional Meeting of the Chicago Linguistic Society*, 345–356.

Lassiter, Daniel. 2017. *Graded modality: Qualitative and quantitative perspectives*. Oxford: Oxford University Press.

McConnell-Ginet, Sally. 1982. Adverbs and logical form: A linguistically realistic theory. *Language* 58:144–184. URL https://doi.org/10.2307/413534.

McCready, Elin. 2010. Varieties of conventional implicature. *Semantics & Pragmatics* 3:1–57. URL https://doi.org/10.3765/sp.3.8.

Nakamata, Naoki. 2010. *Sonna* ya *nanka* wa naze teihyooka ni katayoruka? [Why are *sonna* and *nanka* biased toward negative evaluation?]. In *Proceedings of the 10th Conference of the Japanese Cognitive Linguistics Association*, 427–437.

Ogihara, Toshiyuki, and Kiyomi Kusumoto. 2021. The interpretation of tense: "I didn't turn off the stove". In *The Wiley Blackwell companion to semantics*, ed. Daniel Gutzmann, Lisa Matthewson, Cécile Meier, Hotze Rullmann, and Thomas Ede Zimmerman, 1463–1486. Oxford: Wiley.

Okazaki, Tomoko. 2018. Gendaigo, chukogo no kannenyoho: *Ano*, *kano* [Recognitional use in modern and middle Japanese: *Ano* and *kano*]. In *Barieeshon no naka no nihongo [Japanese in variations]*, ed. Tomoko Okazaki, Tomohide Kinuhata, Mariko Fujimoto, and Yuta Mori, 119–138. Tokyo: Kuroshio Shuppan.

Oshima, David Y. 2021. When (not) to use the Japanese particle *wa*: Groundhood, contrastive topics, and grammatical functions. *Language* 97(4):e320–e340. URL https://doi.org/10.1353/lan.2021.0073.

Oshima, David Y, and Elin McCready. 2017. Anaphoric demonstratives and mutual knowledge: The cases of Japanese and English. *Natural Language and Linguistic Theory* 35(3):801–837. URL https://doi.org/10.1007/s11049-016-9356-6.

Partee, Barbara H. 1973. Some structural analogies between tenses and pronouns in English. *Journal of Philosophy* 70 (18):601–609.

Partee, Barbara H. 1986. Noun phrase interpretation and type-shifting principles. In *Studies in discourse representation theory and the theory of generalized quantifiers*, ed. Jeroen Groenendijk, Dick de Jongh, and Martin Stokhof, 115–143. Dordrecht: Foris.

Portner, Paul. 2007. Instructions for interpretation as separate performatives. In *On information structure, meaning and form*, ed. Susanne Winkler Kerstin Schwabe, 407–426. Amsterdam/Philadelphia: John Benjamins.

Potts, Christopher. 2005. *The logic of conventional implicatures*. Oxford: Oxford University Press.

Potts, Christopher. 2007. The expressive dimension. *Theoretical Linguistics* 33:165–197. URL https://doi.org/10.1515/TL.2007.011.

Rett, Jessica. 2011. Exclamatives, degrees and speech acts. *Linguistics and Philosophy* 34(5):411–442. URL https://doi.org/10.1007/s10988-011-9103-8.

Rett, Jessica, and Sarah E. Murray. 2013. A semantic account of mirative evidentials. In *Proceedings of SALT 23*, 453–472.

Sawada, Jun. 2016. Shiji to shoo no goyooron [Pragmatics of reference and anaphora]. In *Goyooron kenkyuuhoo gaidobukku [A guidebook for research in pragmatics]*, ed. Shigehiro Kato and Takiura Masato, 49–76. Tokyo: Hitsuji publishers.

Sawada, Jun, and Osamu Sawada. 2013. Nihongo moodaru shijishi niokeru imi no tajigensei: Imiron to goyouron no intaafeesu. [The multidimentional meaning of the Japanese modal demonstratives: The semantics-pragmatics interface]. In *Proceedings of the Kansai Linguistic Society 33*, 73–84.

Sawada, Osamu. 2007. The Japanese contrastive *wa*: A mirror image of EVEN. In *Proceedings of the Thirty-third Annual Meeting of the Berkeley Linguistics Society*, 374–387. Berkeley, CA: Berkeley Linguistics Society.

Sawada, Osamu. 2010. Pragmatic aspects of scalar modifiers. Doctoral Dissertation, University of Chicago.

Sawada, Osamu. 2017. *Pragmatic aspects of scalar modifiers: The semantics-pragmatics interface*. Oxford: Oxford University Press.

Sawada, Osamu, and Jun Sawada. 2010. Saliency and scalarity in the meaning of the Japanese modal affective demonstratives. In *Proceedings of the Seventh International Workshop of Logic and Engineering of Natural Language Semantics (LENLS 7)*, 111–124.

Sawada, Osamu, and Jun Sawada. 2014. The meaning of modal affective demonstratives in Japanese. In *Japanese/Korean Linguistics 21*, ed. Seungho Nam, Heejeong Ko, and Jongho Jun, 181–196. Stanford: CSLI Publications.

Sawada, Osamu, and Jun Sawada. 2017. On the property of mirativity in the Japanese modal demonstrative *ano*. In *Japanese/Korean Linguistics 24*, ed. Kenshi Funakoshi, Shigeto Kawahara, and Christopher D. Tancredi, 141–155. Stanford: CSLI Publications.

Sawada, Osamu, and Jun Sawada. 2019. The ambiguity of tense in the Japanese mirative sentence with *nante/towa*. In *The Proceedings of the16th International Workshop of Logic and Engineering of Natural Language Semantics (LENLS) 16*, Paper 16, 1–14.

Sawada, Osamu, and Jun Sawada. 2021. Cross-linguistic variations in the interpretation of tense in mirative sentences: A view from Japanese mirative expressions *nante/towa*. In *Expressive meaning across linguistic levels and frameworks*, ed. Andreas Trotzke and Xavier Villalba, 216–247. Oxford: Oxford University Press.

Sawada, Osamu, and Jun Sawada. 2022. Information structure of the Japanese mirative demonstrative *ano*. *Kobe Papers in Linguistics* 13:16–34.

Searle, John R. 1969. *Speech acts*. Cambridge: Cambridge University Press.

Searle, John R, and Daniel Vanderveken. 1985. *Foundations of illocutionary logic*. Cambridge: Cambridge University Press.

Slobin, Dan I., and Ayhan A. Aksu. 1982. Tense, aspect, and modality: In the use of the Turkish evidential. In *Tense-aspect: Between semantics and pragmatics*, ed. Paul J. Hopper, 185–200. Amsterdam: John Benjamins Publishing Company.

Sohn, Ho-Min. 1994. *Korean*. London: Routledge.

Storch, Anne. 1999. *Das hone und seine stellung im zentral-jukunoid [The Hone and its position in the Central Jukunoid*. Cologne: Rüdiger Köppe.

Storch, Anne. 2009. Hone. In *Coding participant marking: Construction types in twelve African languages*, ed. Gerrit J. Dimmendaal, 123–140. Amsterdam: John Benjamins Publishing Company.

Tomioka, Satoshi. 2016. Information structure in Japanese. In *The Oxford handbook of information structure*, ed. Caroline Fery and Shinichiro Ishihara, 753–773. Oxford: Oxford University Press.

Trotzke, Andreas, and Anastasia Giannakidou. 2024. Exclamation, intensity, and emotive assertion. *Theoretical Linguistics* URL `https://doi.org/10.1515/tl-2024-2022`.

Umeda, Hiroyuki. 1982. Choosengo-no shijishi [Demonstratives in Korean]. In *Kooza nihongogaku 12, Gaikokugo-to-no taishoo iii [Japanese linguistics 12, Contrast with foreign languages iii]*, ed. Hideo Teramura, 173–184. Tokyo: Meiji Shoin.

Vanderveken, Daniel. 1990. *Meaning and speech acts*. Cambridge: Cambridge University Press.

Yoshimoto, Kei. 1986. On demonstratives *ko*/*so*/*a* in Japanese. *Gengo Kenkyu* 90:48–72.