The Semantics and Pragmatics of English Rising Declaratives

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이 논문을 문학석사 학위논문으로 제출함

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Abstract

The Semantics and Pragmatics of English Rising Declaratives

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English rising declaratives are one of non-canonical structures, composed of morphosyntactically declarative sentences with rising intonation. This thesis aims to address the question of how rising declaratives are conveyed and interpreted, taking into account the interaction of clause types, intonation, and discourse context. The final goal is to develop a comprehensive and compositional account of the contributions of rising intonation to the declaratives it accompanies.

I start out by adopting two fundamental types of rising declaratives (Jeong, 2018a, 2018b) which differ in their function. The two main types of

rising declaratives are labeled as assertive rising declaratives and inquisitive rising declaratives, and they each act as tentative assertions or biased questions. Additionally, I introduce subtypes of rising declaratives that have not received much attention in previous research. In the case of assertive rising declaratives, the tentativeness may be epistemic, but it can also be metalinguistic. These structures are often associated with indirectness and are frequently employed as a politeness strategy. Conversely, inquisitive rising declaratives can convey the speaker's positive bias, but sometimes they imply negative bias instead. Furthermore, when expressing negative speaker bias, they may additionally indicate the speaker's mirativity.

I pursue an account couched within the Table model (Farkas & Bruce, 2010; Malamud & Stephenson, 2015), extended from Lewisian model of discourse (Lewis, 1979). Building on this framework, I propose two significant contributions of rising intonation to the conventional discourse effect of canonical declaratives. Firstly, rising intonation conventionally increases the inquisitive content of the proposition, influenced by the steepness of the rise. Secondly, rising intonation signals the projection of discourse components by interacting with the discourse context. The resulting account effectively reconciles the role of both semantics and pragmatics in the interpretation of rising declaratives. It also sheds light on how the interface of semantics and pragmatics generates discourse effects observed in different types of rising declaratives.

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Chapter 1

Introduction

Language serves as a medium for various types of actions. To comprehend how human use language, it is crucial to understand the concept of speech acts and how they are differentiated and recognized by discourse participants.[1] The formal marking of sentence types is referred to as mood and it is associated with a particular meaning across languages. A significant correlation between the selection of grammatical mood and the intended type of discourse move is as follows (Roberts, 2018): Declaratives canonically provide information, interrogatives canonically request information, and imperatives give commands.[2] Within these three moods, the former two are associated with speech acts that are related to changing context. That is, assertions and questions are basic direct speech acts that are used to exchange information. In English as well, they align with distinct syntactic forms: assertions correspond to falling declaratives and questions correspond to polar interrogatives, as illustrated in (1).

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[1] I will use 'speech act' to refer to illocutionary acts (Austin, 1962), unless stated otherwise.

[2] This distinctions between sentence types are cross-linguistically stable (Sadock and Zwicky, 1985; König & Siemund, 2007).

(1) a. She's home$^{\downarrow}$.   (FALLING) DECLARATIVE

    b. Is she home$^{\uparrow}$?   (RISING) POLAR INTERROGATIVE

(1a) and (1b) are prototypical forms of making a statement and asking a yes or no (polar) question, respectively.[3] (1a) is traditionally considered as denoting a proposition, a set of possible worlds in which she is home. The speaker intends to propose a possible addition to the Common Ground (Stalnaker, 1978) by uttering a declarative sentence. However, (1b) is construed a denoting s a set of propositions, namely two sets of possible worlds: the one where she is home and the other where she is not home. Thus, the sum of two sets of possible worlds consists every possible world. The speaker is raising an issue whether she is home is true, assuming that the addressee would provide an answer.

Considering the intonation, $^{\downarrow}$ and $^{\uparrow}$ are used to correspondingly indicate falling and rising intonation in (1). The final contour of declaratives is falling by default, while the polar interrogatives naturally combine with a final rising contour. This relation stems from the close interaction between the speech act

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[3] It is important to note that polar interrogatives are not the only type of interrogatives. There are other major classes of interrogatives, other than polar interrogatives, illustrated as follows (Ciardelli et al., 2019):

(i) a. Is he attractive$^{\uparrow}$ or charming$^{\downarrow}$?   ALTERNATIVE INTERROGATIVES
    b. Is he attractive$^{\uparrow}$ or charming$^{\uparrow}$?   OPEN DISJUNCTIVE INTERROGATIVES
    c. Who is attractive?   CONSTITUENT INTERROGATIVES

For the purposes of my thesis, I will restrict my discussion to polar interrogatives, which specifically ask for the truth-value of the expressed proposition. Other types will be omitted from consideration.

and intonation: canonical assertions accompany falling intonation while canonical questions accompany rising intonation.[4]

However, consider non-canonical structures such as (2) that convey marked meaning.[5]

(2) *She's home$^\uparrow$?*

In (2), the basic assumption between sentence type and intonation is overridden. Although its syntax is identical to that of (1a), it features rising intonation similar to that of a polar interrogative, as seen in (1b). This unique construction, which involves a declarative sentence with rising intonation, is referred to as RISING DECLARATIVES (henceforth, RDs).

Due to their linguistic mismatch, RDs highlight the complex pattern of phonetic, syntactic, semantic, and pragmatic interface. Compared to canonical speech acts, it is widely recognized that RDs provide further information beyond the expressed proposition. However, the interface does not seem to contribute to the truth condition of the proposition but to its speech act. Still, RDs have similarities in their speech act with both of the two canonical types since they have both properties of falling declaratives and

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[4] Note that this basic assumption may not hold for languages other than English. For example, a declarative syntactic form and a finial rise prosodic form combination in Bangla translates into a polar question (Bhadra, 2020).

[5] For the rest of the thesis, I will simply use the question mark ('?') in the end of the sentence to indicate rising intonation. In case of more precise representation is required, ToBI representation of intonation (Beckman & Ayers, 1997) or specific markers ($\uparrow$ or $\downarrow$) will be adopted.

rising polar interrogatives. To exemplify, consider two RDs, (3a) that overlaps with assertions and (3b) that overlaps with questions.

(3) a. OVERLAP WITH ASSERTIONS

[Context: **A** asks **B** where Sally is. **B** is not sure of Sally's whereabouts:]

A: Where's Sally?

B: (Um…) *She's home?*

b. OVERLAP WITH QUESTIONS

[Context: Sally has been skipping school without any specific reason. **B** has just come back from work and **A** wants **B** to speak with Sally immediately about her issues.]

A: You should speak to Sally right away.

B: *She's home?*

Although the two types of RDs share identical overt forms, they differ in their speech acts. For instance, (3a) functions as an assertion, in which Speaker B responds to the addressee's question by providing information about where Sally is, but they are not perfectly sure whether they are uttering the truth. In contrast, (3b) functions more like a question asking whether she is home at the moment, and at the same time, the speaker seems more likely to believe that Sally might be home. The central question that lies in these phenomena is how to account for two distinctive types of RDs. A few previous approaches

seek a unified account (e.g., Malamud & Stephenson, 2015; Rudin, 2022), while others focus on more specific types of RDs, acknowledging that other types of RDs can exist (e.g., Farkas & Roelofsen, 2017). Jeong (2018a, 2018b) is the first approach arguing for two fundamentally different types of RDs. Following her view on two distinct types of RDs, this thesis takes a close look at the specific function of RDs that have not received much attention in the literature. I argue that each function of RDs can be drawn from their interaction with sentence type, conventional intonation, and discourse context.

In this thesis, I discuss the complex compositional meaning of rising intonation and a declarative syntactic form of RDs, especially focusing on the semantics and pragmatics in the course of their interpretation. The interpretation of an utterance involves a combination of at least three factors (Farkas & Roelofsen, 2017): (i) semantic denotations, (ii) conventional discourse effects, and (iii) pragmatic discourse effects. The first two are concerned with the semantics of a sentence which in virtue remains stable across contexts, whereas the last is derived from the discourse context. Following the basic procedure, the interpretive effects of RDs arise from the interaction of these factors during the process of exchanging information. The main purpose of the present study is to address the role of each factor and how they interact with each other to construct the intended meaning of RDs. That is, I aim to precisely capture *the division of labor* between semantics and pragmatics in exchanging information.

For this purpose, I set four main goals. The first goal is to generalize the properties of RDs. I explore the general concepts of RDs, encompassing not only the inquisitive function (e.g., Westera, 2017, 2018; Rudin, 2018a, 2022) but also the assertive function. Additionally, I expand the empirical observations by presenting the role of rising intonation in RDs compared with canonical assertions and questions.

The second goal is to present a diverse paradigm of RDs. Though the discourse effects of RDs are multifarious, most previous works have focused on a particular use. Building on Jeong (2018a, 2018b), I empirically motivate that RDs can be classified into subtypes according to their contribution in discourse context. Furthermore, I present specific functions that RDs can convey and highlight the distinctions between them.

The third goal is to build a formal representation of how semantic convention and pragmatic reasoning interact in the interpretation process of an utterance. It aims to determine which effects remain consistent across different contexts of utterances and which do not. In this regard, I provide a fine-grained account for how the speaker of an RD can convey the intended meaning over the others, and how the addressee can accurately comprehend and interpret it.

The last goal is to provide a formal representation of RDs' context update convention. Based on the framework of expanded Table model (Stalnaker, 1978; Lewis, 1979; Farkas & Bruce, 2010; see also Malamud & Stephenson,

2015; Farkas & Roelofsen, 2017; Jeong, 2018a, 2018b; Rudin, 2018a, 2018b), I seek to represent diverse context update patterns of each subtype of RDs.

This thesis is organized into two parts: Part I examines the empirical patterns of English RDs and summarizes previous studies on them. Part II proposes a formal analysis of the data presented in Part I.

In Chapter 2, I present the phenomena of RDs and generalize their empirical properties. Following Jeong (2018a, 2018b), RDs are divided into two and compared with the previous analysis on assertions and questions by Farkas (2020, 2022).

In Chapter 3, I review previous approaches and offer alternative insights. By expanding the discussion, I aim to provide a more comprehensive understanding of the phenomenon.

In Part II, Chapter 4 introduces basic concepts of the framework and diagnostics. Then, Chapter 5 and Chapter 6 formalize the discourse effects of each subtype of RDs.

In Chapter 4, I model the framework required for formalizing the discourse effects of RDs. I refine the definition of semantic contents, commitments, biases, and conventional discourse effects. Employing these components, I demonstrate how semantics and pragmatics interact and discuss the contributions of rising intonation on semantic content and discourse components.

In Chapter 5, I provide a proposed analysis of RDs that overlap with assertions, building on the framework developed in Chapter 4. I particularly

focus on what brings about tentativeness: whether it is epistemic or metalinguistic. I additionally argue that RDs can be a politeness strategy. With this distinction, I provide the contextual conditions that bring out each interpretation, emphasizing the relation between the proposition and the current Question Under Discussion.

In Chapter 6, I proceed with my account of another type of RDs that act like questions, again based on Chapter 4. I capture the bi-directional bias by means of discourse participants' commitments. I show how the prior context regarding the addressee's belief or bias affects the implied bias.

Lastly, Chapter 7 contains a concluding discussion. I summarize the main claims of this thesis and discuss several remaining issues that are left for future research.

Part I

Rising Declaratives in English

Chapter 2

Phenomena

In this chapter, I present the empirical patterns and general properties of RDs. I classify RDs according to their discourse acts, whether they assert or interrogate. §2.1 begins with presenting two main types of RDs and then §2.2 makes empirical generalizations of each.

2.1 Observations

RDs have complicated discourse effects since they have a syntactic structure of declaratives but combined with an intonation of polar interrogatives. This mismatch causes semantic-pragmatic complexity, making them to be multifunctional. Due to this complexity, the semantic contribution of RDs has received a lot of attention from previous authors (e.g., Hirschberg & Ward, 1995; Gunlogson, 2003, 2008; Šafářová, 2007; Poschmann, 2008; Malamud & Stephenson, 2015; Westera, 2017; Farkas & Roelofsen, 2017; Jeong, 2018a, 2018b; Rudin, 2018a, 2022; Goodhue, 2021; among others).

As introduced in the previous chapter, the first speech act of RDs is to assert.

(4) [Context: **A** is asking **B** on leaving the theater:]

    A: (movie-goer) So, what did you think of the movie?

    B: (companion) *I thought it was funny?*

<div align="right">(Hirschberg & Ward, 1995, p. 408)</div>

In (4), speaker B's utterance with an RD implicates their positive opinion about the movie. The intention of the speaker matches with the primary goal of the assertion, sharing information or communicating beliefs or desires. Thus, RDs such as (4) bear an act overlapping with assertions.

    The second speech act of RDs is to ask a question.

(5) [Context: **A** is sitting in a windowless computer room when another person enters. The newcomer is wearing a wet raincoat and boots.]

    A: *It's raining?*

<div align="right">(Gunlogson, 2003, p. 65)</div>

In (5), the speaker is asking a question that anticipates a response from the addressee. Unlike (4), the RD in (5) is not intended to provide information, but rather requires a response regarding the issue for which the addressee is expected to have more competence, similar to a polar interrogative.

    I will refer to RDs like (4) that overlap assertions as ASSERTIVE RISING DECLARATIVES (henceforth, ARDs) and RDs like (5) that overlap questions as INQUISITIVE RISING DECLARATIVES (henceforth, IRDs), following Jeong's

<div align="center">11</div>

(2018a, 2018b) terms. Her observation on the paradigm of RDs is summarized in (6).[6]

(6) **Paradigm of Rising Declaratives**

    a.   CONTRADICTORY QUESTIONS

       A: John has a sister. We should invite her too.

       B: *John has a sister?* No way. You must be thinking of his young brother.

    b.   INCREDULOUS QUESTIONS

       A: John went to the airport to pick up his sister.

       B: (What?) *John has a sister?*

    c.   CONFIRMATIVE QUESTIONS

      [Context: **A** is giving tips to **B**, who needs to interview a female relative of a friend:]

       A: You should talk to John. He has a few female members in the family.

       B: (Aha!) *John has a sister?*

    d.   UNSURE ABOUT A METALINGUISTIC ISSUE

       A: Do you know if John has any female relatives?

       B: (Um...) *John has a sister?*

    e.   UPTALK (politeness; building rapport; eliciting uptake)

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[6] This paradigm is also accepted by Rudin (2018a, 2022) and, with some modifications, by Goodhue (2021).

A: Tell me about John's family.

B: *John has a sister?* But no other siblings? He's quite close to her?

<div align="right">(Jeong, 2018a, p. 308)</div>

Among five types above, (6a), (6b), and (6c) are classified as IRDs, whereas (6d) and (6e) are classified as ARDs. Aside from their patterns of speech acts, nuclear pitch accent is argued to be another core indicator for the distinction between ARDs and IRDs (Hirschberg & Ward, 1995; Jeong, 2018a, 2018b; c.f., Westera, 2013). Following the ToBI convention (Silverman et al., 1992), it is often assumed that a lower rise with a high nuclear pitch accent (H*H-H%) indicates ARDs, while a steeper rise with a low nuclear pitch accent (L*H-H%) is related to IRDs (Jeong, 2018a, 2018b; c.f., Goodhue, 2021).

While RDs have received considerable attention in research (e.g., Gunlgoson, 2003, 2008; Westera, 2013, 2014, 2017, 2018; Jeong, 2018a, 2018b; Rudin, 2018a, 2022) as their two main types, the specific functions of each RD have not received as much attention. It is my aim to incorporate them with the current understanding to provide more detailed overview. To begin with, my proposed paradigm of ARDs is provided with examples in (7).

(7) **Paradigm of Assertive Rising Declaratives**

   a. EPISTEMIC UNCERTAINTY

     [Context: **A** asks **B** where Sally is. **B** is not sure of Sally's whereabouts.]

A: Where's Sally?

B: (Um...) *She's home?*

b. METALINGUISTIC UNCERTAINTY

A: Do you speak Chinese?

B: *I speak Cantonese?*

I propose two main types of ARDs in terms of the speaker's uncertainty. In (7a), speaker B is not perfectly certain that Sally is home, which leads to their epistemic tentativeness. I name this first type EPISTEMIC UNCERTAINTY ARDs. In contrast, the second type relies more on pragmatics. In (7b), the speaker is not sure whether they are giving an adequate answer to the prior question. I relate this with the uncertainty of the relevance to the context, which is not directly associated with the truth value of the proposition. I call the second type METALINGUISTIC UNCERTAINTY ARDs.[7]

Additionally, I follow Jeong's (2018a, 2021) approach that each type of ARDs can bear politeness as in (8), which are often used as a rapport-building process (Podesva, 2011; Levon, 2016; Jeong, 2018a, 2018b, 2021).

(8) **Politeness Effect Invoked by ARDs**

a. EPISTEMIC UNCERTAINTY POLITENESS

A: Do you want a glass of water?

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[7] The relationship between the final rise and uncertainty has been also noticed by some previous researchers (e.g., Chen et al., 2001; Gussenhoven, 2004).

B: *I'll have a wine?*

b. METALINGUISTIC UNCERTAINTY POLITENESS

A: Hello, *my name is David? I'll be your waiter today?*

Each politeness use of ARDs in (8a) and (8b) respectively corresponds with (7a) and (7b).

For IRDs, I propose the paradigm in (9).

(9) **Paradigm of Inquisitive Rising Declaratives**

a. CONFIRMATIVE

[Context: **B** is buying a ticket for a flight to Seoul at the airport.]

A: (flight agent) There's one flight to Seoul.

B: (customer) *The flight leaves at 10am?*

b. CONTRADICTORY

A: I went to the concert last night. Dave is a good singer.

B: *Dave is a good singer?* You must be thinking about John.

b′. MIRATIVE

[Context: **B** thought that John is the only child in his family. Therefore, **A**'s encounter with John's brother is unexpected to **B**.]

A: I met John's brother yesterday.

B: (What?) *He has a brother?*

(9a) and (9b) differ in terms of the speaker's epistemic bias toward the expressed proposition. (9a) illustrates the speaker's high degree of certainty on the expressed proposition. The speaker asks whether 'The flight leaves at 10am' with a supposition that it would be in fact true. As this type of IRDs is used to confirm the speaker's prediction, they are named CONFIRMATIVE IRDs (Jeong, 2018a, 2018b).[8] In contrast, (9b) implicates the speaker's disbelief in the proposition that 'Dave is a good singer'. It is much closer to asking a question with high suspicion on the uttered proposition (e.g., Are you really assuming that Dave is a good singer? I don't think so.). As this type of IRDs contradicts the addressee's uttered or presupposed content, I call it CONTRADICTORY IRDs. Additionally, I classify IRDs that convey the speaker's surprise as a subtype of Contradictory IRDs (c.f., Goodhue, 2021). In (9b′), the speaker is surprised by the expressed proposition and a surprised speaker should not have prior knowledge or belief about the proposition, which is related to a negative bias. As they implicate mirativity, they are named MIRATIVE IRDs.

To recapitulate, I follow Jeong (2018a, 2018b) to classify RDs into two fundamental types. For ARDs, I propose two types of uncertainties, namely Epistemic Uncertainty ARDs and Metalinguistic Uncertainty ARDs. The contrast between the two comes from what the speaker is tentative. Additionally, ARDs can have an additional pragmatic function, politeness.

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[8] The overall contrast is brought up in Gunlogson (2003, 2008), though maybe not in the exact labels (confirmative and contradictory).

Based on these observations, the formal distinction and semantic contribution of ARDs will be presented in Chapter 5. Following Gunlogson (2003, 2008) and Jeong (2018a, 2018b), I divide IRDs into two as well, namely Confirmative IRDs and Contradictory IRDs. They differ in terms of the speaker's bias toward the expressed proposition. I further classify Mirative IRDs as a subtype of Contradictory IRDs. Related discussions on IRDs will be provided in Chapter 6.

2.2 Empirical Generalizations

In this subsection, I will provide empirical generalizations on RDs. For the sake of comparison, I compare Farkas' (2020) proposal on the default pragmatic assumptions of canonical assertions and questions.

2.2.1 Assertive Rising Declaratives

As ARDs have a lot in common with canonical assertions (i.e., falling declaratives), I refer to a default assumption of canonical assertions made by Farkas (2020) as presented below.[9]

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[9] Unlike Farkas' (2020) generalizations, I do not mention OPEN ISSUE in (10) and (16) since it is the feature shared by every discourse move of exchanging information. Farkas (2020) defines OPEN ISSUE as follows (P is an informative issue added to the *Table*):

   (i) The speaker assumes that the issue she places on the Table is not resolved in the input context, i.e., that there is no alternative $p \in P$, such that $p \in cg_i$.

<div align="right">(Farkas, 2020, p.11)</div>

(10) **Default pragmatic assumptions on canonical assertions**

    a. SPEAKER COMPETENCE

       The speaker presents herself as believing that $w_a \in p$.

    b. ADDRESSEE IGNORANCE

       The speaker presents herself as assuming that the addressee does

       not already believe $w_a \in p$.

    c. ADDRESSEE COMPLIANCE

       The speaker presents herself as assuming that the addressee will

       in fact commit to p, and therefore that p will be added to the

       current CG.

                                        (Farkas, 2020, p. 11)

In (10), p is the unique alternative, w_a is the world in which the conversation takes place, and the CG is the common ground that contains mutual commitments between speakers (Stalnaker, 1978). SPEAKER COMPETENCE is related to the speaker's belief. Since cooperative discourse participants would not say what they think is false or what is not supported by evidence, the speaker is basically assumed to believe the expressed proposition. ADDRESSEE IGNORANCE pertains to a speaker's intention to increase mutual information, which is a primary goal of discourse. For mutual information to

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However, the speaker should raise an issue which is new to the context (i.e., OPEN ISSUE) as all conversational moves normally intend to increase information relative to P (Farkas & Bruce, 2010). If not, the information would be redundant.

be increased, the speaker should utter *p* which has not been formerly known by the addressee. Otherwise, the utterance would be redundant and violate the basic assumption. ADDRESSEE COMPLIANCE is also concerned with the basic assumption of discourse. To increase mutual information, the most expected response from the address is to agree on the issue. In this respect, the speaker has an expectation that the address would eventually agree with the information they have raised.

In comparison with canonical assertions, I generalize ARDs as follows:

(11) **Generalizations of Assertive Rising Declaratives**

    a. WEAKENED SPEAKER COMPETENCE

       The speaker presents themselves as having an uncertainty on believing that $w_a \in p$ or $p \in \text{P}$.[10]

    b. ADDRESSEE IGNORANCE

       The speaker presents themselves as assuming that the addressee does not already believe $w_a \in p$.

    c. ADDRESSEE RATIFICATION

       The speaker presents themselves as relying on the addressee's ratification on licensing that $w_a \in p$.

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[10] P is the issue placed on the *Table*.

ARDs share (11b) with canonical assertions, but (11a) and (11c) subtly differ. The latter two are crucial features of ARDs in comparison with canonical assertions. In the following subsections, I will explain each general property in detail.

2.2.1.1 Weakened Speaker Competence

Canonical assertions implicate the speaker's belief on p (i.e., SPEAKER COMPETENCE). ARDs, on the other hand, show the speaker's tentativeness, a lowered level of commitment. In (7a), the speaker is not sure that 'Sally is home' but assumes it's high probability. (7b) also shows the tentativeness which comes from the uncertainty about the appropriateness of the response. They both show lowered competence of the speaker, either in terms of the truth of the expressed proposition or its relevance to the context provided by the prior question.

Note that my definition of competence is less restricted than Farkas' (2020). She also notices non-canonical assertions in which speaker competence is overridden, which seem similar to ARDs. However, she only focuses on the weakened commitment to the propositional truth value, but I additionally argue that commitment can also be metalinguistically weakened.

2.2.1.2 Addressee Ignorance

ARDs also require ADDRESSEE IGNORANCE, again following the assumption that the conversation aims to increase mutual information. To prevent redundancy, the raised issue should not include the addressee's prior knowledge.[11] For example, compare (12) and (13).

(12) [Context: To a receptionist **A**, who is **B**'s acquaintance:]

    A: Hi, Tony.

    B: *#My name is Tony Green?*

(13) [Context: At a hotel, to a receptionist:]

    A: I'd like to check in, please. *My name is Tony Green?*

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[11] In the 'Quiz' context, this assumption can be overridden. Consider (i).

  (i) [Context: A teacher **A** is quizzing a student **B** on state capitals. **B** isn't sure of the answer, but thinks it might be Albany.]
    A: What's the capital of New York?
    B: *It's Albany?*

                                    (Malamud & Stephenson, 2015, p. 282)

In (i), speaker A's question is an example of non-canonical 'quiz' questions (Farkas, 2020). Unlike canonical questions, 'quiz' questions aim to check the addressee's competence. Thus, speaker A is competent, while speaker B's competence remains open. In this context, the addressee of an ARD is not ignorant. I also suppose rhetorical questions (e.g., Biezma & Rawlins, 2017) may denote similar implications.

In (12), an ARD is infelicitous as the addressee already knows the information.[12] In contrast, an ARD in (13) gives new information about the speaker's name to the ignorant addressee.

ARDs used for a response to a polar question as in (7a) and (7b) also support ADDRESSEE IGNORANCE. Canonical questions imply that the speaker is ignorant about the issue.[13] Thus, other discourse participants who answer the question would normally assume the ignorance of the addressee (i.e., the questioner).

2.2.1.3 Addressee Ratification

The information exchange of ARDs relies more on the addressee than canonical assertions, and thus requires ADDRESSEE RATIFICATION. ADDRESSEE RATIFICATION is closely related to WEAKENED SPEAKER COMPETENCE. The addressee would acquire more authority on judging the speaker's weakened competence to make the discourse progress. Consider (14), repeated from (7b) with the additional ratification process.

(14)   A: Do you speak Chinese?

         B: *I speak Cantonese?*

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[12] The RD in (12) may become felicitous if it is used as a question (e.g., in cases where speaker B's name is not Tony but Steve). In this case, an RD is a question and arguably can be substituted for a polar interrogative (e.g., Are you really thinking that I'm Tony Green?).

[13] For the relevant discussion, see §2.2.2.

A: Oh, I see.

In (14), speaker A agrees with speaker B's uttered proposition and expands their mutual information.

In contrast, the speaker of an ARD cannot pursue their opinion any further when the addressee refuses to ratify it.

(15)   A: Do you speak Chinese?

          B: *I speak Cantonese?*

          A: No, I mean Mandarin.

          B: a. Oh, then, no.

               b. #I DO speak Cantonese.

In (15), the cooperative speaker would not keep track of the issue after the repair request.

2.2.2 Inquisitive Rising Declaratives

IRDs exhibit a question-like discourse act. For the sake of comparison, I begin with Farkas' (2020) pragmatic assumption on canonical questions in (16).

(16) **Default pragmatic assumptions on canonical questions**

    a. SPEAKER IGNORANCE

       The speaker presents herself as being an epistemic state that does not support commitment to any of the alternatives in P.

    b. ADDRESSEE COMPETENCE

       The speaker presents herself as assuming that the addressee's epistemic state supports their commitment to the `true' alternative in P, i.e., that alternative that has w_a as its element.

    c. ADDRESSEE COMPLIANCE

       The speaker presents herself as assuming that the addressee will resolve the issue by publicly committing to the true alternative in P.

<div align="right">(Farkas, 2020, p. 13)</div>

SPEAKER IGNORANCE and ADDRESSEE COMPETENCE are reversed from generalizations of canonical assertions. If the speaker is competent, they would simply assert a declarative, the most efficient way of increasing information. However, the pattern of competency is reversed for questions and the responsibility to resolve the issue is anchored to the addressee (i.e., ADDRESSEE COMPETENCE). As canonical questions follow the basic assumption to increase information as well, they share ADDRESSEE COMPLIANCE with canonical assertions.

    Compared with (16), generalizations of IRDs are given in (17).

(17) **Generalizations of Inquisitive Rising Declaratives**

    a. VARIABLE SPEAKER EPISTEMIC BIAS

       The speaker presents their epistemic preference for one alternative over the other, depending on the context.

    b. ANTICIPATION OF ADDRESSEE COMMITMENT

       The speaker presents themselves as if they have a reason to believe that the addressee believes $w_a \in p$.

    c. REQUEST OF ADDRESSEE RESPONSE

       The speaker requires the addressee to respond regarding P.

As IRDs have question-like nature, there are lots of similarities between (16) and (17). Precisely, (17b) and (17c) arguably correspond to (16b) and (16c) but the main difference comes from the contrast between (16a) and (17a). Each general property will be discussed in the following subsections.

2.2.2.1 Variable Speaker Epistemic Bias

IRDs involve the speaker's epistemic bias, unlike canonical questions that involve an ignorant speaker.

(18) a. **Positive Bias**

    A: I'm a big fan of Dave.

    B: *Dave is a good singer?*

b. **Negative Bias**

> A: I went to the concert last night. Dave is a good singer.

> B: *Dave is a good singer?* You must be thinking about John.

Despite the identical overt form of (18a) and (18b), the speakers' belief about the expressed proposition differs. (18a) is much more likely to be committed to the expressed proposition while (18b) seems to be skeptical of it. That is to say, the bias can be toward either p or $\neg p$, according to the context.

2.2.2.2 Anticipation of Addressee Commitment

Regardless of the bias, the speaker of an IRD assumes the addressee's belief on p (Jeong, 2018a, 2018b), as shown in the contrast between (19) and (20).

(19) [Context: **A** is sitting in a windowless computer room when another person enters. The newcomer is wearing a wet raincoat and boots.]

> A: *It's raining?*

> (Gunlogson, 2003, p. 65)

(20) [Context: **A** has just seen her coworker enter the office wearing a wet raincoat. She goes into her boss's office, from which the coworker's entrance was not visible, and says to her boss:]

> A: *#It's raining?*

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A wet raincoat and boots in the context of (19) provide strong contextual evidence for the addressee's state of belief about the weather. In contrast, the addressee in (20) is not expected to have their own belief about the weather. An IRD is felicitous only in (19), but not in (20): When the speaker cannot assume the existence of the addressee's commitment, an RD is considered infelicitous.[14]

Notably but predictably, the speaker expects the addressee to believe p even when they are negatively biased. Since the speaker's main purpose is to contradict or negate the addressee's belief, the assumption is that the addressee is committed to p.

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[14] Note that this does not imply that the context must provide direct evidence of the addressee's belief or bias.

    (i) [Context: **B** is buying a ticket for a flight to Seoul at the airport.]
        A: There's one flight to Seoul.
        B: *The flight leaves at 10am?*

                                                            (repeated from (9a))

In (i), there is no contextual information regarding speaker A's commitment. However, speaker B can infer that speaker A, as a flight agent, will confirm p by providing a positive answer. The account on the relation between contextual information and interpretive meaning of IRDs will be proposed in §6.2.

2.2.2.3 Request of Addressee Response

Similar to polar interrogatives, IRDs solicit an answer from other interlocutors (Rudin, 2018a). This is presented in (21).[15]

(21) [Context: **B** is buying a ticket for a flight to Seoul at the airport.]

    A: (airline agent) There's one flight to Seoul.

    B: (customer) *The flight leaves at 10am?*

    A: a. Yes, it leaves from Gate 5.

       b. No, at 9.

       c. #You can check in your luggage.

In (21), speaker B should give an answer, either positive as (21a) or negative as (21b), while moving on to a related issue as (21c) is not acceptable. This pattern is identical with canonical questions as in (22).

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[15] In certain contexts, only a positive response can only be appropriate or acceptable, depending on the situation.

  (i) [Context: **A** is giving tips to **B**, who needs to interview a female relative of a friend.]
    A: You should talk to John. He has a few female members in the family.
    B: (Aha!) *John has a sister?*
    A: a. Yes, he does.
       b. #No, he doesn't.

                             (adapted from Jeong, 2018a, p. 308)

In (i), since speaker A has already committed to the proposition, they cannot deliver a negative response as in (ib).

(22) [Context: Same as (21).]

      A: (airline agent) There's one flight to Seoul.

      B: (customer) Does the fight leave at 10am?

      A: a. Yes, it leaves from gate 5.

          b. No, at 9.

          c. #You can check in your luggage.

2.2.3 Takeaways

In §2.2.1, I summarized the pattern of ARDs in comparison to canonical assertions. ARDs implicate WEAKENED SPEAKER COMPETENCE, which necessitates ADDRESSEE RATIFICATION. However, they share the characteristic of ADDRESSEE IGNORANCE with canonical assertions. ARDs and canonical assertions both aim to increase mutual information, but ARDs are produced with lower levels of speaker competence. Thus, ARDs are considered *tentative* assertions (Jeong, 2018a, 2018b).

Pertaining to IRDs, they resemble canonical questions with REQUEST OF ADDRESSEE RESPONSE. However, the attitude of the speaker is not neutral; IRDs convey VARIABLE SPEAKER EPISTEMIC BIAS. To implicate bias, the speaker should have ANTICIPATION OF ADDRESSEE COMMITMENT. Like canonical questions, IRDs request information from the addressee, but with a more specific focus and intention. In essence, IRDs can be classified as *biased* questions (Jeong, 2018a, 2018b).

Chapter 3

Previous Approaches

In this chapter, I review previous approaches and provide some alternative insights. I summarize basic prerequisites for the Table model and introduce a few notable accounts.

3.1 Preliminaries

I begin by presenting the basic discourse components and context updating convention, mainly drawing on Farkas & Bruce (2010) and Malamud & Stephenson (2015).

3.1.1 Discourse Components

Since Lewis (1979) put forward the scoreboard model of conversation, its extended and enriched models of discourse have been developed in the literature (e.g., Gunlogson, 2003, 2008; Malamud & Stephenson, 2015; Farkas & Roelofsen, 2017; Jeong, 2018a, 2018b; Rudin, 2018a, 2022; Goodhue, 2021; among others). In this thesis, I adopt the discourse components proposed by Farkas & Bruce (2010) and Malamud & Stephenson (2015) in the representation of the semantic contribution of RDs.

The Common Ground (henceforth, *CG*), a set of commitments shared by discourse participants, is assumed to play a significant role in tracking participants' commitments throughout the discourse (Stalnaker, 1978). Generally, the role of the discourse is often considered as expanding the *CG* and reducing the context set (henceforth, *cs*). However, subsequent works have identified a limitation of Stalnakerian *CG* in its incapability to represent the individual commitment of each participant with a single set. For example, Gunlogson (2003) proposes the necessity of separate tracking of each participant's commitments. Following her idea, Farkas & Bruce (2010) set each participant's discourse commitment (henceforth, DC_X) apart from the *CG*, while the *CG* is reserved as a set of propositions that all interlocutors have agreed upon. Each interlocutor has individual DC_X which is a belief of one's own, having a possibility to be added to the *CG*. Thus, the total commitment of speaker *X* throughout the discourse is $DC_X \cup CG$. Note that this commitment is doxastic by default and does not need to be true in the world where the conversation takes place.[16]

In the process of discourse, the *Table* records the Question Under Discussion (henceforth, *QUD*; Ginzburg, 1996; Roberts, 1996, 2012; Büring, 2003). In other words, the *Table* is a stack that records 'at-issue' items. When the item is added to the *Table*, the speaker projects possible future *CG*s which

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[16] There are different assumptions for other types of speech acts. For example, the speaker of an imperative is assumed to have preferential commitments (Condoravdi & Lauer, 2012).

is called the projected Common Ground (henceforth, CG^*).[17] For example, an assertion projects expressed proposition p to the CG ($CG^* = \{CG \cup \{p\}\}$) and a polar question projects each of two possibilities, p or $\neg p$ ($CG^* = \{CG \cup \{p\}, CG \cup \{\neg p\}\}$). The projected commitments of discourse participants (henceforth, DC_X^*) are defined as analogous to the CG^*. Malamud & Stephenson (2015) posit the DC_X^* to allow the moves for tentative commitments of the speaker (speaker's projected commitment; henceforth, DC_{sp}^*) or the speaker's best guess on commitments of the addressee (addressee's projected commitment; henceforth, DC_{ad}^*).[18]

A cooperative discourse participant would remain consistent with their doxastic commitments in a single discourse move (Krifka, 2015). I also suppose that the DC_X^* should be consistent throughout the discourse, along with the present ones (i.e., $\cap DC_X \neq \emptyset$, $\cap DC_X^* \neq \emptyset$, and $\{\cap DC_X\} \cap \{\cap DC_X^*\} \neq \emptyset$). If the commitment, whether present or projected, is restricted to worlds where p is true, the worlds where p does not hold are eliminated. As a result, the intersection with worlds where p does not hold is bound to be empty, which is an unexpected outcome considering that the discourse aims to expand the CG.

The discussion up to this point is summarized in (23), which will be revised in Chapter 5.

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[17] The same component is referred to as the projected set (*ps*) by Farkas & Bruce (2010), but I follow Malamud & Stephenson's (2015) term, the CG^*, to remain consistent with other projected components (e.g., DC_{sp}^*, DC_{ad}^*).

[18] When the DC_X and the DC_X^* are contrasted, I refer to the former as the *present* commitment.

(23) **Discourse Components** (to be revised)

   a. **Common Ground** (*CG*): the set of propositions that all speakers are publicly committed to (Stalnaker, 1978)

   b. **Discourse Commitment** (*DC$_X$*): the set of propositions that the speaker has publicly committed to during the conversation up to the relevant time, and which are not shared by all the other participants (Farks & Bruce, 2010)

   c. **Table (*T*)**: the stack that records the at-issue content in the conversation (Farkas & Bruce, 2010)

   d. **Projected Common Ground** (*CG**): the set of potential *CG*s that gives possible resolutions for the top issue on the *Table* in the next expected stage of the conversation (Farkas & Bruce, 2010; Malamud & Stephenson, 2015)

   e. **Projected Discourse Commitment** (*DC$_X^*$*): the set of propositions that the speaker is expected to become committed to or the best guess of commitments made by other interlocutors (Malamud & Stephenson, 2015)

The dynamic status of a proposition in the course of interpretation can be formalized in terms of the components in (23). Building on Gunlogson (2008), Farkas & Bruce (2010), and Malamud & Stephenson (2015), I define the status of a proposition *p* as follows.

(24) **Status of a proposition *p* with respect to a discourse context *C*:**

    a.   *p* is a **COMMITMENT** in *C* of an agent *X*, i.e., $p \in DC_X$, iff *X* is publicly committed to $w_a \in p$.

    b.   *p* is a **PROJECTED COMMITMENT** in *C* of an agent *X*, i.e., $p \in DC_X^*$, iff *X* is tentatively committed to $w_a \in p$ or assumed to be committed to $w_a \in p$.

    c.   *p* is a **JOINT COMMITMENT** in *C* iff both agents have a commitment to *p*.

    d.   *p* is **RESOLVED** in *C* iff either *p* or ¬*p* is a joint commitment; otherwise, *p* is **UNRESOLVED** in *C*.

    e.   *p* is **CONTROVERSIAL** in *C* iff ¬*p* is a commitment or a projected commitment of at least one agent, *p* is unresolved in *C*, and *C* is not empty.

As mentioned, the main goal of the speech act is to increase a joint commitment (Stalnaker, 1978; Farkas & Bruce, 2010). That is, a discourse is a process of adding a new issue to the *Table* and resolving it in a way that expands the *CG* and reduces the *cs*. I also adopt the simplified notation of Farkas & Bruce (2010, p. 90) as in (25) to represent stack operations on the *Table*.[19]

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[19] In Farkas and Bruce's (2010) original proposal, the concepts of *pop* (*T*) and *top* (*T*) are also introduced. However, for the purpose of the current discussion, I only present operations that takes place in the *Table*, which requires two arguments: *e* and *T*.

(25) **Stack Operations on *Table* (*T*)**

    a. *push* (*e*, *T*) represents the new stack obtained by adding item *e* to the top of the stack *T*.

    b. *remove* (*e*, *T*) represents the stack obtained by removing the top-most occurrence of *e* from stack *T*. If *e* does not occur in *T,* then *T* is returned.

When the issue is raised by one of the participants in the discourse, it is *pushed* to the top of the *Table*. If participants reach a joint commitment on the issue, it is *removed* from the *Table* and incorporated into the *CG*.

3.1.2 Context Update Conventions

Farkas & Bruce (2010) propose context update conventions for the two unmarked discourse acts, indicating that the context undergoes consecutive changes throughout the discourse. Their model adds syntactic objects and their denotations to the *Table* with sentential features [D] and [I]. These features distinguish declarative and interrogative sentences, providing different contributions to the *Table*. Following Hamblin (1973) semantics, the

declarative $S[D]$ denotes a singleton set $\{p\}$ of the sentence radical. Default assertion **A** is defined as follows:[20]

(26) $\mathbf{A}(S[D], a, K_i) = K_o$ such that

    (i) $DC_{a,o} = DC_{a,i} \cup \{p\}$

    (ii) $T_o = push(\langle S[D]; \{p\}\rangle, T_i)$

    (iii) $CG^*_o = CG^*_i \; \overline{\cup} \; \{p\}$

<div align="right">(Farkas & Bruce, 2010, p. 92)</div>

As an assertion is a proposal to expand the CG with the propositional content, it commits the speaker to p as (26i). Then, $\{p\}$, a topic waiting to be resolved, is pushed to the top of the stack in (26ii). The speaker's expectation of p to be included in future CG is conveyed by p being added to the CG^*, as in (26iii).

    Recall that the resolution of the issue can be achieved by having a joint commitment. The process of assertion confirmation **AC**, i.e., the process to achieve a joint commitment, is provided in (27).[21]

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[20] In more recent works (e.g., Farkas (2022)), declaratives and interrogatives are assumed to have the same discourse effect, following Inquisitive Semantics (e.g., Ciardelli et al., 2013, 2015, 2019). For the exact conventions, see §4.1.

[21] I omit reversing responses such as (i), but the process is basically identical.

    (i)   A: Mary ordered Chicken yesterday.
            B: No, she didn't. / No, it was beef.

Interested readers may refer to Farkas & Bruce (2010).

(27) Assertion Confirmation (**AC**)

    a. *Input context conditions:*

        (i) *top* $(T_i) = \langle S[\mathrm{D}]; \{p\}\rangle$

        (ii) p in $DC_{a,i}$

    b. *Change:*

    AC $(b, K_i) = K_o$ where $DC_{b,o} = DC_{b,i} \cup \{p\}$

<div align="right">(Farkas & Bruce, 2010, p. 98)</div>

Once the confirmation is made, the proposition is included in each participant's commitment set. Farkas and Bruce (2010) assume that the *CG* expands by removing p from each participant's individual commitment set and adding it to the *CG*. I also endorse this approach.

    In terms of (26) and (27), speaker A's assertion and the following confirmation made by speaker B are schematized as follows:

(28) K_2: A asserted falling declarative 'John has a sister' relative to K_1

	A utters **A**	B utters **AC**	After **AC**
Table	⟨'John has a sister' [D];{p}⟩	⟨{p}⟩	⟨⟩
DC$_A$	{p}	{p}	{}
DC$_B$	{}	{p}	{}
CG	s_1	s_1	$s_2 = s_1 \cup \{p\}$
CG*	{$s_1 \cup \{p\}$}	{$s_1 \cup \{p\}$}	

By including p in the commitment sets of both discourse participants (DC_A and DC_B), they have jointly committed to resolving the issue, resulting in the removal of p from both commitments and an expansion of the CG.

Meanwhile, the polar question $S[I]$ denotes a non-singleton set $\{p, \neg p\}$, following Karttunen (1977). The default polar question operator **PQ** is defined in (29).

(29) **PQ**($S[I]$, K_i) = K_o such that

    (i) $T_o = push(\langle S[I]; \{p, \neg p\}\rangle, T_i)$

    (ii) $CG^*_o = CG^*_i \cup \{p, \neg p\}$

<div align="right">(Farkas & Bruce, 2010, p. 95)</div>

The main contrast of (29) with the assertion is that the speaker does not commit themselves to p. Consequently, the CG^* contains both alternatives p

and ¬p, as in (29ii). Regarding this matter, the confirmation of polar questions (**P-QC**) causes more changes in the context than **AC**.

(30) P-Question Confirmation (**P-QC**)

    a. *Input context condition:*

       top $(T_i) = \langle S[\mathrm{I}]; \{p, \neg p\}\rangle$

    b. *Change:*

       (i) **P-QC** $(b, K_i) = K_o$ where $DC_{b,o} = DC_{b,i} \cup \{p\}$, where p is the denotation of S.

       (ii) $T_o = push(\langle S[\mathrm{I}]; \{p\}\rangle, T_i)$

                                      (Farkas & Bruce, 2010, p. 103)

The core effect of **P-QC** that differs from **AC** is replacing the issue on the *Table* from $\{p, \neg p\}$ to $\{p\}$. Moreover, unlike **AC**, **P-QC** does not automatically resolve the issue. Consider the consequences of **PQ** and **P-QC**, illustrated in (31).

(31) K_3: A polar question p? is asked relative to the initial input context K_1

	A utters **PQ**	B utters **P-QC**	After **P-QC**
Table	⟨'John has a sister'[I]; $\{p, \neg p\}$⟩	⟨$\{p\}$⟩	⟨$\{p\}$⟩
DC$_A$	{}	{}	{}
DC$_B$	{}	$\{p\}$	$\{p\}$
CG	s_1	s_1	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}\}$

Contrary to (28), no joint commitment is accomplished after **P-QC** in (31) as speaker A has not been committed to p yet. The issue still remains on the *Table*, waiting for an additional process for the resolution.[22]

3.2 Previous Approaches

Numerous accounts on RDs have been proposed based on the basic components introduced above. In this subsection, I will investigate these previous analyses on RDs. While all of these approaches involve both semantics and pragmatics, the exact allocation between the two varies.

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[22] Note that non-linguistic cues such as nodding can be the process of resolution as well.

3.2.1 Hirschberg & Ward (1995)

Building on the theory of intonation by Pierrehumbert & Hirschberg (1990), Hirschberg & Ward (1995) investigate the meaning of high-rise question contour (H*H-H%) of declaratives.[23] The high-rise contour aims to propose the information to be added to mutual belief space and to instruct the hearer to relate the information with their belief space. To illustrate, see (32).

(32) [Context: A Chicago Radio DJ **A** is getting a call from **B**:]

      A: Good morning Susan. Where are you calling from?

      B: *I'm calling from Skokie?*

                             (adapted from Hirschberg & Ward, 1995, p. 408)

The primary purpose of an RD in (32) is to give a response to the question, which is assertive. That is, the caller proposes the new information as a potential mutual belief with the DJ. However, it additionally plays a question-like role, asking whether the place named Skokie is familiar to the DJ, so they can possibly relate it to their own belief. On the contrary, even with the same context, (33) is infelicitous.

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[23] They use the term 'belief space' for treating rising contours. While no formal definition has been given, I intuitively assume it as similar to commitment. Discourse participants' belief space is their DC_X, while mutual belief space stands for the CG.

(33) [Context: Same as (32).]

    A: Good morning Susan. Where are you calling from?

    B: *#I'm calling from Chicago?*

                          (adapted from Hirschberg & Ward, 1995, p. 411)

In (33), there is no reason for the caller to doubt whether the Chicago radio station DJ has the information about the location of Chicago in their private belief space. Without such doubt, high-rise contour is infelicitous.[24]

    Their idea brings out the specific issue of Metalinguistic Uncertainty ARDs. However, their account runs into the problem with the tentativeness of the proposition's truth value. To illustrate, see (34), repeated from (7a).

(34) [Context: **A** asks **B** where Sally is. **B** is not sure of Sally's whereabouts.]

    A: Where's Sally?

    B: (Um...) *She's home?*

                                (repeated from (7a))

In (34), it is not likely to be expected for the addressee to face difficulty in relating the issue to their own belief space.

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[24] However, I assume that the rising intonation can constitute uptalk and politeness indicating RDs while Hirschberg & Ward (1995) do not specifically address these particular functions.

3.2.2 Gunlogson (2003, 2008)

Gunlogson (2003) proposes the concept of 'attribution' for the questioning use of RDs. Her analysis supposes commitment requirements for both falling and rising declaratives, but the former locates the commitment to the speaker while the latter locates it to the addressee. Consequently, two declaratives have different features in terms of context updates; Falling declaratives update the speaker's commitment set, whereas rising declaratives update the addressee's commitment set.

She supposes that contextual evidence should support the addressee's commitment to make RDs felicitous. This is shown in (35) and (36).

(35) [Context: **A** is sitting in a windowless computer room with no information about current weather conditions when another person enters.]

 A: *#It's raining?*

<div align="right">(Gunlogson, 2003, p. 64)</div>

(36) [Context: **A** is sitting in a windowless computer room when another person enters. The newcomer is wearing a wet raincoat and boots.]

 A: *It's raining?*

<div align="right">(Gunlogson, 2003, p. 65)</div>

The contextual evidence for the addressee's commitment licenses an RD exclusively in (36). In this respect, she also proposes the anticipation of addressee commitment (§2.2.2.2) as a general property of IRDs. Her proposal has an advantage in generating predictions about IRDs with a negative bias. By attributing the commitment to the addressee while remaining open with the speaker's commitment, the speaker can exhibit bias toward or commitment to $\neg p$.[25]

However, her account remains unclear for cases like (37).[26]

(37)   A: Schiphol Information.

          B: Hello, this is G.M. I have to go to Helsinki, from Amsterdam. Can you tell me which flight leaves next Sunday?

          A: Just a moment. Yes, there are several flights. One leaves at 9.10, one at 11.10, and one at 17.30.

          B: *The flight takes about three hours?*

(adapted from Beun, 2000)

In (37), speaker B lacks contextual evidence on speaker A's commitment to p.

In her later work (Gunlogson, 2008), she focuses on Initiating Declarative Questions (IDQs), biased questions in out-of-blue contexts. They

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[25] The relation between the lack of the speaker's commitment and a negative bias will be discussed in §6.1.2.

[26] The original example is in Dutch, translated and adapted by Gunlogson (2003, p. 63) and also accepted by Poschmann (2008) and Farkas & Roelofsen (2017).

are declaratives which function as questions with the speaker's commitment being contingent on the addressee's. That is, the addressee's epistemic uncertainty to p is higher than that of the speaker. This makes empirically correct predictions on the questioning use of RDs. See (38) for an example.

(38) [Context: **B** has just entered the room, where **A** sees her for the first time that day.]

    A: *You got a haircut?*

(adapted from Gunlogson, 2008, p. 27)

In (38), the speaker can infer but cannot assure the change in the addressee's appearance. In this context, the speaker's assumption is naturally weaker than the addressee's commitment.[27]

Gunlogson (2008) can properly capture Confirmative IRDs with a positive bias of the addressee's commitment. However, this alternative approach comes out with a cost, as pointed out by Jeong (2018a, 2018b). A negative epistemic bias that can be previously explained by Gunlogson (2003) cannot be predicted anymore as in the following example:

(39)   A: Please apologize him.

        B: *I was wrong and I should apologize?* No way.

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[27] Therefore, speaker B's denial of speaker A's utterance prevents speaker A from arguing for their position further.

Gunlogson's (2008) approach is limited in such cases where Speaker B dissents the proposition without being contingent.[28] Moreover, it is unclear how her approaches (Gunlogson, 2003, 2008) can be expanded to ARDs which seem to be more related to speaker-oriented commitments.

3.2.3 Poschmann (2008)

Poschmann's (2008) account is also one of the initial studies that notices the diverse commitment update pattern. She attempts to classify RDs in terms of "attribution" (i.e., commitment shift suggested by Gunlogson (2003, 2007)), which refers to the lack of the speaker's commitment. To illustrate, see (40) and (41).

(40) ECHO QUESTION

    A: (entering the room) It's raining.

    B: *It's raining?*

(Poschmann, 2008, p. 251)

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[28] I also assume that the speaker of negatively biased RDs is not committed to p. This assumption will be justified in §6.1.2.

(41) **CONFIRMATIVE QUESTION**

[Context: **A** is sitting in a windowless computer room when another person enters. The newcomer is wearing a wet raincoat and boots.]

A: *It's raining?*

(Poschmann, 2008, p. 251)

The echo question in (40) refers to a previous utterance in the context, whereas the confirmative question in (41) conveys the speaker's inference from contextual non-linguistic evidence. Echo questions are attributive speech acts (i.e., acts without commitments) which allow metalinguistic operations. They involve a commitment shift from the speaker to the addressee. Poschmann's (2008) account gives empirically correct prediction on negative bias, similar to Gunlogson (2003). Contrastively, confirmative questions are non-attributive speech acts which involve the speaker's commitment and raises a tentative reading. The use of rising intonation can create a tentative reading for speech acts that involve the speaker committing to something, as it explicitly prompts the addressee to acknowledge the act performed by the speaker.

From this contrast, she concludes that the former is related to metalinguistic operations while the latter is only related to the propositional content. This analysis is advantageous in capturing diverse conventions of commitment update with the speaker's weakened commitments, which is

analogous to the $DC_{sp}*$. She further extends her analysis to tentative assertions, which necessitate a response from the addressee unlike canonical assertions.

However, attribution can be expanded over echo questions. For example, see (42).

(42) [Context: A mother **A** asks her child **B** to set the table and he does a particularly bad job of it but appears to consider the chore finished.]

     A: (mother) *This table is set?* Where are the wine glasses? Where are the napkins?

<div align="right">(Farkas & Roelofsen, 2017, p. 276)</div>

In (42), even though the speaker is not echoing the addressee's explicit assertion, the DC_{sp} remains uninvolved.

3.2.4 Westera (2013, 2014, 2017, 2018)

In a series of studies, Westera (2013, 2014, 2017, 2018) attempts to give a unified approach to the diverse phenomena of RDs. In his recent work (Westera, 2017, 2018), he develops the idea of the Intonational Compliance Marking (ICM) theory from his earlier works (Westera, 2013, 2014). He accepts the idea of 'true to form' from Gunlogson (2003) that declarative syntaxes are technically assertions which add a proposition to the *CG*. The

rising terminal contour added to the declarative syntax signals a potential non-compliance with conversational maxims (Grice, 1975) as in (43) and (44).

(43) a. [Context: To a receptionist:]

  A: *Hello, my name is Mark Liberman?*

 b. A: Is John at the party?

  B: (Well,) *it's raining...?*

<div align="right">(Westera, 2017, p. 159)</div>

(44) [Context: English tourist in a French cafe:]

  A: *I'd like... err... je veux... a black coffee?*

<div align="right">(Westera, 2017, p. 159)</div>

(43a) and (43b) illustrate a violation of the Maxim of Relevance. Meanwhile, the speaker in (44) is unsure whether their pronunciation is appropriate, which is a violation of the Maxim of Manner.[29]

 As Jeong (2018a, 2018b) notes, Westera's (2017, 2018) analysis with Maxims may be a plausible candidate for *MLI^P* (Malamud & Stephenson, 2015). However, it is difficult to see how it could explain negative epistemic bias as in (45).

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[29] Westera's (2018) account expands the idea that a steep rise indicates a violation of more serious maxims. Within the clash between maxims, the Maxim of Quality is assumed to be the most important Maxim. Since IRDs signal a violation of the Maxim of Quality, they have steep rises.

(45)   A: (student) The answer to this problem is 5 because the square root

          of 9 is 2 and 2+3 is 5.

      B: (teacher) *The square root of 9 is 2?*

<div align="right">(Farkas & Roelofsen, 2017, p. 269)</div>

As he assumes that RDs would always intend to expand the *CG*, negative bias such as (45) is difficult to be explained.[30] Additionally, how to reconcile assertion, which is standardly associated with commitments, with inquisitive uses of RDs is another issue.

3.2.5 Malamud & Stephenson (2015)

Malamud & Stephenson (2015) develop an analysis of the tentativeness expressed by RDs in terms of projected commitment sets and metalinguistic issue (henceforth, *MLI^p*). *MLI^p* is an inquisitive issue having a non-singleton set, built on Ginzburg's (1996, 2012) idea on clarification requests (termed CRification). In case of non-interrogative rising intonation (NI-rise; i.e., RDs),

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[30] According to the pretense-based account, the teacher in (45) would be pretending not to be an authority. Meanwhile, an account based on a metalinguistic sense would assume that the teacher's intent can be explicated roughly as follows:

    (i) {Are you / you are} saying "the square root of 9 is 2"?

<div align="right">(Westera, 2017, p. 221)</div>

MLI^p signals the speaker's tentativeness toward the anchored proposition. Their model is summarized in (46).[31]

(46) **A utters p with an NI-rise**

(Proposition q is already in the *CG*.)

	Previously	after A's move (uttering p with NI-rise)
Table	$\langle\rangle$	$\langle MLI^p, \{p\}\rangle$
DC$_A$	{}	{}
DC$_A$*	{{}}	{{p}}
DC$_B$	{}	{}
DC$_B$*	{{}}	{{}}
CG	{q}	{q}
CG*	{{q}}	{{q, R1}, {q, R2}}

(Malamud & Stephenson, 2015, p. 295)

The core effect of NI-rises consists of two stages: adding MLI^p and p to the *Table* and adding p to the $DC_{sp}{}^*$. Since MLI^p takes the priority to be added to the stack, its two possible resolutions, $R1$ and $R2$, must precede the resolution of p. In the same vein, resolutions for MLI^p take priority to be updated in the CG^*. The issue regarding $\{p\}$ can be taken into consideration after the resolution of MLI^p. In terms of the proposition p, it is added to the $DC_{sp}{}^*$ in the first place, but if the addressee uptakes the move and resolves the

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[31] They assume two possible resolutions for MLI^p ($R1$ and $R2$) for the sake of simplicity, but it's worth noting that there can be more than just two potential resolutions.

metalinguistic issue on the *Table*, it would be moved to the DC_{sp}. The resulting effect is very similar to simply asserted p in the first place.

Their approach is advantageous for predicting Metalinguistic Uncertainty ARDs, but various other subtypes of RDs remain unaddressed. For example, how their proposed analysis can be extended to the case of Contradictory IRDs like (47) is left unexplained.

(47) [Context: Same as (42).]

    A: (mother) *This table is set?* Where are the wine glasses? Where are the napkins?

                         (repeated from (42))

In (47), the speaker is not committed to the proposition, but its negation ($\neg p$). One might attempt to apply the notion of MLI^p to negatively biased IRDs like (47), but to the best of my knowledge, it has nothing to do with reversing the interlocuter's epistemic bias.

Epistemic Uncertainty ARDs remain unaddressed as well. I assume that their own example in (48) can be predicted as an instance of such cases.

(48) [Context: A teacher **A** is quizzing a student **B** on state capitals. **B** isn't sure of the answer, but thinks it might be Albany:]

    A: (teacher) What's the capital of New York?

    B: (student) *It's Albany?*

In (48), employing rising intonation stems from the speaker's uncertainty on the truth of the proposition, not from the metalinguistic issue. [32] To recapitulate, their account runs into a problem in predicting cases like (47) and (48) with MLI^p.

3.2.6 Farkas & Roelofsen (2017)

Couched in the Inquisitive Semantics framework (Ciardelli et al., 2013, 2015, 2019, and references therein), Farkas & Roelofsen (2017) present discourse effects of IRDs. Their approach focuses on IRDs and sets ARDs aside, assuming that they are varying in semantic contribution. IRDs share an inquisitive sentence radical with their corresponding rising polar interrogatives although the former is more marked than the latter. RDs have special effect in that they signal the speaker's credence level. Based on this assumption, they propose the model in (49).

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[32] For alternative approaches to address this issue, consult Jeong's (2018a, 2018b) revised MLI^p as well.

(49) **Conventional discourse effects of a rising declarative**

When a discourse participant x utters a rising declarative φ, expressing the proposition $⟦ϕ⟧ = \{α, \bar{α}\}^↓$, the discourse context is affected as follows:

1. Basic effect

- The proposition expressed by φ, $⟦φ⟧$ is added to the **table**.

- The informative content of φ, $∪⟦φ⟧$, is added to **commitments(x)**.

2. Special effect

- $⟨α, [\text{zero, low}]⟩$ is added to **evidence(x)**.

(Farkas & Roelofsen, 2017, pp. 268-269)

Their model has an advantage in negative bias with zero evidence. Recall (42).

(50) [Context: Same as (42).]

A: (mother) *This table is set?* Where are the wine glasses? Where are the napkins?

(repeated from (42))

According to their model, the speaker's negative bias is implied by having, at best, a low level of confidence. In other words, it conveys a preference for ¬p over p.

However, their proposed analysis seems difficult to capture the case with a positive bias because the credence level of IRDs scales only from zero to low. To illustrate, consider (51), repeated from (9a).

(51) [Context: **B** is buying a ticket for a flight to Seoul at the airport.]

    A: (flight agent) There's one flight to Seoul.

    B: (customer) *The flight leaves at 10am?*

<div align="right">(repeated from (9a))</div>

In (51), speaker B assumes that p is more probable than $\neg p$: the credence level seems to be higher than the average.

3.2.7 Jeong (2018a, 2018b)

Jeong (2018a, 2018b) proposes a clear categorization between two types of RDs: ARDs are *tentative* assertions while IRDs are *biased* questions. Rising intonations, RISE-A (assertive rises) and RISE-I (inquisitive rises), call for a marked interpretation of morphosyntactically declarative utterances. ARDs are marked because they are essentially assertive but are paired with rising intonation, while IRDs are marked because they are essentially inquisitive but are paired with declarative syntax. Other elements like *CG*, *CG**, *DC_X*, and *Table* are defined identically with prior works (e.g., Farkas & Bruce 2010;

Malamud & Stephenson 2015). With these basic notions, the formal interpretation of ARDs is presented as follows:

(52) **Assertive Rising Declaratives** (content: $\{p\}$)

    a. Add p to a speaker's current commitment set, $\boldsymbol{DC_{sp}}$.

    b. Add $\{p\}$ to the ***Table***.

    c. Add MLI^p to the ***Table***.

<div align="right">(Jeong, 2018a, p. 336)</div>

In (52), ARDs update MLI^p to the *Table*, similar to Malamud & Stephenson (2015), where MLI^p it must be resolved prior to p by being placed at the top of the *Table*. However, her approach diverges from Malamud & Stephenson (2015) by further defining MLI^p along Gricean Maxims. Thus, her analysis can arguably elucidate Epistemic Uncertainty ARDs as a case where 'Quality' based MLI^p is raised.[33]

IRDs are argued to have different context update convention as follows:

(53) **Inquisitive Rising Declaratives** (content: $\{p, \neg p\}$)

    a. Add $\{p, \neg p\}$ to the current **Table**.

    b. Add p to the addressee's projected commitments set, $\boldsymbol{DC_{Ad}}^*$.

    c. cf. $[\![\text{POLAR-I}]\!] = [\![\text{INT}]\!] = \lambda p \lambda q\ [q = p \lor q = \neg p]$

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[33] In case of Malamud & Stephenson (2015), MLI^p is primarily about 'Relevance'.

The sentence radical is identical with IRDs and polar interrogatives, but the former additionally updates the positive answer p to the $DC_{ad}{}^*$. Regarding bias, she argues that (53) addresses both biases. Specifically, negative bias arises from redundancy, as illustrated below.

(54) A: You should apologize to Sam. t_1

   B: *I was wrong and I should apologize?* t_2

   A: Yes, that's the right thing to do. t_3

   B: No way. You don't know the whole story. t_4

	A utters p in t_1	B utters p? in t_2	A utters *Yes* in t_3	B utters *No way* in t_4
Table	$\langle\{p\}\rangle$	$\langle\{p, \neg p\}\rangle$	$\langle\{p\}\rangle$	$\langle\{\neg p\}\rangle$
DC$_A$	$\{p\}$	$\{p\}$	$\{p\}$	$\{p\}$
DC$_A$*		$\{\{p\}\}$		
DC$_B$				$\{\neg p\}$
DC$_B$*				
CG	s_1	s_1	s_1	s_1
CG*	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\},$ $s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{\neg p\}\}$

(Jeong, 2018a, pp. 344-345)

According to Jeong (2018a, 2018b), speaker B's negative bias is expressed by the redundancy between two gray rows in t_2, DC_A and $DC_A{}^*$. Following (53), an IRD updates p to the $DC_{ad}{}^*$ (i.e., $DC_A{}^*$) even though p is already present in the DC_{ad} (i.e., DC_A), which results in redundancy. This redundancy triggers the pragmatic reasoning that the speaker has a reason to elicit further explanation or justification from the addressee. Her proposal elegantly accounts for cases of negative epistemic bias, but it's not clear how it can be expanded to (55).

(55) [Context: **A** has set up a game for **B**. **A** has placed various objects in a room, and asks **B** to follow her instructions. There are three vases in the room, of different sizes. Two vases are in front of **B**; the third, which is by far the largest, is behind him. **A** asks **B** to bring her the largest vase in the room. **B** moves toward the largest of the two vases in front of him, unaware that the largest vase is behind him.]

    A: *That's the largest vase?*

<div align="right">(Rudin, 2022, p. 348)</div>

In (55), the addressee's present and projected commitment sets are not redundant, yet the speaker still coveys a negative bias. To properly account the negative bias, the analysis to come entertains an alternative way of relaxing 'prior addressee utterance that entails p' to 'prior contextual

information that addressee thinks that p'.[34] Nonetheless, Jeong's (2018a, 2018b) overall idea that the inference of negative bias arises in cases where the prior context is such that the addressee is pivoted toward p (instead of being neutral) still holds.

3.2.8 Rudin (2018a, 2022)

Adopting Jeong's (2018a, 2018b) key distinction between two fundamental types of RDs, Rudin (2018a) presents a formal pragmatic examination, drawing on Farkas and Bruce (2010). His assumption on the basic effect of utterance in relation to tone is presented in (56).[35]

(56) **The Basic Discourse Effect of Utterance**

For any utterance u: $\langle sp, s, t, c_n \rangle \rightarrow c_{n+1}$,

a. $T_{n+1} = T_n + [\![s]\!]$

b. modulo the effect of t, in all other respects $c_{n+1} = c_n$

(Rudin, 2018a, p. 19)

His assumption on the contributions of falling intonation (H*L-L%) and rising intonation (L*H-H%) on the utterance function in (56) is as follows: (i)

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[34] Related discussion will be presented in §6.2.
[35] Glossing the details, sp is a speaker, s is a sentence, t is a tune, c is a context, and T is the *Table*.

H*L-L% adds the informative content of a sentence in the speaker's commitment ($DC_{a,n+1} = DC_{a,n} + \cup[\![s]\!]$) and (ii) L*H-H% adds W, the denotation of $\{p, \neg p\}$ that makes the commitment trivial ($DC_{a,n+1} = DC_{a,n}$).[36]

He also assumes a pragmatic competition between discourse move minimal pairs. Falling declaratives and RDs constitute a minimal pair, but the distinction lies in the fact that the former commits the speaker to p while the latter does not, because of the conventional effect of the rising intonation. RDs also constitute a minimal pair with rising polar interrogatives, only differing in whether $\neg p$ is contained in the issue. (57) is the summary of proposed minimal pairs.

(57) **Minimal Pairs**

	L*H-H%	H*L-L%
Dec	Rising Declarative	Falling Declarative
Int	Rising Polar Interrogative	Falling Polar Interrogative

(Rudin, 2018a, p. 59)

Minimal pairs in (57) compete with each other: If the two discourse moves comprise a minimal pair, one move m triggers the conventional inference that m', the other pair, would be uncooperative.

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[36] This convention is from Inquisitive Semantics (e.g., Ciardelli et al., 2013, 2015, 2019). See §4.1 for more detail.

The specific convention of RDs stems from the competition between their minimal pair, rising polar interrogatives. If the speaker chooses an RD, a polar interrogative would be uncooperative. The only source for being uncooperative is $\neg p$ since they both contain p: The semantic content of RDs is a singleton $\{p\}$ while the issue of rising polar interrogatives is a non-singleton $\{p, \neg p\}$. In other words, projecting $\neg p$ to the *CG* would violate the maxim of QUALITY. As the speaker chose not to commit to p (from the effect of the rising tune), it should be the addressee's private beliefs that prevent p to be added to the *CG*. To put it together, the speaker expects the addressee to say p is true, soliciting the addressee to commit to p.

Meanwhile, the bias of RDs arises from the pragmatic competition with the other minimal pair, falling declaratives, which differs in whether the speaker commits to p. The uncooperativeness of a falling declarative when an RD is opted for is due to the violation of QUALITY. Both positive and negative bias can be predicted by the Maxim of QUALITY: the speaker has limited evidence (positive bias) or the speaker knows the proposition is false (negative bias). To illustrate a positive bias, see (58).

(58) [Context: The ship's captain **A** is consulting with the android who maintains the ship about the logistics of their colonization voyage.]

    A: *We have, what, eight more recharge cycles to go before we go to Origae-6?*

<div align="right">(Rudin, 2018a, pp. 72-73)</div>

The speaker in (58) supposes that the addressee will commit to p. With the pragmatic assumption of opting for RDs instead of rising polar interrogatives, the speaker has a positive bias toward p. In contrast, (59) exemplifies a negative bias.

(59) [Context: A student **A** is solving a math problem in front of the class.]

    A: (student) The answer to this problem is 5 because the square root of 9 is 2 and 2 + 3 is 5.

    B: (teacher) *The square root of 9 is 2?*

       (Rudin, 2018a, p. 73; from Farkas & Roelofsen, 2017, p. 269)

As speaker B in (59) is extremely knowledgeable on the falsity of p, it would be uncooperative for them to commit to it, which leads to their negative epistemic bias.

In later work (Rudin, 2022), he expands the idea by applying the pragmatics with the style of Optimality Theoretic (OT) tableaux (Prince & Smolensky, 2004).[37] The cooperative use of RDs, not violating any maxims,

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[37] The informal definition of the four maxims provided by Rudin (2022) is as follows:

(i) INFORMAL DEFINITION OF MAXIMS
    a. SINCERITY (SIN)
        1. Do not commit to a proposition if you know it to be false.
        2. Do not commit to a proposition if you don't know it to be true.
    b. PUBLICITY (PUB)
        1. Commit to the content of the Issue you raise, modulo SINCERITY.
        2. Do not commit to a proposition if you don't know it to be true.
    c. VIABILITY (VIA)
        1. Do not project a *CG* if it is incompatible with some interlocutor's commitment.

predicts positive bias. In the OT tableau, RDs are cooperative when the speaker is not sure about the truth of p but considers that the addressee believes p. Conversely, being minimally uncooperative, violating the least important Maxim (only VIABILITY: assert p even they know that their addressee believes $\neg p$), results in negative bias as in (60).[38]

(60) **Tableau for Negative Bias**

$p \uparrow$	SIN	PUB	VIA	COMP
$\langle sp(p), ad(p) \rangle$		*		
$\langle sp(p), \neg ad(p) \rangle$		*		
$\langle sp(p), ad(\neg p) \rangle$		*	*	
$\langle \neg sp(p), ad(p) \rangle$				
$\langle \neg sp(p), \neg ad(p) \rangle$				*
$\langle \neg sp(p), ad(\neg p) \rangle$			*	*
$\triangleright \langle sp(\neg p), ad(p) \rangle$			*	
$\langle sp(\neg p), \neg ad(p) \rangle$			*	*
$\langle sp(\neg p), ad(\neg p) \rangle$			*	*

(Rudin, 2022, p. 374)

In (60), none of the speaker's utterance can receive a cooperative interpretation, but rather exhibits minimal uncooperativeness. This

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2. Do not project a CG if you have reason to believe it is incompatible with some interlocutor's private beliefs.
   d. COMPREHENSIVENESS (COMP)
     1. Project a comprehensive CG^{*}, modulo VIABILITY.

(Rudin, 2022, pp. 363-365)

[38] The importance of four maxims is ordered as: SINCERITY > PUBLICITY > VIABILITY > COMPREHENSIVENESS, from the most to the least.

uncooperativeness violates the fewest and least important constraints, as shown in the seventh column. From the assumption that the speaker is well-aware of *p*, the only cooperative cell is excluded. Meanwhile, in the minimally uncooperative cell, the speaker violates VIABILITY, making the context be characterized as a situation involving speaker pretense.

However, expanding his account to ARDs is remained as an open question. To illustrate, see (61).

(61)   A: Do you know if John has any female relatives?

        B: (Um...) *John has a sister?*

<div align="right">(Jeong, 2018a, p. 310)</div>

His approach may capture the speaker's assumption on the probability of the addressee's belief on *p*, but at the same time, speaker B is apparently giving new information.

A similar problem is observed as well when metalinguistic issues are involved. See the example in (62).

(62)   A: Do you speak Spanish?

        B: *I speak Ladino?*

If we follow Rudin (2018a), speaker B would not have commitments due to rising intonation. However, the speaker in (62) is committed to the

proposition that they speak Ladino and, additionally, do not believe that it is likely for the addressee to hold the belief in p.[39]

3.2.9 Goodhue (2021)

Also building on Jeong (2018a, 2018b), Goodhue (2021) tries to give a unified account which relies heavily on pragmatics.[40] His experimental result shows that Incredulous IRDs (arguably identical to Contradictory IRDs in my terms) have a steep rise to higher H%, while Confirmative IRDs have a shallow rise to lower H% akin to ARDs.[41]

His main proposal is that rising intonation contributes to a not-at-issue lack of speaker commitment which stems from related issues that may not necessarily to be a propositional content. For the purpose of the flexibility to bring both ARDs and IRDs into the fold, sparse dynamic pragmatics is supposed. The only semantic convention is to add the issue to the *Table*. That is, clause types and intonations do not immediately determine the illocutionary force by their combination. The addressee needs to rely on some

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[39] Rudin (2018a, 2022) would say that the rising tune associated with ARDs is associated with a different convention, but what it is remains to be seen as he explicitly mentions that he is restricting his discussion to IRDs.

[40] Goodhue (2021) simplifies Jeong's (2018a, 2018b) paradigm of RDs. He assumes that Contradictory IRDs are a special kind of Incredulous IRDs. I also agree Contradictory IRDs and Incredulous IRDs are closely related but in different hierarchical order. As opposed to Goodhue (2021), I propose Mirative IRDs (i.e., Incredulous IRDs of Jeong (2018a, 2018b)) are a special kind of Contradictory IRDs with mirativity being added. See §6.1.3 and §6.2.3 for the justification of the claim.

[41] I suspect this may be related to the bias of the speaker: the high rise might be related to a negative epistemic bias. ARDs and Confirmative IRDs convey positive bias, while Contradictory IRDs convey negative bias (§6.1.1).

amount of additional pragmatic inference to determine the intention of the speaker.

He follows Rudin (2018a) in separating QUD from the *Table* and assumes the context as a tuple, $\langle CG, \textit{Table}, QUD \rangle$.[42] By default, rising intonation denotes the lack of the speaker's commitment to proposition q, identified with the content p. In special contexts where the speaker is more knowledgeable than the addressee, q is not p itself but some proposition such that $q \cap p$ addresses the QUD.

With more burden on pragmatics, the default effect of utterances of any declarative or interrogative form is proposed as shown in (63).

(63) UTTERANCE $(\phi, c_n) \rightarrow c_{n+1}$ such that

    a. $T_{n+1} = T_n + [\![\phi]\!]$

<div align="right">(Goodhue, 2021, p. 961)</div>

Following Hamblin (1973), all declaratives have identical semantic denotation $\{p\}$; thus, so do RDs. As in (63), the only effect of the utterance is to add $[\![\phi]\!]$ to the *Table* without having any commitments. Commitments

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[42] According to Rudin (2018a), the *Table* pertains to the specific details of what is currently at-issue and the possibilities for elliptical and anaphoric references based on the most recent move. The connection of discourse moves to the present line of inquiry is established through a QUD, which may persist for multiple moves and is not always determined by the latest move.

rather come from the pragmatic pressure to expand the *CG*, defined as follows:[43]

(64) **Pragmatic requirement of support for a proposition *p* in *I***

When an issue *I* is added to the table *T*, there is pressure for an interlocutor to add a proposition $p \in I$ to their discourse commitments.

(Goodhue, 2021, p. 962)

The pragmatic requirement in (64) diverges significantly from traditional approaches, as it posits that the fundamental function of discourse moves is to remove an issue from the *Table*. A representative example of ARDs is presented in (65).

(65) ASSERTIVE RISING DECLARATIVE

[Context: **A** is enrolling his daughter in a summer camp with the camp organizer **B**.]

A: I want to sign her up for Spanish classes in the mornings, and rock climbing in the afternoons.

B: Okay, there are limited places in each activity based on age group, and some of the age groups have already filled up for rock climbing. How old is your daughter?

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[43] Defining the relationship between *p* and *I* seems to remain unaddressed. However, I suppose that it would be pragmatically determined if we follow Goodhue's (2021) approach.

A: *She's nine?*

In (65), the rise signals the lack of the speaker's commitment to proposition *q* that addressees the QUD. The default assumption about the lack of the speaker's commitment is contextually overridden since Speaker A is in a better position than the addressee to tell their daughter's age. Consequently, the speaker is raising a second issue, the issue other than the primary at-issue: the answer may not address the larger QUD.

IRDs are based on the identical assumption despite the marginal difference in their function. See (66) for example.

(66) **INQUISITIVE RISING DECLARATIVE**

[Context: **A** and **B** are on their way to a birthday party for the daughter of **B**'s friend. They stop at a store to get a birthday card. As they are both scanning the display for a card for the correct age, **A** is trying to remember how old the girl has just turned, and he thinks he remembers **B** telling him that she just turned nine, but he wants to confirm it.]

A: *She's nine?*

As the rise signals the lack of the speaker's commitment to the proposition, the conversation requires the addressee to commit to *p* by providing an answer.

Since RDs are declaratives, the proposition that the addressee is expected to be committed is a singleton set, unlike polar questions. This leads to a contextual bias. If the speaker had no bias, she would use polar questions instead.

Although Goodhue's (2021) approach provides a unified approach to RDs, a few issues remain. While the propositional tentativeness is limited to IRDs in Goodhue (2021), ARDs may be triggered by propositional tentativeness as well. To illustrate, see (67).

(67)   A: I heard Jane has a younger sister. How old is she?

           B: (Um…) *She's nine?* But I'm not sure.

Intuitively, speaker B's answer with an ARD is clearly relevant to the QUD. This suggests the need for further discussion.

3.3 Summary

Tale 3.1 summarizes how each of the previous studies explain the paradigm outlined in §2.1.[44]

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[44] MAYBE suggests that an explanation may be feasible but pose difficulties due to a variety of factors.

Table 3.1 Summary of Previous Studies

	ARDs		IRDs	
	Epistemic Uncertainty	Metalinguistic Uncertainty	Confirmative	Contradictory[45]
Hirschberg & Ward (1995)	NO	YES	NO	NO
Gunlogson (2003)	NO	NO	YES (with contextual evidence)	YES
Gunlogson (2008)	NO	NO	YES	NO
Poschmann (2008)	MAYBE	MAYBE	YES	MAYBE
Westera (2013, 2014, 2017, 2018)	YES	YES	YES	NO
Malamud & Stephenson (2015)	NO	YES	NO	NO
Farkas & Roelofsen (2017)	NO	NO	NO	YES
Jeong (2018a, 2018b)	YES	YES	YES	YES (with the addressee's prior commitment[46])
Rudin (2018a, 2022)	NO	NO	YES	YES
Goodhue (2021)	NO	YES	YES	YES

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[45] None of the previous works provide a formal analysis of Mirative IRDs, the subtype of Contradictory IRDs (see §6.1.3 and §6.2.3; c.f. Goodhue, 2021).

[46] With the weakening of this, while maintaining the broader ethos, it may extend to other supposedly problematic cases.

Part II

Formal Analysis

Chapter 4

Interpretation

Built on previous analyses presented in the previous chapter, I aim to propose a fine-grained model for the semantics and pragmatics of RDs. In this chapter, I present an overview of how rising intonation affect the conventional discourse effect of declaratives.

In §4.1, I present the necessary framework for constructing a comprehensive model of interpretive effects and delve into the interaction between semantics and pragmatics in shaping the interpretation of conveyed meaning. §4.2 explores the overriding influence of rising intonation on the conventional discourse effects, especially on semantic content and discourse components.

4.1 The Framework

4.1.1 Semantic Content

It is widely accepted (e.g., Farkas & Bruce (2010)) that declaratives denote a singleton set $\{p\}$ (Hamblin, 1971), while polar interrogatives denote a non-singleton set $\{p, \neg p\}$ (Karttunen, 1977). Due to the identical syntactic form with falling declaratives, RDs are often regarded as having a singleton set as their semantic content (e.g., Gunlogson, 2003; Malamud & Stephenson,

2015). On the contrary, some authors who focus on the inquisitive illocutionary functions of RDs assume that they denote a downward closed non-singleton set (e.g., Truckenbrodt, 2012; Farkas & Roelofsen, 2017). However, I argue that RDs have options for both types of semantic content (i.e., a singleton set or a non-singleton set), following Jeong (2018a, 2018b): ARDs denote $\{p\}$ whereas IRDs denote $\{p, \neg p\}$.

To model the semantic content of RDs, I adopt the framework of Inquisitive Semantics (Ciardelli et al., 2013, 2015, 2019, and references therein) and begin by providing a brief introduction. In possible worlds semantics, a sentence expresses a proposition which denotes a set of possible worlds. However, in Inquisitive Semantics, a sentence not only conveys informative content but it also expresses inquisitive content by raising an issue. The informative content of proposition P is the union of all downward closed sets of information states: $\mathbf{info}(P) = \cup P$.[47] If the informative content is non-trivial (i.e., info(P) $\neq W$, where W is the set of all possible worlds), P is informative. The inquisitive content of proposition P is a potential to raise an issue. In case inquisitive content is non-trivial (i.e., info(P) $\notin P$), P is inquisitive. In other words, when its informative content is 'not sufficient to settle the issue' (Ciardelli et al., 2019, p. 23), P is inquisitive. Figure 4.1 visually depicts these two contents.

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[47] Downward closed is defined as follows:

  (i) If I contains a state s, then it contains every t that contains at least as much information as s ($t \subseteq s$) as well.

<div align="right">(Ciadelli et al., 2019, p. 17)</div>

a. ⟦She is home⟧   b. ⟦Is she home?⟧
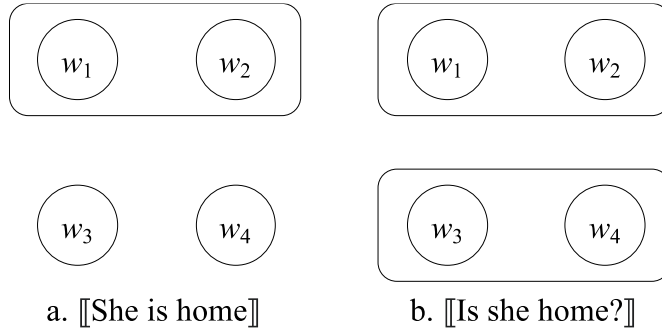
Figure 4.1 Simple Propositions

In Figure 4.1, w_1 and w_2 are the worlds where she is home and w_3 and w_4 are

worlds where she is not home. If the declarative *She is home* is uttered, the

speaker provides information that either w_1 or w_2 would be the actual world,

without requesting any further information. By contrast, if the interrogative

Is she home? is uttered, all worlds remain open to be the actual world. The

issue raised here requires further information to determine which of the

worlds, either $\{w_1, w_2\}$ where she is home or $\{w_3, w_4\}$ where she is not home

would be the actual world. Thus, (a) contains a single alternative, while (b)

contains two, and I will respectively refer to these as $\{p\}$ and $\{p, \neg p\}$. If the

issue contains a single alternative $\{p\}$, it is not inquisitive, while it is

inquisitive if it contains multiple alternatives $\{p, \neg p\}$.

Based on this intuition, Inquisitive Semantics proposes a two-

dimensional framework for representing propositions, as illustrated in Figure

4.2 (Farkas & Roelofsen, 2017).
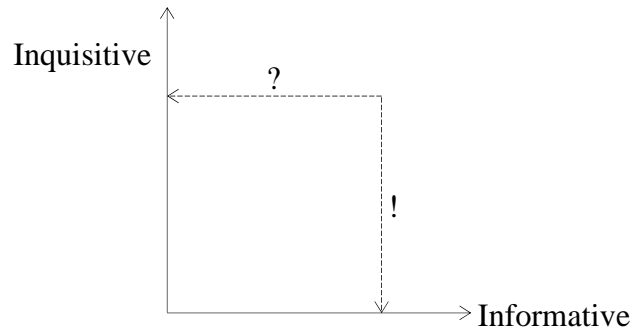
Figure 4.2 Informative Content and Inquisitive Content

In Figure 4.2, purely informative propositions are on the horizontal axis, where inquisitive content is trivial. Falling declaratives are non-inquisitive by default. Meanwhile, propositions on the vertical axis are purely inquisitive. Rising polar interrogatives are basically non-informative with informative content being trivialized. All other propositions of which informative and inquisitive content are both nontrivial are located off the axes.

I place RDs also off the axes where neither informative content nor inquisitive content is trivial.[48] In Figure 4.3, I identify the two main types of RDs.

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[48] I suppose other types of non-canonical interrogatives (e.g., tag questions, falling interrogatives, negative polar questions, etc.) can also be located off the axes. Due to space limitations, further discussions on other types are left for future work.
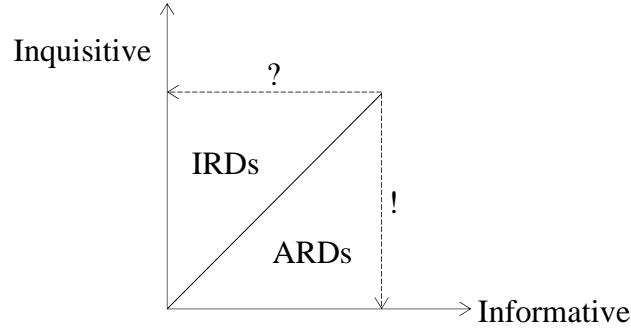
Figure 4.3 Informative Content and Inquisitive Content of RDs

In Figure 4.3, ARDs are located closer to the informative horizontal axis than to the inquisitive vertical axis. This demonstrates that ARDs are more informative than inquisitive. While primarily remaining as informative, ARDs are less informative than canonical falling declaratives as they are tentative assertions. On the other hand, the pattern is reversed for IRDs, as they are located closer to the inquisitive vertical axis: IRDs exhibit more inquisitiveness than informativeness. Compared with canonical rising polar interrogatives, IRDs are more informative since they convey additional information on the bias.

Derived from Figure 4.3, I propose that semantic content of RDs derives from the two distinctive types. ARDs denote $\{p\}$ as they are informative than inquisitive, whereas IRDs denote $\{p, \neg p\}$ as they are inquisitive than informative. It also matches our intuitive observation that ARDs are *assertion-like* while IRDs are *question-like*.[49]

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[49] In line with Rudin (2022), this is a simpler assumption which follows Hamblin semantics (Hamblin, 1973).

We can capture different semantic content of ARDs and IRDs from their substitution patterns. Falling declaratives and rising polar interrogatives correspond to ARDs and IRDs as a felicitous substitution of each.[50] Consider the case of ARDs below.

(68) **ARD (singleton set; {*p*})**

     A: Where's Sally?

     B: a. (Um...) *She's home?*

           b. She's home.

           c. #Is she home?

In (68), a falling declarative is the only acceptable substitution for an ARD. It stems from ARDs' informative property which makes them share assertive act with falling declaratives.

In contrast, rising polar interrogatives felicitously substitute IRDs. Consider the example in (69).

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[50] Obviously, ARDs and IRDs are not perfectly identical to falling declaratives and rising polar interrogatives, respectively, as can be also seen in Figure 4.3. For example, since IRDs are more biased than rising polar interrogatives, they are not interchangeable when strong neutrality is required, as in (i).

    (i) [Context: on a health insurance form:]
        a.   Are you married?
        b.   *#You're married?*
        c.   #You're married.

(69) **IRD (non-singleton set; {*p*, ¬*p*})**

[Context: **B** is buying a ticket for a flight to Seoul at the airport.]

    A: (airline agent) There's one flight to Seoul.

    B: a. (customer) *The flight leaves at 10am?*

          b. (customer) #The flight leaves at 10am.

          c. (customer) Does the flight leave at 10am?

Unlike (68), an IRD can only be replaced with a rising polar interrogative in (69c).

I take the substitution pattern above as evidence indicating that ARDs and falling declaratives share semantic content, represented as a singleton set {*p*} and IRDs and rising interrogatives share semantic content, represented as a non-singleton set {*p*, ¬*p*}.

Before closing, I will provide additional comments on the existing diagnostics for ARDs and IRDs. It is important to take the context into account since the context affects the diagnostic. Jeong (2018a, 2018b) extends the '*Yes*/*Oh*' test to RDs in the spirit of Gunlogson (2008).[51] In her analysis, *Oh* (with a falling intonation) is used as a response to ARDs, and *Yes* is used as a response to IRDs.

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[51] The original test is introduced to test falling declaratives.

(70) **ARD**

      A: Do you know if John has a close female relative?

      B: (Um...) *John has a sister?*

      A: **Oh**, I didn't know that. / #**Yes**, he does.

<div align="right">(Jeong, 2018a, p. 310)</div>

(71) **IRD**

      A: (an actor talking to a stage director) So, *my name is Wendy?*

      B: (stage director) **Yes**, we changed it from Molly, because we thought Wendy sounds friendlier. / #**Oh**, I see.

<div align="right">(Jeong, 2018a, p. 310)</div>

The ARD in (70) and the IRD in (71) respectively allow *Oh* or *Yes* as a felicitous response. The commitment source of *Yes* is the speaker themselves (Gunlogson, 2008), but *Oh* relies on the addressee's prior commitment and signals the receipt of new information (Heritage, 1984).[52] That is, *Oh* signals the contingent commitment of the speaker and to be targeted for the contingency, the speaker of the prior utterance (i.e., the addressee) must have a commitment.[53] ARDs convey the speaker's commitment, which can become the source of the contingency. In contrast, since IRDs do not commit

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[52] As Gunlogson (2008) notes, an explicit expression of prior ignorance (e.g., *Oh, I didn't know that*) following *Oh* makes the acknowledgment of new information more explicit.

[53] If the number of discourse participants is three or more, the speaker of the prior utterance may not be the addressee. However, I keep limiting the discussion to only two participants for simplicity.

the speaker to the expressed proposition, the other discourse participant cannot be contingent on IRDs but has to have their own source of commitment, which is implied by *Yes*.

However, we should aware that the result of '*Yes*/*Oh*' test is affected by the context. To illustrate, consider (72).

(72) [Context: The teacher **A** is quizzing the student **B** about state capitals.]

    A: (teacher) Where's the capital of Canada? t_1

    B: (student) (Um...) *It's Ottawa?* t_2

    A: **#Oh**, I see. / **Yes**, it is. t_3

In (72), as the RD at t_2 is an ARD, *Oh* is predicted to be a felicitous response. However, *Yes* is much more natural at t_3, due to speaker A's position of being more competent on the issue.[54]

In contrast, the response with *Oh* is felicitous in the following context:

(73) [Context: **A** asks her friend **B** about the answer to the crossword puzzle.]

    A: (student) Where's the capital of Canada? t_1

    B: (friend) (Um...) *It's Ottawa?* t_2

    A: **Oh**, I see. / **#Yes**, it is. t_3

---

[54] I assume that speaker B has projected their commitment and speaker A ratifies it with *Yes*. In my observation, projected commitment sets blur the clear binary differentiation of the diagnosis. The convention of ARDs and the process of ratification will be discussed in Chapter 5.

Contrary to (72), the context of (73) does not indicate that speaker A is more knowledgeable than speaker B. The two examples in (72) and (73) show that the '*Yes*/*Oh*' test is affected by discourse context, also tracking the relative authority between speakers. In typical contexts, the speaker's authority is higher in assertions and ARDs, whereas the addressee's authority is higher in questions and IRDs. However, in a special context, such as following a 'quiz' question in (72), the speaker of a question has more authority, which renders the use of *Oh* infelicitous. Nonetheless, the RD in (72) remains an ARD. The diagnostics should not be considered as a necessary condition for characterizing something as ARDs (i.e., not all ARDs need be or can be followed by *Oh*). Rather, it's a sufficient condition (i.e., all RDs that are / can be followed by *Oh* are ARDs, not IRDs). The same applies to IRDs as well.

To summarize, I have discussed the semantic status of RDs and showed how they can bear both informative content and inquisitive content. In specific, ARDs convey $\{p\}$, while IRDs convey $\{p, \neg p\}$, and thus they can be substituted with falling declaratives and rising polar interrogatives given their overlapping semantic content. The discrepancy of RDs discussed in this subsection is summarized in Table 4.1.

Table 4.1 RDs in Comparison with Canonical Sentence Types

Types	Falling Declaratives	Rising Declaratives		Rising Polar Interrogatives
		Assertive Rising Declaratives	Inquisitive Rising Declaratives	
Semantic Content	Informative			Inquisitive
	$\{p\}$		$\{p, \neg p\}$	
Intonation	↘	↗		

4.1.2 Commitments

I now move on to the commitments of discourse participants. Canonically, falling declaratives convey the speaker's commitment to p while polar interrogatives do not convey any commitment (Farkas & Bruce, 2010).[55] When it comes to non-canonical sentence types (e.g., tag questions, rising declaratives), the commitments can be updated in a more diverse range of patterns.

Building on Malamud & Stephenson (2015), I will model commitments in terms of discourse participants' present and projected commitment sets (i.e., DC_{sp}, DC_{sp}^*, DC_{ad}, and DC_{ad}^*). The speaker can update all the discourse commitment sets except for the other interlocutor's present commitment (i.e.,

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[55] Alternatively, it is because the information of the issue (info(I)) of polar interrogatives is trivial (Farkas, 2022). This will be discussed in §4.5.

DC_{ad}) since every interlocutor is responsible for their own commitment. Therefore, I will consider only three types of commitments to model the discourse effects of RDs.[56]

The first type of commitment is the DC_{sp}. The proposition p is added to the DC_{sp} when the speaker has a doxastic belief (Farkas & Bruce, 2010) and thus it is related to the unacceptability of epistemic modals. For example, see (74).

(74) [Context: to a receptionist:]

    A: a. *Hi, my name is Mark Liberman?*

          b. #Hi, my name **may** be Mark Liberman.

          c. #Hi, my name **must** be Mark Liberman.

             (adapted from Pierrehumbert & Hirschberg, 1990, p. 290)

Considering that the speaker would not normally have tentativeness about their own name, the information about the name is in the DC_{sp}. Since speaker is fully committed to what they are asserting, lowering the assertive force with epistemic modals as in (74b) and (74c) would not be allowed.

The projected variant of the DC_{sp}, the DC_{sp}^{*}, is a tentative commitment of the speaker, which indicates the speaker's unsureness about the proposition. By definition, the DC_{X}^{*} is an expected next stage of a conversation (Malamud

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[56] Note that the DC_{ad} is needed as well to show the whole process including the final stage where the addressee is also fully committed to p.

& Stephenson, 2015). In the proposed model, I utilize this notion of the DC_X^* as a crucial step in context updates. Particularly, with the ratification of the other interlocutor, the content in the DC_X^* is automatically moved to the DC_X, in examples like (75).

(75)　　A:　Does John have a male relative?　　　　　　　　　　　　t_1

　　　　　B:　(Well...) *He has a brother?*　　　　　　　　　　　　　t_2

　　　　　A:　Are they close with each other?　　　　　　　　　　　t_3

Although speaker B is tentative on p at t_2, p functions as if it is in DC_B, expanding the CG at t_3. To put it simply, I assume p in DC_B^* has moved to DC_B with the ratification of the addressee (speaker A).

　　For the DC_{ad}^*, I will use the '*Really*' test as a diagnostic. The question with the adverb *Really?* indicates the speaker's desire to verify their assumption without committing to it. This is intuitively analogous to the definition of the DC_{ad}^*, i.e., the speaker's guess on the commitments of other participants. If this 'double-checking' *Really* occurs right after an RD as in (76), it emphasizes the presence of p in the DC_{ad}^*.[57]

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[57] The adverb *really* can also predict the presence of the DC_{ad}. Consider the example in (i).

　　(i)　A: He is here.
　　　　B: Oh, is he here? **Really?**

In (i), *really* is used after a polar interrogative, where addressee has committed to p.

(76)   A: Please apologize him.

        B: *I was wrong and I should apologize?* **Really?**

In (76), speaker B assumes that speaker A believes the expressed proposition from its overt assertion. Precisely, speaker B updates p to the $DC_{ad}{}^*$, and this is emphasized by the following *Really*.

In contrast, *Really?* is infelicitous without the speaker's suspicion.

(77) [Context: **A** is giving tips to **B**, who needs to interview a female relative of a friend.]

        A: You should talk to John. He has a few female members in the family.

        B: (Aha!) *John has a sister?* **#Really?**

(adapted from Jeong, 2018a, p. 308)

In (77), speaker B does not intend to implicate a dissent on the addressee's commitment, but rather seems to assent with it, which does not allow *really* to be followed. The difference between (76) and (77) lies in the speaker's bias toward the expressed proposition, which will be discussed in the next subsection.

4.1.3 Biases

Gunlogson (2003, 2008) shows that non-neutral (i.e., biased) sentences are infelicitous in the following scenario.

(78) [Context: In a job interview or on an application form:]

    a.   Have you been convicted of a felony?

    b.   #You've been convicted of a felony?

    c.   #You've been convicted of a felony.

    d.   #Haven't you been convicted of a felony?

    e.   #You've been convicted of a felony, haven't you?

As the given context strongly requires neutrality, only the unbiased utterance in (78a) is acceptable. The other utterances in (78b-e) are infelicitous and they are all biased (e.g., van Rooij & Šafářová, 2003; Romero & Han, 2004; Biezma & Rawlins, 2012), including the RD in (78b).

    As proposed earlier in Chapter 2, IRDs are biased toward either p (positive bias) or $\neg p$ (negative bias). However, ARDs can be only positively biased. This is because in order to assert a proposition, even tentatively, the speaker must assume that p is more probable than $\neg p$.

    The implication of bias in RDs can be tested by Negative Polarity Items (NPIs). It has been well known (e.g., Trinh & Crnič, 2011; Horn, 2016; Farkas

& Roelofsen, 2017; Rudin, 2018a) that RDs do not license NPIs, as shown in (79).

(79) **NPIs in Each Sentence Type**

    a. You didn't eat *any* cake.   NEGATIVE FALLING DECLARATIVE

    b. Did you eat *any* cake?   POLAR INTERROGATIVE

    c. #You ate *any* cake?   RISING DECLARATIVE

                                   (Rudin, 2018a, p. 81; italics mine)

While a negative falling declarative in (79a) and a polar question in (79b) license NPIs, an RD in (79c) does not license an NPI. NPIs are authorized under the condition with the presumption that the speaker lacks any specific justification to prefer p over $\neg p$ (Horn, 2016). This is also adopted by Farkas & Roelofsen (2017) and Rudin (2018a). Farkas & Roelofsen (2017) assume that NPIs are licensed when there is no evidence for the highlighted alternative (i.e., not biased). As RDs are disallowed to be accompanied with NPIs, they are biased.

    The compatibility with immediate dissent such as *No way* or *No, that's not true* makes negative bias more explicit. *No way* or other equivalent expressions of dissent indicate that $\neg p$ is the speaker's doxastic commitment. If they can be followed, RDs are negatively biased, but if not, they are positively biased. It is guaranteed by the speaker's consistency, constantly

having congruent commitments. (80) is an example of an RD with a negative bias.

(80) [Context: A mother **A** asks her child **B** to set the table and he does a particularly bad job of it but appears to consider the chore finished.]

 A: *This table is set?* **No way.** Where are the wine glasses? Where are the napkins?

(adapted from Farkas & Roelofsen, 2017, p. 276)

In (80), speaker A does not assume that the table is set, and this negative bias on the proposition allows for the following *No way*. On the contrary, when the speaker has a positive bias, such expressions are infelicitous. Consider the case of a positively biased RD in (81).

(81) [Context: **A** and **B** made plans two days ago to get drinks tonight. They haven't spoken about it since.]

 A: *We're still on for tonight?* #**No way.**

(adapted from Rudin, 2022, p. 346)

Considering that the speaker's intention is not to cancel their plan but rather to confirm it, the speaker is positively biased. In the given context, *No way* is infelicitous.[58]

4.1.4 Conventional Discourse Effects

Before proposing a formal model for RDs, I will revisit the conventional discourse effects (CDEs) of canonical declaratives and interrogatives in this subsection. I mainly refer to Farkas & Bruce (2010) and Farkas' (2022) model and expand it to RDs. In line with Hamblin (1971) and Inquisitive Semantics (Ciardelli et al., 2013, 2015, 2019, and references therein), Farkas (2020, 2022) identifies the semantic types of declaratives and interrogatives. Both declaratives and interrogatives denote a set of propositions, an issue *I*. Every proposition in the set *I* ($\cup I$; a union of *I*) is the informative content of an issue, info(*I*).

Based on the idea above, the basic CDE is specified as follows:[59]

(82) Basic CDE: updating c_i with *I*

    (i)   *Table$_o$ = Table$_i$* $\cup$ *{I}*

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[58] While the speaker of ARDs can have *No way* in the same turn, it is more natural for the speaker of IRDs to utter *No way* in the next turn. As IRDs are question-like, they require responses and it is more probable to postpone conveying a negative bias until the response of the addressee is made.

[59] Following Meriçli (2016), Farkas (2022) assumes that the anchor of the proposition in the CG^* is the addressee by default, but I will remain constant with the basic proposal made by Farkas & Bruce (2010).

(ii) $CG^*_o = CG^*_i \oplus I$

(iii) $DC_{sp,o} = DC_{sp,i} \cup \{info(I)\}$

<div align="right">(Farkas, 2022, p. 306)</div>

The discourse adds the issue to the *Table* (= 82i) and projects it to the CG^* (= 82ii), abbreviated by $\oplus$ (i.e., for each $p \in I$, the CG^* contains a future $DC_{X,o} = DC_{X,i} \cup \{p\}$). It also updates $info(I)$, a resolution of the issue placed on the *Table*, to the DC_{sp} (= 82iii).

Farkas (2022) adopts Faller (2002) that the difference between the discourse effects of interrogatives and declaratives comes from their issue. Following Farkas' (2022) basic CDE in (82), I will assume (83) and (84) as the CDEs of declaratives and interrogatives.[60]

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[60] In Farkas (2022), the original CDE supposes $DC_{sp,o} = DC_{sp,i} \cup \{info(I)\}$ for both (83) and (84). Although they share the update convention of the DC_{sp}, $info(I)$ differs throughout declaratives and interrogatives. Declarative sentences contain a unique alternative for I (the maximal set of these propositions) as in (i).

(i) a. The window is closed.
    b. $I = \{\{w\colon \text{The window is closed in } w\}\}$

(ib) shows that the speaker commits themselves to a unique alternative of the issue. In contrast, interrogatives contain more than one alternative as in (ii).

(ii) a. Is the window closed?
    b. $I = \{\{w\colon \text{The window is closed in } w\}, \{w\colon \text{The window is not closed in } w\}\}$

In (iib), I contains every alternative. Since $info(I) = W$, commitment to $info(I)$ is contextually trivial, making interrogatives non-informative. To put it simply, declaratives commit p to the speaker while interrogatives trivialize $info(I)$, functioning as if the speaker's commitment does not present.

However, while the CDEs of Farkas (2022) and mine in (83) and (84) share basic assumptions, my proposed analysis adds $\{p\}$ or $\{p, \neg p\}$ instead of $info(I)$. I assume that the propositional alternative denoted by an overt syntactic form can be placed in various commitments, not limited to the DC_{sp}. It is because $info(I)$ updated to other commitments is not trivial even for interrogatives. To model these without confusion, using $\{p\}$ rather than $\{info(I)\}$ is preferred. This will be clearer with models proposed in Chapter 5 and Chapter 6.

(83) CDE of declaratives

    (i)   *Table$_o$* = *Table$_i$* ∪ {p}

    (ii) $CG^*{}_o = CG^*{}_i$ ∪ {p}

    (iii) $DC_{sp,o} = DC_{sp,i}$ ∪ p

(84) CDE of interrogatives

    (i)   *Table$_o$* = *Table$_i$* ∪ {p, ¬p}

    (ii) $CG^*{}_o = CG^*{}_i$ Ū {p, ¬p}

I will further argue that rising intonation of an RD overrides the basic CDE of declaratives in (83). Even for IRDs, I assume that the basic model of discourse effect is declarative (Gunlogson, 2003; Rudin, 2018a; c.f., Farkas & Roelofsen, 2017; Jeong, 2018a, 2018b). Before proceeding to how rising intonation affects the basic CDE of declaratives, it is necessary to examine the interface between semantics and pragmatics in determining the intended interpretation as rising intonation also carries both semantic and pragmatic implications.

4.1.5 The Division of Labor

Presumably, the interpretation of an utterance involves both semantics and pragmatics. In detail, semantics are captured, as in much previous work, by

positing certain (i) semantic denotations and (ii) conventional discourse effects. Then, pragmatic reasonings are concerned with the discourse context or other linguistic and non-linguistic cues. In understanding this overall procedure, the important question is: how to allocate the labor of interpretive burden between semantics and pragmatics?

There are many previous approaches that address the problem, especially on sentence types and conventional discourse effects. Most of the latest prevalent approach (e.g., Gunlogson, 2008; Farkas & Bruce, 2010; Northrup, 2014; Malamud & Stephenson, 2015; Murray & Starr, 2021) assumes the role of both a semantic component and a discourse component, with a balanced division of labor between the two. Falling declaratives and polar interrogatives are associated with different conventions of use, as well as different semantic values. In expanded works on non-canonical types (e.g., Beyssade & Marandin, 2006; Malamud & Stephenson, 2015; Krifka, 2017), RDs, falling declaratives, and tag interrogatives are not differentiated at the semantic level, but associated with different conventions of use. Some other approaches place greater emphasis on the role of pragmatics, as observed in the works of Rudin (2018a) and Goodhue (2021), while Jeong (2018a, 2018b) takes a middle ground approach.

In line with the aforementioned works, I aim to propose a more fine-grained model for the semantics and pragmatics of RDs. In the next subsection, I will mainly propose two claims: (i) assertive and inquisitive meanings are conventionally derived and (ii) the speaker's intention to

convey one type over others and the addressee's understanding of this intention are associated with the discourse context.

4.2 Contributions of Rising Intonation

Previous researchers have made various proposals on the effect of rising intonation in RDs: (i) eliminating commitments (e.g., Gunlogson, 2008; Rudin, 2018a), (ii) adding metalinguistic issues (e.g., Malamud & Stephenson, 2015), (iii) indicating the violation of Gricean Maxim (e.g., Westera, 2013, 2017, 2018), or (iv) composing markedness (e.g., Farkas & Roelofsen, 2017). Departing from current accounts, I propose that rising intonation overrides the convention of falling declaratives in two distinct ways: (i) by increasing the inquisitive content of the proposition and (ii) by projecting discourse components. The former is conventionally marked, while the latter is context-dependent, and each will be discussed in the following subsections.

4.2.1 On Semantic Content

The first contribution of rising intonation is to increase the inquisitive content of the uttered proposition. I follow Jeong's (2018a, 2018b) experimental results on two types of RDs that the convention of ARDs and IRDs comes from their intonation. As discussed in §4.1.1, ARDs have a singleton set as

semantic content, while IRDs have a non-singleton set. The difference between semantic content in two fundamental types of RDs arises from the contribution of rising intonation, increasing the inquisitiveness of the semantic content. Specifically, a weak rise (H* H-H%) increases inquisitive content up to the point where it is no higher than informative content, which means that the proposition remains primarily informative, resulting in a singleton $\{p\}$. In contrast, with a steep rise (L* H-H%), inquisitive content surpasses informative content, and thus the content is shifted from a singleton set $\{p\}$ to a non-singleton set $\{p, \neg p\}$, turning the primary speech act into a question.

4.2.2 On Discourse Components

The second contribution of rising intonation is projecting discourse components. My proposed analysis is built on Gunlogson (2008) and Rudin (2018a). Gunlogson (2008) proposes that rising intonation indicates contingent commitment, to be dependent on the addressee's commitment. However, RDs need not be always dependent on the prior utterance from other interlocutors, as we have already discussed in §3.2.2. The example in (85) illustrates this point.

(85) [Context: **A** and **B** made plans two days ago to get drinks tonight. They haven't spoken about it since.]

    A: *We're still on for tonight?*

<div align="right">(Rudin, 2022, p. 346)</div>

The IRD in (85) does not require the addressee's prior utterance but it is merely the speaker's expectation toward the addressee (i.e., the $DC_{ad}{}^{*}$) which differs from Gunlogson's (2008) contingent commitment. To be contingent on speaker B's commitment, for example, speaker B should have their commitment (i.e., DC_B). However, the $DC_{ad}{}^{*}$ does not concern the actual commitment of the addressee, but only the best guess about the addressee's commitment made by the speaker. Therefore, while speaker A in (85) assumes that the addressee is committed to p, it does not necessarily mean that the commitment is contingent.

Rudin (2018a) argues that the final rising tone in an RD indicates the speaker's lack of commitment to its expressed proposition. Following some core ideas of this view, I analyze rising intonation as projecting commitments. However, note that in my proposal, rising intonation projects commitments, rather than indicating the lack of commitments. For example, the speaker can project p to either their own commitment ($DC_{sp}{}^{*}$) or the addressee's ($DC_{ad}{}^{*}$) with rising intonation. I further argue that the application of the projection can be expanded to other discourse components as well, especially the projected *Table* (*Table**), which will be defined in §5.1.2.

To recapitulate, the role of rising intonation is summarized as follows:

(86) **Two Contributions of Rising Intonation**

  a. *Contribution on the Semantic Content:*

    The information that is added to the *Table* becomes more or less

    inquisitive.

  b. *Contribution on Discourse Components:*

    The present discourse components (DC_{sp} and *Table*) are

    projected to the projected discourse components ($DC_{sp}{}^{*}$, $DC_{ad}{}^{*}$,

    and *Table**).

The remaining issue is how to systemize the exact contextual condition that determines (86b). In the remaining two chapters, I will focus on each subfunction of two main types of RDs and their interpretation process.

Chapter 5

Assertive Rising Declaratives

This chapter develops an analysis of the first major type of RDs, ARDs, by applying the model proposed in Chapter 4. I show that there are two subtypes of ARDs which are distinguished by their sources of tentativeness. I also demonstrate how each type is derived from contextual cues and argue that they have different commitment updating conventions although they denote the same semantic content, a singleton set $\{p\}$.

In §5.1, I put forward several modifications to previous analyses. §5.2 offers an in-depth analysis of the occurrences of ARDs within the given context, while §5.3 explores the specific ways in which each type of ARD updates the discourse context. Finally, in §5.4, a summary of the chapter is provided.

5.1 Proposals

5.1.1 Two Types of Uncertainty

I propose that RDs can express two different kinds of uncertainty, epistemic and metalinguistic, and reserve distinct context-update conventions. I argue that they differ in terms of how the speaker's tentativeness is triggered, and this difference calls for classifying ARDs into two subtypes: Epistemic

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Uncertainty ARDs and Metalinguistic Uncertainty ARDs. On the one hand, Epistemic Uncertainty ARDs convey the interlocutor's tentativeness to the truth of an expressed proposition. They are analogous to epistemic modals in the way of lowering the assertive strength (e.g., Šafárová, 2005; c.f. Poschmann, 2008). On the other hand, Metalinguistic Uncertainty ARDs express the speaker's uncertainty about whether they are adequately addressing the current QUD.

The tentativeness of RDs has often been attributed to metalinguistic issues (e.g., Hirschberg & Ward, 1995; Malamud & Stephenson, 2015; Jeong, 2018a, 2018b). That is, the speaker of an ARD is tentative because they are not sure about certain kinds of metalinguistic issues (Ginzburg, 1996, 2012) which are contextually provided. According to Malamud & Stephenson (2015), the speaker's tentativeness arises from postponing the resolution of the proposition until they complete the resolution of metalinguistic issues. Jeong (2018a, 2018b) expands MLI^p with systemic constraints of Gricean Maxim that can include epistemic tentativeness, incorporating the speaker's intention into a single concept of MLI^p. However, I propose an analysis that deviates from the notion of MLI^p and instead focus on the distinct context-updating conventions associated with each type of ARD.

To further elaborate the paradigm of ARDs, reconsider (7), repeated in (87), to illustrate the difference between the two.

(87) a. **EPISTEMIC UNCERTAINTY ARD**

[Context: **A** asks **B** where Sally is. **B** is not sure of Sally's whereabouts.]

A: Where's Sally?

B: (Um...) *She's home?*

b. **METALINGUISTIC UNCERTAINTY ARD**

A: Do you speak Chinese?

B: *I speak Cantonese?*

(repeated from (7))

Both ARDs in (87a) and (87b) convey the meaning of the speaker's tentativeness, but they differ in terms of about which they are unsure of. In (87a), the speaker is unsure about whether Sally is home. In contrast, (87b) does not express the speaker's unsureness on whether they speak Cantonese. It rather conveys meaning such as, e.g., 'Is this exactly what you're asking?'. That is, the speaker is questioning whether their response could be counted as an appropriate answer in accordance with.[61]

In what follows, I provide two pieces of evidence for the two subtypes of ARDs. First of all, they differ in terms of the close relationship between Epistemic Uncertainty ARDs and epistemic modals. Both of them express the speaker's lowered degree of certainty on the truth of the expressed proposition

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[61] Westera (2017) defines the relevance of the response to the main QUD as 'exhaustively' answering the question.

(c.f., Šafárová, 2005, 2007), as illustrated by the following example where an Epistemic Uncertainty ARD can by replaced by an epistemically modalized utterance.[62]

(88) [Context: Same as (87a).]

    A: Where's Sally?

    B: a. (Um...) *She's home?*

       b. She **must** be home.

       c. She **may** be home.

In contrast, Metalinguistic Uncertainty IRDs cannot be substituted with modal sentences.

(89)   A: Do you speak Chinese?

    B: a. *I speak Cantonese?*

       b. #I **must** speak Cantonese.

       c. #I **may** speak Cantonese.

Unlike (88), modal substitution is infelicitous in (89b) and (89c). This contrast between (88) and (89) provides significant support for my claim on the two different subtypes of ARDs; while Epistemic Uncertainty ARDs are

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[62] In this respect, Epistemic Uncertainty ARDs are arguably reminiscent of epistemic modals which are closely related to evidentials (e.g., Matthewson et al., 2007; McCready & Ogata, 2007; Lee, 2013; Faller, 2017; Kwon, 2018; Smirnova, 2021).

concerned with the truth value of the expressed proposition like epistemic modals, Metalinguistic Uncertainty ARDs have nothing to do with it.

Secondly, the parallel behaviors of Epistemic Uncertainty ARDs and epistemic modals are also observed in terms of modal subordination (Roberts, 1987, 1989). The examples of modal subordination are presented in (90).

(90)   a. A thief$_i$ might break into the house. #He$_i$ took/takes the silver.

         b. A thief$_i$ might break into the house. He$_i$ would take the silver.

                           (adapted from Roberts, 1989, p. 697)

In (90), the pronoun *he*, referring back to *a thief* in the preceding modal sentence, prevents the second sentence from occurring without a modal. The second sentence should be modally subordinated like (90b). It is noteworthy that the same pattern is observed in Epistemic Uncertainty ARDs, as shown in (91).

(91) [Context: Same as (87a).]

     A: Where's Sally?

     B: a. (Um...) *She$_i$'s home?* She$_i$ must have come from school early.

           b. (Um...) *She$_i$'s home?* #She$_i$ has come from school early.

In (91), the Epistemic Uncertainty ARD can be followed by a modal utterance, but the absence of a modal results in an infelicitous utterance.

On the contrary, Metalinguistic Uncertainty ARDs do not exhibit modal subordination.

(92)　　A:　Do you speak Chinese?

　　　　B:　a. *I speak Cantonese?* #I must be born in Hong Kong.

　　　　　　b. *I speak Cantonese?* I was born in Hong Kong.

In (92), the subsequent modal sentence after a Metalinguistic Uncertainty ARD makes the utterance infelicitous.

Rather than the truth-conditional meaning, the tentativeness of Metalinguistics ARDs is concerned with the relevance to QUD. Consider Roberts' (1996; 2012) definition of a relevant discourse move in (93).

(93) A move *m* is *Relevant* to the question under discussion *q*, i.e., to last (QUD(*m*)), *iff m* either introduces a partial answer to *q* (*m* is an assertion) or is part of a strategy to answer *q* (*m* is a question).

(Roberts, 2012, p. 21)

A relevant discourse move makes the discourse progress toward an answer to the current QUD (Rudin, 2018a). To illustrate, see the example in (94).

(94) [Context: **A** hasn't met **B**'s neighbor and **B** isn't sure if **A** wants to know

about neighborliness or suitability for dating.]

    A: What do you think of your new neighbor?

    B: *He's attractive?*

(Malamud & Stephenson, 2015, p. 280)

In (94), speaker B is uncertain about what the current QUD is, and they can expect at least two possible QUDs, e.g., 'How's the new neighbor's neighborliness?' or 'Is he suitable for dating?'. On the basis of their best guess, speaker B infers that the current QUD raised by speaker A is the neighbor's suitability for dating. This makes them utter *He's attractive*, hoping for their response to be relevant to the current QUD.

5.1.2 The Projected Table

To incorporate Metalinguistic Uncertainty ARDs into the Table model, I introduce a modified version of the 'projected' *Table* (henceforth, *Table*[*]; Malamud & Stephenson, 2012; Bhadra, 2020) which represent a tentative proposal of raising an issue.[63] Bhadra (2020) defines the *Table*[*] as an ordered stack which contains tentative issues (i.e., proposals to be added to the *Table*

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[63] Alternative approachs on the uncertainty may define *MLI*[p] in terms of the Gricean Maxims to be related with uncertainty (e.g., Jeong 2018a, 2018b). Specifically, uttering an ARD is considered as raising an *MLI*[p] that questions Grice's quality maxim.

for future resolution). I follow her account with the formulation of the *Table** as a stack, but additionally provide a more restrained definition for the tentative issue: the issue which the speaker expects to be relevant to the current QUD. A further difference between her approach and mine comes from the CG^*. She claims that the tentative issue updated to the *Table** does not update the CG^*, but I argue that the issue on the *Table** also affects the CG^*, remaining consistent with Malamud & Stephenson (2012). Also, in treating the CG^* projected by questions, my approach aligns with the framework proposed by Farkas & Bruce (2010) and Malamud & Stephenson (2015) with a non-singleton set. In contrast, Bhadra (2020) deviates from these and adopts a singleton-set approach to polar interrogatives, which traces its roots back to Bolinger (1978).[64]

The *Table** is defined analogous to the DC_X^* and the CG^*, since they all reflect the expected next stage of conversation. Recall the definition of projected elements (Farkas & Bruce, 2010; Malamud & Stephenson, 2015). The CG^* is a set of potential future CGs relative to the at-issue content on the *Table*. Likewise, the DC_X^* is a tentative commitment of the speaker (the DC_{sp}^*) or the speaker's expectation or guess to the commitment of other participants in the discourse (the DC_{ad}^*). Thus, the DC_X^* also represents the expected next stage of conversation. In the same way, the propositional content added in the *Table** represents the speaker's *expectation* to be relevant to the current

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[64] Bhadra (2020) proposes SalientAlts, which is provided by the context, to capture the interrogative force of polar interrogatives.

QUD.[65] Therefore, updating semantic content to the *Table** reflects, at the same time, the speaker's uncertainty on the relevance (Roberts, 1996, 2012) to the current QUD and their expectation of the information becoming relevant to it.

Following the discussion above, I revise basic discourse components in (23) as follows:

(95) **Discourse Components** (final)

   a. **Common Ground** (***CG***): the set of propositions that all speakers are publicly committed to (Stalnaker, 1978)

   b. **Discourse Commitment** (***DCx***): the set of propositions that the speaker has publicly committed to during the conversation up to the relevant time, and which are not shared by all the other participants (Farkas & Bruce, 2010)

   c. **Table** (***T***): the stack that records at-issue content in the conversation (Farkas & Bruce, 2010)

   d. **Projected Common Ground** (***CG****): the set of potential *CG*s that gives possible resolutions for the top issue on the *Table* in the next expected stage of the conversation (Farkas & Bruce, 2010; Malamud & Stephenson, 2015)

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[65] For rising imperatives, splitting the *Table* into doxastic and teleological halves has been proposed (e.g., Rudin, 2018b; Ihara & Asano, 2020). However, my proposal on RDs differs in that both the *Table* and the *Table** are doxastic, remaining consistent with the original idea of Farkas & Bruce (2010).

e. **Projected Discourse Commitment (DC_X^*)**: the set of propositions that the speaker is expected to become committed to or the best guess of commitments made by other interlocutors (Malamud & Stephenson, 2015)

f. **Projected Table (T^*)**: the stack that records at-issue content which the speaker expects to be relevant to the current QUD (Malamud & Stephenson, 2012; Bhadra, 2020)

I also propose the following operational mechanism of the *Table** (T^*).

(96) **Stack Operations on the *Table** (T^*)**

a. *push* (*e*, T^*) represents the new stack obtained by adding item *e* to the top of the stack T^*.

b. *move* (*e*, T^*, *T*) represents the stack obtained by moving the topmost occurrence of *e* from stack T^* to the top of stack *T*.

(96a) is applied to the *Table* as well, as we have already seen in (25). The key proposal lies in the *move*-operation in (96b). The conversation reaches a stable state when an issue under discussion is *removed* from the *Table* by becoming a joint commitment. If the relevance to the current QUD is not guaranteed, the issue in the *Table** cannot be directly *removed*. It should first *move* to the *top* of the *Table* by the addressee's ratification on the relevance. When an item is moved from the *Table** to the *Table*, it should move to the

top of the stack since a topmost item in the *Table* represents the current topic of the discourse. I will schematize the operations of the *Table** in §5.3.2.

5.1.3 Politeness Effects

Before discussing how the proposed analysis can account the politeness use of ARDs, I first explain politeness and its relation to rising intonation. Traditionally (e.g., Brown & Levinson, 1987), politeness is considered to be closely related to the notion of 'face' (Goffman, 1967) which is 'the public self-image that every member wants to claim for himself' (Brown & Levinson, 1987, p. 61). The face consists of two aspects: (i) the want to be unimpeded by others (POSITIVE FACE) and (ii) the want to be desirable (NEGATIVE FACE). The politeness strategy is related to independence or indirectness (Leech, 1983; Blum-Kulka, 1987) which aims to avoid the situation of losing face, being humiliated or being embarrassed. Indirect illocutions are assumed to be more polite for two reasons (Leech, 1983): (i) by increasing the degree of optionality and (ii) by having more diminished and tentative force.

The series of literature has noted that politeness is generally associated with our pragmatic reasoning (e.g., Clark & Schunk, 1980; Brown & Levinson, 1987; Leech, 1983, 2014). However, the role of semantic

conventions for politeness associated with intonation as in (97) remains unresolved.[66]

(97)   A: Do you want a glass of water?

        B: *I'll have a beer?*

(Ladd, 1980, p. 153)

Speaker B in (97) is using an ARD to refuse the suggestion from speaker A. By using a 'politeness softening' RD (Ward & Hirschberg, 1985), the speaker can be more polite than using its falling counterpart (Jeong & Potts, 2016). As refusing is a critical face threatening act which results in impoliteness, the speaker tries to minimize the chance to threaten the addressee's face by using a rising terminal contour. Thus, a rising tone indicates polite indirectness (Leech, 1983).[67] Since the rising tone is related to politeness, both types of ARDs, Epistemic Uncertainty ARDs and Metalinguistic Uncertainty ARDs, can be a strategy for politeness.

    In (97), the politeness is closely related to commitment. Compared with its corresponding falling declarative, the ARD in (97) sounds more polite as if requesting the addressee's ratification on the speaker's tentativeness. This

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[66] By semantic conventions of politeness, I refer to the property of politeness which is not derived from the context.

[67] Excessive indirectness can be instead related to impoliteness. See Blum-Kulka (1987), Terkourafi (2015), and Chapter 7 for relevant discussion.

type of politeness is driven by Epistemic Uncertainty ARDs which express the speaker's lowered degree of commitment.

It is noteworthy that a different kind of polite ARDs which is irrelevant with commitments is found as well.

(98) [Context: A waiter **A** is introducing himself.]

      A: a. Hello, *my name is David? I'm your waiter today?*

           b. Hello, my name is David. I'm your waiter today.

In (98), although the propositional content expressed by (98a) is identical to that of its falling counterpart in (98b), the speaker is being more polite with rising intonation. Intuitively, one would have a full commitment to his own name and occupation. Therefore, the politeness in (98a) is not due to the lowered commitment like in (97). It is rather because of the speaker's pretense as if they are tentative on the proposition's relevance to the current QUD. This kind of politeness is observed in Metalinguistic Uncertainty ARDs. In summary, both subtypes of ARDs, characterized by their tentativeness, can serve as a politeness strategy.

To come up with a precise account, I will adopt Jeong's (2018a, 2021) modified assumptions on politeness. In contrast to Brown & Levinson (1987), she assumes that alternatives can be ranked on a continuum of politeness. Furthermore, she associates politeness with enhancing the addressee's face (Clark & Schunk, 1980), and that the addressee's perspective plays a critical

role in evaluating inferences of politeness. In §5.3.3, I will show that my proposed analysis matches these assumptions.

Note that, unlike my approach, Jeong (2018a, 2021) predicts the politeness effect of ARDs based on the operation of MLI^p. According to her perspective, by opting for an ARD rather than a falling declarative, the speaker raises an MLI^p, instead of directly being committed to p. This comes out with a dual effect. First, with the MLI^p, the speaker is checking with the addressee about the uttered proposition, for example, its relevance. Second, as MLI^p is an inquisitive issue, it projects multiple CG^*s, providing the addressee with more options to choose from. As a result, ARDs are typically perceived to be more polite than falling declaratives. Although the process of operation differs, the politeness effect of RDs analyzed by Jeong (2018a, 2021) remains valid and will be discussed in §5.3.3.

5.2 Contextual Interpretation

The response to the current QUD of a non-singleton set $\{p, \neg p\}$ can have arguably three possibilities regarding its truth condition: p, $\neg p$, or unsure whether p or $\neg p$. Epistemic Uncertainty ARDs implicate the last option, the speaker's tentativeness on the truth value of the expressed proposition. To explicitly convey the speaker's tentativeness on p, expressions such as *I'm not sure* can be used. To illustrate, consider (99).

(99) **Assertive Rising Declaratives**

    a. EPISTEMIC UNCERTAINTY

        [Context: **A** asks **B** where Sally is. **B** is not sure of Sally's whereabouts.]

        A: Where's Sally?

        B: **I'm not sure.** (Um...) *She's home?*

    b. METALINGUISTIC UNCERTAINTY

        A: Do you speak Chinese?

        B: **#I'm not sure.** *I speak Cantonese?*

The use of truth conditional uncertainty expression *I'm not sure* is only felicitous in the case of Epistemic Uncertainty ARDs. However, considering (99b), supplementary markers indicating the potential uncooperativeness of the speaker and the violation of the relevance are necessary to make the statement more acceptable within the given context. For example, the expression *I'm not sure if this is what you're asking, but...* is one of hedges that indicates the speaker's intention to opt out of the maxim. This additional expression stems from the proposition not directly targeting the QUD.

    I argue that this contextual information regarding the relevance to the QUD determines the specific paradigm of ARDs. When the relevance is clear enough, the type of uncertainty in ARDs is epistemic, but when it is unclear, it is metalinguistic. This can be captured by comparing the semantic content of the current QUD and the ARD. Specifically, an ARD that conveys a

proposition that is a subset of the current QUD is construed as an Epistemic Uncertainty ARD, whereas an ARD that conveys a proposition that is not a subset of the current QUD is understood as a Metalinguistic Uncertainty ARD. For example, in (99a), the content of an ARD is {*Sally is home*}. This proposition is a subset of the current QUD, {*Sally is home*, *Sally is at school, Sally is at the café, Sally is at the gym, ...*}, which is updated to the topmost stack of the *Table* (i.e., $p \in P$). In contrast, in (99b), {*I speak Cantonese*} is not a subset of {*I speak Chinese*, *I don't speak Chinese*} (i.e., $p \notin P$).[68] This result correctly categorizes (99a) as an Epistemic Uncertainty ARD and (99b) as a Metalinguistic Uncertainty ARD.

The process of interpreting ARDs can be summarized as follows:

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[68] Roberts (1996; 2012) interprets a question as a set of its alternatives and the answer to a question can be either partial or complete by being compared with the alternatives. Note that the inclusion relation I propose is not affected by whether it is partial or complete. To provide an example, consider (i) from Roberts (2012).

(i) Who did Mary invite?

If we restrict the domain as {Mary, Alice, Grice}, the denotation of (i) would be (ii).

(ii) {*Mary invited Alice*, *Mary invited Grice*}

Based on (ii), the sets of complete answers to the question are those which entail one member of the set, as shown in (iii).

(iii) {*Mary invited Alice and Grice*, *Mary invited Alice but not Grice*, *Mary invited Grice but not Alice*, *Mary invited nobody*}

Both Epistemic Uncertainty ARDs in (iv), where (iva) is a partial answer and (ivb) is a complete answer, can be used to answer (i).

(iv) a. *Mary invited Alice?*
      b. *Mary invited Alice and Grice?*

It also corresponds with the definition of Relevance given in (93): a move is relevant to the current QUD if it introduces a partial answer of is part of a strategy to answer (Roberts, 1996; 2012).

(100) **Division of Labor in Interpreting ARDs**

    a. Default Form (i.e., the CDE of falling declaratives)

        (i) *top* $(T) = \langle \{p\} \rangle$

        (ii) p in DC_{sp}

    b. Interpretation

        1. *Semantic Convention*

            A weak rise increases inquisitive content up to the point where it is no higher than informative content.

        2. *Pragmatic Reasoning*

            ▪ If $p \in \mathrm{P}$, epistemic uncertainty use of ARDs is allowed.

            ▪ If $p \notin \mathrm{P}$, metalinguistic uncertainty use of ARDs is allowed.

    c. Discourse Effects

        1. The proposition remains primarily informative, resulting in a singleton set $\{p\}$.

        2. Corresponding discourse components are projected.

Once the conventional meaning of ARDs is established, the specific type is determined by the context, and discourse components are projected as a consequence.

5.3 Paradigms

In this section, I delve into the specific interpretation process and the resulting discourse effect of each ARD. I aim to demonstrate the formalization of each ARD in relation to their specific discourse effects.

5.3.1 Epistemic Uncertainty

The first subtype of ARDs is Epistemic Uncertainty ARDs. They denote a singleton set $\{p\}$, as they can be felicitously substituted with falling declaratives, but not with polar interrogatives.

(101) [Context: **A** and **B** are sorting paint cans in a store into a 'red' bin and an 'orange' bin. **B** points to orangish-red paint.]

    A: What color would you say this is?

    B: a. *It's red?*

         b. It's red.

         c. #Is it red?

                 (adapted from Malamud & Stephenson, 2015, p. 281)

The ARD in (101a) expresses that the speaker believes p but with a low degree of certainty. Without altering the context, it can be substituted with the falling

declarative in (101b), while the polar interrogative in (101c) is infelicitous for substitution. Furthermore, the use of Epistemic Uncertainty ARDs as a response to a polar interrogative provides additional evidence for their denotation of a singleton set.

Regarding the speaker's commitment, it is important to note the difference between the DC_{sp} and the $DC_{sp}{}^{*}$. I propose a context-update convention of Epistemic Uncertainty ARDs that updates p to the $DC_{sp}{}^{*}$ since the speaker is tentative on the truth value of the proposition itself. The contextual information in the following two examples makes it clear that the $DC_{sp}{}^{*}$ affects the felicity of Epistemic Uncertainty ARDs.

(102) [Context: **A** and **B** are looking at the picture of **B** and her brother. **A** asks the name of **B**'s brother.]

    A: What's his name?

    B: #(Um...) *He is Jimmy?* I'm not sure.

(103) [Context: **A** and **B** are watching an old movie. **A** asks the actor's name in the scene but **B** is not sure about it.]

    A: What's his name?

    B: (Um...) *He is Jimmy?* I'm not sure.

If the speaker is committed to an expressed proposition as in (102), an Epistemic Uncertainty ARD is infelicitous.[69] In contrast, in a context where the speaker is tentative about their commitment, an Epistemic Uncertainty ARD is felicitous as shown in (103).

Updating p to the $DC_{sp}{}^{*}$ is further supported by the parallel behaviors between Epistemic Uncertainty ARDs and their corresponding falling declaratives. Consider the example in (104).

(104) [Context: Same as (101).]

	A:	What color would you say this is?	t_1
	B:	*It's red?*	t_2
	A:	Yeah, I agree.	t_3

In (104), the issue is resolved without additional discourse moves. For an issue to be resolved from the *Table*, participants must reach a joint commitment. Therefore, p should be in DC_A and DC_B at t_3. If p has not been updated to speaker B's commitment sets (either DC_B or $DC_B{}^{*}$) at t_2 by speaker B themselves, joint commitment cannot be accomplished since speaker A cannot update DC_B. I analyze p as being updated to $DC_B{}^{*}$ by speaker B at t_2 and then being moved to DC_B by speaker A's utterance at t_3.

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[69] (102) is allowed if the speaker's primary intention is altered (e.g., *Why are you asking?*). However, this does not denote the speaker's epistemic uncertainty.

Lastly, nothing is updated to the DC_{ad}^* because Epistemic Uncertainty ARDs are used to *assert* the speaker's own tentative commitment, not to make a best *guess* on the addressee's commitments. This is supported by the 'Really' test.

(105) [Context: Same as (101).]

    A: What color would you say this is?

    B: *It's red?* **#Really?**

In (105), continuing the Epistemic Uncertainty ARD with *Really?* is infelicitous as the proposition has not been updated to the DC_{ad}^*.

On the basis of the discussion above, I define the discourse effect of Epistemic Uncertainty ARD as shown in (106).[70] For the sake of comparison, I repeat the CDE of falling declaratives (based on Farkas & Bruce, 2010; Farkas, 2020, 2022) in (107).

(106) **Discourse Effect of Epistemic Uncertainty ARDs** (updating c_i with $\{p\}$)

    (i) *Table$_o$* = *Table$_i$* $\cup$ $\{p\}$

    (ii) $DC_{sp}^*{}_{,o} = DC_{sp}^*{}_{,i} \cup p$

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[70] Since the convention of updating the CG^* can be automatically derived from its definition, I do not explicitly mention it in my model of discourse effects. Since the issue at the top of the stack (i.e., the *Table*) is projected, $\{p\}$ would be updated in the case of ARDs ($GG^*{}_o = CG^*{}_i \cup \{p\}$), and $\{p, \neg p\}$ would be updated in the case of IRDs ($CG^*{}_o = CG^*{}_i \cup \{p, \neg p\}$).

	A utters p?
Table	$\langle\{p\}\rangle$
Table*	
DC$_A$	
DC$_A$*	$\{\{p\}\}$
DC$_B$	
DC$_B$*	
CG	s_1
CG*	$\{s_1 \cup \{p\}\}$

(107) CDE **of Falling Declaratives** (updating c_i with $\{p\}$)

    (i)   *Table$_o$ = Table$_i$* $\cup$ $\{p\}$

    (ii) $DC_{sp,o} = DC_{sp,i} \cup p$

Comparing (106ii) and (107ii), Epistemic Uncertainty ARDs are characterized by updating the DC_{sp}^* rather than the DC_{sp}. For Epistemic Uncertainty ARDs, the contribution of rising intonation is to weaken the force of commitment by projecting the DC_{sp}.[71] To some extent, my account is

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[71] Updating p to the DC_{ad}^* still provides a felicitous condition for *Oh* response to be followed. A falling *Oh* requires a prior commitment of other discourse participants, but this commitment does not necessarily have to be a full commitment, as demonstrated in (i).

    (i) A: Where's Sally?
          B: She may in her office.
          A: **Oh**, I see.

In the context of employing epistemic modals such as *may*, the speaker is not fully committed to the proposition. Nevertheless, the utterance *Oh* can still be considered a felicitous follow-up discourse move. Similarly, Epistemic Uncertainty ARDs can be followed by *Oh*.

similar to Malamud & Stephenson (2015) and differs from Jeong (2018) by updating p to the $DC_{sp}{}^{*}$ instead of the DC_{sp}, but differs from both that I do not utilize MLI^{p}.

I now move on to the visual representation of the updates within the conversational scoreboard model. Reconsider (101), which is repeated with its proposed analysis.[72]

(108) [Context: Same as (101).]

  A: What color would you say this is? t_1

  B: *It's red?* t_2

  A: Yeah, I agree. t_3

---

[72] Following Jeong (2018a), I assume $\{q, \neg q\}$ at t_1 is retracted and replaced by $\{p\}$ at t_2. This can be done as speaker B takes p as a partial answer. This retraction process is accepted only when the speaker has assurance on the fact that p is relevant to the issue on the *Table*. For the speaker's uncertainty on the relevance, see §5.3.2.

	A utters q? in t_1	B utters p? in t_2	A utters Oh in t_3	after t_3 step 1	step 2
Table	$\langle\{q, \neg q\}\rangle$	$\langle\{p\}\rangle$	$\langle\{p\}\rangle$	$\langle\{p\}\rangle$	
Table*					
DC$_A$			$\{p\}$	$\{p\}$	
DC$_A$*					
DC$_B$				$\{p\}$	
DC$_B$*		$\{\{p\}\}$	$\{\{p\}\}$	$(\{\{p\}\})$	
CG	s_1	s_1	s_1	s_1	$s_2 = \{s_1 \cup \{p\}\}$
CG*	$\{s_1 \cup \{q\},$ $s_1 \cup \{\neg q\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}\}$	

At t_3, speaker A ratifies the proposition p which speaker B is uncertain about. Then, p is automatically moved to DC_B (step 1), allowing the issue to be resolved in a way that expands the CG (step 2).[73] As discussed in the preceding section, the item in the $DC_{sp}{}^*$ can be automatically moved to the DC_{sp} to resolve the issue from the *Table*.

The commitment moving process is unnecessary for falling declaratives. Compare a falling declarative in (109) with an Epistemic Uncertainty ARD in (108).

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[73] Note that these two steps take place simultaneously but are visually separated only for ease of explanation, which is also true for other divided sequences throughout the thesis.

(109) [Context: Same as (101).]

    A: What color would you say this is? t_1

    B: It's red. t_2

    A: Yeah, I agree. t_3

	A utters q? in t_1	B utters p in t_2	A utters *Oh* in t_3	after t_3
Table	$\langle\{q, \neg q\}\rangle$	$\langle\{p\}\rangle$	$\langle\{p\}\rangle$	
Table*				
DC$_A$			$\{p\}$	
DC$_A$*				
DC$_B$		$\{p\}$	$\{p\}$	
DC$_B$*				
CG	s_1	s_1	s_1	$s_2 = \{s_1 \cup \{p\}\}$
CG*	$\{s_1 \cup \{q\}, s_1 \cup \{\neg q\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}\}$	

In (109), speaker B has already been committed to p, and thus the issue on the *Table* can be resolved without requiring any additional process at t_3.

The convention in (106) shows that the speaker of Epistemic Uncertainty ARDs has a positive bias, p in the $DC_{sp}{}^*$. This explains why an Epistemic Uncertainty ARD is infelicitous to be continued by *No Way*, as shown in (110).

(110) [Context: A teacher **A** is quizzing a student **B** on state capitals. **B** isn't sure of the answer, but thinks it might be Albany:]

    A: (teacher) What's the capital of New York?[74] t_1

    B: (student) *It's Albany?* (t_2') **#No way.** (t_2'') t_2

	A utters p? in t_1	B utters p? in t_2'	B utters *No way* in t_2''
Table	$\langle\{\textbf{\textit{f, g, h, ...}}\}\rangle$	$\langle\{\textbf{\textit{p}}\}\rangle$	$\langle\{\neg\textbf{\textit{p}}\}\rangle$
Table*			
DC$_A$			
DC$_A$*			
DC$_B$			#$\{\neg\textbf{\textit{p}}\}$
DC$_B$*		$\{\{\textbf{\textit{p}}\}\}$	$\{\{\textbf{\textit{p}}\}\}$
CG	s_1	s_1	s_1
CG*	$\{s_1 \cup \{\textbf{\textit{f}}\}, s_1 \cup \{\textbf{\textit{g}}\},$ $s_1 \cup \{\textbf{\textit{h}}\}, ...\}$	$\{s_1 \cup \{\textbf{\textit{p}}\}\}$	$\{s_1 \cup \{\neg\textbf{\textit{p}}\}\}$

Due to the presence of p in $DC_B{}^*$, $\neg p$ cannot be added to DC_B at t_2''. As discussed in §4.1.2, a cooperative speaker would not simultaneously add p and $\neg p$ to their discourse commitment sets, whether it is present or projected.

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[74] Unlike polar questions, constituent questions can have more than two alternatives. As my aim is not to give a unified theory on inquisitive discourse moves, I do not give a detailed analysis of the issue constituent questions update to the *Table* but assume that every interrogative sentence type denotes a non-singleton set. For more precise analysis and discussion, refer to Chapter 5 of Ciardelli et al. (2019) and the references therein.

5.3.2 Metalinguistic Uncertainty

Metalinguistic Uncertainty ARDs denote a singleton set $\{p\}$ as well, in the same manner as Epistemic Uncertainty ARDs.[75]

(111) [Context: A Chicago Radio DJ **A** is getting a call from **B**:]

    A: (Radio Station DJ): Good morning, Susan. Where are you calling from?

    B: a. (Caller) *I'm calling from Skokie?*

          b. (Caller) I'm calling from Skokie.

          c. (Caller) #Am I calling from Skokie?

                (adapted from Hirschberg & Ward, 1995, p. 408)

Speaker B in (111a) is not sure if their response is an appropriate answer to the current QUD raised by speaker A. That is, they are tentative about whether their answer contains the relevant information to the QUD and conveys e.g., *Did you hear about a place called Skokie?* However, the main issue of the utterance is that the speaker is calling from a place named Skokie. The function of giving some information to the addressee can be maintained only

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[75] Most examples of Metalinguistic Uncertainty ARDs are used as a response to a linguistically overt question. However, note that their use is not restricted to such cases, as illustrated in (i).

  (i) [Context: to a receptionist:]
    A: Hi, *my name is Mark Liberman?*
                (Pierrehumbert & Hirschberg, 1990, p. 290)

when an ARD is substituted with its corresponding falling declarative as shown in (111b), but not with a polar interrogative as shown in (111c).

If the context is clear that the speaker's discourse movement is relevant to the current QUD, Metalinguistic Uncertainty ARD is infelicitous, as illustrated in (112).

(112) [Context: Same as (111).]

  A: Good morning, Susan. Where are you calling from?

  B: *#I'm calling from Chicago?*

             (Hirschberg & Ward, 1995, p. 411)

In (112), speaker B is confident that they are properly addressing the current QUD, as it is unlikely for a Chicago radio station DJ to be unaware of the location of Chicago. Because there is no reason for speaker B to assume that their answer may be inadequate, the possibility of using a Metalinguistic Uncertainty ARD is ruled out.[76]

---

[76] A similar idea has been proposed by Hirschberg & Ward (1995). They relate the unacceptability of RDs such as (112) with two absences: the absence of information in mutual belief space and the absence of plausible uncertainty about the hearer's private beliefs. Though Hirschberg & Ward's (1995) idea is more primitive than the concept of QUD, their argument on felicity conditions of the terminal high-rise contour resembles mine to some extent. The former absence is concerned with the QUD. To make the rising contour felicitous, the information should have not yet been resolved and become QUD. The latter absence pertains to the speaker's tentativeness. It indicates that the speaker is not sure whether the addressee can relate the information to the QUD.

As previously presented in §5.1.1, modal substitution is not allowed for Metalinguistic Uncertainty ARDs, since the tentativeness does not stem from the speaker's lowered commitment (i.e., $DC_{sp}{}^*$).

(113) [Context: Same as (111).]

  A: (Radio Station DJ): Good morning, Susan. Where are you calling from?

  B: (Caller) #I *might* be calling from Skokie.

The infelicity of *might* shows that the assertive force of the proposition is not lowered and the speaker is fully committed to the proposition. With the speaker's concrete belief about the issue, p is updated to the DC_{sp}, equivalent to falling declaratives.

Obviously, the $DC_{ad}{}^*$ is has no relation with Metalinguistic Uncertainty ARDs as they do not involve the addressee's commitment. This is illustrated in (114).

(114) [Context: **A** hasn't met **B**'s neighbor and **B** isn't sure if **A** wants to know about neighborliness or suitability for dating.]

  A: What do you think of your new neighbor?

  B: *He's attractive?* **#Really?**

<div align="right">(adapted from Malamud & Stephenson, 2015, p. 280)</div>

In (114), the infelicity of *Really?* demonstrates that the speaker is not making a guess about other interlocutors' commitments.

On the basis of their content and commitments, I define the discourse effect of Metalinguistic Uncertainty ARDs as given in (115).[77] The CDE of falling declaratives is presented in (116) as well, for the sake of comparison.

(115) **Discourse Effect of Metalinguistic Uncertainty ARDs** (updating c_i with $\{p\}$)

    (i) $Table^*_o = Table^*_i \cup \{p\}$

    (ii) $DC_{sp,o} = DC_{sp,i} \cup p$

	A utters p?
Table	
Table*	$\langle\{p\}\rangle$
DC$_A$	$\{p\}$
DC$_A$*	
DC$_B$	
DC$_B$*	
CG	s_1
CG*	$\{s_1 \cup \{p\}\}$

---

[77] Note that (115) differs from Malamud & Stephenson (2012, 2015) that it updates p to the DC_{sp}, rather than the $DC_{sp}{}^*$. It is to ensure the speaker's current commitment on the truth of the expressed proposition.

(116) **CDE of Falling Declaratives** (updating c_i with $\{p\}$)

    (i)   *Table$_o$ = Table$_i$* $\cup$ $\{p\}$

    (ii) *DC$_{sp,o}$ = DC$_{sp,i}$* $\cup$ *p*

(115) and (116) are identical except for the fact that Metalinguistic Uncertainty ARDs do not directly add $\{p\}$ to the *Table*, but to the *Table**, as shown in (115i). The effect of canonical assertion (i.e., proposing *p*, which is now speaker's commitment, to become a mutual commitment) is delayed by putting *p* on the *Table** (Malamud & Stephenson, 2012). This delay conveys the speaker's tentativeness and seeks the approval from the addressee. The effect of rising intonation in Metalinguistic Uncertainty ARDs is to project the *Table*.

Like Epistemic Uncertainty ARDs, Metalinguistic Uncertainty ARDs are interchangeable with falling declaratives in most contexts. This can be analyzed as automatic movement of $\{p\}$ from the *Table** to the *Table* with the addressee's ratification, as defined in (117).

(117) Ratification of the *Table** (**R$_T$**)

    a. *Input context conditions:*

        (i) *top (Table*$^*_i$*)* = $\langle\{p\}\rangle$

        (ii) *p* in *DC$_{sp,i}$*

    b. *Change:*

        (i) **R$_T$**(*ad, c$_i$*) = *c$_o$* where *DC$_{ad,o}$ = DC$_{ad,i}$* $\cup$ *p*

(ii) $Table_o = move (\{p\}, Table^*_o, top (Table_i))$

(117) captures the process by which the issue in the $Table^*$ enters the top of the $Table$ through the addressee's ratification, confirming its relevance to the current discussion. After the process, the issue will be resolved since a joint commitment has already been achieved. The example is given in (118).

(118)   A: Do you speak Spanish? t_1

   B: *I speak Ladino?* t_2

   A: **Oh, I see.** t_3

	A utters p? in t_1	B utters p? in t_2	A utters *Oh* in t_3 step 1 (= (117bi))	A utters *Oh* in t_3 step 2 (= (117bii))	after t_3
Table	$\langle\{p, \neg p\}\rangle$			$\langle\{p\}\rangle$	
Table*		$\langle\{p\}\rangle$	$\langle\{p\}\rangle$	$(\langle\{p\}\rangle)$	
DC$_A$			$\{p\}$	$\{p\}$	
DC$_A$*					
DC$_B$		$\{p\}$	$\{p\}$	$\{p\}$	
DC$_B$*					
CG	s_1	s_1	s_1	s_1	$s_2 = \{s_1 \cup \{p\}\}$
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}\}$	

With the falling *Oh* at t_3, speaker A confirms speaker B's expectation to update the *Table*. After the automatic move process to the *Table*, the rest of the convention is identical to falling declaratives.

The ratification in (117) is a sufficient condition for resolving an issue in the *Table*[*]. If the conditions are not met, discourse participants cannot achieve joint commitments. In the case of canonical assertions, disagreement of the addressee would lead to 'agree to disagree' (Farkas & Bruce, 2010) or putting the issue at the bottom of the *Table* in order not to be discussed unless one of the speakers changes their own commitments.[78] However, the speaker of Metalinguistic Uncertainty ARDs does not an equal position with the addressee, and thus the progress of the discourse is more dependent on the addressee.[79] Therefore, the speaker cannot remain constant with their commitment if it is not ratified by the addressee. To illustrate, see (119).

(119) A: Do you speak Spanish? t_1

   B: *I speak Ladino?* t_2

   A: No, I meant Spanish, not Judaeo-Spanish. t_3

   B: a. #Well, I speak Ladino. t_4

     b. Oh, then, no. I don't speak Spanish.

---

[78] As it is out of the scope of this thesis, I remain open between two possibilities.
[79] A similar idea has been proposed by Gunlogson (2008) and Poschmann (2008).

If the addressee rejects the relevance of the proposition to the current QUD, as at t_3, the speaker needs to modify their commitment since the addressee, not the speaker, is the one who holds the authority to progress the discourse. This is also related to being polite, a topic to be discussed in §5.3.3.

Like Epistemic Uncertainty ARDs, Metalinguistic Uncertainty ARDs express a positive bias, with p being updated to the DC_{sp}. Correspondingly, immediate negation is infelicitous.

(120) A: What are you eating? t_1

       B: *This is persimmon?* (t_2') **#No way.** (t_2'') t_2

	A utters p? in t_1	B utters p? in t_2'	B utters *No* in t_2''
Table	$\langle\{p, \neg p\}\rangle$		$\langle\{\neg p\}\rangle$
Table*		$\langle\{p\}\rangle$	
DC$_A$			
DC$_A$*			
DC$_B$		$\{p\}$ ⟷	#$\{\neg p\}$
DC$_B$*			
CG	s_1	s_1	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{\neg p\}\}$

In (120), p in DC_B (in t_2') blocks the speaker's immediate denial $\neg p$ to be updated in the same component at t_2''.

In sum, Metalinguistic Uncertainty ARDs update the *Table**, indicating the speaker's expectation about the issue to be relevant to the current QUD and possibly to be added to the *Table*. The remainder of the convention of Metalinguistic Uncertainty ARDs is identical to that of falling declaratives. My proposal has an advantage in providing systemic constraints by providing a logical explanation with the *Table**. With the additional projected discourse component, my analysis is able to explain the phenomena of ARDs in a uniform system where all discourse components have projected counterparts as well as corresponding present ones.

5.3.3 Politeness

As shown in §5.1.3, rising intonation of ARDs is a linguistic cue which can serve as a politeness strategy. For example, consider (121).

(121)   A: You have a VW, don't you?

        B: *I've got an Opel?*

(Ladd, 1980, p. 154)

Speaker B's utterance with rising intonation in (121) sounds more polite than its counterpart with a falling intonation (Ladd, 1980).

In line with Jeong's (2018a, 2021) idea, I analyze that the speaker's tentativeness pertains not only to their epistemic certainty but also to the

certainty of relevance, i.e., whether they address the QUD appropriately. Therefore, Metalinguistic Uncertainty ARDs can be used as a politeness strategy as well as Epistemic Uncertainty ARDs.

I will first illustrate the case where politeness is related to epistemic uncertainty. See the following example in (122).

(122) [Context: Professor **A** asks a question to student **B**, who is Lenny's

brother:]

   A: (professor) Which city is Lenny from?

   B: (student) *Lenny's from Yemen?*

   A: (professor) Oh, I see.

While being certain about the relevance with the current QUD of their answer, speaker B can employ rising intonation as if conveying an impression of uncertainty. In other words, the speaker uses the Epistemic Uncertainty ARD as a politeness strategy.

The politeness of Epistemic Uncertainty ARDs comes from making the speech act indirect with the process of ratification. Since the speaker pretends as if they are not fully committed to the expressed proposition, Epistemic Uncertainty ARDs provide the addressee with more decisive power in progressing the discourse. This results in enhancing the addressee's face by

minimizing the threats to the addressee's face.[80] With more authority, the addressee can save their face throughout the conversational moves of moving p from the $DC_{sp}{}^{*}$ to the DC_{sp} by at least not rejecting the discourse to progress.[81] They promote the negative face (i.e., the want to be desirable) and the positive face (i.e., independence from others) together.

Metalinguistic Uncertainty ARDs can be used for a politeness strategy as well. See (123) to illustrate.

(123) A: (waiter) Hello, *my name is David? I'm your waiter today?*

    B: (customer) Oh. Hi, David.

It is highly improbable for an individual to be unsure about their own name and occupation. Thus, speaker A updates p in the DC_{sp}, and the indirectness should result from elsewhere. I propose that this politeness comes from the process of updating the *Table** which is the key property of Metalinguistic Uncertainty ARDs.

In the proposed model, the speaker does not update p to the *Table* directly, but to the *Table**. The next step is to move $\{p\}$ to the *Table* from the *Table**. By using the rising terminal contour, the responsibility of the moving process is given to the addressee, assuring more independence for them. Thus, the

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[80] These multiple effects from two faces is based on the ideas put forth by Clark & Schunk (1980), Terkourafi (2015), and Jeong (2018b, 2021).

[81] Note that the ratification can also be done by using non-linguistic cues such as nodding as well as overt linguistic expressions.

discourse becomes more polite by promoting the face of the addressee with the speaker's pretense as if having unsureness of the relevance to the current QUD.

To recapitulate, both subtypes of ARDs can be used as a politeness strategy as they are more indirect than canonical assertions. I analyze the politeness in terms of the speaker's updating p to the projected components for each subtype of ARDs; the $DC_{sp}{}^{*}$ (in the case of Epistemic Uncertainty ARDs) and the $Table^{*}$ (in the case of Metalinguistic Uncertainty ARDs), which leads to enhancing the addressee's face.

This process results in a similar politeness effect proposed by Jeong (2018a, 2021). What she proposes is the operation of MLI^{p}, while my approach is heavily relied on the movement of the content between discourse components, especially from the projected ones to the present ones. As the components in the projected components require additional ratification from the addressee, it enhances the addressee's face, resulting in a similar outcome as proposed in Jeong's (2018a, 2021) account. Thus, my proposal also captures the contextual sensitivity of the politeness strategy and its relation with the role of the addressee (Clark & Schunk, 1980; Leech, 1983, 2014; Jeong, 2018a, 2021).

5.4 Interim Summary

In this chapter, I propose a new paradigm of two functions of ARDs and how each conveyed meaning is understood from the interpretive interaction between semantics and pragmatics. Substantiated by modal substitution and subordination, two types of ARDs are identified: Epistemic Uncertainty ARDs, which express the speaker's uncertainty about the proposition, and Metalinguistic Uncertainty ARDs, which convey uncertainty about the relevance to the current QUD.

The determination of these two types of ARDs is context-dependent and relates to the current QUD. When an ARD conveys a proposition that is a subset of the current QUD, it is construed as an Epistemic Uncertainty ARD. Conversely, if an ARD conveys a proposition that is not a subset of the current QUD, it is understood as a Metalinguistic Uncertainty ARD. The process is illustrated in Figure 5.1.
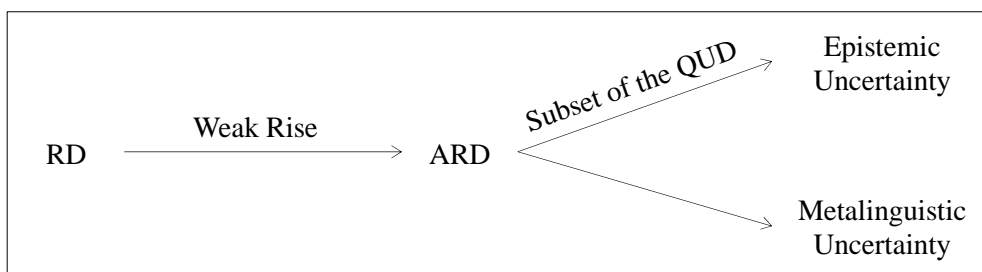

Figure 5.1 The Process of Interpreting ARDs

The former type of ARDs projects the speaker's commitment by updating p to the $DC_{sp}{}^*$, which sets it apart from falling declaratives. Meanwhile, the latter type of ARDs projects the *Table* to the *Table**, indicating a tentative proposal to be updated as the current issue. I also show that both types of ARDs can be used as a politeness strategy. The speaker can pretend to be epistemically tentative to convey politeness, which is an additional function of Epistemic Uncertainty ARDs. At the same time, Metalinguistics Uncertainty ARDs can promote the addressee's face by updating the issue to the *Table**. The paradigm proposed in this chapter is summarized in Table 5.1.

Table 5.1 The Paradigm of ARDs in Comparison with Falling Declaratives

Types	FDs	ARDs	
		Epistemic Uncertainty	Metalinguistic Uncertainty
Intonation	↘	↗	
Bias		p	
Content	$\{p\}$		
Table	$\langle\{p\}\rangle$	$\langle\{p\}\rangle$	
Table*			$\langle\{p\}\rangle$
DC_{sp}	$\{p\}$		$\{p\}$
$DC_{sp}{}^*$		$\{\{p\}\}$	
$DC_{ad}{}^*$			

Chapter 6

Inquisitive Rising Declaratives

In this chapter, I set out two primary goals. The first goal is to establish a clear and distinct categorization of IRDs by presenting three fundamental claims. Firstly, I provide different discourse patterns exhibited by two IRDs. Secondly, I aim to clarify how a negative bias is derived from the absence of the speaker's commitments. Lastly, I argue for classifying Mirative IRDs as a subtype of Contradictory IRDs, conveying an additional mirativity. The second goal is to present the contextual interpretive process of IRDs, focusing on the close interaction of contextual information on the addressee's belief with the speaker's bias.

This chapter begins with three proposals in §6.1, followed by a process of how the context interacts in §6.2. Then, the redefined paradigm and the analyses of each are presented in §6.3. Finally, in §6.4, I summarize the discussion.

6.1 Proposals

6.1.1 Confirmative vs. Contradictory

Due to their syntactic form, RDs are typically expected to convey a positive bias towards the expressed proposition. It would be relatively unanticipated

if the bias is negative, considering the affirmative syntactic form. The only exceptional type of RDs which is negatively biased is Contradictory IRDs, as exemplified in (124), repeated from (9b).

(124)   A: I went to the concert last night. Dave is a good singer.

         B: *Dave is a good singer?* You must be thinking about John.

<div align="right">(repeated from (9b))</div>

Speaker B does not believe the proposition but rather has a skeptical attitude towards it. As proposed, the negative bias of Contradictory IRDs is emphasized by an overt negative expression as follows:

(125) [Context: Same as (124).]

        A: I went to the concert last night. Dave is a good singer.

        B: *Dave is a good singer?* **No way.** You must be thinking about John.

With *No way*, the speaker's intention to disagree with the addressee becomes clearer.

In contrast, Confirmative IRDs cannot be followed by *No way*.

(126)   A: (airline agent) There's one fight to Seoul.

         B: (customer) *The flight leaves at 10 am? #**No way.***

In (126), speaker B is willing to confirm their prediction on *p*, which intuitively leads to a positive bias. When the speaker has a positive bias, they cannot express ¬*p* immediately because conveying *p* and ¬*p* together would constitute an empty set of commitments.

The difference in the semantics of the two subtypes of IRDs is also shown by the addressee's particle response, which is analogous to the particle response (*yes* or *no*) of positive and negative polar questions (henceforth, PPQs and NPQs) (Roelofsen & Farkas, 2015; AnderBois, 2019).

In Roelofsen & Farkas' (2015) system, particle responses bear two features, [+, -] and [AGREE, REVERSE]. Precisely, the former are absolute features whereas the latter are relative features. Absolute features capture whether the speaker is positive or negative about the truth value of the expressed proposition, while relative features capture whether or not the speaker agrees to the addressee. [AGREE] and [+] are signaled by *yes*, while [REVERSE] and [-] are signaled by *no*. Bare particle responses to PPQs are unambiguous while those to NPQs are ambiguous (or 'interchangeable' by Goodhue & Wagner (2018)).

(127) **POSITIVE POLAR QUESTION**

  A: Did Amy leave?

  B: a. Yes / #No, she did.   [AGREE, +]

     b. #Yes / No, she didn't.   [REVERSE, -]

In (127), *yes* is felicitous in accordance with [AGREE] and [+] while *no* is felicitous for [REVERSE] and [-]. In contrast, bare particle responses to NPQs are predicted to be ambiguous.

(128) **NEGATIVE POLAR QUESTION**

    A: Did Amy not leave?

    B: a. Yes / No, she didn't.   [AGREE, -]

        b. Yes / No, she DID   [REVERSE, +]

Unlike (127), *yes* and *no* are ambiguous in (128). Since *no* is multi-functional, it is ambiguous between [-] in (128a) and [REVERSE] in (128b).[82] For responses of NPQs, *no* can be interpreted as [AGREE, -], confirming $\neg p$, and it can also be interpreted as [REVERSE, +], rejecting $\neg p$. The same is true for *yes*.

The different pattern in (127) and (128) are also observed in Confirmative IRDs and Contradictory IRDs. That is, bare particle responses in Contradictory IRDs are ambiguous in a parallel way to NPQs, but those in

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[82] It is worth noting that a gradual difference exists in the acceptability of responses. Specifically, in cases where the respondent provides a negative but agreeing response, the use of *no* is generally more acceptable than *yes* in [agree, -] (Brasoveanu et al., 2013; Goodhue et al., 2015; Goodhue & Wagner, 2018), because [-] is a marked feature while [AGREE] is not (Roelofsen & Farkas, 2015). Additionally, Kramer & Rawlins (2009) and Roelofsen & Farkas (2015) show that bare particles are typically preferred in negative responses over positive ones. It is important to note, however, that this result is limited to the speakers of American English, as different patterns have been observed in other languages, such as German (Claus et al., 2017). For a more comprehensive analysis based on a Linear Optimality Theoretic account (Keller, 2000), see Farkas & Roelofsen (2019).

Confirmative IRDs are not. The responses to the two types of IRDs are illustrated below:

(129) **CONFIRMATIVE IRD**

    A: John has to leave early.

    B: *He'll miss the party then?*

    A: a. Yes / #No, he will.   [AGREE, +]

          b. #Yes / No, he won't.   [REVERSE, -]

(130) **CONTRADICTORY IRD**

    A: Please apologize him.

    B: *I was wrong and I should apologize?* No way!

    A: a. Yes / No, you shouldn't.   [AGREE, -]

          b. Yes / No, you SHOULD.   [REVERSE, +]

In (129), *yes* is an acceptable response according to the features [AGREE] and [+], while *no* is acceptable with [REVERSE] and [-], patterns identically to PPQs. In contrast, Contradictory IRDs can have both (130a) and (130b) as a felicitous response like NPQs: (130a) confirms ¬*p*, but (130b) rejects ¬*p*.

    In addition, PPQs and NPQs exhibit distinct distributions concerning the context for pragmatic reasoning (e.g., Büring & Gunlogson, 2000; Sudo, 2013; Domaneschi et al., 2017) and the same applies to Confirmative IRDs and Contradictory IRDs. NPQs (more specifically, Low Negative Polar Questions;

henceforth, LNQs) require the evidence for the negative answer (Trinh, 2014; Roelofsen & Farkas, 2015; Domaneschi et al., 2017; Goodhue, 2018; Goodhue & Wagner, 2018).[83] Consider the following two examples.

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[83] Note that the distinction being discussed in this thesis is limited to embedded negation only. The ambiguity of polar particle responses of NPQs does not occur if the negation is fronted with the auxiliary (Ladd, 1981; Romero & Han, 2004; Romero, 2006; Kramer & Rawlins, 2009; Goodhue & Wagner, 2018) such as (ii).

   (i) LOW NEGATIVE POLAR QUESTION
      Does Jake not like white wine?

   (ii) HIGH NEGATIVE POLAR QUESTION
      Doesn't Jake like white wine?

The difference is termed as 'inner/outer' (Ladd, 1981) or 'high/low' (AnderBois, 2019). I follow AnderBois (2019) and name negative polar questions like (i) as Low Negative Polar Questions (henceforth, LNQs) and their counterparts like (ii) as High Negative Polar Questions (henceforth, HNQs). LNQs convey the speaker's weak bias toward the negative answer (AnderBois, 2019). In contrast, HNQs are felicitous only if the speaker is based toward p (AnderBois, 2019; Goodhue, 2019; Silk, 2020). With polarity particle responses, HNQs pattern with positive polar questions (Krifka, 2017) as illustrated in (iii) and (iv).

   (iii) POSITIVE POLAR QUESTION
      A: Is Jane here?
      B: a. Yes / #No, she is.
           b. #Yes / No, she isn't.

   (iv) HIGH NEGATIVE POLAR QUESTION
      A: Isn't Jane here?
      B: a. Yes / #No, she is.
           b. #Yes / No, she isn't.

They have a difference in polarity (Roelofsen & Farkas, 2015) and it is analyzed that the difference comes from different syntactic quantification (AnderBois, 2019). AnderBois (2019) additionally argues that the speaker of LNQ expects some discussion regarding the issue and names it as the projected issue.

    For the purpose of my thesis, I will limit the discussion to LNQs and IRDs only. I will also not address complex PQs such as (v).

   (v) [Context: Dialog between two editors of a journal:]
      A: I'd like to send this paper to a senior reviewer, but I'd prefer somebody new.
      B: Hasn't Frege not reviewed for us yet?

                                      (Romero & Han, 2004, p. 619)

For detailed ongoing discussion on PPQs and NPQs (LNQs and HNQs), refer to Büring & Gunlogson (2000), Romero & Han (2004), Sudo (2013), Trinh (2014), Roelofsen & Farkas (2015), Domaneschi et al., (2017), AnderBois (2019), and references therein.

(131) **Positive Evidence**

[Context: **A** has been in a windowless office all day and has no idea what the weather is. **B** walks in with a wet umbrella and raincoat.]

A: a. Is it raining?

b. #Is it not raining?

(132) **Negative Evidence**

[Context: **B** has no idea what the weather is. **A** walks in rubbing his hands together and stamping his feet.]

A: I hate the weather in this town!

B: a. #Is it nice out?

b. Is it not nice out?

(Goodhue, in press)

Given the contrast between (131) and (132), contextual evidence on p is crucial. In (131), the addressee's wet umbrella and raincoat provide positive evidence supporting p, whereas in (132), the addressee's prior utterance provides negative evidence against p.[84] NPQs are felicitous only in (132) and

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[84] Note that the speaker's bias remains neutral in both cases (Domaneschi et al., 2017). To account for PPQs, NPQs, and HPQs, not only the contextual bias but also the speaker's bias should be considered (Roelofsen et al., 2012; Domaneschi et al., 2017; Goodhue, 2018), but I remain open with how to take two kinds of bias into account.

they constitute distinct form-function types with PPQs (Domaneschi et al., 2017).[85]

I propose that this contextual requirement similarly applies to two IRDs. In §6.2, I provide a more detailed discussion on the prior contexts that influence the interpreted meaning of IRDs.

6.1.2 Negative Bias without Commitments

In this section, I develop my analysis of how the speaker's negative bias can be represented in a discourse model, building on Gunlogson (2003) and Jeong (2018a, 2018b). Specifically, my proposal relates a negative bias with the $DC_{ad}{}^{*}$.

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[85] In the Inquisitive Semantics framework (e.g., Roelofsen & Farkas, 2015), these two types of polar interrogatives also have distinct semantic denotations in a compositional manner. They are constituted following the rule in (i).

(i) **Rules for Translating Lists**
  [INT [OPEN [list-body]]]   ⤳   ?φ
  (Roelofsen & Farkas, 2015, p. 375)

The presence of INT and OPEN can be identified by their corresponding interrogative word order and a sentence-final rise, respectively. They are defined as follows:

(ii) a. INT   ⤳ $\lambda p.\ \langle ?\rangle p$
    b. OPEN   ⤳ $\lambda p.\ \lambda f.?p$
  (Roelofsen & Farkas, 2015, pp. 374-375)

From (i) and (ii), interrogatives are analyzed as in (iii).

(iii) **Analysis of Interrogatives**

	SIMPLIFIED TRANSLATION	HIGHLIGHTS
Does Igor speak English? (PPQs)	$?p$	$\lvert p \rvert$
Does Igor not speak English? (NPQs)	$?\neg p$	$\lvert \neg p \rvert$

(Roelofsen & Farkas, 2015, p. 380)

In Gunlogson's (2003) account, RDs attribute the commitment to the addressee. Adding p in the DC_{ad}, rather than the DC_{sp}, leaves the possibility for $\neg p$ open. I will adopt her idea, i.e., emptying the speaker's commitment to make $\neg p$ possible. However, the exact process of conveying negative bias remains unaddressed in Gunlogson (2003) and I will further develop a detailed discourse model in terms of commitments.

Jeong (2018a, 2018b) provides a more elaborate theory on the negative bias related to the commitment of the addressee. She gives a unified account for IRDs, as in (133).

(133) **Inquisitive Rising Declarative** (content: $\{p, \neg p\}$)

    a. Add $\{p, \neg p\}$ to the current **Table**.

    b. Add p to the addressee's projected commitments set, $\mathbf{DC}_{Ad}{}^{*}$.

    c. $[\![\text{POLAR-I}]\!] = [\![\text{INT}]\!] = \lambda p \lambda q\, [q = p \lor q = \neg p]$

                            (repeated from (53))

With (133), she argues that the negative bias is triggered by the redundancy with the prior commitment of the addressee, but this may be overly restrictive. Reconsider the following example of negative bias from Jeong (2018a, 2018b).

(134)   A: You should apologize to Sam.

        B: *I was wrong and I should apologize?*

A: Yes, that's the right thing to do.

B: No way. You don't know the whole story.

<div align="right">(Jeong, 2018a, p. 344)</div>

Speaker A in (134) adds p 'B should apologize to Sam' to DC_A by overtly uttering the proposition. With an IRD, speaker B adds p to the DC_{ad}^* (i.e., DC_A^*), which causes redundancy between DC_A and DC_A^*. According to Jeong (2018a, 2018b), this redundancy triggers pragmatic reasoning that requires the addressee's further explanation on accounting speaker B's disbelief in the proposition.

However, in examples like (135), the speaker's negative bias is expressible despite the lack of addressee's prior commitment.

(135) [Context: A mother **A** sees her child **B** putting on cleats:]

A: What? *You are going to play soccer?* No way! You are staying home and doing your homework.

<div align="right">(Farkas & Roelofsen, 2017, p. 276)</div>

In (135), the addressee neither asserts nor presupposes p, yet the speaker can still convey a negative bias. If the speaker can contextually infer that the addressee is implying p, even if it is not explicitly expressed, a negative bias can be elicited. In other words, the speaker's negative bias does not always stem from the redundancy of commitments, but rather from contextual

evidence.[86] Nonetheless, Jeong's (2018a, 2018b) central concept remains valid, which suggest that prior contextual information on the addressee's belief or bias is necessary for interpreting IRDs as having a negative bias.

I also agree with the series of works which supposes that commitments are the trigger of bias. However, the DC_{sp} cannot be the one, following the Interrogativity Principle (Goodhue, 2022).[87]

(136) **Interrogativity principle**

Ask a question Q only if the context set c does not entail a complete answer to Q.

(Goodhue, 2022, p. 384)

IRDs involve anticipating the commitments of the addressee, as discussed in §2.2.2.2. Thus, if a speaker of an IRD believes an expressed proposition (i.e., p in the DC_{sp}), p is a mutual commitment as they would assume that the addressee also believes it. In this case, c entails p, which creates an inappropriate context for IRDs. The remaining options that can result in a bias are either the $DC_{sp}{}^*$ or the $DC_{ad}{}^*$.

Intuitively, the $DC_{sp}{}^*$ leads to a positive bias. I adopt Goodhue's (2022) view that a bias represents a doxastic necessity. As p in the $DC_{sp}{}^*$ indicates the speaker's 'weaker' doxastic belief, it yields a positive bias.

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[86] See §6.2 for more detail.
[87] The principle is primarily proposed by Roberts (2012, p. 14) and Büring (2003, p. 541).

In contrast, I propose that negative bias is signaled by the lack of the speaker's commitments and thus only by the $DC_{ad}{}^*$. As the fundamental assumption that the speech act is used to increase mutual information (Farkas, 2020, 2022), agreeing with other participants (with DC_{sp} or $DC_{sp}{}^*$) is the most plausible act of cooperative discourse participants. However, the speaker of Contradictory IRDs has not added p to their own commitment sets. Not updating p to the $DC_{sp}{}^*$, but to the $DC_{ad}{}^*$ leaves us two options regarding the bias: the speaker is either ignorant or negatively biased. However, if the speaker is ignorant, polar interrogatives would be chosen as they are more *useful* than IRDs to gain information in an unbiased context. Goodhue's (2022) *usefulness* is based on two assumptions: (i) the goal of the ignorant speaker is to gain information and (ii) utterances that help you achieve your goals are more useful than they don't.[88] Since polar interrogatives are more helpful than IRDs in achieving the goal to gain information about p in neutral context, they are more useful. In case where polar interrogatives were not more useful than IRDs, the speaker must not be ignorant, which means that they are biased. In turn, IRDs updating the $DC_{ad}{}^*$ signal a negative bias.

To recapitulate, I follow Jeong (2018a, 2018b) that the negative bias of IRDs is derived from the $DC_{ad}{}^*$.[89] However, the negative bias is signaled by

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[88] Even though his comparison lies between polar interrogatives and high negation questions, this can be expanded into IRDs as well.

[89] Malamud & Stephenson (2015) propose that SP-tags (same polarity tag questions) add p to the $DC_{ad}{}^*$. However, SP-tags and IRDs do not make the same meaning contribution since the former denote a singleton set while the latter denote a non-singleton set (Jeong, 2018a, 2018b). For more discussions on the bias of tag questions, see Northrup (2014).

the lack of speaker's commitments, but not by the redundancy, which resembles Gunlogson (2003). From the discussion thus far, negative bias is defined as below:

(137) **The NEGATIVE BIAS of the speaker**

With a non-singleton set $\{p, \neg p\}$, the speaker has a NEGATIVE BIAS toward p iff $p \in \cap DC_{ad}{}^*$, $p \notin \cap DC_{sp}$, and $p \notin \cap DC_{sp}{}^*$.

Biases of each IRD and a rising polar interrogative are compared in the table below:

(138) **Bias of IRDs and Rising Polar Interrogatives**

	CONTRADICTORY IRDS	CONFIRMATIVE IRDS	RISING POLAR INTERROGATIVES
Bias	$\neg p$	p	$0 \sim$ very weak p[90]
Table	$\{p, \neg p\}$	$\{p, \neg p\}$	$\{p, \neg p\}$
DC$_{sp}$	$\{\}$	$\{\}$	$\{\}$
DC$_{sp}{}^*$	$\{\}$	$\{p\}$	$\{\}$
DC$_{ad}{}^*$	$\{p\}$	$\{\}$	$\{\}$
CG	s_1	s_1	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$

---

[90] Consider two examples below from Büring & Gunlogson (2000).

One might wonder why $\neg p$ is not added to the DC_{sp} or the DC_{sp}^* to represent the negative bias of Contradictory IRDs. I argue that it is because Contradictory IRDs' negativity is weaker than that of NPQs, which is related to the commitment to $\neg p$. To illustrate, consider (139).

(139) [Context: A mother **A** asks her child **B** to set the table and he does a particularly bad job of it but appears to consider the chore finished.]

> A: a. *This table is set?* Where are the wine glasses? Where are the napkins?
>
> b. #Is this table not set? Where are the wine glasses? Where are the napkins?

(adapted from Farkas & Roelofsen, 2017, p. 276)

In (139), the context only allows an IRD but not an NPQ. Bias and commitment are closely related, but they are not identical. I suppose bias is

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(i) Is she left-handed?
(ii) Is she right-handed?

In (i), the speaker implies that she is more likely to be left-handed. In contrast, (ii) presents a similar example but allows for the opposite inference that the speaker believes she is more likely to be right-handed.

Also, note that the bias here can reflect not only the speaker's beliefs but also goals or desires (van Rooij & Šafářová, 2003; Roelofsen et al., 2012; AnderBois, 2019).

(iii) [Context: Question asked by a doctor in a medical questionnaire.]
    A: Is your child apathetic?

(AnderBois, 2019, p. 125)

In (iii), a question from a doctor is considered appropriate not because of the belief in the higher likelihood of a positive answer, but because it would help the medical staff reach their conversational goal of diagnosis more quickly and effectively than a negative response.

weaker than commitment. As shown in (139), IRDs only have a negative bias, which is weaker than a negative commitment. If the first inquisitive move is $\neg p$, as in (139b) with NPQs, the following positive *wh*-questions are infelicitous. In contrast, the IRD in (139a) can be followed by the same *wh*-questions. If we assign $\neg p$ in the speaker's commitment for IRDs, (139a) would be incorrectly predicted to be infelicitous. As it is not the case, it is arguably correct not to add $\neg p$ in the DC_{sp} or the DC_{sp}^* for Contradictory IRDs. I suggest that speakers of NPQs are committed to $\neg p$ with an overt negative marker, while speakers of IRDs do not, but remain open for further discussion.

6.1.3 Mirative Not-At-Issue Content in Mirative IRDs

Mirativity implicates the speaker's exceeded expectation or surprise on the conveyed information (DeLancey, 1997, 2001; Rett & Sturman, 2021) and it can be expressed by various linguistic forms. For example, Finnish (Rett, 2021) and Mandarin (Wu, 2008) encode mirativity morphologically, while Spanish (Cruschina, 2012, 2019) marks it syntactically, and Chyenne (Rett & Murray, 2013) and Mapudungun (Aikhenvald, 2004) have polysemously marked mirativity (i.e., mirative evidentials). English has a renowned prosodically marked mirativity, namely 'exclamation intonation' (Rett & Sturman, 2021). Goodhue et al. (2015) argue that English RDs can express the mirativity as well (c.f., Hirschberg & Ward, 1992) and I refer to this type

of IRDs as Mirative IRDs. They are used to indicate the mirative mood of the speaker, like other mirative markers.

Rett (2021) analyzes the semantic contribution of mirative markers as a part of not-at-issue content, but she argues that they are not identical to other canonical encoders of not-at-issue content.[91] Canonical not-at-issue content is automatically added to the *CG* (AnderBois et al., 2010; Murray, 2010, 2011), while mirative markers are updated to the DC_{sp}. Canonical not-at-issue content is *descriptive* as it is related to the descriptive content of a sentence, while mirative markers are *illocutionary* as it describes how the speaker uses the utterance (Rett, 2021).

Moore's Paradox shows the contrast between descriptive and illocutionary not-at-issue content (Rett, 2021).[92] Moore's Paradox occurs when a sentence is followed by the denial of the speaker's belief, in which utterance is judged unacceptable as exemplified in (140).

(140) #She has a brother, but I don't believe she has a brother.

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[91] Rett (2021) also discusses emotive markers (something about a state or attitude of the speaker (Kaplan, 1999) that encode other emotive attitudes, e.g., being disappointed or being pleased. However, I limit my discussion to mirative use, as the scope of my thesis is limited to mirativity. To avoid confusion, I also do not use the term *emotive marker*, but rather just simply put *mirative marker*. Note that mirative markers are one subtype of emotive markers; thus, they share the general properties of emotive markers.

[92] Despite the different behavior, however, two encoders of not-at-issue content (i.e., descriptive and illocutionary) have three properties in common: (i) cannot be targeted by truth-conditional operators, (ii) cannot be denied in discourse, and (iii) cannot be used to address the QUD.

Canonical not-at-issue content (i.e., descriptive not-at-issue content) and mirative markers (i.e., illocutionary not-at-issue content) constitute different phenomena in terms of denial. Denying descriptive not-at-issue content results in contradiction while denying illocutionary not-at-issue content results in Moore's Paradox. Mirative evidentials in Cheyenne (Rett & Murray, 2013) as in (141) and (142) illustrate the main distinction between the two.[93]

(141) **EVIDENTIAL**

#⊥É-hó'tàheva-**sėstse** Aénohe naa oha hovánee'e

3-win-RPT.3SG   Hawk   but   nobody

é-sáa-nė-hé-he-Ø.

3-neg-that-say-MODA-DIR

Intended: 'Hawk won, it's said, but nobody said that.'

(Rett & Murray, 2013, p. 461)

(142) **MIRATIVE**

É-hoo'kȯhó-**neho**! ... #Ná-nėšė-héne'ena-Ø   tsé-to'sė-hešė-

3-rain-<u>NAR</u>.SG.INAN   1-continue-know.s.t-DIR   CNJ-going.to-

hoo'koho.

how-rain.

---

[93] Following Rett & Murray (2013), evidentials are **bolded** and mirative evidentials are <u>underlined</u>. Other glosses are as follows: 3 = third person, CNJ = conjectural prefix, DIR = unmarked direct evidential, INAN = inanimate, MOD = agreement that appears with negation and the conjectural evidential, NAR = narrative evidential, neg = negation, RPT = reportative evidential, SG = singular.

Intended: 'It's raining! ... # I *knew* it was going to rain.'

<div align="right">(Rett & Murray, 2013, p. 462)</div>

A mirative evidential marks either indirect evidence or mirativity, depending on the context. Cheyenne native speakers judge both sentences in (141) and (142) are unacceptable, but different reasons were reported. (141) was reported as contradictory (indicated with $\perp$) in addition to infelicity, while no contradiction was reported for (142). Murray (2010, 2011, 2014) concludes that (141) shows an evidential sentence interpretation, while (142) bears a mirative interpretation. On the basis of this observation, Rett (2021) separates mirative markers from other canonical encoders of not-at-issue content. Her main claim is summarized in Table 6.1 (based on Rett & Sturman, 2021).

Table 6.1 Different Content Types and their Theoretical Treatments

Content Type	Example	Theoretical Treatment	Literature
at-issue		updates the CG^*	Farkas & Bruce (2010) Stalnaker (1973)
descriptive (canonical) not-at-issue	evidential markers	updates the CG	Murray (2010)
illocutionary not-at-issue	mirative markers	updates DC_{sp}	Rett (2021)

The contradiction in (141) comes from adding two incompatible propositions p and $\neg p$, which are updated by at-issue content and descriptive not-at-issue content, respectively, to the CG. In contrast, illocutionary not-at-issue content does not result in a contradiction since it updates the DC_{sp}, but not the CG.

Mirative IRDs pattern with illocutionary not-at-issue content in terms of Moore's Paradox.[94] Like the case with mirative markers, a direct negation of Mirative IRDs does not result in contradiction, as illustrated in (143).

(143) [Context: **A** and **B** are watching a girl give a very professional performance in a school debate. From this, **A** is thinking that she might be 12 or 13 years old.]

    A: She's amazing.

    B: I know, and she's only 9 years old.

    A: (What?) *She's nine?* #I KNEW that she is nine.

(adapted from Goodhue, 2021, p. 955)

In (143), the last sentence which follows a Mirative IRD is infelicitous, but it is not a contradiction. This indicates that Mirative IRDs pattern with illocutionary not-at-issue content. Thus, I model Mirative IRDs as

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[94] Another difference between the two not-at-issue content proposed by Rett (2021) is a scope-taking pattern. However, the scope-taking test cannot be applied for diagnosing the not-at-issue type of IRDs since Mirative IRDs are prosodically marked.

illocutionary not-at-issue content which updates flavored commitment to the DC_{sp} (Rett, 2021). Flavored commitments are defined as follows:[95]

(144) **Discourse Commitments**

Let DC_a be sets of propositions of the form **is-surprised**$_a(p)$, representing the public commitments of a with respect to a discourse in which a and b are the participants, where:

a. **is-surprised**$_a(p)$ is a public commitment of a iff 'a is surprised with p' is a mutual belief of a and b.

(Rett, 2021, p. 326)

Flavored discourse commitment in (144) reflects the speaker's attitude other than the belief, including mirativity. More detailed discussion on exact discourse convention will be provided in §6.3.3.

6.2 Contextual Interpretation

Resembling ARDs, the specific use of IRDs is communicated throughout the close interaction with discourse context. Contradictory IRDs are attested when the context indicates that the addressee believes (or at least biased toward) p. Consider the examples below:

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[95] Other sets of propositions of the form **believes**$_a(p)$, **is-pleased**$_a(p)$, **is-disappointed**$_a(p)$, or **is-not-surprised**$_a(p)$ are also proposed by Rett (2021).

(145) **Inquisitive Rising Declaratives**

    a. CONFIRMATIVE

        [Context: **B** is buying a ticket for a flight to Seoul at the airport.]

        A: (flight agent) There's one flight to Seoul.

        B: (customer) *The flight leaves at 10am?*

    b. CONTRADICTORY

        A: I went to the concert last night. Dave is a good singer.

        B: *Dave is a good singer?* You must be thinking about John.

                               (repeated from (9))

As pointed out in Chapter 2, (145a) is biased toward the expressed proposition p, whereas (145b) is biased toward its negation $\neg p$. In both contexts, the speaker assumes that the addressee would be committed to p (§2.2.2.2), but they differ in contextual cues. In (145a), the context does not directly indicate whether the addressee has a commitment on p. In other words, there is no explicit evidence in the context to support the addressee's belief that *the flight leaves at 10am*. On the contrary, the addressee's belief on p is evident to the speaker in (145b) from the explicit expression.[96]

To summarize, the contradictory use of IRDs is not permitted unless it is supported by the appropriate contextual information. Compare (146) with (145b).

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[96] The contextual support can be either linguistic or non-linguistic.

(146)   A: I'm big fan of Dave.

        B: *Dave is a good singer?*

In (146), the speaker cannot be directly supported by the contextual evidence that the addressee believes *p*. In this case, an IRD is more likely to be interpreted as having a positive bias. The contextual contrast observed in (145b) and (146) aligns with the arguments put forth in previous studies (e.g., Gunlogson, 2003; Farkas & Roelofsen, 2017) regarding the necessary contextual condition for contradictory IRDs and the experimental result (e.g., Jeong, 2018a, 2018b): Contradictory IRDs are attested when the context indicates that the addressee believes *p*.

With this account, the cognitive process of deriving negative bias (presented in §6.1.2) becomes more apparent. Similar to Jeong (2018a, 2018b), the negative bias arises from the pragmatic reasoning which suggests that the speaker has a reason to seek further explanation or justification from the addressee. The expression of negative bias occurs when the speaker, in a context where the addressee's commitment on *p* is evident, makes a best guess on the addressee's commitment (in accordance with the definition of the DC_{ad}^*). This intentional open up of the issue regarding $\{p, \neg p\}$ for double-checking the addressee's commitment on *p* is unnecessary in typical context. However, as the speaker deliberately brings up the issue of other's assumed commitment, this leads to the pragmatic reasoning of urging for additional

explanation on the addressee's commitment, due to the speaker's negative bias.

This state of affairs is summarized in (147).

(147) **Division of Labor in Interpreting IRDs**

    a. <u>Default Form</u> (i.e., the CDE of falling declaratives)

      (i) *top* $(T) = \langle \{p\} \rangle$

      (ii) p in DC_{sp}

    b. <u>Interpretation</u>

      1. *Semantic Convention*

      A steep rise increases inquisitive content to surpass informative content.

      2. *Pragmatic Reasoning*

        ▪ If the context does not indicate the addressee's belief or bias, confirmative use of IRDs is allowed.

        ▪ If the context indicates the addressee's belief or bias, contradictory use of IRDs is allowed.

    c. <u>Discourse Effects</u>

      1. The proposition turns its primary speech act into a question, resulting in a transformation of a singleton set $\{p\}$ into a non-singleton set $\{p, \neg p\}$.

      2. Corresponding discourse components are projected.

The following section will discuss how each use of IRDs is communicated with discourse participants through the process in (147).

6.3 Paradigms

In this section, I will present various types of IRDs, which consists of two types: confirmative and contradictory, while Mirative IRDs are categorized as a subtype of Contradictory IRDs with an additional effect.

6.3.1 Confirmative

Since IRDs are more inquisitive than informative, Confirmative IRDs denote a non-singleton set $\{p, \neg p\}$.

(148)　A:　John has to leave early.

　　　　B:　a.　*He'll miss the party then?*

　　　　　　　b.　$^{OK\square}$ He'll miss the party then.

　　　　　　　c.　Will he miss the party then?

(adapted from Gunlogson, 2003, p. 60)

The polar question in (148c) can be substituted with the Confirmative IRD in (148a). The falling declarative in (148b) is also fine (indicated by $^{OK\square}$) but its

implicated meaning is significantly changed.[97] It cannot express the speaker's uncertainty and dependency on the addressee's commitments, which can only be expressed by a polar interrogative. Since Confirmative IRDs are inquisitive, (148a) requires the addressee's response, in the same way as a polar interrogative does in (148c).

Confirmative IRDs update the $DC_{sp}{}^*$. To illustrate, see (149).

(149) [Context: Suppose **A** is writing a rent check for his college student child **B**. This is only the second time **A** has had to pay for **B**'s rent, and he is looking for confirmation that it's $999. **A**, pen in hand, hovering over his checkbook, vaguely remembers that **B**'s rent is $999, but wants to double check.]

    A: *It's nine ninety-nine?*

<div align="right">(Goodhue, 2021, p. 956)</div>

In a double check situation like (149), the speaker has inferred or informed that the rent is $999, but yet to update it to their present commitment. The speaker's intention to be reluctant or tentative about the proposition is represented by updating *p* to the $DC_{sp}{}^*$.

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[97] I follow Malamud & Stephenson's (2015) convention of indicating the fine substitution with an absence of uncertainty as $^{OK\square}$.

From the discussion above, I propose the discourse effect of Confirmative IRDs as in (150). For the sake of comparison, the CDE of declaratives is given again with the CDE of polar interrogatives in (151).

(150) **Discourse Effect of Confirmative IRDs** (updating c_i with $\{p, \neg p\}$)

    (i) *Table$_o$ = Table$_i$ $\cup$ $\{p, \neg p\}$*

    (ii) $DC_{sp}{}^{*}{}_{,o} = DC_{sp}{}^{*}{}_{,i} \cup p$

	A utters p?
Table	$\langle \{p, \neg p\} \rangle$
Table*	
DC$_A$	
DC$_A{}^{*}$	$\{\{p\}\}$
DC$_B$	
DC$_B{}^{*}$	
CG	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$

(151) a. CDE **of Falling Declaratives**

    (i) *Table$_o$ = Table$_i$ $\cup$ $\{p\}$*

    (ii) $DC_{sp,o} = DC_{sp,i} \cup p$

  b. CDE **of Rising Polar Interrogatives**

    (i) *Table$_o$ = Table$_i$ $\cup$ $\{p, \neg p\}$*

The steep rise in intonation leads to the transformation of the issue on the *Table* from $\{p\}$ to $\{p, \neg p\}$, and to the projection of the speaker's commitment, indicating a positive bias instead of a commitment. Confirmative IRDs differ from canonical questions in terms of updating the $DC_{sp}{}^*$, which makes them biased questions. The positive bias is schematized as below:

(152) [Context: **A**'s typically overgrown coworker **B** has just entered the office with a buzzcut. **A** says to **B**:]

A: *You got a haircut?* (t_1') #***No, you're not***. (t_1'') t_1

	A utters *p*? in t_1'	#A utters *No* in t_1''
Table	$\langle\{p, \neg p\}\rangle$	$\langle\{\neg p\}\rangle$
Table*		
DC$_A$		#$\{\neg p\}$
DC$_A$*	$\{\{p\}\}$	$\{\{p\}\}$
DC$_B$		
DC$_B$*		
CG	s_1	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{\neg p\}\}$

(adapted from Rudin, 2018a, p. 36)

Without any further discourse move to rectify the commitment, it is impossible to update $\neg p$ in DC_A when p is already in $DC_A{}^*$. In other words, a Confirmative IRD at t_1' blocks the speaker from updating $\neg p$ to DC_A at t_1'', provided that speaker A is a rational discourse participant.

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As part of the process of reducing the *cs*, the issue pushed to the *Table* by Confirmative IRDs can be resolved through the addressee's ratification.[98] It is because that the speaker is already biased toward *p* which can automatically become a present commitment. The procedure for resolving the issue with Confirmative IRDs is schematized in (153).

(153)   A: There's one flight to Seoul. t_1

        B: *The flight leaves at 10am?* t_2

        A: Yes, it leaves from Gate 5. t_3

	A utters q in t_1	B utters p? in t_2	A utters *Yes* in t_3	after t_3 step1	after t_3 step2
Table	$\langle\{q\}\rangle$	$\langle\{p, \neg p\}\rangle$	$\langle\{p\}\rangle$	$\langle\{p\}\rangle$	
Table*					
DC$_A$	$\{q\}$	$\{q\}$	$\{p\}$	$\{p\}$	
DC$_A$*					
DC$_B$		$\{q\}$		$\{p\}$	
DC$_B$*		$\{\{p\}\}$	$\{\{p\}\}$	$(\{\{p\}\})$	
CG	s_1	$s_1 \cup \{q\} = s_2$	s_2	s_2	$s_2 \cup \{p\} = s_3$
CG*	$\{s_1 \cup \{q\}\}$	$\{s_2 \cup \{p\}, s_2 \cup \{\neg p\}\}$	$\{s_2 \cup \{p\}\}$	$\{s_2 \cup \{p\}\}$	

---

[98] The process of ratification should be much complicated for Contradictory IRDs. See §6.3.2 for more detail.

The resolution of the issue is achieved by the automatic movement of p from $DC_B{}^*$ to DC_B as presented in step 1. In step 2, speakers have joint commitments to p. Thus, the issue is resolved from the *Table* and expands the *CG*.

6.3.2 Contradictory

Contradictory IRDs are used when the speaker has a negative bias. This type of IRD is labeled as *contradictory* since the speaker is biased toward $\neg p$ while the sentence has a syntactic form of p. As Contradictory IRDs are a subtype of IRDs, they denote a non-singleton set $\{p, \neg p\}$ as well.

(154) [Context: **A** and **B** are at a department store. **A** has asked **B** to go pick out a 100% common sweater; **B** does not know much about clothes, and is not particularly detail-oriented. He returns with a sweater.]

    A: a.   *That's 100% cotton?* Maybe you should double check.

          b.   #That's 100% cotton. Maybe you should double check.

          c.   Is that 100% cotton? Maybe you should double check.

(adapted from Rudin, 2022, p. 347)

A Contradictory IRD such as (154a) can be substituted with a polar interrogative as in (154c), but not with a falling declarative as in (154b).

Therefore, the semantic content $\{p, \neg p\}$ is updated to the *Table*, making Contradictory IRDs inquisitive.

The only commitment Contradictory IRDs update is the DC_{ad}^{*}, confirmed by the 'Really' test as follows:

(155) A: Please apologize him.

  B: *I was wrong and I should apologize?* **Really?**

Speaker B in (155) does not think that they did something wrong and should apologize. Instead, they are making a best guess on the addressee's commitment, which they would in fact disagree. This is emphasized by the continuation of *Really?*.

I define the discourse effect of Contradictory IRDs as in (156). The corresponding CDEs for declaratives and polar interrogatives are also given in (157) for the sake of comparison.

(156) **Discourse Effect of Contradictory IRDs** (update c_i with $\{p, \neg p\}$)

  (i) *Table$_o$* = *Table$_i$* $\cup \{p, \neg p\}$

  (ii) $DC_{ad}^{*}{}_{,o} = DC_{ad}^{*}{}_{,i} \cup p$

	A utters p?
Table	$\langle\{p, \neg p\}\rangle$
Table*	
DC$_A$	
DC$_A$*	
DC$_B$	
DC$_B$*	$\{p\}$
CG	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$

(157) a. CDE **of Falling Declaratives**

    (i) $Table_o = Table_i \cup \{p\}$

    (ii) $DC_{sp,o} = DC_{sp,i} \cup p$

  b. CDE **of Rising Polar Interrogatives**

    (i) $Table_o = Table_i \cup \{p, \neg p\}$

Identical to Confirmative IRDs, the issue of on the *Table* becomes a non-singleton set $\{p, \neg p\}$ due to steep rise. Moreover, Contradictory IRDs differ from polar interrogatives in that they update p to the $DC_{ad}{}^*$.

    Without having any commitments from the speaker, the negative alternative is highlighted (c.f. Roelofsen & van Gool, 2010; Roelofsen &

Farkas, 2015). As discussed in §6.1.2, the following example with *No way* confirms that Contradictory IRDs have a negative bias.[99]

(158)　A:　John has a sister. We should invite her too.　　　　　　t_1

　　　　B:　*John has a sister?* (t_2') **No way.** (t_2'') You must be thinking of his young brother.　　　　　　t_2

	A utters p in t_1	B utters p? in t_2'	B utters *No way* in t_2''
Table	$\langle\{p\}\rangle$	$\langle\{p, \neg p\}\rangle$	$\langle\{\neg p\}\rangle$
Table*			
DC$_A$	$\{p\}$	$\{p\}$	$\{p\}$
DC$_A$*		$\{\{p\}\}$	$\{\{p\}\}$
DC$_B$			$\{\neg p\}$
DC$_B$*			
CG	s_1	s_1	s_1
CG*	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$s_1 \cup \{\neg p\}$

---

[99] Note that Contradictory IRDs can also convey the speaker's surprise as well. To illustrate, consider another example in (i).

(i)　[Context: **A** and **B** are watching a sunset, and **B** has just expressed awe at its beauty.]
　　A:　*This is a beautiful sunset?*

(Rudin, 2018a, p. 38)

Speaker A's utterance in (i) indicates: (i) A is not agreeing with B and (ii) A is surprised that B is amused. That is, IRD can convey both meanings of contradiction and mirativity, which is emphasized when *THIS* is focused (Rudin, 2018a). The proposed analysis can predict this phenomenon as I argue that the mirative use of IRD is a subtype of Contradictory IRDs. See §6.3.3 for relevant discussion.

In (158), speaker B does not believe that *John has a sister*, and thus it can be followed by *No way* to emphasize their negative belief. Without having any commitments (gray rows) at t_2', speaker B can have a room to emphasize their negative bias with *No way* at t_2''.

The issue of Contradictory IRDs is more difficult to be resolved than in a positively biased context. Due to the empty DC_{sp} and DC_{sp}^*, the discourse remains in a conversational crisis even after the addressee's ratification.

(159) [Context: **A** is quizzing **B**.]

    A: (student) The answer to this problem is 5 because the square root

        of 9 is 2 and 2+3 is 5. t_1

    B: (teacher) *The square root of 9 is 2?* t_2

    A: Yes. t_3

	A utters p in t_1	B utters p? in t_2	A utters *Yes* in t_3
Table	$\langle\{p\}\rangle$	$\langle\{p, \neg p\}\rangle$	$\langle\{p, \neg p\}\rangle$
Table*			
DC$_A$	$\{p\}$	$\{p\}$	$\{p\}$
DC$_A$*		$\{\{p\}\}$	
DC$_B$			
DC$_B$*			
CG	s_1	s_1	s_1
CG*	$\{s_1 \cup \{p\}\}$	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$	$\{s_1 \cup \{p\}\}$

(adapted from Farkas & Roelofsen, 2017, p. 269)

In (159), speaker B does not update any commitment with the Contradictory IRD at t_2. Due to the lack of commitment from one participant, the issue cannot be resolved even after the other participant utters *Yes* at t_3. The consequence will lead participants to the next stage of the discourse, pursuing to 'agree to disagree' (Farkas & Bruce, 2010) or putting the issue at the bottom of the *Table* to be not discussed unless one of the speakers changes their own commitments. Whatever treatment we assume, they both prevent the issue from expanding the *CG*.

6.3.3 Mirative

Mirative IRDs' semantic contribution overlaps with Contradictory IRDs. They express negative bias and mirativity together, as illustrated below.

(160) [Context: Suppose that rent in the amount of $999 is surprising to **A**.]

      A: How much is the rent?

      B: Nine ninety-nine.

      A: *It's nine ninety-nine?*

<div align="right">(Goodhue, 2021, p. 956)</div>

In (160), speaker A is expressing their amusement with the rising intonation. If the speaker presupposes or has prior knowledge about the expressed

proposition, Mirative IRDs are infelicitous. A relevant example, where presupposed content is questioned, is given in (161).

(161)   A: How's your brother doing recently?

(*At that moment, **B** gets a phone call from his brother. A sees **B**'s phone and says*:)

A: (Wow!) #*You have a brother?*

In (161), speaker A already knows that speaker B has a brother. In this particular context, the use of a Mirative IRD would be infelicitous. In order to convey their surprise, the speaker should not have been committed to *p* prior to the discourse act, i.e., the information should be 'unexpected' (DeLancey, 1997). The lack of speaker's commitments corresponds to their negative bias, as we have seen in Contradictory IRDs. Therefore, Mirative IRDs are a subtype of Contradictory IRDs, having similar discourse effects.

In terms of their semantic content, Mirative IRDs have a non-singleton set in the same way as Contradictory IRDs.

(162)   A: I met John's sister yesterday.

B: a.   (What?) *John has a sister?*

b.   #(What?) John has a sister.

c.   (What?) Does John have a sister?

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The Mirative IRD in (162a) can only be substituted with its corresponding polar interrogative in (162c), which means that they are more inquisitive than informative.

While the speaker is not committed to the expressed proposition, what is added to the DC_{sp} is their emotive attitude. Following the discussion in §6.1.3, I analyze the mirativity of Mirative IRDs as illocutionary not-at-issue content, following Rett's (2021) definition of flavored commitments repeated below:

(163) **Discourse Commitments**

Let DC_a be sets of propositions of the form **is-surprised**$_a(p)$, representing the public commitments of a with respect to a discourse in which a and b are the participants, where:

a. **is-surprised**$_a(p)$ is a public commitment of a iff 'a is surprised with p' is a mutual belief of a and b.

(repeated from (144))

I will also follow Rett & Sturman's (2021) idea on the semantic contribution of mirative markers as in (164).

(164) MIR, for clauses C with content p: MIR $(C, a, K_i) = (C, a, K_o)$ such that

(i) $DC_{a,o} = DC_{a,i} \cup \{\langle\textbf{is-surprised}, p\rangle\}$

(ii) $T_o = push(\langle C; \{p\}\rangle, T_i)$

In a nutshell, the role of a mirative marker is to update the information that the speaker is surprised in the DC_{sp} as in (164i) and to update the issue on the *Table* as in (164ii).

Building on Rett (2021) and Rett & Sturman (2021), I define the discourse effect of Mirative IRDs as in (165). Note that a mirative marker in Rett & Sturman (2021) adds a singleton set $\{p\}$ to the *Table*, while the proposed system adds a non-singleton set $\{p, \neg p\}$.

(165) **Discourse Effect of Mirative IRDs** (update c_i with $\{p, \neg p\}$)

(i) *Table$_o$* = *Table$_i$* $\cup$ $\{p, \neg p\}$

(ii) $DC_{ad}{}^*{}_{,o} = DC_{ad}{}^*{}_{,i} \cup p$

(iii) $DC_{sp,o} = DC_{sp,i} \cup$ **is-surprised**$_{sp}(p)$

	A utters p?
Table	$\langle\{p, \neg p\}\rangle$
Table*	
DC$_A$	**is-surprised**$_a$ (p)
DC$_A$*	
DC$_B$	
DC$_B$*	$\{\{p\}\}$
CG	s_1
CG*	$\{s_1 \cup \{p\}, s_1 \cup \{\neg p\}\}$

(165i-iii) are identical to the discourse effect of Contradictory IRDs in (156). The only difference is to update DC_{sp} with **is-surprised** (p), as specified in (165iii). In this respect, Contradictory IRDs implicate an additional not-at-issue content, mirativity. The process of updating the mirativity of Mirative IRDs is shown in (166).

(166) [Context: **A** and **B** are watching a girl give a very professional performance in a school debate. From this, **A** is thinking that she might be 12 or 13 years old.]

A: She's amazing.		t_1
B: I know, and she's only 9 years old.		t_2
A: (What?) *She's nine?*		t_3

	A utters q in t_1	B utters p in t_2	A utters p? t_3
Table	$\langle\{q\}\rangle$	$\langle\{p\}\rangle$	$\langle\{p, \neg p\}\rangle$
Table*			
DC$_A$	$\{q\}$	$\{q\}$	**is-surprised** (p)
DC$_A$*			
DC$_B$		$\{p\}$	$\{p\}$
DC$_B$*			$\{\{p\}\}$
CG	s_1	$s_1 \cup \{q\} = s_2$	s_2
CG*	$\{s_1 \cup \{q\}\}$	$\{s_2 \cup \{p\}, s_2 \cup \{\neg p\}\}$	$\{s_2 \cup \{\neg p\}\}$

The process other than flavored commitment **is-surprised** (p) at t_3 is identical to Contradictory IRDs.[100]

6.4 Interim Summary

IRDs are biased questions with a non-singleton semantic content $\{p, \neg p\}$, accompanied with steep rise. They are classified into two types according to the bias, whether p or $\neg p$. The inference regarding the speaker's negative bias only emerges when the speaker has prior contextual information about the addressee's belief or bias toward p. If the prior context is such that addressee's belief is known to the speaker, we get contradictory interpretation of IRDs. However, without the contextual restriction, IRDs are more likely to be understood as confirmative. The proposed interpretive process is illustrated in Figure 6.1.

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[100] Mirative IRDs can also take presupposed content as their target of mirative meaning, as shown in (i).

(i)   A: The king of France is bald.
        B: (Wow!) *France is a monarchy?*
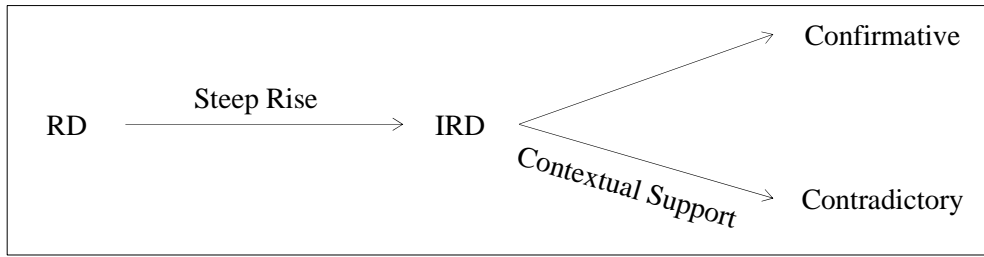
<div align="right">(Gunlogson, 2003, p. 21)</div>

Figure 6.1 The Process of Interpreting IRDs

Unlike previous approaches, I provided distinctive discourse effects for each of them. Confirmatory IRDs have a positive bias with p being updated to the $DC_{sp}{}^*$ while Contradictory IRDs have a negative bias with p being updated to the $DC_{ad}{}^*$. I also argued that Mirative IRDs are a subtype of Contradictory IRDs as they are identical except for the illocutionary not-at-issue content of mirativity which is updated to the DC_{sp}. The paradigm of IRDs proposed in this chapter is summarized in Table 6.2.

Table 6.2 The Paradigm of IRDs in Comparison with Polar Questions

Types	PQs	IRDs		
		Confirmative	Contradictory	
			Mirative	
Intonation	↗			
Bias		p	$\neg p$	
Content	$\{p, \neg p\}$			
Table	$\langle\{p, \neg p\}\rangle$			
Table*				
DC$_{\text{sp}}$			**is-surprised**(p)	
DC$_{\text{sp}}{}^*$		$\{p\}$		
DC$_{\text{ad}}{}^*$			$\{\{p\}\}$	

Chapter 7

Conclusion and Outlook

7.1 Recap of the Analysis

In this thesis, I explore the semantics and pragmatics of RDs in English and how they update discourse contexts throughout the semantic convention and pragmatic reasoning.

I first propose a new paradigm of RDs, mainly based on Jeong (2018a, 2018b). In this paradigm, I distinguish two main types of RDs, ARDs and IRDs, based on their discourse effects. This categorization is determined by whether they convey predominantly informative or inquisitive meanings. ARDs are characterized as tentative assertions, while IRDs are considered biased questions (Jeong, 2018a, 2018b). This difference between the two is rooted in their distinct semantic content. ARDs denote a singleton set $\{p\}$, which is the expressed proposition, whereas IRDs denoted a non-singleton set $\{p, \neg p\}$, the expressed proposition and its negation. This semantic difference is conventionally derived from the rising intonation which amplifies inquisitive content of the proposition. When accompanied by a weak rise, the semantic content remains $\{p\}$, while it expands to $\{p, \neg p\}$ when coupled with a steep rise.

ARDs are divided into two subtypes, Epistemic Uncertainty ARDs and Metalinguistic Uncertainty ARDs. The former is related to the speaker's tentativeness about the truth value, similar to epistemic modals. The latter, in comparison, is related to the speaker's tentativeness on the proposition's relevance to the current QUD.

Following the proposed paradigm, discourse effects of each subtype are differently modeled. Epistemic Uncertainty ARDs have identical update conventions with canonical assertions, except they update p to the $DC_{sp}{}^{*}$ rather than the DC_{sp}. By projecting the commitment of the speaker, the speaker's tentativeness on the truth value of p is captured. For Metalinguistic Uncertainty ARDs, I proposed a new discourse component of the conversational scoreboard model, the *Table**. The *Table** records at-issue content about which the speaker has uncertainty about the relevance to the current QUD. It is analogous to other projected features (the $DC_X{}^{*}$ and the CG^{*}), representing the speaker's expectation on the next stage of discourse. At the same time, these two types of ARDs can be also used for a politeness strategy due to their indirectness (Leech, 1983), which stems from the ratification of projected components (i.e., the $DC_{sp}{}^{*}$ or the *Table**). The ratification process to make the discourse progress leads to the enhancement of the addressee's face (Brown & Levinson, 1987) by being indirect (Jeong, 2018a, 2021).

I argue that IRDs have two main types as well. Confirmative IRDs have a positive bias toward the expressed proposition, whereas Contradictory IRDs

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have a negative bias despite their overt syntactic form. Meanwhile, Mirative IRDs are a subtype of Contradictory IRDs that conveys the speaker's exceeded expectation or surprise.

Regarding discourse effects, Confirmative IRDs and Contradictory IRDs serve to update p to the $DC_{sp}{}^{*}$ and the $DC_{ad}{}^{*}$ respectively. The speaker of a Confirmative IRD exhibits a preference for p to be true, aligning with the definition of the $DC_{sp}{}^{*}$, the speaker's tentative commitment. In contrast, my proposed model predicts a negative bias of Contradictory IRDs by assuming that the speaker lacks their own commitments, but updates the $DC_{ad}{}^{*}$. Furthermore, Mirative IRDs can be considered a specific form of Contradictory IRDs since the speaker should not have had prior commitments to the expressed proposition in order to convey amusement or surprise. The mirativity of Mirative IRDs aligns with the pattern observed in emotive markers, which are illocutionary not-at-issue content (Rett, 2021). Like morphological emotive markers, Mirative IRDs add flavored commitments **is-surprised**$_{sp}(p)$ to the DC_{sp} (Rett, 2021; Rett & Sturman, 2021).

The contributions of rising intonation in each paradigm of RDs is summarized in Table 7.1.

Table 7.1 Division of Labor and Projection in Interpreting RDs

		ARDs		IRDs	
		EU	**MU**	**Conf.**	**Cont.**
Semantics	Rising Intonation	Weak (H* H-H%)		Steep (L* H-H%)	
Pragmatics	Subset of the QUD	YES	NO	-	
	Contextual Information	-		NO	YES
Semantic Content		$\{p\}$		$\{p, \neg p\}$	
Projection		$DC_{sp}{}^{*}$	$Table^{*}$	$DC_{sp}{}^{*}$	$DC_{ad}{}^{*}$

7.2 Future Developments

I will close my thesis by addressing some remaining issues and suggesting probable resolutions. Firstly, in §7.2.1, I discuss the potential impolite uses of RDs. Secondly, in §7.2.2, I present the intricate nature of terminal contour patterns, emphasizing the complexities involved and providing suggestions for future research. Lastly, in §7.2.3, I explore the possibilities of developing a unified approach that can encompass various non canonical sentence types.

7.2.1 Impoliteness

As discussed in §5.1.3, ARDs can be used as a politeness strategy. However, although infrequently, ARDs can implicate impoliteness.

(167)   A: Did you even read the article?

         B: *I wrote it?*

<div align="right">(Jeong, 2021, p. 184)</div>

In (167), an ARD sounds more impolite compared to its falling counterpart. I assume conventionalized indirectness (Terkourafi, 2015) can predict impoliteness. According to Terkourafi's (2015, p. 13) modification of Leech (1983), politeness decreases after a certain point of conventionalized indirectness, even if indirectness continues to increase, as in Figure 7.1.
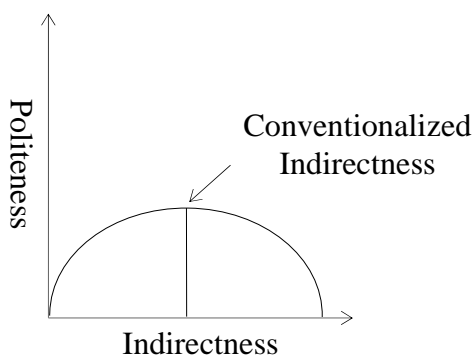
Figure 7.1 Politeness as a Matter of Conventionalization

The impoliteness of (167) may come from exceeding the point of conventionalized indirectness. Due to an excessive indirectness, it becomes a threat to the addressee's face by giving an excessive burden to the addressee.

I also suppose that the impoliteness of IRDs is concerned with conventionalized indirectness. To illustrate, see (168).

(168) [Context: **A** and **B** are colleagues of comparable social standing.]

    A: a. Do you know him?

          b. *You know him?*

Again, I suppose that extreme requirements for ratification can cause impoliteness, but further research is needed to fully establish the comprehensive theory regarding the connection between the form of an utterance and politeness.

7.2.2 Variance in Terminal Contour

Through the discussion, I did not make a clear distinction between the variance in terminal contour. I treat Rise-Fall-Rise (RFR) and Fall-Rise (FR) alike for the present purpose, but I surmise that delay of rise may indicate extra significance as Gussenhoven (1984) and Westera (2019) notice. For further justification, additional supportive experimental evidence is required.

However, at this stage, I will leave it open to explore the phonetic differences around RDs.

7.2.3 Other Non-Canonical Sentence Types

Other types of non-canonical structures have been extensively investigated in the literature as well. These include tag questions (e.g., Malamud & Stephenson, 2015; Farkas & Roelofsen, 2017), rising imperatives (e.g., Rudin, 2018a, 2018b) and negative polar interrogatives (e.g., van Rooij & Šafářová, 2003; Reese, 2006; AnderBois, 2019; Goodhue, 2022). The final step may be developing a comprehensive framework that covers all of these non-canonical sentence types. One plausible step towards this end, for example, may be delve more into the relation between IRDs and NPQs. They seem to be constituted in a similar manner, but the difference seems to lies on the interaction between original bias and contextual bias (e.g., Domaneschi et al., 2017).[101] Constructing a unified approach necessitates further analysis, but I hope that my account on RDs to become the part of a right step toward the unified model for diverse speech acts.

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[101] Another issue to consider is the placement of each type within Figure 4.3.

7.3 In Closing

In this thesis, I aim to present a diverse paradigm of RDs, focusing on their diverse speech acts and how their meanings are acquired throughout the discourse. Given that RDs serve both informative and inquisitive functions, they exhibit multifunctional nature, acting as if assertions or questions. The analysis I propose aims to delineate the roles of semantics and pragmatics and explain their interface in generating the discourse effects observed in different types of RDs. By establishing this framework, the proposed analysis can provide a predictable model for understanding the semantic and pragmatic properties of RDs.

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국문초록

영어 상승 평서문의 의미와 화용

영어의 상승 평서문(English rising declaratives)은 평서문이 상승 억양과 결합한 비정형적(non-canonical) 구조이다. 본 논문은 상승 평서문이 구문의 유형, 억양, 대화 맥락 간의 상호작용을 통하여 전달 및 이해되는 과정에 대해 논하며, 상승 억양이 평서문과 결합하였을 때의 기능에 대한 종합적인 분석을 제시한다.

논의는 Jeong(2018a, 2018b)이 주장한 상승 평서문의 두 가지 기본 유형에서 출발한다. 이 두 기본 유형은 각각 단언적 상승 평서문(assertive rising declaratives)과 문의적 상승 평서문(inquisitive rising declaratives)으로 분류되며, 전자는 유보적 단언(tentative assertion)의 기능을, 후자는 편향적 질문(biased question)의 기능을 가진다. 이에 더하여, 본 논문은 기존 논의가 충분하지 않았던 세부 유형에 대하여 논의한다. 단언적 상승 평서문의 유보성(tentativeness)이 인식론적(epistemic)일 수 있는 동시에 초언어적(metalinguistic)일 수 있음을 주장하며, 간접성(indirectness)과의 밀접한 관련성에 주목하여 공손 전략으로의 사용에 대해 설명한다. 한편, 문의적 상승 평서문은 화자의 긍정적 편향을 전달하고자 사용될 수 있는 동시에, 부정적 편향을 표상할 수 있다. 더 나아가, 화자의 부정적 편향을 표현함과 동시에 놀라움이나 감탄의 기능을 가지는 것 또한 가능하다.

본 저자가 주장하는 이론은 Lewisian 모델 (Lewis, 1979)을 확장한 Table 모델 (Farkas & Bruce, 2010; Malamud & Stephenson, 2015)에 기반하고 있다. 이 체계를 바탕으로, 상승 평서문이 표준(canonical) 평서문에 미치는 두 가지 중요한 역할을 주장한다. 첫째, 상승 억양은 상승의 정도에 따라 관습적(conventional)으로 명제의 탐구성(inquisitive content)을 증가시킨다. 둘째, 상승 억양은 대화 맥락과 상호 작용하여 담화 요소들(discourse components)을 투사(project)한다. 본 논문에서 제안한 이론은 상승 평서문의 해석 과정에서의 의미와 화용의 역할을 효과적으로 설명하는 동시에, 이들의 접합면을 통하여 각기 다른 유형의 상승 평서문의 담화 효과가 생성되는 과정에 대한 해석을 제공한다.

주요어 : 상승 평서문, 유보적 단언, 편향적 질문, 의미-화용 접합면, 억양, 구문 유형, 담화 효과

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