The (Social) Meaning of English Additive Expressions

Dissertation

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William Carl Thomas, MA

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Dissertation Committee:

Ashwini Deo, Advisor

Kathryn Campbell-Kibler, Co-Adviser

Marie-Catherine de Marneffe

Scott Schwenter

Victor Edgar Onea Gáspár

Abstract

This dissertation undertakes an investigation of the meanings of positive-polarity additive particles in English, exemplified in (1). Beginning with the semantics of such particles, I propose a new analysis of *too*, *also*, and *as well* that is motivated by a previously unreported use of *too* in English, shown in (2), which I call the argument-building use. I show that the argument-building use falsifies existing generalizations about additives, and I propose a new analysis of additivity that builds on existing question-based theories of additivity (e.g. Beaver & Clark 2008) by incorporating notions from Inquisitive Semantics and the Rational Speech Act framework to unify the two uses.

(1)   Canonical additive use:
         Mary drinks coffee. She drinks tea, **(too/also/as well)**.

(2)   Argument-building use:
         A room just opened up at this hotel. It looks kind of fancy, **too**!
         (Corpus of Contemporary American English)

I then turn to yet another use of *too*, the refutational use, which expresses disagreement—see (3).

(3)   A: You didn't do your homework!
         B: I did **too**!

Building on the understanding of polarity particles developed by Farkas & Bruce (2010) and Roelofsen & Farkas (2015), I argue that refutational *too* is a [REVERSE, +] polarity particle: It requires a negative antecedent and a positive host sentence. Though such particles are

well-attested cross-linguistically, English has not previously been argued to have one. I also argue that refutational *too* differs from other documented [REVERSE, +] particles: It requires its addressee to have publicly expressed a belief in (though not necessarily a full commitment to) the negation of its host sentence. I propose a new polarity feature, [REFUTE], to account for this behavior. I present experimental data that support this analysis.

Finally, I consider the sociolinguistic role of refutational *too* as an index of speaker qualities. Refutational *too* is stereotyped as children's speech, but it is also used by adults as resource for stance-taking and style construction. Building on recent research by semanticists who have begun to explore "social meaning" (e.g. Acton & Potts 2014; Beltrama & Staum Casasanto 2017; Beltrama et al. 2023) and bringing it into closer dialogue with relevant work in anthropology and sociolinguistics (e.g. Silverstein 1976, 2003; Eckert 2008), I investigate whether there is any relationship between refutational *too*'s meaning as a speaker-quality index and its semantic properties. I present the results of a social perception experiment that are consistent with the hypothesis that there is an indexical link between childishness and the semantic profile that refutational *too* shares with refutational *so*. However, the data also point to a complex interplay between convention, ideology, and reasoning about discourse goals, so I do not analyze the meaning as an implicature the way that some authors have done for other phenomena in this domain (e.g. Burnett 2019; Beltrama et al. 2023; Solt et al. 2025).

Acknowledgments

W. H. Auden apparently once misquoted[1] Paul Valéry as having said that "a poem is never finished, only abandoned." The same can be said about doctoral dissertations. For too many years, the ideas in this thesis have meandered, taken long unplanned detours, and fallen down frightening rabbit holes. The document that has emerged is a snapshot of one moment in this continual evolution that does not, to me, resemble a final destination of any kind. Had I been left to my own devices, I would probably never have committed any of it to text. Alas, convention nonetheless dictates that this .pdf file now be ritually abandoned so that the scholarly authorities might grant me my next credential. To be clear, the effort that produced it continues uninterrupted, and the ideas (merely) represented herein will continue to evolve. But the dissertation *qua* textual artifact must be left behind.

This text has precipitated[2] from the confluence of many streams of thought, and it could only have been written in a linguistics department where discourse is constrained neither by orthodoxy nor by (sub)disciplinary boundaries. At OSU, I am extremely grateful to have found a department where those boundaries are porous, where any dogma can be challenged, and where every assumption must be justified.

I thank first and foremost my advisor, Ashwini Deo, for her tireless dedication and many, many hours of discussion that have indelibly shaped my work and my general outlook. I am extremely fortunate to have had an advisor diligent enough to provide the structure I needed to get started with research, but also patient enough to stick with me (over Zoom, no less) as I went in circles for all these years—not to mention open-minded enough to entertain my

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[1] Or paraphrased, if we're being charitable (see Ratcliffe 2017).

[2] Think salad dressing (cf. Silverstein 2023: 29).

most half-baked ideas and sloppiest handouts. From her I have learned to think carefully about context, to embrace a variety of methodological approaches, and to develop theories that are not just formally rigorous but also illuminating. I am also grateful that she somehow persuaded me to embrace probabilistic pragmatics (which I stubbornly resisted for too long).

My thinking has been influenced no less by Kathryn Campbell-Kibler, my "kinda pseudo-advisor" (her words), who very graciously agreed to assume the burden of paperwork when regulations mandated that I find myself a co-advisor. I will forever be grateful to her for reshaping my worldview by challenging my assumptions and training me to take inter-speaker variation, ideology, fuzziness, and chaos seriously. She has also taught me most of what I know about statistics, and her guidance on designing experiments has greatly benefitted this dissertation—and not just the "social" parts that were supposed to be her purview! I am no longer sure whether my interests are interdisciplinary, adisciplinary, or simply undisciplined. Time will tell whether training in sociolinguistics has made me a better semanticist or not a semanticist at all.

My other three committee members have also provided crucial feedback, advice, and support. I thank Edgar Onea for agreeing to be an external committee member despite the distance between us and for generously making time to discuss parts of this work with me in depth. His thoughtful feedback, insightful questions, and beautiful counterexamples have greatly improved my semantic analyses. I thank Marie-Catherine de Marneffe for helpful feedback on experimental designs, for her commitment to empirical rigor, and for providing my initial exposure to the probabilistic notions that would eventually come to play a central role in my understanding of pragmatics. And I thank Scott Schwenter for his expertise on refutational *too*, for much helpful feedback, and for taking a strong interest in both the semantic and sociolinguistic aspects of this project.

Other OSU faculty who were not officially on my committee have also supported and influenced this work. After having unwittingly followed Prerna Nadathur around for roughly the first two decades of my life, I'm delighted that our paths finally crossed at OSU. Not only have her comments and questions improved my work, but having another semanticist (and generally like-minded person) in the department has made me feel less alone, and I appreciate her for keeping the Pragmatics discussion group alive. I'm thankful to Mike White for being

beginning every essay with a quote I found on the internet. But they also taught me that after you learn the rules, you might find good reasons to break them.

Outside of my academic life, I am grateful to Bridget, Charlie, both Davids, Eric, Luke, Ted, and everyone else in the Unicorn Book Club at Two Dollar Radio (plus honorary members Andrew and Cahner) for getting me into indie literature (and film) and for giving me something almost resembling a social life.

So much has changed since I left Chicago in 2018—and almost none of it for the better. Nothing would be worthwhile without the people who keep the past alive and remind me that a better future is not yet out of reach. I thank Anna R., Cole, Daron, George, Mads, and Ronald for dining better by leaving it there—and Colemanna in particular for the excuse to take a trip to California (for three days... from Germany). I can't thank (or apologize to) Emma enough for not giving up on the extra-curricular writing project I didn't know I needed but have somehow delayed even more egregiously than this project. And I don't know how to thank Anna N., Cindy, Daphne, Dominic, and Natalie for their moral clarity, their courage, and—most importantly—their solidarity, even when we don't all finish the reading. Everything I ever really needed to know I learned alongside these people,[3] in spite of and in opposition to the bureaucratic systems and bemused authority figures that were supposed to be educating us. This academic stuff is all just for fun.[4]

My sanity has benefitted from taking occasional breaks from Ohio. For facilitating that I thank Dominic, Anna N., my sibling Lyle, my cousin Robert, my parents, my grandparents, and my great aunt Katie. My parents are also to be commended for supporting my choices even when they don't understand them, and for tolerating our ever-increasing geographic distantiation.

With gratitude, relief, and slight remorse, I hereby abandon this dissertation.

Stuttgart

July 2025

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[3]And thousands of others. There are so many more of us than there are of them.

[4]See Graeber (2014), please.

Vita

Publications

Deo, Ashwini and William Thomas. 2025. Addressing the widest question: English "just" as a domain widening strategy. *Journal of Semantics 42*(1–2), 1–37.

Thomas, William and Ashwini Deo. 2024. *Just* as a scale widener with maximum-standard adjectives: emphatic/precisifying effects. *Proceedings of Sinn und Bedeutung 28*.

Thomas, William. 2023. English does too have a [REVERSE,+] polarity particle! *Proceedings of Sinn und Bedeutung 27*.

Thomas, William. 2021. Toward a unified semantics for English *either. Proceedings of Semantics and Linguistic Theory (SALT) 31*, 446–465.

Thomas, William. 2021. Social inferences from the use of *just* as an exclusive particle. *Proceedings of the Linguistic Society of America 6*(1), 746–760.

Thomas, William and Ashwini Deo. 2020. The interaction of *just* with modified scalar predicates. *Proceedings of Sinn und Bedeutung 24*, 354–372.

Fields of Study

Major Field: Linguistics

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Chapter 1

Introduction: Additives in discourse

Additives are expressions that (at an intuitive level) mark their host sentence as being "added" to some other related sentence (usually called an "antecedent"). The inventory of additive expressions in English includes the particles *too*, *also*, and *as well*. A few naturally-occurring examples of these particles, drawn from the Corpus of Contemporary American English (COCA; Davies 2008–), are shown below.

(1)   Mitt Romney has such a reputation as a flip flopper that it is sometimes hard to remember that there have been some very constant things in his life and career, **too**.

(2)   In our society, because of the rules we have put into place, choosing to be a teacher is a poor career choice. You get overworked, underappreciated, underpaid, and then on top of that you get demonized by the media and often times by your own community **too**.

(3)   In their investigation, the [Consumer Financial Protection] Bureau found that the two agencies [Equifax and Transunion] had been misrepresenting the scores provided to consumers, telling them that the score reports they received were the same reports that lenders and businesses received, when, in fact, they were not. The investigation **also** found problems with the way the agencies advertised their products, using promotions that suggested that their credit reports were either free or cost only $1.

(4)   "I write, like any artist, for an audience of one," [August Wilson] says, "basically, to

satisfy myself. But I'm **also** trying to make an aesthetic statement. What I am trying to do is put Black culture on stage and demonstrate to the world—not to White folks, not to Black folks, but to the world—that it exists and that it is capable of sustaining you."

(5)   A trade war is not conceivable. China exports $440 billion worth of goods to America. If the U.S. imposed a 45-percent tariff then China couldn't export that much, so lots of Chinese would lose their jobs. But China would retaliate against America. Hundreds of thousands of Americans would lose their jobs **as well**. Therefore, a mature leader would not develop a confrontational trade relationship to that extent.

(6)   With the 2012 Super Bowl played in Indianapolis, the modest capital city got a huge reputation boost. "Super Bowl 2012 Erases Indianapolis Image as Naptown," the Huffington Post proclaimed. The Indianapolis startup scene may deserve a reputation boost **as well**.

Although there is quite a large existing literature on the semantics and pragmatics of additivity, two uses of *too* have so far largely escaped the attention of semanticists, and they will play a central role in this dissertation. One is what I call the **argument-building** use, exemplified in (7-a–c), which I argue conveys that its host sentence strengthens the argument for a previously suggested conclusion. The other is what Schwenter & Waltereit (2010) call the **refutational** use, exemplified in (8-a–b), which expresses disagreement.

(7)   **Argument-building** *too*

a.   Ernie who's been raising or helping to raise somebody's children [...] since she was maybe thirteen years old, just naturally took Iree in with no authority but her own. [...] Good thing she did **too** because something happened in the birthing time of Iree and she's got epilepsy [...]   (COCA)

b.   (Online forum discussion) i have never gotten a ticket but i know a cpl people who have.. i guess the fine is a hefty one **too**. depending on what im driving, i chance it.   (COCA)

c.   A room just opened up at this hotel. [...] It looks kind of fancy, **too**.   (COCA)

(8) **Refutational *too***

    a.   A: You didn't do your homework!

        B: I did **too**!   (Schwenter & Waltereit 2010)

    b.   A: You ate all my cookies.

        B: I did not!

        A: You did **too**!   (Rullmann 2003)

Existing semantic analyses of *too* do not adequately account for either of these uses, and thus one goal of this dissertation is to develop new analyses that do. Taking a broad view of the nature of "meaning", however, the investigation will not be restricted to formal semantic/pragmatic analysis. Starting from the observation that many English speakers report the impression that refutational *too* is typical of children's speech, this dissertation also makes use of experimental methods from sociolinguistics to examine the role of refutational *too* in conveying social information about speakers. The reported childishness of refutational *too* might be hypothesized to have something to do with its semantics: As a very conspicuous marker of conversational conflict, it seems to flagrantly violate norms of politeness in a way that might be seen as typical of children. This study therefore aims to bring the sociolinguistic and semantic literatures into closer dialogue, taking a cue from recent steps toward a more integrated, inter-disciplinary theory of linguistic meaning (e.g Eckert 2019; Beaver & Stanley 2023).

Broadly speaking, this dissertation has three main goals:

- To broaden the empirical scope of research on additive expressions by examining previously unanalyzed uses of such expressions, making use of naturally-occurring corpus examples and experimental data, and investigating "social" meaning phenomena outside the scope of semantics and pragmatics.

- To strengthen the explanatory power and empirical adequacy of formal theories of additivity, while at the same time more clearly demarcating the boundaries of the applicability of formal theories of discourse within the broader landscape of linguistic meaning.

- To bring the semantics/pragmatics, sociolinguistics, and linguistic anthropology literatures into closer dialogue towards the long-term goal of a more integrated theory of linguistic meaning.

More concretely, this dissertation examines three main functions of English additive expressions in discourse: to supplement previously known information, to reject previous claims, and to evoke childishness for the purpose of taking conversational stances. This introductory chapter provides a preview of the main results concerning each of the these functions. Chapter 2 uses formal tools from question-based theories of discourse, Inquisitive Semantics, and probabilistic pragmatics to develop a novel semantic analysis unifying the argument-building use of *too* with the canonical additive use and then extends that analysis to other positive-polarity additives. Chapter 3 proposes an analysis of refutational *too* and presents experimental data to support it. Chapter 4 reviews the existing literature on social meaning and previous work aiming to bridge semantics and sociolinguistics before Chapter 5 presents a social perception experiment aimed at understanding how refutational *too* shapes listeners' impressions of speakers across a range of conversational contexts. Chapter 6 concludes by suggesting some directions for future work.

1.1 Supplementing prior information with *too*, *also*, and *as well*

Since additives contribute nothing to the truth-conditional meaning of their host sentences, it may not be immediately obvious why languages should have additives at all. What is their communicative utility? According to Zeevat (2012), "The purpose of additive marking [...] is to mark that both answers hold at the same time and to prevent an interpretation of the host as a correction or a restatement of the first answer." Thus it is clear in (9-b) that B intends to convey that Peter and Pia *both* ate pasta: *Pia ate pasta* cannot be interpreted as a correction of *Peter ate pasta*, nor can it be interpreted to mean that Pia and Peter are the same person.

(9)   Q: Who ate pizza?

a. A: Peter ate pizza.

   B: Pia ate pizza.

   ⤳ Peter did not eat pizza. (correction)

b. A: Peter ate pizza.

   B: Pia ate pizza, **too/also/as well**.

   ⤳ Peter and Pia both ate pizza.

The idea that additives prevent corrections seems to be implicit in the earlier proposal of Krifka (1998), who argues that additives are needed to block exhaustive implicatures to which their antecedents would otherwise give rise: If no additive is used in (9), *Peter ate pasta* gives rise to the implicature that no one other than Peter ate pasta, and then *Pia ate pasta* has the feeling of a contradiction. Sæbø (2004) argues, however, that additives are also needed to prevent other unwanted contrasts in contexts where no such contradiction would arise. In (10), for example, the antecedent *The 5000 m race was won by Gianni Romme* does not give rise to an implicature that only the 5000 m race was won by a Dutch skater. Rather than blocking a contradiction, the additive here serves to prevent the false inference that Gianni Romme is not Dutch.

(10)   a.   The 5000 m race was won by Gianni Romme. The 1500 m race was won by a Dutch skater.

         ⤳ Gianni Romme is <u>not</u> a Dutch skater.

   b.   The 5000 m race was won by Gianni Romme. The 1500 m race was won by a Dutch skater **too/also/as well**.

         ⤳ Gianni Romme is a Dutch skater.

   (adapted from Sæbø 2004)

All of this thinking about the discourse function of additives has been motivated by the old claim (apparently originating with Green 1968) that additives are in some sense "obligatory"—that is, sentences containing additives tend to sound odd or give rise to absurd inferences if the additive is removed, as in (11)–(13), which are typical constructed examples from the semantics literature. The implicatures that Krifka (1998) and Sæbø (2004) discuss

are meant to explain the oddness of such utterances.

(11)   Q: What did Peter and Pia eat?

         A: Peter ate pasta. Pia ate pasta, #(**too**/**also**/**as well**).

         (cf. Krifka 1998)

(12)   Lemmy is proud to be a bass player. Roberto plays bass #(**too**/**also**/**as well**).

         (Winterstein 2011)

(13)   Q: Can Lemmy and Ritchie buy whisky [in France]?

         A: Lemmy's eighteen and Ritchie is of legal drinking age #(**too**/**also**/**as well**).

         (Winterstein 2011)

It is not entirely clear whether those implicatures actually arise in these sorts of contexts, however. As pointed out by Eckardt & Fränkel (2012), a challenge for implicature-based explanations of additives' "obligatoriness" is to explain why, given that implicatures are supposed to be cancellable, one would ever arise in a context where it would produce a contradiction. They and others (e.g. Amsili & Beyssade 2006; Winterstein 2011) instead take the obligatoriness to be a consequence of some version of Heim's (1991) *Maximize Presupposition!* principle (but see Bade 2014, 2016 and Bade & Tiemann 2016 for another implicature-based analysis). At the same time, these authors observe that additives are not, in fact, obligatory in all contexts where a suitable antecedent is present, as demonstrated by (14-a–b).

(14)   a.   John is sick. Mary is sick. Paul is sick. Everybody seems sick these days.

                                                                        (cf. Amsili & Beyssade 2006)

         b.   I entered the old farm yard and didn't believe my eyes. There was a chicken in
               front of the door. There was a chicken in front of my car, there was a chicken
               behind me, and a chicken on the dung heap...   (Eckardt & Fränkel 2012)

Eckardt & Fränkel (2012) observe that in these and similar examples omission of the additive does not give rise to a contradiction or a contrast but rather to certain literary effects, such as a feeling of loss of control. They argue on the basis of such data that the discourse function

of additives (and presuppositional expressions more generally) is to reassure the listener that the speaker is keeping track of what is happening in the discourse and can therefore be taken to be competent and reliable.

Since these sentences sound rather dramatic without additives, they might still be viewed as somewhat deviant even if the additive is not strictly obligatory. Indeed, Eckardt & Fränkel take the speaker/author of such sentences to be flouting *Maximize Presupposition!*, and so they maintain the assumption that including the additive is the default, unmarked choice. However, as Amsili et al. (2016) have pointed out, there are in fact contexts in which additives can be omitted flawlessly, without producing any noticeable oddness or particular stylistic effect. This is the case in (1), repeated in (15).

(15)   Mitt Romney has such a reputation as a flip flopper that it is sometimes hard to remember that there have been some very constant things in his life and career **(too)**.

Moreover, the argument-building use of *too* presented in (7) seems to always be optional, and it forces us to reconsider what it is that additives actually do in discourse. Consider (16-a), adapted from (7-c). Here *too* seems to convey that its antecedent and host sentence argue for the same answer to the question. This implies that a fancy room is desirable. This effect contrasts with that of *but*, which has been argued to convey that the two clauses it joins do not argue for the same answer (see Jasinkaja & Zeevat 2009; Toosarvandani 2014). *But* thereby gives rise to the inference that a fancy room is not desirable (perhaps because it would be too expensive). If neither *too* nor *but* is used, as in (16-c), it may not be clear whether or not the speaker would like a fancy room. Thus *too* contributes some information about the speaker's preferences, and it is in no way obligatory.

(16)   Q: What hotel should we stay at?

    a.   A room just opened up at this hotel. It looks kind of fancy, **too**.
          ↝ A fancy room would be good to stay in.
    b.   A room just opened up at this hotel, **but** it looks kind of fancy.
          ↝ A fancy room would not be good to stay in.

c. A room just opened up at this hotel. It looks kind of fancy.

⤳ ???

The question of why additives sometimes seem to be obligatory, then, is really the question of why it is pragmatically odd in contexts like (11)–(13) to assert two structurally parallel sentences in succession without any connective (or perhaps a list intonation). The explanations that have been proposed for this have more to do with general principles of discourse (either *Maximize Presupposition* or the Gricean principles that are use to account for implicatures) than with the meaning of additives, so they lie beyond the scope of this dissertation.

The semantic issue that is of primary interest for present purposes and will be the focus of Chapter 2 is the relationship between an additive's antecedent and its host sentence. Existing analyses (e.g. Rullmann 2003; Beaver & Clark 2008; Winterstein 2011; Ahn 2015), which are largely based on constructed examples, generally assume that additives' antecedents and host sentences always bear the kind of close structural similarity seen in (9). In particular, the sentences are usually assumed to be focus alternatives of each other—that is, they differ only by a single element that carries prosodic focus (see Rooth 1985). Deriving the predictions of such theories, then, begins with identifying the relevant set of focus alternatives. But this will not do for the argument-building use, as it usually involves an antecedent and host sentence that do not have the kind of structural similarity that would allow us to identify such a set of alternatives. (They may indeed be construed as focus alternatives of each other if the entire sentence is taken to be in focus, but every sentence with such focus is a focus alternative of every other, so this would not usefully constrain the set of possible antecedents for any given host sentence.)

Taking question-based theories of additivity (e.g. Beaver & Clark 2008; Zeevat & Jasinskaja 2007) as my point of departure, I avoid this problem by taking *too* to require only that *there exist* some contextually relevant *wh*-question that the additive's antecedent and host sentence resolve "better" together than the antecedent does alone (in a sense to be made precise in Chapter 2). This existential quantification over relevant questions avoids the need to identify any particular set of focus alternatives or Question Under Discussion on the

basis of the structure of the host sentence. Chapter 2 presents further data concerning the argument-building use, develops this intuition further, and presents a formal analysis of *too* that unifies the argument-building and canonical additive uses by incorporating Inquisitive Semantics (see Ciardelli et al. 2019) and a probabilistic notion of context update (borrowed from the Rational Speech Act framework; see Goodman & Frank 2016).

1.2   Rejecting prior claims with refutational *too*

At least in American English, *too* has yet another use: the so-called "refutational" use (Schwenter & Waltereit 2010), shown in (17). Whereas the antecedent of the canonical additive use is always understood to be accepted by the speaker, refutational *too* conveys that the speaker rejects the antecedent.

(17)   A: You didn't do your homework!
        B: I did **too**!
        (Schwenter & Waltereit 2010)

(18)   A: You ate all my cookies.
        B: I did not!
        A: You did **too**!
        (Rullmann 2003)

Building on the understanding of polarity particles developed by Farkas & Bruce (2010) and Roelofsen & Farkas (2015), I argue in Chapter 3 that refutational *too* is a [REVERSE, +] polarity particle—that is, it requires a negative antecedent and a positive host sentence. Though such particles are well-attested cross-linguistically (German *doch* and French *si* being well-known examples—see (19)), English has not previously been argued to have one.

(19)   a.   French:
                  A: Anne n'est pas partie. 'Anne didn't leave.'
                  B: Mais **si**. 'You are wrong, she did.'
        b.   German:

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A: Anna kommt nicht mit ins Kino. 'Anna isn't coming along to the movies.'

B: **Doch!** Sie kommt schon. 'You are wrong. She's coming.'

(Farkas & Bruce 2010)

I also argue, however, that there is a crucial difference between refutational *too* and other documented [REVERSE, +] particles: It requires its addressee to have publicly expressed a belief in (though not necessarily a full commitment to) the negation of its host sentence. This is illustrated by (20-B), where *too* is infelicitous in spite of the availability of the negative sentence *It's not raining* to serve as an antecedent, which would be expected to license [REVERSE, +] particles. I propose a new polarity feature, [REFUTE], to account for this behavior. This analysis was published previously (Thomas 2023) and is now supported by data from a large-scale experiment, the results of which are reported in Chapter 3.

(20)   <u>**Context:**</u> A and B are planning to go to the beach later today, but only if it's sunny. A has been working in a windowless room all day and has no idea what the weather is like. B comes in from outside.

A: I hope we can still go to the beach. It's not raining, is it?↑

B: It is (#**too**)! / (Yes/no), it is raining.   [REVERSE, +]

Refutational *too* is diachronically related to additive *too*, and intuitively, there is a clear kinship between their meanings: Both seem to keep open an issue that a previous utterance has already addressed, but whereas additive *too* improves on a previous answer, refutational *too* rejects one. I do not argue for a unified analysis of the two uses, however, and I must leave the elucidation of the diachronic pathway from additive to refutational *too* to future work.

1.3   Sounding childish with refutational *too*

The final portion of this dissertation considers the meaning of refutational *too* from another perspective: Its sociolinguistic role as an index of particular speaker qualities. That is, it considers what refutational *too* signals to listeners about speakers' characteristics, attitudes,

and identity—in line with the "Third Wave" of sociolinguistic variation research (see Eckert 2012). Refutational *too* is stereotyped as children's speech in US-American metapragmatic discourse, but it is also available to adults as a resource for stance-taking and style construction. The social perception experiment presented in Chapter 5 compares evaluations of speakers using refutational *too* to those of speakers expressing disagreement in other ways. I find that refutational *too* indexes childishness, playfulness, and lack of intelligence, but its indexical meaning varies somewhat depending on context. In responses to accusations, such as (21-B), refutational *too* has a softening effect: Speakers using it in those contexts are rated significantly kinder, less aggressive, and less defensive. In responses to self-deprecation, such as (22-B), refutational *too* has exactly the opposite effect: It is associated with higher ratings of aggression and defensiveness and lower ratings of kindness. Moreover, refutational *so* (e.g. *I did so!*), which is a near-synonym for refutational *too*, is found also to index childishness, playfulness, and lack of intelligence and to soften accusations in the same way as refutational *too*.

(21)   A: You didn't water the plants!
        B: I did **too**!

(22)   A: I didn't look good in that hat.
        B: You did **too**!

Placing these results in dialogue with recent research by semanticists who have begun to explore "social meaning" (e.g. Acton & Potts 2014; Acton 2019; Beltrama & Staum Casasanto 2017; Beltrama et al. 2023), I investigate the extent to which the indexical meanings observed in the experiment might be understood as involving conversational implicature, and whether there is any relationship between refutational *too*'s meaning as a speaker-quality index and the semantic properties examined in Chapter 3. On the one hand, the fact that *too* uniformly indexes childishness, playfulness, and unintelligence across contexts but also has additional context-dependent effects does indeed resemble the enrichment of literal semantic meaning via Gricean implicature. Moreover, the fact that *too* and *so* exhibit largely similar effects on speaker evaluation judgments hints that their shared semantics might somehow influence

their social indexical meanings. On the other hand, the softening effect of *too* and *so* in responses to accusations is rather surprising in view of neo-Gricean approaches to politeness (see Brown & Levinson 1987) that might lead us to expect speakers to use indirectness to make disagreement seem less threatening. It is difficult to construe *too* and *so* as being indirect—if anything, *I did too/so!* is more direct than *Yes, I did!* The observation that *too* and *so* are associated with kindness and non-aggression in such responses thus points to a complex interplay between ideology, linguistic convention, and pragmatic reasoning about speakers' discourse goals. Chapter 5 explores this interplay in search of greater clarity about where the simplifying assumptions of formal semantic/pragmatic theory break down and how formal semantics and pragmatics might fit into a broader understanding of linguistic semiosis. I suggest in Chapters 4 and 6 that engaging with the anthropological literature and recovering some ideas from the semiotic theory Charles Sanders Peirce—whose work has influenced not only the study of meaning in sociolinguistics and linguistic anthropology but also the development of symbolic logic—may be useful to that end.

Chapter 2

Too, *also*, and *as well*: A probabilistic, question-based approach to additivity

2.1 Introduction

This chapter proposes a new approach to additivity that synthesizes insights from Inquisitive Semantics and probabilistic approaches to pragmatics. This approach is motivated by a use of the English additive particle *too* that has not previously been analyzed in the semantics and pragmatics literature, which I call the ARGUMENT-BUILDING USE. Some naturally-occurring examples drawn from the Corpus of Contemporary American English (COCA; Davies 2008–) are shown in (1).

(1)   a.   Ernie who's been raising or helping to raise somebody's children [...] since she was maybe thirteen years old, just naturally took Iree in with no authority but her own. [...] Good thing she did **too** because something happened in the birthing time of Iree and she's got epilepsy [...]   (COCA)

         b.   (Online forum discussion) i have never gotten a ticket but i know a cpl people who have.. i guess the fine is a hefty one **too**. depending on what im driving, i chance it.   (COCA)

         c.   A room just opened up at this hotel. [...] It looks kind of fancy, **too**.   (COCA)

Intuitively, the argument-building use marks two pieces of information as building an argument together for some conclusion. This differs from the canonical additive use, which has been claimed by Beaver & Clark (2008) and Zeevat & Jasinskaja (2007) to require the presence of two independent answers to a contextually salient question, as in (2).

(2)   Q: Who did Avery invite?

       A: Avery invited Bailey. She invited Cameron, **too**.

This chapter proposes a unified analysis of the argument-building and canonical additive uses of *too*. It argues that *too* uniformly requires the existence of a contextually relevant question that is answered (in a sense to be made precise) by its antecedent, but has a resolution that its antecedent and prejacent argue for more strongly together than either of them does alone. I begin with some background on additivity in Section 2.2, before presenting some puzzles related to the argument-building use in Section 2.3. The intuitions behind the analysis are then developed in Section 2.4 and formalized in Section 2.5. In Section 2.6, I extend the approach to other positive-polarity additives in English before concluding with some directions for future work in Section 2.7.

2.2   Previous work on *too*

At least since Kripke (2009), it has been widely assumed that *too* and other additive expressions require a contextually salient antecedent. What Kripke points out is that (3), where $[]_F$ indicates prosodic focus, is only felicitous if there is some other salient person besides Sam who is having dinner in New York tonight. This is counter-evidence to any analysis (e.g. Karttunen 1974) that claims that the presupposition of *too* is simply existential—that is, that there exists someone who is eating dinner in New York tonight, which is true at all times in every context in the actual world.

(3)   Tonight $[\text{Sam}]_F$ is having dinner in New York, too.   (Kripke 2009)

Heim (1992) and other early contributors to the literature on additivity (e.g. Zeevat 2002;

Geurts & van der Sandt 2004) took *too* to be anaphoric on a contextually salient individual, and analyzed *too* as carrying a presupposition that the property predicated of the individual focused in the host sentence holds of that antecedent individual. Heim's formulation of this presupposition is shown in (4), where α_F is the individual focused in the host sentence.

(4) $\phi[\alpha_F]too_i$ presupposes $x_i \neq \alpha$ & $\phi[x_i]$.

Other analyses have assumed that *too* requires a propositional antecedent, rather than an individual, to be salient. Many authors (e.g. Rullmann 2003; Winterstein 2011; Ahn 2015) have claimed that the antecedent must be a focus alternative of the host sentence.[1] Focus alternatives, as introduced by Rooth (1985, 1992), are generated by replacing the focused material in a sentence with other expressions of the same semantic type. In (5-a), for instance, the antecedent *I like [pizza]*$_F$ is a focus alternative of the host sentence *I like [spaghetti]*$_F$, and in (5-b), the antecedent *I don't like [pizza]*$_F$ is a focus alternative of the host sentence *I don't like [spaghetti]*$_F$.

(5)   a.   I like [pizza]$_F$, and I like [spaghetti]$_F$, **too**.
       b.   I don't like [pizza]$_F$, and I don't like [spaghetti]$_F$, **either**.
       (Rullmann 2003)

Rullmann (2003) argues that *too* carries the presupposition that a contextually salient focus alternative of its host sentence is true, as shown in (6). Here Rullmann makes use of Rooth's notions of "ordinary semantic value" and "focus value" of an expression, given by the functions $[\![\cdot]\!]^o$ and $[\![\cdot]\!]^f$. (The ordinary semantic value of α is its usual denotation, while the focus value of α is the set of focus alternatives to α.) In (5-a), this presupposition is satisfied by the fact that *I like pizza* is true and contextually salient.

(6)   Semantics of *too*   (Rullmann 2003)

       a.   ordinary semantic value: $[\![\alpha \; too]\!]^o = [\![\alpha]\!]^o$

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[1]And see Kobuchi-Philip (2009), Yang (2020), Balogh & Langer (2021), and Butschety (2023) for related analyses of additives in Japanese, Mandarin, Hungarian, and German, respectively.

b. focus value: $[\![\alpha \text{ too}]\!]^f = \{[\![\alpha]\!]^o\}$

c. presupposition: $[\alpha \text{ too}]$ presupposes that there is at least one contextually salient proposition $p \in [\![\alpha]\!]^f - \{[\![\alpha]\!]^o\}$ such that p is true.

"Salient" is notoriously difficult to define, and there is a great deal of controversy in the literature about what exactly *too* requires to be overtly present in the discourse context and what can be accommodated (see e.g. Kamp & Rossdeutscher 1994; Zeevat 2002; Geurts & van der Sandt 2004; Beaver & Zeevat 2007; Winterstein 2011; Tonhauser et al. 2013; Abrusán 2014; Grubic 2019). It is well known that this does not require the antecedent proposition to be explicitly asserted in the context, as the examples in (7) from Winterstein (2011) nicely illustrate.

(7)   a.   Lemmy is proud to be a bass player. Roberto plays bass **too**.
           (Antecedent: Lemmy plays bass.)

      b.   Lemmy, that idiot, came to the party. Ritchie is an idiot, **too**.
           (Antecedent: Lemmy is an idiot.)

      c.   For his breakfast, Lemmy had an apple. Ritchie only had a fruit **too**.
           (Antecedent: Lemmy only had a fruit)

Winterstein (2011) demonstrates, however, that the availability of such an antecedent is not sufficient to license *too* (though he does assume that it is necessary). Note that a proposition that is conversationally implicated in the context can serve as the antecedent of *too*, as in (7-c), where *Lemmy only had a fruit* is conversationally implicated, but not entailed, by *Lemmy had an apple*. Winterstein points out, however, that *too* is infelicitous in (8) even though the proposition *Lemmy solved some of the problems* is available as an antecedent since it is implicated by *Lemmy did not solve all the problems*.

(8)   Q: Did Lemmy and Ritchie do well at the maths exam?
      A: Lemmy did not solve all the problems. Ritchie solved some of them (#**too**).

Winterstein argues from the infelicity of (8-A) that *too* requires its antecedent and host sentence to have the same "argumentative orientation", a notion borrowed from Anscombre

& Ducrot (1983) and Merin (1999). Two sentences have the same argumentative orientation if there is some discourse goal H such that both sentences raise the probability of H, where a discourse goal is a proposition that the speaker wishes to argue in favor of (see van Rooij 2004 for further discussion). According to Winterstein, the antecedent and host in (8-A) do not have the same argumentative orientation because *Lemmy did not solve all the problems* lowers the probability that Lemmy and Ritchie did well at the maths exam, but *Ritchie solved some of them* raises it.

Beaver & Clark (2008: 93–94), rather than stipulating that the antecedent must be a focus alternative of the host sentence,[2] instead seek to explain the apparent focus sensitivity of additive particles by means of an analysis of additivity within Roberts' (1996) theory of discourse. That framework assumes that every utterance addresses some Current Question Under Discussion (CQ), which may be implicit. Beaver & Clark take a *wh*-question to denote the set of propositions (also called "alternatives") corresponding to the possible answers to that question that are generated by replacing the *wh*-element with an expression denoting an individual or the conjunction of such expressions. An example is shown in (9). They

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[2]According to Krifka (1998), the associate of *too* does not actually carry the prosody of focus marking, but rather that of contrastive topic marking, and *too* itself actually seems to bear focus. Krifka argues that the apparent focus marking on *too* is polarity focus and that *too* therefore should be taken to address a polar question. Sæbø (2004) proposes that the function of *too* is to add the topic of its antecedent sentence to the topic of its host sentence. To illustrate, according to him the asserted content of the last sentence in (i-a) is (i-b).

(i)   a.   [To the north]$_T$ lay the yellow-brown desert, a low belt of green cactus-covered ridges and distant blue mountain ranges with sharp peaks. [To the south]$_T$ **too** he could see mountains.

        b.   [To the south and to the north]$_T$ he could see mountains.

        (Sæbø 2004)

Rullmann (2003), on the other hand, claims that although *too* appears to associate with a contrastive topic, it actually associates with a focus-marked trace. For the most part, however, subsequent literature seems not to have taken up the claim that *too*'s associate bears CT-marking and generally assumes that *too* associates with focus. Ahn (2015), for example, proposes an analysis similar to Sæbø's whereby *too*-sentences assert the conjunction of their host sentence and their antecedent, but she assumes that the antecedent must be a focus alternative of the host sentence.

call this the "Rooth-Hamblin" semantics for questions because it combines Hamblin's (1973) semantics for questions with Rooth's (1985; 1992) Alternative Semantics.

(9)   ⟦Who does Mary like?⟧
       = {⟦Mary likes Adam⟧, ⟦Mary likes Bertha⟧, ⟦Mary likes Casper⟧,
       ⟦Mary likes Adam and Bertha⟧, ⟦Mary likes Adam and Casper⟧,
       ⟦Mary likes Bertha and Casper⟧, ⟦Mary likes Adam, Bertha, and Casper⟧...}

Beaver & Clark propose that additives carry a presupposition that the CQ has already been partially answered by some salient proposition in the common ground. In order to address the same CQ, the antecedent and host sentence must be focus alternatives of each other. In (5), for example, the CQ is *What do you like?*, and *I like pizza* provides a partial answer to that question, thereby satisfying the additive presupposition. Umbach 2010 and Grubic 2018 develop similar QUD-based treatments of the German additives *auch* and *noch*.

(10)   CQ: What do you like?

        a.   Partial answer: I like [pizza]$_F$.
        b.   I like [spaghetti]$_F$, **too**.

Beaver & Clark (2008: 94) also argue that additives carry an additional presupposition that the host sentence does not entail the antecedent. This explains the infelicity of utterances like (11), where *too* seems to be unacceptable because *Sam is happy* is entailed by *He's ecstatic*.

(11)   #Sam is happy. He's ecstatic, **too**.

Too is also unacceptable if its antecedent entails its host sentence, as in (12). However, the infelicity of utterances like (12) might be explained by the fact that *Sam is happy* is redundant after it has been asserted that he is ecstatic, in which case it would not be necessary to stipulate a presupposition that the antecedent does not entail the host sentence.

(12)   #Sam is ecstatic. He's happy, **too**.

Beaver & Clark (2008) only consider CQs that are single *wh*-questions, but Zeevat & Jasinskaja (2007) propose a somewhat more flexible notion of "generalized additivity" that allows the antecedent and host sentence of an additive to address a multiple *wh*-question. Their main objective is to analyze *and* as an additive, but they point out that *too* can also occur in responses to multiple *wh*-questions, as in (13).

(13)   Q: Who loves whom?

        A: I love you.

        B: I love you, **too**.

However, *too*'s occurrence in responses to multiple *wh*-questions seems to be much more restricted than *and*'s: According to Winterstein & Zeevat (2012), *too* occurs almost exclusively with single *wh*-questions. For example, without any additional contextual information, *too* does not seem to be acceptable in (14-A) even though the antecedent and host sentence both address the multiple *wh*-question *Who ate what?* In contrast, *and* is perfectly acceptable in (14-A′).

(14)   Q: Who ate what?

        A: John ate pizza. #Mary ate spaghetti, **too**.

        A′: John ate pizza, **and** Mary ate spaghetti.

It is not clear, on Zeevat & Jasinskaja's (2007) analysis, why *too* is acceptable in (13-B) but not in (14-A).

To sum up, existing analyses of additives generally take for granted a close structural similarity between the host sentence and a salient antecedent proposition. This has been accounted for in two main ways: By stipulating either that the antecedent must be a focus alternative of the host sentence, or by stipulating that the two sentences must address the same question. Authors have also sought to account for various other constraints on *too*'s behavior, such as the argumentative parallelism observed by Winterstein (2011) and the fact that the host sentence cannot entail the antecedent. *Too*'s non-uniform behavior in responses to multiple *wh*-questions is a puzzle for all these analyses, however. I turn now to

some puzzling data that have not yet been discussed in the literature and that challenge the common assumption that the host sentence and antecedent proposition must be structurally similar.

2.3   Data: The argument-building use

The argument-building use of *too* occurs without the kind of antecedent that *too* has been taken to require in prior analyses. The examples from (1) are repeated in (15) with additional context. In (15-a), the preceding context does not contain any sentence that is obviously a focus alternative of *Good thing she did*. The same is true for *I guess the fine is a hefty one* and *It looks kind of fancy* in (15-b) and (15-c), respectively.

(15) a. Iree was daughter of Ernie's then best friend Sibyl, who died when Iree was about four years old. [...] Anyway, Ernie who's been raising or helping to raise somebody's children, her mama's, her brother, Jeremiah's, even mine, since she was maybe thirteen years old, just naturally took Iree in with no authority but her own. [...] Good thing she did **too** because something happened in the birthing time of Iree and she's got epilepsy [...]   (COCA)

   b. (Online forum discussion)
       [A:] Cops dont enforce the carpool lane down there in the dirty south?
       [B:] i have never gotten a ticket but i know a cpl people who have.. i guess the fine is a hefty one **too**. depending on what im driving, i chance it.   (COCA)

   c. (Characters in a comedy film are trying to find a hotel room in Berlin)
       There are no rooms left in the whole city. It says it's the G8 this week. Oktoberfest, too. Folsom Europe. And the Berlin Marathon. This week. [Phone chimes with a message from Orbitz.] Okay. Yeah. A room just opened up at this hotel. Oh, yeah. It looks kind of fancy, **too**. It's the Dandlin Annex and the rooms are "habitable works of art," it says.   (COCA)

If we wanted to maintain a Beaver & Clark-style analysis of *too*, we would need to show that the CQ in each example in (15) is a *wh*-question that the antecedent and prejacent

each partially answer. Given any antecedent and prejacent, one can usually construct such a question *ad hoc*. One might, for example, claim that the CQ for the *too*-sentence in (15-a) is something like *What reasons do we have to think that Iree has benefitted from Ernie's support?* Then *Ernie took Iree in with no authority but her own* and *It was a good thing she did* could be taken to be partial answers to that CQ. But discourse coherence is usually taken to require that CQs be somehow relevant to preceding discourse moves, and it is not at all clear why that question would be relevant since it requests reasons for a conclusion that has not been suggested in the preceding context. It would be rather counter-intuitive for a relevance constraint on CQs to license such a move.

If we do not require the CQ to be a *wh*-question, we could take it to be a disjunction of polar questions, like *Did Ernie take Iree in, and if so, was it a good thing she did?* This question is arguably relevant in the context of (15-a) since the assertion of the fact that Iree's mother died could cause a hearer to wonder whether Ernie took her in. But allowing *too* to access these kinds of conjoined questions without any further constraints would make the analysis too permissive. If we take the question *Did Ernie take Iree in, and if so, was it a good thing she did?* to be relevant in (15-a), then surely the question *Did Ernie take Iree in, and if so, was it a **bad** thing she did?* is also relevant. Yet *too* becomes odd if we replace *good* with *bad* in (15-a) without changing anything about the context, as in (16-a). It becomes similarly odd in (15-b–c) if we reverse the argumentative force of its host sentence, as shown in (16-b–c). (These sentences may work in different contexts—more on this below—but they are odd in the contexts given in (15).)

(16)   [Same contexts as (15).]

    a.   Ernie took Iree in. It was a bad thing she did, #**too**.

    b.   I know a couple people who've gotten a ticket. The fine is a small one #**too**.

    c.   A room just opened up at this hotel. It looks kind of dingy, #**too**.

Any analysis that allows *too* to access implicit conjunctive questions without any further constraints would also wrongly predict that *too* should be licensed in (14), as the question *What did John eat, and what did Mary eat?* is clearly relevant there. A satisfactory question-

based analysis of *too* therefore needs to precisely characterize the constraints that govern the relationship between the antecedent, the prejacent, and the question.

2.4   Intuition

This section develops the intuitions on which the analysis to be presented in Section 2.5 is based. In particular, it is shown in Section 2.4.2 that in all of the cases considered thus far, there is a sense in which *too*'s antecedent suggests an answer to a contextually relevant question, but the conjunction of the antecedent and prejacent does so more strongly than either the antecedent or prejacent does alone. The relationship between the prejacent and the contextually relevant question is then examined in Section 2.4.3 before fleshing out what it means to "suggest an answer" in Section 2.4.4. First, however, a framework for the representation of discourse context needs to be adopted.

2.4.1   Background: Discourse trees

Discourse is standardly characterized as a cooperative endeavor aimed at developing a shared understanding of how the world is. Interlocutors accomplish this by incrementally expanding the *Common Ground* (henceforth CG), the set of propositions to which they are jointly committed. Following Stalnaker (1978), the common ground is usually represented as the set of possible worlds in which all of these propositions are true. Following Roberts (1996), van Kuppevelt (1996), and Ginzburg (1996), discourse is usually taken to proceed through the resolution of a series of (possible implicit) Questions Under Discussion whose answers are then added to the Common Ground. Every utterance is taken to address some such question.

I represent the progression of discourse as a tree, as in Büring 2003. In Büring's discourse trees (or "d-trees"), every node represents a discourse move—either a question or an assertion—where each question node's daughter nodes form a strategy for answering that question. The question node that immediately dominates any given move is the Current Question Under Discussion (CQ) for that move.

An example of a discourse tree (or d-tree) from Büring (2003) is shown in Figure 2.1, where the question *Who ate what?* is answered by answering the questions *What did Fred*

eat? and *What did Mary eat?*. The question *What did Fred eat?* is the CQ for *Fred ate the beans*, while *What did Mary eat?* is the CQ for *Mary ate the eggplant.*
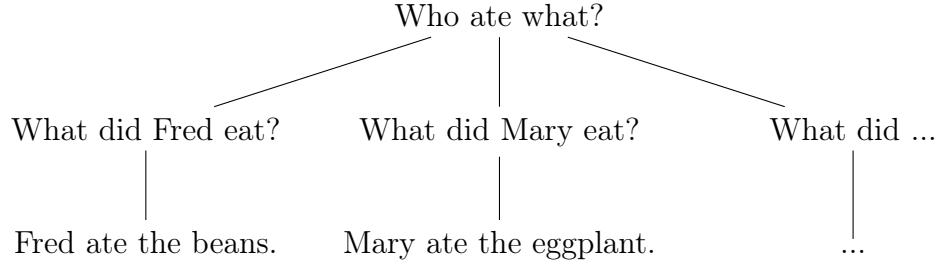
Figure 2.1: A discourse tree representing a discourse that answers the question *Who ate what?*

In order for discourse to be coherent, each node must be RELEVANT to the node that dominates it. One influential formulation of relevance in the literature is the one from Roberts (1996), according to which an assertion is relevant to a question if and only if it is at least a partial answer to the question. However, as Büring (2003: fn. 6) points out, this definition of relevance is too strong if we want it to capture responses like (17-a), which is not a partial answer in Roberts' sense because it neither entails that A can come to the party nor that A cannot.

(17)   CQ: Can you come to the party?
        A: Presumably.

Büring therefore takes an assertion A to be relevant to a question Q if A "shifts the probabilistic weights among the propositions denoted by Q", and he takes a question Q' to be relevant to Q if some answer to Q' is relevant to Q. By Büring's own admission, this is a "rather vague formulation", but I adopt it for now with the aim of characterizing the intuitions that the present analysis aims to capture. Reformulating this conception of relevance slightly and provisionally adopting the Rooth-Hamblin semantics for questions used by Beaver & Clark (2008) yields the preliminary definition of relevance shown in (18). A more precise definition will be provided in Section 2.5.1.

(18)   RELEVANCE: (preliminary)

a. An assertion A is relevant to a question Q if A changes the probability that some Rooth-Hamblin alternative $a \in [\![Q]\!]$ is true.

b. A question Q' is relevant to a question Q if there is some Rooth-Hamblin alternative $a' \in Q'$ such that asserting a' would change the probability that some alternative $a \in Q$ is true.

2.4.2 The relationship between the antecedent and prejacent

Intuitively, the prejacent of *too* in each of the puzzling examples in (15) seems to strengthen an argument by providing additional evidence in favor of some conclusion for which an antecedent sentence has already provided evidence. In (15-a), the antecedent is *Ernie ... just naturally took Iree in with no authority but her own*. The listener is likely to assume that Ernie's unilateral decision to take Iree in helped Iree a great deal, but it is possible that Ernie's actions were not helpful at all—suppose Ernie was not equipped to care for Iree, for example. The prejacent, *It was a good thing she did*, removes this uncertainty by making it clear that Ernie's actions were helpful, thereby strengthening the argument that Ernie helped Iree a great deal by taking her in. In (15-b), the antecedent is *I know a couple people who have gotten tickets*, which indicates that the risk of getting caught for violating traffic laws is non-negligible. This is evidence that one should worry quite a bit about traffic enforcement. The prejacent, *The fine is a hefty one* provides further evidence for that conclusion. Similarly, in (15-c) the antecedent and prejacent both provide evidence that the hotel in question would be a good place to stay. The antecedent and prejacent in each of (15-a)–(15-c) can therefore be taken to argue for an answer to the questions shown in (19). These observations resonate with Winterstein's (2011) proposal that *too* marks its antecedent and prejacent as having the same argumentative orientation, though he maintains the assumption that they must be focus alternatives of one another, which cannot be maintained here.

(19) a. Q: How much has Ernie helped Iree?

A: Ernie took Iree in with no authority but her own. It was a good thing she did, **too**.

⤳ Ernie has helped Iree a great deal.

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b.   Q: How much should I worry about traffic enforcement?

      A: I know a couple people who have gotten tickets. The fine is a hefty one, **too**.

      ⤳ You should worry quite a bit about traffic enforcement.

c.   Q: What would be a good hotel to stay at?

      A: A room just opened up at this hotel. It looks like a fancy one, **too**.

      ⤳ This hotel would be a good one to stay at.

Note that the antecedents and prejacents in (19) are neither complete answers nor partial answers (in the sense of Roberts 1996 or Beaver & Clark 2008) to the questions shown, as they do not entail any possible answers or the negation of any possible answers. In certain contexts, they might conversationally implicate a partial answer, but this is not guaranteed: A's statement in (19-c), for example, would not necessarily be understood to be expressing a preference for the hotel in question if uttered in a context where the interlocutors are going down a list of hotels and considering the pros and cons of each one.

Instead, the antecedents in (19) merely provide evidence for an answer. In (19-a), for example, if it is assumed that Iree needed someone to take her in, then *Ernie took Iree in with no authority but her own* provides evidence that Ernie greatly helped Iree by doing so. However, it does not rule out the possibility that Ernie's decision to take Iree in was not actually helpful—perhaps Ernie was not adequately prepared to care for Iree and should have allowed someone else to do it. Similarly, in (19-b), *I know a couple people who have gotten tickets* provides evidence that traffic enforcement is something to worry about, but it does not rule out the possibility that traffic enforcement is actually not worth worrying about—perhaps tickets are rare and fines are small. And in (19-c), the utterance of *A room just opened up at this hotel* provides evidence that the speaker thinks the hotel in question would be a good place to stay, but it does not rule out the possibility that some other hotel would be more suitable.

I do not wish to claim that the questions in (19) are necessarily the CQs for the corresponding responses. (In (19-c), for example, one might wish to claim on the basis of focus congruence that *A room just opened up at this hotel* actually addresses the implicit question *What hotels have rooms opened up at?*) What I claim is that the antecedent and prejacent

of the argument-building use of *too* can always be taken to argue for an answer to some (possibly implicit) *wh*-question that is relevant to the interlocutor's discourse goals. Such contextually relevant questions will henceforth be called "Relevant Questions" ("RQs" for short) in order to distinguish them from CQs.

The infelicity of the examples in (16), repeated in (20), seems to be due to the fact that no suitable RQ can be found in the contexts provided in (15). In (20-a), where Iree is an orphan with disabilities and the interlocutors are discussing their evaluation of Ernie's actions toward her, then *Ernie took Iree in with no authority but her own* suggests that Ernie's decision to take Iree in was helpful, but *It was a bad thing she did* argues for the opposite conclusion. Consequently, there is no relevant question to which the conjunction of the prejacent and antecedent provides clear evidence for an answer. Similarly, in (20-b), given that getting a ticket is undesirable but having the fine be small would mitigate its undesirability somewhat, there is no relevant question to which the conjunction of *I know a couple people who have gotten tickets* and *The fine is a small one* would provide evidence for an answer, and in (20-c), given that the interlocutors are looking for a nice hotel room to stay in, there is no question relevant to that goal to which *A room just opened up at this hotel* and *It looks like a dingy one* would provide evidence of a resolution.

(20)   a.   Q: ???

            A: Ernie took Iree in with no authority but her own. It was a bad thing she did, (#**too**).

        b.   Q: ???

            A: I know a couple people who've gotten tickets. The fine is a small one, (#**too**).

        c.   Q: ???

            A: A room just opened up at this hotel. It looks like a dingy one, (#**too**).

On the other hand, if the contexts of the utterances in (20) are modified so that an appropriate question can be found, then *too* becomes acceptable. If, for example, Ernie was not supposed to make decisions about Iree unilaterally and better caregivers may have been available, then (20-a-A) becomes acceptable and can be taken to answer the question *What did Ernie do wrong?*, as shown in (21-a). And (20-c-A) is acceptable in a context where the

interlocutors are looking for a dingy hotel room to provide the setting for a music video, as shown in (21-b).

(21)   a.   **Context:** There were other people besides Ernie who are supposed to be involved in decisions about Iree's care.

Q: What did Ernie do wrong?

A: Ernie took Iree in with no authority but her own. It was a bad thing she did, **too**(, because she had no idea how to manage Iree's epilepsy).

⤳ It was wrong for Ernie to take Iree in.

b.   **Context:** A band is looking for a dingy hotel room in which to shoot a music video.[3]

Q: Where would be a good place to shoot our music video?

A: A room just opened up at this hotel. It looks like a dingy one, **too**.

⤳ This hotel would be a good place to shoot our music video.

In sum, the antecedent of the argument-building use of *too* provides evidence for a particular answer to an RQ, and the conjunction of that antecedent with the prejacent argues even more strongly for that answer.

Unifying the argument-building use with the canonical additive use

In the canonical additive case, the antecedent and prejacent are related in a different way than they are in the argument-building case: The prejacent, instead of strengthening the argument that the antecedent introduces, provides new information that argues for a conclusion that is not suggested by the antecedent. For example, in (10) (repeated in (22)), the conjunction of the antecedent and prejacent entails that A likes *both* pizza and spaghetti, whereas the antecedent on its own does not provide any evidence that A likes spaghetti.

(22)   Q: What do you like?

A: I like pizza. I like spaghetti, **too**.   (repeated from (10))

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[3]Thanks to Judith Tonhauser for this example.

I claim that what the argument-building and canonical additive uses have in common is the existence of an RQ that satisfies the following conditions:

(23)   ANTECEDENT CONDITION: (informal—preliminary)
        The antecedent suggests an answer to the RQ.

(24)   CONJUNCTION CONDITION: (informal—preliminary)
        There is some answer to the RQ that the conjunction of the antecedent and prejacent
        suggests more strongly than the antecedent does alone.

What distinguishes the two uses is whether the answers that satisfy these two conditions are distinct: For the argument-building use, the answer suggested by the antecedent is identical to the one suggested by the conjunction of the antecedent and prejacent; for the canonical additive use, the two answers are distinct. In (22), for example, both conditions are satisfied if Q is taken to be the RQ because the antecedent suggests the answer *I like pizza* by entailing it, while the conjunction of the antecedent and prejacent suggests (again by entailment) the answer *I like pizza and spaghetti*—an answer which the antecedent by itself does not suggest at all. But of course a sentence can "suggest an answer" to a question without entailing an answer, as in (25), where *I eat a lot of pizza* merely implicates that the speaker likes pizza.

(25)   RQ: What foods do you like?
        A: I eat a lot of pizza. I like spaghetti, **too**.

If an RQ that satisfies both conditions cannot be found, then *too* is infelicitous. In (26), for example, *too* sounds odd because no ordinary context would allow us to identify a question that satisfies the Conjunction Condition. If, for instance, the RQ were taken to be *What kind of animals are dogs?*, then the conjunction of the prejacent and antecedent would indeed suggest an answer to the RQ (because it entails that dogs are mammals), but it would not do so any more strongly than the antecedent alone since the antecedent entails the same answer. This sets *too* apart from *by the way*, which seem to allow their prejacents to be unrelated to the preceding discourse.

(26)   RQ: ??

        A: Dogs are mammals. #I had pancakes for breakfast, **too**.

        A′: Dogs are mammals. **By the way,** I had pancakes for breakfast.

It is worth noting again that RQs should not be identified with CQs. Consider (27), for example. Here the interlocutors seek to resolve the question *Who ate what?* by answering the explicitly uttered subquestions *What did Peter eat?*, *What did Pia eat?*, etc. for each relevant person. *Too* seems to be licensed in (27) because *Peter ate pasta* and *Pia ate pasta* can both be taken to answer the RQ *Who ate pasta?* But at no point is *Who ate pasta?* the CQ, nor is it a higher question in the discourse tree. This shows that RQs need not be in the discourse tree at all.

(27) Q_0: Who ate what?

        Q_1: What did Peter eat?

        A: Peter ate pasta.

        Q_2: What did Pia eat?

        A: Pia ate pasta, **too**.

The behavior of *too* in embedded clauses further illustrates this point. Consider the naturally-occurring example in (28). Here the antecedent *Ivan has a new violin just his size* is an apparent answer to the question *Who has a violin just their size?* That question is nonetheless not the CQ for the host sentence of *too*, which seems to address a question like *What could you and Ivan do if you had a violin? Too* is licensed by the fact that the *if*-clause it appears in answers *Who has a violin just their size?* even though the sentence as a whole does not answer that question. (A similar kind of access to questions that are not the CQ has also been observed in exclusives by Coppock & Beaver (2011) and in embedded focus marking by Zimmermann (2014).)

(28)   "Ivan has a new violin just his size," said Sebastian. "If I had one, **too**, he and I could play together at the Easter dances."   (COCA)

2.4.3 Constraints on the prejacent

In addition to the Antecedent Condition and the Conjunction Condition, something needs to be said about the relationship between the prejacent and the RQ. Unlike the antecedent, the prejacent need not suggest an answer by itself. To see why, consider the prejacent in (29): *He studied hard for it* does not suggest any answer to *In what ways is Dana struggling at school?* because on its own, studying hard for an exam is not a way of struggling at school. The prejacent's relevance to the question is only clear in view of the information provided by the antecedent, that is, failing a test *in spite of* studying hard for it can be considered struggling.

(29)   RQ: In what ways is Dana struggling at school?
       A: He failed the test. He studied hard for it, **too**.

However, the prejacent is subject to some constraints of its own. In (30-a), for example (repeated from (11)), the question *What is Sam's emotional state?* satisfies the Antecedent Condition and Conjunction Condition, yet *too* is infelicitous. *Too* is similarly infelicitous in (30-b-A) (in contrast to the argument-building use in (30-b-A′)). Beaver & Clark (2008) account for the unacceptability of *too* (30-a) with a presupposition that *too*'s prejacent does not entail its antecedent, but that will not account for (30-b) since *Sam stole the cookies* does not entail *Sam's fingerprints were found on the cookie jar.*

(30)   a.   RQ: What is Sam's emotional state?
          A: Sam is happy. #He's ecstatic, **too**.   (Beaver & Clark 2008)
      b.   RQ: Who stole the cookies?
          A: Sam's fingerprints were found on the cookie jar. #He stole the cookies, **too**.
          A′: Sam's fingerprints were found on the cookie jar. He has crumbs on his shirt, **too**.

Too also sounds odd in (31-A) because it suggests that Avery is believed to play the cello, which has not been claimed. Analyses that require the antecedent and prejacent to be focus alternatives of each other have no trouble ruling out (31-A), but such a requirement is out of

the question if we are to account for the argument-building use. Note that if *instrument* and *cello* are swapped, *too* becomes perfectly acceptable, as in (31-A′). This asymmetry indicates that the constraint that prevents *too* from appearing in (31-A) does not have an analogue applying to the antecedent.

(31)   RQ: Who plays an instrument?
       A: Avery plays an instrument. Bailey plays the cello, (#**too**).
       A′: Avery plays the cello. Bailey plays an instrument, **too**.

To account for the data in (30), I propose the condition in (32-a), and to account for (31), I propose the condition in (32-b).

(32)   PREJACENT CONDITIONS:
       a.   The prejacent does not entail the answer to the RQ that is suggested by the conjunction of the antecedent and the prejacent.
       b.   The conjunction of the antecedent and the prejacent suggests an answer to the RQ more strongly than the conjunction of the antecedent with any sentence that is informationally weaker than the prejacent.

(30-a) violates (32-a) because the answer suggested by the conjunction of the antecedent and prejacent is *Sam is ecstatic*, which is entailed by the prejacent. Similarly, (30-b) violates (32-a) because the answer suggested by the conjunction of the antecedent and the prejacent is *Sam stole the cookies*, which is entailed by the prejacent. (31-A) violates (33-b) because the conjunction of the antecedent and prejacent entails the answer *Avery and Bailey play instruments*, which is also entailed by the conjunction of the antecedent with *Bailey plays an instrument*—a weaker proposition than the prejacent. (Since both conjunctions entail the same answer, there is no answer that the conjunction of the antecedent and prejacent suggests more strongly.)

With the basic intuitions behind the analysis established, I turn now to making the notion of "suggesting an answer" more precise.

2.4.4 What does it mean to "suggest an answer" to a question?

As seen with the argument-building use in Section 2.4.2, an antecedent can suggest an answer to an RQ by merely providing evidence for a particular answer, without entailing or even conversationally implicating that answer. Providing evidence also suffices to suggest an answer in the case of the additive use. This was demonstrated by (25), repeated in (33), where A's having eaten a lot of pizza can be taken as evidence that A likes pizza.

(33)   Q: What foods do you like?   (repeated from (25))
        A: I eat a lot of pizza. I like spaghetti, **too**.

It is also possible for an antecedent to suggest an answer by conversationally implicating one without providing any information that could straightforwardly be considered evidence for it. Consider (34), for example. Here A implicates that Q is allowed to drink soda by saying *There's soda in a fridge*. By itself, however, the information that there is soda in the fridge is not evidence that Q is allowed to drink it.

(34)   Q: What am I allowed to drink?
        A: There's soda in the fridge. You can drink tea, **too**.

What *is* evidence for that conclusion is the fact that A uttered *There's soda in the fridge* in this context. For the Antecedent Condition to be satisfied, then, we must take the antecedent proposition not to be the proposition denoted by *There's soda in the fridge*, but rather the proposition that A uttered *There's soda in the fridge*.[4] The example in (35) (provided by an anonymous reviewer) further illustrate this point. In (35), the content of the question *Will there be food there?*, which is uninformative, does not change the probability that the group should go to the bar in question. Nonetheless, *too* is licensed in the (35) sentence because the fact that the speaker asked the question indicates that the speaker is not certain that there is food there, which lowers the probability that it would be a good outing location for hungry people.

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[4]Thanks to Ashwini Deo for suggesting this.

(35)   **Context:** The group is discussing the next step for their work outing. Some people in the group are hungry. Someone just proposed to go to a bar they know on the other side of town.

a.   (Implicit Q: Where should we go?)
      A: I don't think we should go to that place. Will there be food there? It's quite far **too**.

Too also accepts non-linguistic antecedents, as in (36). In (36-a), Bailey infers from Avery's facial expression that Avery likes the cake, and this licenses Bailey's use of *too* in an utterance that can be taken to answer the RQ *Who likes the cake?*. The fact that raises the probability of an answer here is not the fact that any utterance was made but rather the fact that Avery made a particular facial expression.

(36)   (Avery and Bailey are eating a cake. They take their first bite at the same time. An expression of bliss immediately crosses Avery's face.)
      Bailey: I like it, **too**!

To further complicate the issue, additives can sometimes be used in contexts where nothing in particular—an utterance, a facial expression, or any other event—has happened that would raise the probability of an answer to a suitable RQ. Some examples provided by Grubic (2019) are reproduced in (37)–(37).

(37)   Bereavement benefits must support [unmarried couples]$_F$ **too**.
      ⤳ Bereavement benefits (already) support married couples.

(38)   Last Christmas, Paul visited [his girlfriend's parents]$_F$, **too**.
      ⤳ Last Christmas, Paul visited his own parents.

Such data challenges Kripke's (2009) widely adopted claim that additives require contextually salient antecedents, much like pronouns. "Salience" has always eluded precise definition but is usually taken, at minimum, to require that some event has happened in the prior context to draw attention to an antecedent (see e.g. Kamp & Rossdeutscher 1994; Geurts

& van der Sandt 2004)—whether that event be an utterance or some non-linguistic event like Avery's expression in (38). But no such event is necessary for the interpretation of (37) and (38): Without any additional context, it is easily inferred from an utterance of (37) that bereavement benefits already support married couples, and this inferred proposition seems to function as *too*'s antecedent.[5] Similarly, in (38) it is easily inferred that Paul visited his own parents last Christmas. Grubic (2019) suggests on the basis of examples like this that additives do not require their antecedents to be salient but rather merely "identifiable"—but see also Ruys (2015), who contends that the additive presupposition is merely existential after all.

I cannot properly weigh in on this debate here, but due to the existence of examples like (37)–(38), I do not assume that the antecedent must be salient in the way that is standardly assumed. What I do assume is that additives require the context to provide some reason for the listener to think that the probability of a particular answer to an RQ is elevated. This reason is what I will treat as the antecedent. In (37)–(38), it seems to be an expectation or piece of background knowledge: In (37), it is presumably obvious to everyone that bereavement benefits already support married couples, (RQ: *What kinds of couples should bereavement benefits support?*), and in (38), one can reasonably presume that Paul visited his own parents last Christmas (RQ: *Who did Paul visit last Christmas?*) because many people visit their parents on Christmas. The problem with (3), in contrast, is that common knowledge provides many possible answers to the question *Who is having dinner in New York tonight?*, but without further context there is no reason to think that the speaker had any particular one in mind. Some examples of such answers are shown in (39).

(39)   RQ: Who is having dinner in New York tonight?

        #Sam is having dinner in New York tonight, **too**.

        Potential answers to RQ:

        a.   Zohran Mamdani is having dinner in New York tonight.

        b.   The cast of *Saturday Night Live* is having dinner in New York tonight.

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[5]The term is admittedly not terribly apt when applied to something not previously salient, but I continue to use it in conformity with previous literature.

c.   Millions of people who live in New York are having dinner there tonight.

d.   etc.

I must leave a fuller investigation of how antecedents are identified and what role salience plays in that process to future work, but it is clear in any case that there are several ways in which an answer to question can be "suggested": An utterance can entail, conversationally implicate, or provide evidence for an answer; a non-linguistic event in the context can provide evidence for one; or background knowledge can suggest that some answer is likely to be true. For the Antecedent Condition to capture all of these the antecedent of *too* cannot be assumed to be an explicitly uttered sentence. I take it, then, that the antecedent proposition is instead a fact about the context—which might be the fact that an interlocutor produced a particular utterance, the fact that some non-linguistic event occurred, such as Avery's expression in (36), or the fact that the interlocutors share a particular expectation or assumption. For an antecedent proposition to "suggest an answer" is then simply to increase the probability that a particular answer is true more than it increases the probability that any other answer is true. For example, in (36) Avery's expression increases the probability that Avery likes the cake, in (38) the expectation that people visit their own parents on Christmas increases the probability that Paul visited his own parents last Christmas, and in any context the fact that someone has said something that entails, implicates, or provides evidence for an answer to a question increases the probability of that answer being true (assuming that the speaker is cooperative and knowledgeable, of course). This intuition will be formalized within a probabilistic pragmatic framework in Section (57) by treating context update as Bayesian inference.

The notion of answerhood

The last thing that needs to be explicated before the intuitions laid out in this section can be formalized is what exactly constitutes an "answer" for the purposes of the Antecedent, Conjunction, and Prejacent Conditions. As pointed out by Theiler (2019), Beaver & Clark's 2008 proposal that the antecedent is a partial answer to the CQ does not account for the unacceptability of discourses like (40), where the antecedent is a partial answer to the ques-

tion since it rules out one possible answer, but the antecedent and prejacent have opposite polarity.

(40)   Q: What do you like?
         A: I don't like pizza. #I like spaghetti, **too**.

Thus it is clear that an antecedent that partially answers an RQ is not sufficient to satisfy the Antecedent Condition. It is also clear that it is not necessary for it to be a complete answer, as *I like pizza* in (22) cannot plausibly be interpreted as such, since there is surely more than one food that A likes. We might then conclude that *too* is licensed in (22) but not in (40) simply because *I like pizza* is one of the Rooth-Hamblin alternatives that Beaver & Clark take to constitute the denotation of the question *What do you like?*, while *I don't like pizza* is not.

Too's interaction with multiple *wh*-questions complicates the picture, however. Recall from Section 2.2 that the appearance of *too* in responses multiple *wh*-questions presents a challenge for existing analyses. Consider the contrast between (41) and (42), for example. In both cases, the sentence uttered by A is not only a partial answer to the multiple *wh*-question but also identical to one of that question's Rooth-Hamblin alternatives. In (41), however, *too* is infelicitous. By itself, this may not be a problem for Beaver & Clark's (2008) analysis since their claim is that the antecedent and prejacent must be partial answers to the CQ, but that requirement might not be satisfied here since responses to multiple *wh*-questions are standardly taken to address implicit subquestions (see e.g. Roberts 1996; Büring 2003), in which case the CQ for (41-A) would be *What did Avery eat?* and the CQ for (41-B) would be *What did Bailey eat?* But analyzing (41) in this way leaves us in need of an explanation for the occurrence of *too* in (42): A Beaver & Clark-style analysis can account for it if we take *Who is married to whom?* to be the CQ, but then it is not at all clear why the multiple *wh*-question would not be allowed to function as the CQ in (41) if it can do so in (42).

(41)   **Context:** Avery and Bailey are known to have gone to a restaurant together. It is presumed that both of them ate something there.
         Q: Who ate what?

A: Avery ate pizza.

B: Bailey ate spaghetti, (#**too**).

(42)   **Context:** Avery, Bailey, Cameron, Dana, and others are attending a large party. It is likely that there are some married couples among the attendees, but it is not presumed that any of them are married to each other.

Q: Who (at this party) is married to whom?

A: Avery is married to Bailey.

B: Cameron is married to Dana, **too**.

I claim that the acceptability of *too* in (42) is related to the fact that, until the utterance of the prejacent, the antecedent can be taken to fully satisfy the question asker's informational needs. In particular, the asker wants to know *all* of the attendees who are married to another attendee, and *Avery is married to Bailey* could be taken to provide that information since the asker does not know how many married couples there are at the party. In contrast, the antecedent in (41) clearly cannot be taken to satisfy the asker's informational needs because the asker knows that *both* Avery and Bailey went to the restaurant and wants to know what each of them ate.

The sense in which the antecedent in (42) satisfactorily answers the question is captured by the notion of a *resolution* from Inquisitive Semantics. In Inquisitive Semantics, a question is said to be resolved by any information state (that is, any set of possible worlds) that contains enough information to settle the issue that the question raised (see Ciardelli et al. 2019). What counts as resolving a question, then, depends on how much information is needed to satisfy the questioner. As pointed out by Hintikka (1976) and others, *wh*-questions are ambiguous between "mention-some" and "mention-all" interpretations. Mention-all questions require exhaustive answers, but mention-some questions do not. For example, the question *What foods do you like?* will generally receive a mention-some interpretation since it would be unreasonable to expect an interlocutor to state every food that they like, while *Who did Avery invite to dinner?* is more likely to be interpreted as a mention-all question since someone who utters it is likely interested in knowing every individual who Avery invited. (For clarity, I will henceforth usually use *all* and *some* to construct mention-all and mention-some

questions, respectively (e.g. *Who all did Avery invite?* or *Who is someone Avery invited?*), but the presence of *all* is not necessary for the mention-all interpretation to arise, as context can make it clear whether an exhaustive answer is required.)

I wish to make the usual mention-some/mention-all distinction a bit more granular by pointing out that the amount of information necessary to resolve a mention-some question varies. The question *What are some foods that you like?*, for example, seems request at least two foods that A likes. I will call this kind of question a "mention-two" question. There are other mention-some questions, however, which can be resolved by supplying only one individual with a specified property. To resolve the question in (43), for example, it suffices to supply only one individual who can give Bailey a ride.

(43)   Context: Bailey does not have a car and therefore needs a ride to Avery's party. Avery asks the other attendees:

    a.   Who can give Bailey a ride?   (cf. Ciardelli et al. 2017)

A questioner can in fact request any arbitrary number of entities having some property, as illustrated by the naturally-occurring mention-three question and mention-four question in (44-a–b).

(44)   a.   Class started off with a question: What are three books that you remember reading?   (COCA)
    b.   What are four sources of natural energy?   (COCA)

The multiple *wh*-questions in both (41) and (42) are mention-all questions: The question in (41) can only be resolved by saying what Avery ate *and* what Bailey ate, and the question in (42) can only be resolved by providing *all* of the married couples at the party. *Too*'s acceptability in (42) is due to the fact that its antecedent can be interpreted (until the prejacent is uttered) as an exhaustive answer—and thus a resolution—to the question that was asked. *Too* is similarly acceptable in the dialogues in (45), which show that the antecedent is not required to be interpretable as an exhaustive answer to an RQ—it suffices for it to provide a resolution, which need not be exhaustive if the question is mention-some.

(45)   a.   Q: Who can give Bailey a ride?

           A: Cameron can. Dana can, **too**.

       b.   Q: What are some foods that you like?

           A: I like pizza and spaghetti. ... (Oh, and) I like lasagna, **too**.

       c.   Q: What are three books you've read recently?

           A: I've read *War and Peace*, *Crime and Punishment*, and *Pride and Prejudice*.
           I've read *Sense and Sensibility*, **too**.

This indicates that providing a resolution to an RQ is a sufficient condition for the antecedent to satisfy the Antecedent Condition. It is worth noting that there are cases in which *too* is acceptable even though its antecedent fails to resolve an explicitly asked question. Some examples are shown in (46-a–c). (Such antecedents are most naturally uttered with a signal of some sort that they do not resolve the question, such as rising intonation or *well*.) Since an RQ is not required to be explicitly uttered or even to be a CQ, (46-a–c) can be accounted for by identifying some other contextually relevant question that the antecedent can be taken to resolve. The notion of relevance still needs to be made precise, but for now I wish to point out that the indicated RQs in (46-a–c) satisfy the Antecedent, Conjunction, and Prejacent conditions. A suitable definition of relevance according to which these questions are relevant to the explicitly asked questions will be provided in Section 2.5.1.

(46)   a.   Q (explicit): What are some foods that you like?
           RQ (implicit): What is (at least) one food that you like?
           A: (Well,) I like pizza$^\uparrow$... I like spaghetti, **too**.

       b.   Q (explicit): What are three books you've read recently?
           RQ (implicit): What are some books that you've read recently?
           A: (Well,) I've read *War and Peace* and *Crime and Punishment*$^\uparrow$... I've read
           Pride and Prejudice, **too**.

       c.   Q (explicit): Who all did Avery invite?
           RQ (implicit): Who is (at least) one person that Avery invited?
           A: (Well,) he invited Bailey$^\uparrow$... He invited Cameron, **too**.

Let us consider what happens in (41). I claim that once we adopt resolution as our notion of answerhood, it is not possible to identify an RQ that satisfies both the Antecedent and Conjunction Conditions. The resolution of a multiple *wh*-question seems to always require that a particular issue be settled for *every* member of a salient set of entities associated with one of the *wh*-elements; that is, they are mention-all questions with respect to at least one of the *wh*-elements. In particular, the question *Who ate what?* in (41) is mention-all on its first *wh*-element—it can only be interpreted as asking what Avery ate *and* what Bailey ate.[6] Thus there is no mention-some interpretation of *Who ate what?* that could serve as RQ in (41) analogously to how *Who is someone Avery invited?* does in (46-c). The question *Who ate Italian food?* would satisfy the Antecedent and Conjunction Conditions if pizza and spaghetti are understood by the interlocutors to be Italian foods, but it would not satisfy the Prejacent Condition since *Bailey ate Italian food* is a weaker alternative to the prejacent whose conjunction with the antecedent entails the same resolution to the question as the conjunction of the antecedent prejacent. The only other *wh*-questions that would satisfy the Antecedent Condition are *What did Avery eat?* and *Who ate pizza?*, neither of which satisfy the Conjunction Condition. Hence *too*'s infelicity in (41).

2.4.5   Interim Summary

In view of the conclusion that to "suggest an answer" to a question is to raise the probability of some resolution to it, the Prejacent, Conjunction, and Antecedent Conditions can now be refined as follows:

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[6]In the literature on multiple *wh*-questions (e.g. Dayal 1996; Bošković 2001; Dayal 2002; Surányi 2007; Kotek 2016), authors distinguish between "pair list" and "single pair" interpretations of multiple *wh*-questions. The difference between them is that "single pair" interpretations carry a presupposition that there is only one pair of entities that stands in the specified relation, e.g. the single-pair interpretation of *Who is married to whom?* would presuppose that there is only one married couple among the salient set of individuals. Thus I take both "pair list" and "single pair" multiple *wh*-questions to be mention-all questions with respect to at least one *wh*-element. It does seem to be possible for such question to be mention-some with respect to the other *wh*-element, i.e., there may be an interpretation of *Who ate what?* that can be resolved by supplying one food that each individual ate even if some of them ate more than one thing. But this need not concern us here.

(47)   **Felicity conditions of additive *too***   (informal)

A sentence containing *too* is felicitous in any context in which there is a contextually relevant *wh*-question RQ and an identifiable antecedent fact such that the following conditions hold:

a.   ANTECEDENT CONDITION: The antecedent fact increases the probability of some resolution to the RQ more than it increases that of any other resolution.

b.   CONJUNCTION CONDITION: The conjunction of the antecedent and prejacent increases the probability of some resolution to the RQ more than it increases that of any other resolution, and it increases that probability more than the antecedent does alone.

c.   PREJACENT CONDITIONS:

(i)   The prejacent does not entail the answer to the RQ that is suggested by the conjunction of the antecedent and the prejacent.

(ii)   The conjunction of the antecedent and prejacent increases the probability of some resolution to the RQ more than the conjunction of the antecedent with any sentence that is informationally weaker than the prejacent does.

2.5   Analysis

This section formalizes the felicity conditions described in (47). I begin with some preliminaries in Section 2.5.1, propose a formal analysis in Section 2.5.2, and then apply that proposal in Sections 2.5.3 and 2.5.4 to account for the data presented in the preceding sections.

2.5.1   Formal preliminaries

The present analysis is formulated in the version of Inquisitive Semantics presented by Ciardelli et al. (2019) and a Question Under Discussion framework based on those of Roberts (1996) and Büring (2003) but with a Bayesian conception of linguistic inference borrowed from the Rational Speech Act (RSA) framework (see Frank & Goodman 2012; Goodman & Frank 2016). I summarize the essential features of those frameworks in this section before

presenting the analysis in Section 2.5.2.

Inquisitive Semantics

A proposition is standardly identified with the set of worlds (or *information state*) in which it is true. In Inquisitive Semantics, however, propositions are non-empty, downward-closed sets of information states known as *issues*. Under this conception of a proposition, the semantic content of a declarative sentence is the proposition that contains the set of worlds in which the sentence is true, plus all of the subsets of that set. For instance, the meaning of the sentence *Avery invited Bailey* is the set containing the set of worlds in which Avery invited Bailey as well as all the subsets of that set, as shown in (48). (As in Ciardelli et al. 2019, $|\phi|$ will be used throughout as shorthand for the set of worlds in which ϕ is true, and a superscripted ↓ will be used to indicate downward closure of sets.)

(48) $[\![\text{Avery invited Bailey}]\!] = \{s | s \subseteq |\text{Avery invited Bailey}|\} = \{|\text{Avery invited Bailey}|\}^{\downarrow}$

As is the case with classical propositions, entailment in Inquisitive Semantics amounts to set inclusion, as shown in (49).

(49)   ENTAILMENT: For any propositions P and Q, $P \models Q$ iff $P \subseteq Q$.

The maximal elements of a proposition are called its *alternatives*. A proposition which, like (48), has a unique maximal element is said to be *non-inquisitive*. A proposition that has more than one maximal element is said to be *inquisitive*. The meaning of a question is the inquisitive proposition whose alternatives correspond to its minimally resolving answers— that is, the answers that provide just enough information to resolve the question. Thus one advantage of Inquisitive Semantics is that it allows for a uniform treatment of declaratives and interrogatives, as both are taken to denote propositions. For example, as shown in (50), the meaning of the polar question *Does Cameron like pizza?* is the inquisitive proposition containing the set of worlds in which Cameron likes pizza, the set of worlds in which Cameron does not like pizza, and all of the subsets of those sets.

(50) ⟦Does Cameron like pizza?⟧

$= \{s|s \subseteq |$Cameron likes pizza$|$ or $s \subseteq |$ Cameron does not like pizza$|\}$

Note that (50) is equivalent to the union of the proposition expressed by *Cameron likes pizza* and that expressed by its negation *Cameron does not like pizza*, as shown in (51). A proposition P is negated by taking its set complement, notated $\overline{P}$.

(51) ⟦Does Cameron like pizza?⟧

$= \{s|s \subseteq |$Cameron likes pizza$|\} \cup \{s|s \subseteq |$Cameron does not like pizza$|\}$

$= $⟦Cameron likes pizza⟧ $\cup$ ⟦Cameron does not like pizza⟧

$= $⟦Cameron likes pizza⟧ $\cup$ $\overline{⟦\text{Cameron likes pizza}⟧}$

In general, taking the union of two mutually non-entailing, non-inquisitive propositions yields an inquisitive proposition, and the semantic value of a question is the union of the propositions corresponding to its minimally sufficient possible answers. Thus the semantic value of the polar question of whether a proposition is true is the union of a proposition and its complement, as in (51).

As discussed in section 2.4, it is necessary to distinguish between mention-all questions, such as (52-a), and mention-some questions, such as (53-a).

(52) **Context:** Cameron is deciding whether to attend Avery's dinner party tonight. Cameron and Dana are arch-enemies, so Cameron will not attend if Dana will be there. To find out whether Dana will be there, Cameron asks Bailey:

a. Who (all) did Avery invite to the party tonight?

(53) **Context:** Bailey does not have a car and therefore needs a ride to the party. Avery asks the other attendees:

a. Who can give Bailey a ride to the party?

I adopt Ciardelli et al.'s (2019) treatment of the mention-some/mention-all distinction. Since the minimally resolving answers to mention-some and mention-all questions are different, they have different sets of alternatives, so they express different propositions. The

alternatives in a mention-all question form a partition of the Common Ground, as in (54), which is the proposition such that for every individual x in a contextually salient domain of individuals, each alternative specifies whether Avery invited x. The alternatives in a mention-some question, on the other hand, do not form a partition because they overlap. This is illustrated by (55), which is the proposition whose alternatives correspond to answers of the form *x can give Bailey a ride home* for some individual x, which entails that x can give Bailey a ride home but does not provide any information about whether anyone else can. The alternatives corresponding to *Cameron can give Bailey a ride* and *Ezra can give Bailey a ride*, for example, overlap because either one resolves the question in a world where Cameron and Ezra can both give Bailey a ride. As suggested in Section (39), I refine Ciardelli et al.'s classification of *wh*-questions slightly by distinguishing subclasses of mention-some questions according to how many entities their minimally resolving answers require. Mention-one questions, like (55), can be resolved by providing only one individual with the specified property, while mention-two questions require at least two such individuals, as exemplified by (56). In principle, there are mention-n questions for any integer n, as illustrated in (44).

(54)   MENTION-ALL:

⟦Who all did Avery invite?⟧
$= \{s | \forall x \in D : s \subseteq |\text{Avery invited x}| \text{ or } s \subseteq \overline{|\text{Avery invited x}|}\}$

(55)   MENTION-ONE:

⟦Who can give Bailey a ride to the party?⟧
$= \{|x \text{ can give Bailey a ride to the party}| \mid x \in D\}^{\downarrow}$

(56)   MENTION-TWO:

⟦What are some foods that Cameron likes?⟧
$= \{|\text{Cameron likes } x \text{ and } y| \mid x, y \in D\}^{\downarrow}$

The union of all the information states in a proposition P is called the informative content of P and notated $\mathsf{info}(P)$, as shown in (57). If P is a non-inquisitive proposition, $\mathsf{info}(P)$ is identical to the maximal element of P.

(57)   INFORMATIVE CONTENT: For any proposition P, $\mathsf{info}(P) := \bigcup P$.

Probabilistic pragmatics

In view of the observations in Section 2.4.4, I assume that agents have probabilistic belief states. Given a set of interlocutors and a question Q, the beliefs of an interlocutor S about the correct answer to Q can be modeled as a probability distribution over the question's alternatives, where the probability $P_S(A)$ assigned to an alternative $A \in \mathsf{alt}(Q)$ represents the degree to which S believes that A is true in the actual world.

Given another information state B, the conditional probability $P_S(A|B)$, then, is the degree of S's belief in A given that S is certain that B is true. As is done in the Rational Speech Act (RSA) framework (see Frank & Goodman 2012; Goodman & Frank 2016), I assume that interlocutors update their belief states via Bayesian inference: When a listener L hears a speaker S utter a sentence ϕ, L revises their belief state by using Bayes' Rule (shown in (58)) to update the probability of each alternative in the CQ in view of the fact that S uttered ϕ.

(58)   BAYES' RULE: For any two information states A and B, $P(A|B) = \frac{P(B|A)P(A)}{P(B)}$.

Modifying a notational convention from Lauer (2013), I use $\mathsf{utter}(S, C, \phi)$ to represent the proposition that S uttered ϕ in a context C, as shown in (59).[7] L's new belief state after S utters ϕ in C is then given by (60), which says that the probability (from L's perspective) that any alternative A is true given that S uttered ϕ is proportional to the probability that S would choose to utter ϕ (out of some set of possible alternative utterances) if A were true, multiplied by L's prior probability that A is true (that is, the degree to which L believes A before S's utterance of ϕ).

(59) $\mathsf{utter}(S, C, \phi) = \{w : S \text{ uttered } \phi \text{ at context } C \text{ in world } w\}^{\downarrow}$

(60) $P_L\big(A|\mathsf{info}(\mathsf{utter}(S, C, \phi))\big) \propto P_S\big(\mathsf{info}(\mathsf{utter}(S, C, \phi))|A\big)P_L(A)$

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[7]Lauer (2013: 21) uses this notation slightly differently, treating $\mathsf{utter}(i_1, i_2, \varphi)$ as the *event* of i_1 uttering φ toward i_2. Rather than adopting an ontology that includes events, I define $\mathsf{utter}(S, C, \phi)$ to be a proposition.

Thus L's belief revision results from reasoning about what S would be expected to say in each of the possible worlds under consideration. This reasoning corresponds to that which is done by the "pragmatic listener" in the RSA literature. The probabilities P_S correspond to those computed by what is called the "pragmatic speaker" in the RSA literature. That computation involves optimizing each possible utterance's utility for communicating each possible information state to a hypothetical "literal listener" who understands only the conventional meaning of each utterance.

How exactly utterance utility is calculated in RSA is beyond the scope of the present discussion. The interested reader may consult Goodman & Frank (2016) and Franke & Jäger (2016) for details. I simply assume that if a sentence ϕ entails an alternative A in some question Q and L takes S to be cooperative and knowledgeable, then

$$P_L\big(A|\mathsf{info}(\mathsf{utter}(S, C, \phi))\big) = 1.$$

If, on the other hand, the utterance of ϕ only conversationally implicates A, then I assume that for any other alternative $A' \in \mathsf{alt}(Q)$,

$$P_L\big(A'|\mathsf{info}(\mathsf{utter}(S, C, \phi))\big) < P_L\big(A|\mathsf{info}(\mathsf{utter}(S, C, \phi))\big) < 1.$$

Relevance and answerhood

I follow Büring (2003) in using discourse trees to track the flow of questions and responses in discourse, as discussed in 2.4.1. However, Büring's notions of relevance and answerhood require some refinement to capture the intuitions discussed in Section 2.4.

For Büring, there is no distinction between relevance and answerhood for assertions: An assertion is relevant if and only if it answers its QUD, and it answers the QUD if it "shifts the probabilistic weights among the propositions denoted by the question." I make this probabilistic notion of relevance more precise by taking an assertion to be relevant to a question if and only if it changes the probability of some alternative in that question—that is, according to a listener L, an assertion R is relevant to a question Q if and only if there is some alternative $A \in \mathsf{alt}(Q)$ such that the conditional probability $P_L(A|R)$ is different from the prior probability $P_L(A)$.

We also need to define the relevance of a question to another question. Intuitively, a question Q_1 is relevant to a question Q_2 if Q_1 can be used as part of a strategy for answering Q_2. Roberts (1996) cashes out this intuition by requiring Q_1 to be a *subquestion* of Q_2, that is, requiring every complete answer to Q_2 (the *superquestion*) to entail an answer to Q_1. However, the question semantics that Roberts borrows from Hamblin does not distinguish between mention-all and mention-some questions, and it turns out that subquestionhood is not a necessary condition for relevance once mention-some questions enter into the equation. In (61), for example, the polar question *Does Cameron like pizza?* is intuitively relevant to the mention-some CQ *What are some foods Cameron likes?*, but it is not a subquestion according to Roberts' definition since there are answers to that CQ—such as *Cameron likes spaghetti*—that do not entail any answer to *Does Cameron like pizza?*

(61)   CQ: What are some foods Cameron likes?

        Q: Does Cameron like pizza?

I therefore follow Büring (2003) in assuming that a question is relevant to another question if at least one of its answers is relevant to that question. The uniform treatment of declaratives and interrogatives in Inquisitive Semantics allows for the formulation of a single Relevance principle that covers both assertions and questions:

(62)   RELEVANCE:

        a.   Given any proposition R and an inquisitive proposition S, a listener L takes R to be Relevant to S iff there is an alternative $A \in \mathsf{alt}(R)$ and an alternative $A' \in \mathsf{alt}(S)$ such that $P_L(A'|A) \neq P_L(A')$.

        b.   Given any two sentences ϕ and ψ, if $[\![\phi]\!]$ is Relevant to $[\![\psi]\!]$, then ϕ is licensed as a daughter of ψ in the discourse tree.

For the purposes of the present analysis, Answerhood needs to be a stronger notion that Relevance—that is, all Answers are Relevant, but not all Relevant assertions are Answers. In particular, a proposition Answers a question if it increases the probability of some resolution to that question more than it increases the probability of any other resolution. A suitable

definition of Answerhood is formalized in (63), where the left and right sides of the inequality in (63-b) are the factors by which knowledge of the proposition R increases the probability of $\bigcap \mathcal{A}$ and $\bigcap \mathcal{A}'$, respectively—sometimes called the "impact" of R in Bayesian argumentation theory (see e.g. Godden & Zenker 2018). This definition ensures that if the antecedent of *too* Answers an RQ, the Antecedent Condition in (47) is satisfied. Note here that the notion of a resolution is weaker than the notion of an alternative: For mention-some questions—whose alternatives do not partition the Common Ground—the conjunction of any two alternatives is also resolution. Accordingly, raising the probability of the conjunction of some proper subset of alt(RQ) more than the conjunction of any other subset is sufficient to make a proposition an Answer.

(63)   ANSWERHOOD: For a listener L, a proposition R Answers an inquisitive proposition Q iff there is a nonempty (possibly singleton) set of alternatives $\mathcal{A} \subset \mathsf{alt}(Q)$ such that

   a. $P_L\left(\bigcap \mathcal{A}|\mathsf{info}(R)\right) > P_L\left(\bigcap \mathcal{A}\right)$, and

   b.   for all $\mathcal{A}' \subset \mathsf{alt}(Q)$, if $\bigcap \mathcal{A}' \not\supseteq \bigcap \mathcal{A}$, then $\dfrac{P_L\left(\bigcap \mathcal{A}|\mathsf{info}(R)\right)}{P_L\left(\bigcap \mathcal{A}\right)} > \dfrac{P_L\left(\bigcap \mathcal{A}'|\mathsf{info}(R)\right)}{P_L\left(\bigcap \mathcal{A}'\right)}$.

   If such a set $\mathcal{A}$ exists, it is unique. Call $\bigcap \mathcal{A}$ the **resolution of Q evidenced by R**, or $Q|_R$ for short.

One last definition will be useful for formulating the analysis: One proposition R evidences a resolution **more strongly** than another proposition R' does if R impacts the probability of that resolution more than R' does. This is shown formally in (64).

(64)   Given a listener L, an inquisitive proposition Q, any two propositions R and R', and a nonempty (possibly singleton) set of alternatives $\mathcal{A} \subset \mathsf{alt}(Q)$, R Evidences $\bigcap \mathcal{A}$ **more strongly** than R' does iff $P_L\left(\bigcap \mathcal{A}|\mathsf{info}(R)\right) > P_L\left(\bigcap \mathcal{A}|\mathsf{info}(R')\right)$.

2.5.2 Proposal

I propose that additive *too* has the felicity conditions shown in (65), which formalizes (47).[8]

(65) **Felicity conditions of additive *too*** (final)

TOO(π) requires the existence of an antecedent proposition ANT embodying a fact about the context and a (single or multiple) *wh*-question RQ that is Relevant to some question DQ in the discourse tree such that the following conditions hold:

a. ANTECEDENT CONDITION: ANT Answers RQ.

b. CONJUNCTION CONDITION: ANT$\cap[\![\pi]\!]$ Answers RQ, and RQ$|_{\text{ANT}\cap[\![\pi]\!]}$ is Evidenced more strongly by ANT $\cap [\![\pi]\!]$ than by ANT.

c. PREJACENT CONDITIONS:

 (i) $[\![\pi]\!] \not\subseteq$ RQ$|_{\text{ANT}\cap[\![\pi]\!]}$.

 (ii) For any proposition $S \supset [\![\pi]\!]$, ANT$\cap[\![\pi]\!]$ Evidences RQ$|_{\text{ANT}\cap[\![\pi]\!]}$ more strongly than ANT $\cap S$ does.

I turn now to demonstrating that this analysis accounts for the data that have been presented.

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[8]It is worth noting that (65) does not say anything about the polarity of the antecedent and prejacent. Many authors have noted that the acceptability of *too* is degraded when the prejacent contains negation, and *either* is preferred in such contexts. However, nothing in (64) rules out utterances like (i-A).

(i) Q: What are some foods you don't like?
A: I don't like pizza. ?I don't like spaghetti, **too**.
A': I don't like pizza. I don't like spaghetti, **either**.

My own intuition is that, although *either* sounds more natural than *too* in (i), *too* is not entirely unacceptable. I therefore do not propose any constraint that would rule out (i-A), and I concur with Rullmann (2003) that the awkwardness of *too* in sentences like (i-A) is likely the result of competition with *either*. A full explication of the felicity conditions of *either* must be left to future work, however.

2.5.3 Accounting for the argument-building use

To see how the conditions in (65) are satisfied by the argument-building use, consider (19-c), repeated in (66), as an illustrative example.

(66) Context: A and some traveling companions need to find a suitable to place to stay during their upcoming vacation. A is searching for a hotel room on the internet.

Q: What would be a good hotel for us to stay at?

A: A room just opened up at this hotel.

It looks kind of fancy, **too**.

Here we have $\llbracket \pi \rrbracket = \{|\text{The room looks kind of fancy}|\}^\downarrow$. As discussed in Section 2.4.4, I take the antecedent to be the fact that A uttered *A room just opened up at this hotel* in context C—that is, $\textsc{ant} = \mathsf{utter}(A, C, (66\text{-A}))$. Q is a mention-one question, so

$$\llbracket Q \rrbracket = \{|\text{Hotel A would be a good place to stay}|, |\text{Hotel B would be a good place to stay}|,$$
$$|\text{Hotel C would be a good place to stay}|, ...\}^\downarrow$$

Let $\textsc{rq} = \llbracket Q \rrbracket$. Then it can be shown as follows that the felicity conditions in (65) are satisfied:

a. ANTECEDENT CONDITION: A hotel can only be a good place to stay if it has available rooms, so the fact that a room just opened up at the hotel in question increases the probability that it is a good place to stay. Thus

$$P_L\big(|\text{This hotel would be a good place to stay}| \ \mathsf{info}(\textsc{ant})\big)$$
$$> P_L\big(|\text{This hotel would be a good place to stay}|\big).$$

ANT does not, however, increase the probability that any other hotel would be a suitable place to stay, so

$$\frac{P_L\big(|\text{This hotel would be a good place to stay.}| \ \mathsf{info}(\textsc{ant})\big)}{P_L\big(|\text{This hotel would be a good place to stay.}|\big)} > \frac{P_L\big(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant})\big)}{P_L\big(\bigcap \mathcal{A}'\big)}$$

for all $\mathcal{A}' \subset \mathsf{alt}(\textsc{rq})$ such that $\bigcap \mathcal{A}' \not\supseteq |\text{This hotel would be a good place to stay}|$. Thus ANT Answers RQ, with $\textsc{rq}|_{\textsc{ant}} = |\text{This hotel would be a good place to stay}|$.

b. CONJUNCTION CONDITION: ANT and $[\![\pi]\!]$ each increase the probability that the hotel in question would be a good place to stay but do not increase the probability that any other hotel would be, so we have

$$P_L\big(|\text{This hotel would be a good place to stay}|\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)$$
$$> P_L\big(|\text{This hotel would be a good place to stay}|\big)$$

and

$$\frac{P_L\big(|\text{This hotel would be a good place to stay}|\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)}{P_L\big(|\text{This hotel would be a good place to stay}|\big)}$$
$$> \frac{P_L\big(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)}{P_L\big(\bigcap \mathcal{A}'\big)}$$

for all $\mathcal{A}' \subset \mathsf{alt}(\textsc{rq})$ such that $\bigcap \mathcal{A}' \not\supseteq |\text{This hotel would be a good place to stay}|$. Thus $\underline{\textsc{ant} \cap [\![\pi]\!]\ \text{Answers} \ \textsc{rq}}$, and the resolution of RQ provided by $\textsc{ant} \cap [\![\pi]\!]$ is that the hotel in question would be a good place to stay (that is,

$$\textsc{rq}\big|_{\textsc{ant}\cap[\![\pi]\!]} = |\text{This hotel would be a good place to stay}|).$$

Since $[\![\pi]\!]$ contributes evidence that ANT does not, we have

$$P_L\big(\textsc{rq}\big|_{\textsc{ant}\cap[\![\pi]\!]}\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big) > P_L\big(\textsc{rq}\big|_{\textsc{ant}\cap[\![\pi]\!]}\ \mathsf{info}(\textsc{ant})\big).$$

Thus $\underline{\textsc{ant} \cap [\![\pi]\!]\ \text{Evidences} \ \textsc{rq}\big|_{\textsc{ant}\cap[\![\pi]\!]}\ \text{more strongly than} \ \textsc{ant} \ \text{does.}}$

c. PREJACENT CONDITIONS:

i. The fact that the hotel room looks fancy does not entail that the hotel in question would be a good place to stay. Thus $\underline{[\![\pi]\!] \not\subseteq \textsc{rq}\big|_{\textsc{ant}\cap[\![\pi]\!]}}$.

ii. For any proposition $S \supset [\![\pi]\!]$,

$$P_L\big(|\text{This hotel would be a good place to stay}|\ \mathsf{info}(\textsc{ant} \cap S)\big) <$$
$$P_L\big(|\text{This hotel would be a good place to stay}|\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)$$

because any proposition weaker than *It looks kind of fancy* (such as *It looks nice enough*) provides a less compelling reason to think that the hotel in question is a good place to stay. Thus $\underline{\textsc{ant} \cap [\![\pi]\!]\ \text{Evidences} \ \textsc{rq}\big|_{\textsc{ant}\cap[\![\pi]\!]}\ \text{more strongly than}}$ $\underline{\textsc{ant} \cap S \ \text{does.}}$

It was noted in Section 2.3 that the acceptability of *too* in the context of (66) depends on the fact that the antecedent and host sentence are both desirable to the interlocutors: *Too* becomes unacceptable if *fancy* is replaced by *dingy*, for example, as shown in (67).

(67)   Context: A and some traveling companions need to find a suitable to place to stay during their upcoming vacation. A is searching for a hotel room on the internet.

A: A room just opened up at this hotel. It looks kind of dingy, (#**too**).

The infelicity of *too* in (67) is accounted for by the requirement for the existence of some question RQ that is relevant to some question DQ in the discourse tree. This requirement was satisfied in (66) because the question *Where would be a good place for us to stay?* can itself be taken to be a node in the discourse tree if finding a good place to stay is a goal of the interlocutors. But that question cannot serve as the RQ in (67) because ANT $\cap$ $[\![\pi]\!]$ does not raise the probability of any resolution to it (assuming that a dingy hotel room is undesirable). Moreover, there is no other question relevant to the interlocutors' discourse goals in (67) that ANT $\cap$ $[\![\pi]\!]$ Answers. Hence *too*'s infelicity.

In contrast, the context in (68) (repeated from (21) does allow a suitable RQ to be identified, namely *Where would be a good place to shoot our music video?*

(68)   Context: A's band is looking for a dingy hotel room in which to shoot a music video.

RQ: Where would be a good place to shoot our music video?

A: A room just opened up at this hotel. It looks kind of dingy, **too**.

2.5.4   Accounting for the canonical additive use

Let us first consider the canonical additive use in responses to mention-some questions, as in (69).

(69)   Q: Who are some people Avery invited?

A: She invited Bailey and Cameron.

B: She invited Dana, **too**.

Here we have $\textsc{ant} = \mathsf{utter}(\text{A}, C, (69\text{-A}))$, $[\![\pi]\!] = \{|\text{Avery invited Dana}|^{\downarrow}$, and $[\![\text{Q}]\!] = \{|\text{Avery invited Bailey}|, |\text{Avery invited Cameron}|, |\text{Avery invited Dana}|, \dots^{\downarrow}$. Again, let $\textsc{rq} = [\![\text{Q}]\!]$. Then it can be shown as follows that the proposed felicity conditions of *too* are satisfied:

a. ANTECEDENT CONDITION: Assuming that A is cooperative and knowledgeable,

$$P_L\big(|\text{Avery invited Bailey and Cameron}| \, \mathsf{info}(\textsc{ant})\big) = 1$$
$$> P_L\big(|\text{Avery invited Bailey and Cameron}|\big).$$

since (69-A) entails that Avery invited Bailey and Cameron. As required by (63), |Avery invited Bailey and Cameron| is the intersection of a proper subset of $\mathsf{alt}(\textsc{rq})$, namely $\{|\text{Avery invited Bailey}|, |\text{Avery invited Cameron}|$. For any $\mathcal{A}' \subset \mathsf{alt}(\textsc{rq})$, if $\bigcap \mathcal{A}' \not\supseteq |\text{Avery invited Bailey and Cameron}|$, we have two cases to consider:

Case 1: For all $A \in \mathcal{A}'$, $A \not\supseteq |\text{Avery invited Bailey and Cameron}|$. In this case, (69-A) does not increase the probability of $\bigcap \mathcal{A}'$, so $\frac{P_L(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant}))}{P_L(\bigcap \mathcal{A}')} = 1$.

Case 2: For some $A \in \mathcal{A}'$, $A \supset |\text{Avery invited Bailey and Cameron}|$, that is, $A = |\text{Avery invited Bailey}|$ or $A = |\text{Avery invited Cameron}|$. In this case, assuming the probabilities of the alternatives in $\mathsf{alt}(\textsc{rq})$ are independent, we have $P_L\left(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant})\right) = P_L\left(\bigcap \mathcal{A}'|A\right) = \frac{P_L(\bigcap \mathcal{A}')}{P_L(A)} < \frac{P_L(\bigcap \mathcal{A}')}{P_L(|\text{Avery invited Bailey and Cameron}|)}$. It follows that $\frac{P_L(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant}))}{P_L(\bigcap \mathcal{A}')} < \frac{1}{P_L(|\text{Avery invited Bailey and Cameron}|)}$.

In both cases, we have

$$\frac{P_L\big(|\text{Avery invited Bailey and Cameron}| \, \mathsf{info}(\textsc{ant})\big)}{P_L\big(|\text{Avery invited Bailey and Cameron}|\big)} > \frac{P_L\left(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant})\right)}{P_L\left(\bigcap \mathcal{A}'\right)},$$

so $\underline{\textsc{ant} \text{ answers } \textsc{rq},}$ with $\textsc{rq}|_{\textsc{ant}} = |\text{Avery invited Bailey and Cameron}|$.

b. CONJUNCTION CONDITION: Assuming again that A is cooperative and knowledgeable, we have

$$P_L\big(|\text{Avery invited Bailey, Cameron, and Dana}| \, \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big) = 1$$
$$> P_L\big(|\text{Avery invited Bailey, Cameron, and Dana}|\big).$$

For all $\mathcal{A}' \subset \mathrm{alt}(\mathrm{RQ})$, if $\bigcap \mathcal{A}' \not\supseteq$ |Avery invited Bailey, Cameron, and Dana|, we have

$$\frac{P_L\big(|\text{Avery invited Bailey, Cameron, and Dana}|\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)}{P_L\big(|\text{Avery invited Bailey, Cameron, and Dana}|\big)}$$
$$> \frac{P_L\big(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)}{P_L\big(\bigcap \mathcal{A}'\big)},$$

by reasoning similar to that for the Antecedent Condition directly above. Thus $\underline{\textsc{ant} \cap [\![\pi]\!]}$ $\underline{\text{answers RQ,}}$ with $\mathrm{RQ}|_{\textsc{ant} \cap [\![\pi]\!]} = $ |Avery invited Bailey, Cameron, and Dana|. Furthermore,

$$P_L\big(|\text{Avery invited Bailey, Cameron, and Dana}|\ \mathsf{info}(\textsc{ant})\big) < 1$$

because (69-A) does not entail that Avery invited Dana. Thus $\underline{\textsc{ant} \cap [\![\pi]\!]\ \text{argues for}}$ $\underline{\mathrm{RQ}|_{\textsc{ant} \cap [\![\pi]\!]}\ \text{more strongly than}\ \textsc{ant}\ \text{does.}}$

c. PREJACENT CONDITIONS:

    i. *Avery invited Dana* does not entail that Avery invited Bailey, Cameron, and Dana, so $[\![\pi]\!] \not\subseteq \mathrm{RQ}|_{\textsc{ant} \cap [\![\pi]\!]}$.

    ii. For any proposition $S \supset [\![\pi]\!]$,

$$P_L\big(|\text{Avery invited Bailey, Cameron, and Dana}|\ \mathsf{info}(\textsc{ant} \cap S)\big) < 1$$

because neither (69-A) nor S entails that Avery invited Dana. (For example, consider $S = [\![\text{Avery invited Dana or Ellis}]\!]$.) Thus $\underline{\textsc{ant} \cap [\![\pi]\!]\ \text{argues for}\ \mathrm{RQ}|_{\textsc{ant} \cap [\![\pi]\!]}}$ $\underline{\text{more strongly than}\ \textsc{ant} \cap S\ \text{does.}}$

Antecedents that do not entail a resolution to the RQ

In (69), ANT and $\textsc{ant} \cap [\![\pi]\!]$ each answer Q by entailing a resolution to it. The definition of answerhood in (63) also allows for dialogues like (70), where ANT does not entail a resolution.

(70)   Q: What are some foods you like?
       A: I eat a lot of pizza.
          I like spaghetti, **too**.

Here we have $\textsc{ant} = \mathsf{utter}(\mathrm{A}, C, (70\text{-A}))$ and $[\![\pi]\!] = \{|\mathrm{A} \text{ likes spaghetti}|^{\downarrow}$. Since $\textsc{ant}$ provides evidence that A likes pizza but does not provide evidence that A likes anything else, we have

$$\frac{P_L\big(|\mathrm{A} \text{ likes pizza}| \; \mathsf{info}(\textsc{ant})\big)}{P_L\big(|\mathrm{A} \text{ likes pizza}|\big)} > \frac{P_L\big(\bigcap \mathcal{A}' \; \mathsf{info}(\textsc{ant})\big)}{P_L\big(\bigcap \mathcal{A}'\big)}$$

for all $\mathcal{A}' \subset \mathsf{alt}(\textsc{rq})$ such that $\bigcap \mathcal{A}' \not\supseteq |\mathrm{A} \text{ likes pizza}|$. Thus $\underline{\textsc{ant} \text{ Answers } \textsc{rq}}$, satisfying the Antecedent Condition. The Conjunction Condition and the Prejacent Conditions are satisfied here in the same way that they were in (69).

Mention-all RQs

If $\textsc{rq}$ is a mention-all question, then $\textsc{ant}$ may resolve it via Quantity implicature. In (71), for example, A's utterance implicates (but does not entail) that Avery invited Bailey, Cameron, Dana, *and no one else.*

(71)   Q: Who all did Avery invite?
        A: She invited Bailey, Cameron, and Dana.
        B: She invited Ellis, **too**.

Here $\textsc{ant} = \mathsf{utter}\big(\mathrm{A}, C, (71\text{-A})\big)$, $[\![\pi]\!] = \{|\mathrm{Avery \; invited \; Ellis}|^{\downarrow}$, and

$$[\![\mathrm{Q}]\!] = \big\{|\text{Avery invited only Bailey}|, |\text{Avery invited only Cameron}|, |\text{Avery invited only Dana}|,$$
$$|\text{Avery invited only Bailey and Cameron}|, |\text{Avery invited only Bailey and Dana}|,$$
$$|\text{Avery invited only Cameron and Dana}|, |\text{Avery invited only Bailey, Cameron, and Dana}|, \ldots^{\downarrow}.$$

Once again, it can be shown that the proposed felicity conditions of *too* are satisfied by setting $\textsc{rq} = [\![\mathrm{Q}]\!]$:

  a. ANTECEDENT CONDITION: If A knew that Avery invited anyone else besides Bailey, Cameron, and Dana, A would be expected to say so in order to comply with the Maxim

of Quantity. It follows[9] that

$$\frac{P_L\big(|\text{Avery invited only Bailey, Cameron, and Dana}|\ \mathsf{info}(\textsc{ant})\big)}{P_L\big(|\text{Avery invited only Bailey, Cameron, and Dana}|\big)} > 1.$$

For all $\mathcal{A}' \subset \mathsf{alt}(\textsc{rq})$ such that $\bigcap \mathcal{A}' \not\supseteq |\text{Avery invited only Bailey, Cameron, and Dana}|$, if $\mathcal{A}'$ is a non-singleton set we have $\bigcap \mathcal{A}' = \emptyset$ since the alternatives of a mention-all question are non-overlapping, but if $\mathcal{A}'$ contains only one alternative, we have

$$\frac{P_L\big(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant})\big)}{P_L\big(\bigcap \mathcal{A}'\big)} = 1$$

since ANT does not raise the probability of any mention-all answer other than *Avery invited only Bailey, Cameron, and Dana*. Therefore,

$$\frac{P_L\big(|\text{Avery invited only Bailey, Cameron, and Dana}|\ \mathsf{info}(\textsc{ant})\big)}{P_L\big(|\text{Avery invited only Bailey, Cameron, and Dana}|\big)}$$
$$> \frac{P_L\big(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant})\big)}{P_L\big(\bigcap \mathcal{A}'\big)}$$

Thus ANT answers RQ, with $\textsc{rq}_{\textsc{ant}} = |\text{Avery invited only Bailey, Cameron, and Dana}|$.

b. CONJUNCTION CONDITION: Although the assertion of $[\![\pi]\!]$ cancels the implicature that Avery invited no one besides Bailey, Cameron, and Dana, it only provides the information that Avery invited Ellis, so $\textsc{ant} \cap [\![\pi]\!]$ constitutes evidence that Avery did not invite anyone besides Bailey, Cameron, Dana, and Ellis. (In other words, a weaker version of the exhaustive inference survives the assertion of π.) Therefore,

$$\frac{P_L\big(|\text{Avery invited only Bailey, Cameron, Dana, and Ellis}|\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)}{P_L\big(|\text{Avery invited only Bailey, Cameron, Dana, and Ellis}|\big)}$$
$$> \frac{P_L\big(\bigcap \mathcal{A}'|\mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)}{P_L\big(\bigcap \mathcal{A}'\big)}$$

for all $\mathcal{A}' \subset \mathsf{alt}(\textsc{rq})$ such that $\bigcap \mathcal{A}' \not\supseteq |\text{Avery invited only Bailey, Cameron, Dana, and Ellis}|$. Thus $\textsc{ant} \cap [\![\pi]\!]$ Answers RQ, with

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[9]See Goodman & Stuhlmüller (2013), Degen et al. (2013), and Degen & Tanenhaus (2015) for explanation of how Quantity implicatures can be modeled in RSA.

$\text{RQ}|_{\text{ANT} \cap \llbracket \pi \rrbracket} = |\text{Avery invited only Bailey, Cameron, Dana, and Ellis}|$. Since ANT by itself suggests that Avery did *not* invite Ellis,

$$P_L\big(|\text{Avery invited only Bailey, Cameron, Dana, and Ellis}| \; \mathsf{info}(\text{ANT} \cap \llbracket \pi \rrbracket)\big)$$

$$> P_L\big(|\text{Avery invited only Bailey, Cameron, Dana, and Ellis}| \; \mathsf{info}(\text{ANT})\big).$$

Thus $\underline{\text{ANT} \cap \llbracket \pi \rrbracket \text{ Evidences } \text{RQ}|_{\text{ANT} \cap \llbracket \pi \rrbracket}}$ more strongly than ANT does.

c. PREJACENT CONDITIONS:

    i. The fact that Avery invited Ellis does not entail that Avery invited Bailey, Cameron, Dana, and Ellis. Thus $\llbracket \pi \rrbracket \nsubseteq \text{RQ}|_{\text{ANT} \cap \llbracket \pi \rrbracket}$.

    ii. For any proposition $S \supset \llbracket \pi \rrbracket$,

$$P_L\big(|\text{Avery invited Bailey, Cameron, Dana, and Ellis}| \; \mathsf{info}(\text{ANT} \cap S)\big)$$

$$< P_L\big(|\text{Avery invited Bailey, Cameron, Dana, and Ellis}| \; \mathsf{info}(\text{ANT} \cap \llbracket \pi \rrbracket)\big)$$

because S is weaker evidence that Avery invited Ellis than $\llbracket \pi \rrbracket$ is. (For example, consider $S = \llbracket \text{Avery invited Ellis or Francis} \rrbracket$.) Thus $\underline{\text{ANT} \cap \llbracket \pi \rrbracket \text{ Evidences}}$ $\underline{\text{RQ}|_{\text{ANT} \cap \llbracket \pi \rrbracket}}$ more strongly than $\text{ANT} \cap S$ does.

RQs that are not explicitly asked

It has been shown that the conditions in (65) are satisfied in (69)–(71) when RQ is taken to be the question that was explicitly asked. But (65) does not require this; it only requires RQ to be relevant to some question DQ in the discourse tree. As seen in Section 2.4, there are cases in which the RQ whose existence satisfies *too*'s felicity conditions is not an explicitly asked question. For example, consider (72). Since the explicitly asked question Q is a mention-two question, each of its alternatives entail that Bailey invited at least two individuals. The antecedent (*She invited Bailey*) only provides one individual. (Such an antecedent sounds most natural when it is introduced by *well* and uttered with rising intonation, as indicated in (72).)

(72)   Q: Who are some people Avery invited?

       A: (Well,) she invited Bailey.$^\uparrow$... She invited Cameron, **too**.

If the alternatives in Q are independent and the prior distribution over them is uniform, *She invited Bailey* increases the probability of every alternative that entails that Avery invited Bailey by the same amount, which is to say

$$P_L\big(|\text{Avery invited Bailey and Cameron}| \,\, |\text{Avery invited Bailey}|\big)$$
$$= P_L\big(|\text{Avery invited Bailey and Dana}| \,\, |\text{Avery invited Bailey}|\big)$$
$$= P_L\big(|\text{Avery invited Bailey and Ellis}| \,\, |\text{Avery invited Bailey}|\big)$$
$$= \cdots.$$

In this case, then, *She invited Bailey* does not Answer Q, so the Antecedent Condition is not satisfied here if $\text{RQ} = [\![Q]\!]$.

However, there is a question Relevant to Q that is answered by *She invited Bailey*, namely the mention-one question *Who is someone that Avery invited?* That question is Relevant, according to (62), because each of its alternatives increases the probability of some of Q's alternatives: For example,

$$P_L\big(|\text{Avery invited Bailey and Cameron}| \,\, |\text{Avery invited Bailey}|\big)$$
$$> P_L\big(|\text{Avery invited Bailey and Cameron}|\big).$$

The Conjunction and Prejacent conditions can also be shown to be satisfied by taking $\text{RQ} = [\![\text{Who is someone that Avery invited?}]\!]$. I omit the proof because it is analogous to the one in the mention-some case considered above. The examples in (45) can be treated along similar lines.

2.5.5 Accounting for constraints on *too*'s distribution

The Conjunction Condition accounts for the fact that *too* is unacceptable in contexts where π does not contribute any information that would make $\text{ANT} \cap [\![\pi]\!]$ a more satisfactory resolution than ANT to any contextually relevant question. An example of such a context can be seen in (73).

(73)   Q: Who are some people Avery invited?

A: She invited Bailey and Cameron.

B: #Dogs are mammals, **too**.

Here we have $\textsc{ant} = \mathsf{utter}(A, C, (73\text{-}A))$ and $[\![\pi]\!] = \{|\text{Dogs are mammals}|\}^{\downarrow}$. Since $\textsc{ant}$ is evidence that Avery invited Bailey and Cameron but *Dogs are mammals* provides no information about who Avery invited, we have $Q|_{\textsc{ant} \cap [\![\pi]\!]} = |\text{Avery invited Bailey and Cameron}|$ and

$$P_L\big(|\text{Avery invited Bailey and Cameron}|\ \mathsf{info}(\textsc{ant} \cap [\![\pi]\!])\big)$$
$$= P_L\big(|\text{Avery invited Bailey and Cameron}|\ \mathsf{info}(\textsc{ant})\big).$$

Thus $\textsc{ant} \cap [\![\pi]\!]$ does not Evidence $Q_{\textsc{ant} \cap [\![\pi]\!]}$ any more strongly than $\textsc{ant}$ does. This means the Conjunction Condition is not satisfied by taking $\textsc{rq} = [\![Q]\!]$. There is no other contextually relevant question that satisfies the Conjunction Condition, either, so the analysis correctly predicts that *too* is infelicitous in (73-B).

(74)   CQ: What kind of animals are dogs?

A: Dogs are mammals. #I had pancakes for breakfast, **too**.

Part (i) of the Prejacent Condition accounts for the fact, observed by Beaver & Clark (2008), that *too* is infelicitous in (75-A).

(75)   Q: What is Sam's emotional state?   (repeated from (11))

A: Sam is happy. #He's ecstatic, **too**.

Here we have $\textsc{ant} = \mathsf{utter}(A, C, \textit{Sam is happy})$ and $[\![\pi]\!] = \{|\text{Sam is ecstatic}|\}^{\downarrow}$. The Antecedent Condition and the Conjunction Condition can be satisfied by taking $\textsc{rq} = [\![Q]\!]$. This fails to satisfy part (i) of the Prejacent Condition, however, because $Q|_{\textsc{ant} \cap [\![\pi]\!]} = |\text{Sam is ecstatic}|$, which is entailed by $[\![\pi]\!]$.

Part (ii) of the Prejacent Condition rules out dialogues like (76).

(76)   Q: Who plays an instrument?   (repeated from (31))

A: Avery plays an instrument. #Bailey plays the cello, **too**.

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Here we have $\textsc{ant} = \mathsf{utter}(A, C,$ *Avery plays an instrument*$)$ and $[\![\pi]\!] = \{|\text{Bailey plays the cello}|\}^{\downarrow}$. The Antecedent and Conjunction Conditions are both satisfied if

$$\textsc{rq} = [\![\text{Who is someone who plays an instrument?}]\!],$$

which yields $\textsc{rq}|_{\textsc{ant} \cap [\![\pi]\!]} = \{|\text{Avery and Bailey play instruments}|\}^{\downarrow}$. There is no other possible $\textsc{rq}$ that would satisfy both the Antecedent and Conjunction conditions. (Although *Who is someone who plays the cello?* is relevant to Q, it will not work as $\textsc{rq}$ because $\textsc{ant}$ does not answer it.) However, the Prejacent Condition is not satisfied because

$$\{|\text{Bailey plays an instrument}|\}^{\downarrow} \supset [\![\pi]\!]$$

but $\textsc{ant} \cap \{|\text{Bailey plays an instrument}|\}^{\downarrow}$ Evidences $|\text{Avery and Bailey play instruments}|$ just as strongly as $\textsc{ant} \cap [\![\pi]\!]$ does.

Responses to multiple *wh*-questions

In addition, the proposal accounts for the observed behavior of *too* in responses to multiple *wh*-questions (see Section 2.4.4). Consider (41), repeated in (77).

(77)   **Context:** Avery and Bailey are known to have gone to a restaurant together. It is presumed that both of them ate there.
         Q: Who ate what?
         A: Avery ate pizza.
         B: Bailey ate spaghetti, (#**too**).

Here $\textsc{ant} = \mathsf{utter}(A, C, (77\text{-A}))$, $[\![\pi]\!] = \{|\text{Bailey ate spaghetti}|^{\downarrow}$, and

$$[\![Q]\!] = \big\{|\text{Avery and Bailey ate pizza}|, |\text{Avery ate pizza and Bailey ate spaghetti}|,$$
$$|\text{Avery and Bailey ate spaghetti}|, |\text{Avery ate spaghetti and Bailey ate pizza}|,$$
$$|\text{Avery and Bailey ate lasagna}|, \dots {}^{\downarrow}.$$

In this context, every resolution to *Who ate what?* specifies what Avery ate and what Bailey ate. Therefore, if $\textsc{rq} = [\![Q]\!]$, the Antecedent Condition is not satisfied because $\textsc{ant}$ does not

provide any information as to what Bailey ate. The only contextually relevant *wh*-questions that ANT does resolve are the ones shown in (78).

(78) a. What did Avery eat?

b. Who ate pizza?

c. What is something that was eaten?

If RQ = $[\![(78\text{-a})]\!]$ or RQ = $[\![(78\text{-b})]\!]$, then the Conjunction Condition is not satisfied because we have $\text{RQ}|_{\text{ANT} \cap [\![\pi]\!]}$ = |Avery ate pizza|, which ANT Evidences just as strongly as ANT $\cap$ $[\![\pi]\!]$ does. If RQ = $[\![(78\text{-c})]\!]$, then $\text{RQ}|_{\text{ANT} \cap [\![\pi]\!]}$ = $\{|\text{Pizza and spaghetti were eaten}|\}^{\downarrow}$ and the Prejacent Condition is not satisfied because $\{|\text{Spaghetti was eaten}|\}^{\downarrow} \supset [\![\pi]\!]$ but ANT $\cap \{|\text{Spaghetti was eaten}|\}^{\downarrow}$ Evidences $\text{RQ}|_{\text{ANT} \cap [\![\pi]\!]}$ just as strongly as ANT $\cap$ $[\![\pi]\!]$ does. This accounts for *too*'s infelicity in (77).

In contrast, *too* is acceptable in (79) (repeated from (42)).

(79) **Context:** Avery, Bailey, Cameron, Dana, and others are known to have attended a large party. It is likely that there were some married couples among the attendees, but it cannot be assumed that any of them were married to each other.

Q: Who is married to whom?

A: Avery is married to Bailey.

B: Cameron is married to Dana, **too**.

Here ANT = $\mathsf{utter}(A, C, (79\text{-A}))$, $[\![\pi]\!] = \{|\text{Cameron is married to Dana}|\}^{\downarrow}$, and

$[\![Q]\!] = \{|\text{Avery is married to Bailey}|, |\text{Avery is married to Cameron}|, |\text{Avery is married to Dana}|,$ $|\text{Bailey is married to Cameron}|, |\text{Bailey is married to Dana}|, |\text{Cameron is married to Dana}|, ...\}^{\downarrow}$.

The felicity conditions of *too* are satisfied by taking RQ = $[\![Q]\!]$: Since Q can be resolved in this context by supplying only one married couple, (79-A) Answers Q, thereby satisfying the Antecedent Condition. The Conjunction Condition and Prejacent Condition are satisfied in the same way they are with mention-some single *wh*-questions (see (69) above).

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Cases where *too* takes narrow scope

In the data discussed so far, *too*'s prejacent is the entire host sentence. However, it is not a problem for the proposed analysis that *too* can also take narrow scope.

For example, Rullmann (2003) points out that *too* can occur in negated sentences, as in (80).[10] Rullmann argues that the negation in (80) outscopes *too*, so I take the prejacent to be the positive sentence *Ian washes the dishes*, as shown in (81-a).

(80)   Ian cooks the food. He shouldn't wash the dishes **too**.   (cf. Rullmann 2003: 330)

The antecedent is the fact that the speaker asserted that Ian cooks the food, as shown in (81-b). This utterance would presumably occur in a conversation about what tasks Ian should be responsible for (perhaps with the goal of dividing up chores between members of a household), so I assume that the question *What should Ian do?* is in the discourse tree. The felicity conditions of *too* are satisfied if the RQ is taken to be *What does Ian do?* (with a mention-one interpretation, as shown in (81-c)). This question is Relevant to the DQ *What should Ian do?* because information about what Ian already does affects how the interlocutors are likely to resolve that DQ: If Ian already has one task, the probability that he should do others decreases.

(81)   a. $[\![\pi]\!] = \{|\text{Ian washes the dishes}|\}^{\downarrow}$

        b.   ANT = $\mathsf{utter}(Sp, C, \text{Ian cooks the food})$

        c.   RQ = $\{|\text{Ian cooks the food}|, |\text{Ian washes the dishes}|, |\text{Ian sweeps the floor}|, ...\}^{\downarrow}$

Note that *too*'s felicity depends only on the existence of an RQ that has the required relationship to $[\![\pi]\!]$ and ANT. The host sentence *He shouldn't wash the dishes* does not come into consideration.

Too also occurs in subordinate clauses. An example is shown in (82). In this case the prejacent is the clause in which *too* appears, so again the host sentence does not come into

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[10]The antecedent in Rullmann's example is actually *Ian cooked the food*, which requires a more complicated analysis since it is a past-tense sentence. I consider only this simpler present-tense version and leave the investigation of how *too* interacts with tense to future work.

consideration. In (82), the felicity conditions of *too* are satisfied by taking RQ to be *What does Ian do?*, just as in (81).

(82)   Ian cooks the food. If he washes the dishes **too**, that's very kind of him.

    a. $[\![\pi]\!] = \{|\text{Ian washes the dishes}|\}^{\downarrow}$

    b.   ANT $=$ utter$(Sp, C, \text{Ian cooks the food})$

    c.   RQ $= \{|\text{Ian cooks the food}|, |\text{Ian washes the dishes}|, |\text{Ian sweeps the floor}|, ...\}^{\downarrow}$

When *too* appears in polar questions, as in (83), I assume that it takes scope under a polar question operator. Then the prejacent in (83) is *Bailey went to the party*, and the felicity conditions of *too* are straightforwardly satisfied by taking RQ to be *Who is someone who went to the party?*

(83)   Q: Who went to the party?

        A: Avery went to the party. Did Bailey go, **too**?

    a. $[\![\pi]\!] = \{|\text{Bailey went to the party}|\}^{\downarrow}$

    b.   ANT $=$ utter$(A, C, \text{Avery went to the party})$

    c.   RQ $= \{|\text{Avery went}|, |\text{Bailey went}|, |\text{Cameron went}|, ...\}^{\downarrow}$

Too also appears in certain kinds of *wh*-questions. Theiler (2019) examines the behavior of *also* in such questions and points out that *also*'s acceptability in (84) hinges on the domain restriction *other books (besides Middlemarch)*. According to her, *also* is also acceptable in (85-a) (which she calls a "summoning question") because such questions implicitly restrict their domain to the group of listeners being addressed by the speaker. *Too*, which Theiler (2019) does not analyze, is just as acceptable as *also* in these two kinds of questions.[11]

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[11] *Also* is known to also appear in showmaster questions, which convey that the asker has a particular answer in mind (see Umbach 2010). Interestingly, the showmaster interpretation does not seem to be available to *too*, as evidenced by the infelicity of (i-b). The explanation for this difference between *also* and *too* must be left to future work.

(i)   **Showmaster questions:**

       (Little Lisa tells her mother what happened when she visited the zoo with Auntie.)

(84)   ***Wh*-questions with explicit domain restriction:**

      a.   John read Middlemarch. What #(other books) did John **also** read?

      b.   John read Middlemarch. What #(other books) did John read, **too**?

(85)   **Summoning questions:**

      a.   I'm getting an ice cream for Mary. Who **also** wants one?

      b.   I'm getting an ice cream for Mary. Who wants one **too**?

In Inquisitive Semantics, *wh*-questions are analyzed as involving quantification (see Ciardelli et al. 2019), so on the present analysis, I take it that *too*'s prejacent in (84-b) and (85-b) contains a variable that is bound by an quantifier that takes scope over *too*, as shown in (86) and (87). A rigorous analysis of *too*'s behavior in *wh*-questions must be left to future work, but I suggest that *too* is licensed in *wh*-questions only if its felicity conditions are satisfied for all possible assignments of the variable in the prejacent. The Prejacent Condition will then be satisfied only if the domain of quantification is properly restricted.

(86)   John read Middlemarch. What #(other books) did John read, **too**?

      a. $\llbracket \pi \rrbracket = \{|\text{John read } x| : x \neq \text{Middlemarch}\}^{\downarrow}$

      b.   RQ: What did John read?

(87)   I'm getting an ice cream for Mary. Who (among you) wants one **too**?

      a. $\llbracket \pi \rrbracket = \{|x \text{ wants an ice cream}| : x \text{ is an addressee}\}^{\downarrow}$

      b.   RQ: Who wants an ice cream?

2.6   Other positive-polarity additives

The analysis of *too* developed in this chapter can readily be extended to other additive expressions. In this section I provide analyses of *also*, and *as well*. Future work can apply the approach to the negative-polarity additive *either*, the scalar additive *even*, and additives

      a.   Auntie to Lisa: And what **also** happened at the zoo?   (Umbach 2010)

      b.   Auntie to Lisa: #And what happened at the zoo, **too**?

in other languages.

2.6.1 *As well*

As well does not have an argument-building use. This can be seen by attempting to replace any of the argument building uses of *too* discussed above with *as well*, as shown in (88). Having only a canonical additive use, it behaves the way additives are traditionally assumed to. It need not occur in sentence-final position, but its syntactic position does not appear to have any effect on its meaning, as shown in (89).

(88) a. Ernie took Iree in with no authority but her own. It was a good thing she did (**too**/#**as well**).

   b. I know a couple people who've gotten tickets. The fine is a hefty one (**too**/#**as well**).

   c. A room just opened up at this hotel. It looks like a fancy one, (**too**/#**as well**).

(89) a. (i) If the U.S. imposed a 45-percent tariff then China couldn't export that much, so lots of Chinese would lose their jobs. But China would retaliate against America. Hundreds of thousands of Americans would lose their jobs **as well**.

                                                                (repeated from (5))

      (ii) [...] Hundreds of thousand of Americans, **as well**, would lose their jobs.

   b. (i) With the 2012 Super Bowl played in Indianapolis, the modest capital city got a huge reputation boost. [...] The Indianapolis startup scene may deserve a reputation boost **as well**.   (repeated from (6))

      (ii) [...] The Indianapolis startup scene, **as well**, may deserve a reputation boost.

Recall that on the present analysis, the difference between the argument-building and canonical additive uses is whether the antecedent and its conjunction with the host sentence Evidence the same resolution to an RQ or different ones. *As well*'s lack of an argument-building use can thus be accounted for by a Conjunction Condition that requires ANT and

ANT $\cap [\![\pi]\!]$ to Evidence different resolutions, as shown in (90-b).

(90) **Felicity conditions of *as well***

AS-WELL(π) requires the existence of an antecedent proposition ANT embodying a fact about the context and a (single or multiple) *wh*-question RQ that is Relevant to some question DQ in the discourse tree such that the following conditions hold:

    a.   ANTECEDENT CONDITION: ANT Answers RQ.

    b.   CONJUNCTION CONDITION: ANT $\cap [\![\pi]\!]$ Answers RQ, and RQ$|_{\text{ANT}\cap[\![\pi]\!]} \neq$ RQ$|_{\text{ANT}}$.

    c.   PREJACENT CONDITIONS:

        (i) $[\![\pi]\!] \nsubseteq$ RQ$|_{\text{ANT}\cap[\![\pi]\!]}$.

        (ii) For any proposition $S \supset [\![\pi]\!]$, ANT$\cap[\![\pi]\!]$ Evidences RQ$|_{\text{ANT}\cap[\![\pi]\!]}$ more strongly than ANT $\cap S$ does.

2.6.2 *Also*

The meaning of *also* varies depending on its syntactic position. In non-initial position, I argue that *also* shares the semantics proposed here for *too*, though they exhibit somewhat different syntactic behavior. In sentence-initial position, on the other hand, I argue that *also* requires a slightly different semantic analysis to account for its more flexible behavior.

Non-initial *also* and *too*

In sentence-final position, *also* seems to be more or less equivalent to sentence-final *too*. The argument-building examples of *too* discussed in this chapter can be replaced with *also*, as in (91). I have the intuition that *too* might be preferable here, especially in (91-a), but *also* does not seem to me to be entirely unacceptable.

(91)   a.   Ernie took Iree in with no authority but her own. It was a good thing she did **(too/?also)**.

    b.   I know a couple people who've gotten tickets. The fine is a hefty one **(too/also)**.

    c.   A room just opened up at this hotel. It looks like a fancy one, **(too/also)**.

Sentence-medial "also" does not seem to have an argument-building use, however—and neither does sentence-medial *too* for that matter. Thus all the additives in (92) are unacceptable. I suggest that the explanation for this has something to do with prosody. The prosodic characteristics of sentences containing additives are a matter of some controversy (see Section 2.2, fn. 1) and their proper elucidation must be left to future work, but it seems to me that the argument-building use requires a particular prosodic contour, with a falling pitch accent in the predicate—on *good thing, hefty,* and *fancy* in (91-a), (91-b), and (91-c), respectively. When an additive is inserted sentence-medially, however, it seems to bear a falling pitch accent of its own and require a rising accent somewhere else in the sentence (anywhere in the sentence for *also*, but on the immediately preceding element for *too*). This disrupts the prosodic contour required by the argument-building use. If this is on the right track, then the absence of an argument-building interpretation of sentence-medial additives should not be specified in their semantics but rather explained in terms of the phonology and pragmatics of prosody. I therefore take sentence-medial *also* and *too* to have the same semantics proposed for sentence-final *too*.

(92)   a.   Ernie took Iree in with no authority but her own.

         It was (#**also**) a good thing she did. / It, (#**too**/#**also**), was a good thing she did.

      b.   I know a couple people who've gotten tickets.

         The fine is (#**also**) a hefty one. / The fine, (#**too**/#**also**), is a hefty one.

      c.   A room just opened up at this hotel.

         It (#**also**) looks like a fancy one. It, (#**too**/#**also**), looks like a fancy one.

Sentence-initial *also*

Sentence-initial *also* has both a canonical additive use and an argument-building use. Some naturally-occurring examples of its canonical additive use are shown in (93). To see that these are indeed the canonical additive use, notice that *as well* or sentence-medial *also* could be used instead.

(93) a. (blog about dog training)

Teach your dog to sit-stay. He can not sit-stay and jump up at the same time. When he is sitting you can then kneel down and give him a warm hug and kiss. **Also,** it's your job to never let anyone else allow your puppy to jump up on them! (COCA)

(i) [...] It's **also** your job to never let anyone else allow your puppy to jump up on them.

b. (magazine article about coding techniques for websites)

As mentioned, the content that is inserted is not visible in the page's source. It's visible only in the CSS. **Also,** the inserted element is by default an inline element (or, in HTML5 terms, in the category of text-level semantics). So, to give the inserted element a height, padding, margins and so forth, you'll usually have to define it explicitly as a block-level element. (COCA)

(i) [...] The inserted element is by default an inline element **as well**. [...]

Some naturally-occurring examples of the argument-building use of sentence-initial *also* are shown in (94). In (94-a), *also*'s host sentence strengthens the argument that Ryder was not the murderer; in (94-b), it strengthens the argument that the molten salt reactor is safe. Notice that *too* can be used with the same effect, but *as well* cannot.

(94) a. (police procedural TV series)

Found the hit man. Dead. Recent. We believe he was killed by whomever hired him. And Ryder was still in Australia. Yeah. **Also,** Ryder's credit cards appear to have been compromised. Someone else seems to have gotten ahold of all of the cards' numbers and made the bets with Sugar Wells. So, again, not Ryder. Think he was just an innocent victim. (COCA)

(i) [...] Ryder's credit cards appear to have been compromised, **(too/#as well)**. [...]

b. (academic paper in a mechanical engineering journal)

The [molten salt reactor experiment] was radically different from anything that had been built before, researchers at Oak Ridge National Laboratory were able

to operate the 8 MW reactor without incident for almost five years. Molten salt reactors run at near-atmospheric pressure, so the thick-walled pressure vessels found in light-water reactors is unnecessary. Since there is no water or sodium in the reactor fluids, there is zero possibility of a steam explosion or hydrogen production within the containment. Indeed, molten salt reactors can be designed without a graphite moderator, so combustible material need not even be present. MSR designs have very strong negative temperature and void coefficients, which act instantly, aiding safety and allowing automatic load following operation. **Also,** the fluid nature of the fuel means meltdown is an irrelevant term. (COCA)

(i) [...] The fluid nature of the fuel means meltdown is an irrelevant term, **(too/#as well)**.

Sentence-intial *also* is more flexible than sentence-final *too*, however. For one thing, sentence-initial *also* does not seem to be subject to part (ii) of the Prejacent Condition, as (95-A) sounds much more natural than (95-A′).

(95) Q: Who plays an instrument?

A: Avery plays an instrument. **Also,** Bailey plays the cello.

A′: Avery plays an instrument. #Bailey plays the cello, **too**.

In addition, sentence-initial *also* evidently has a weaker antecedent condition than *too*, as it is acceptable in precisely the kinds of responses to multiple *wh*-questions that were observed not to license *too* in Section (39). This is shown in (96). In Section (39), the unacceptability of (96-A') was used to argue that the antecedent of *too* must Answer an RQ. In contrast, the acceptability of (96-A) indicates that the antecedent of sentence-initial *also* merely needs to be Relevant to an RQ, not necessarily an Answer.

(96) Q: Who ate what?

A: Avery ate pizza. **Also**, Bailey ate spaghetti.

A′: Avery ate pizza. Bailey ate spaghetti, **too**.

To account for these facts about sentence-initial *also*, I propose the semantics in (97),

which is identical to that proposed for *too* except that it omits Prejacent Condition (ii) and only requires the antecedent fact to be Relevant to an RQ rather than an Answer.

(97)   **Felicity conditions of sentence-initial *also***

AS-WELL(π) requires the existence of an antecedent proposition ANT embodying a fact about the context and a (single or multiple) *wh*-question RQ that is Relevant to some question DQ in the discourse tree such that the following conditions hold:

a.   ANTECEDENT CONDITION: ANT is Relevant to RQ.

b.   CONJUNCTION CONDITION: ANT $\cap$ $[\![\pi]\!]$ Answers RQ. RQ$|_{\text{ANT}\cap[\![\pi]\!]}$ is Evidenced more strongly by ANT $\cap$ $[\![\pi]\!]$ than by ANT.

c.   PREJACENT CONDITION: $[\![\pi]\!] \not\subseteq$ RQ$|_{\text{ANT}\cap[\![\pi]\!]}$.

It is worth mentioning that *too* sometimes also appears in sentence-initial position, as shown in (98). This seems to be rather rare, however, and my intuitions about it are not clear enough to provide an analysis here.

(98)   a.   (science fiction story)

The girl has replaced her hair and cranial bone with a dome of Al Gieban crystal. The dome allows easy addition of memory to her thought storage and processing crystals, and permits display of the crystals' aesthetically pleasing appearance. **Too,** the girl has replaced her biological fingers and toes with hypersensitive transauric digits.   (COCA)

b.   (blog post about the life of Johnny Cash)

Cash was spinning out of control. His marriage was collapsing and divorce seemed inevitable. **Too,** his grueling tour schedule (which was now up to 300 shows a year) had taken its toll.   (COCA)

2.7   Conclusion and directions for future work

This chapter has offered an analysis of English positive-polarity additives that provides greater empirical coverage than previous approaches by accounting for the argument-building

use of *too* and *also*. According to the proposed analysis, *too* and *also* uniformly requires the existence of a contextually relevant question that is answered by its antecedent but has some resolution that its antecedent and prejacent together argue for more strongly than the antecedent does alone. This analysis crucially relies on a notion of Answerhood that brings Inquisitive Semantics together with probabilistic approaches to pragmatics.

In future work, the approach taken here can be extended to other additive expressions. I suggest that the felicity conditions of other additives vary around a shared semantic core that requires the existence of an RQ that is Answered by both an antecedent proposition and the conjunction of that antecedent with the additive's prejacent. An important English additive that has not been analyzed here is *either*, which has a close kinship to *too* but is a negative polarity item with a distribution nearly complementary to *too*'s (see Rullmann 2003). Like *too*, *either* has non-canonical uses, as reported by Thomas (2021) and exemplified by the naturally-occurring (99-b). *Either* likely shares some of *too*'s felicity conditions, but additional constraints will need to be stipulated to explain *either*'s NPI behavior.

(99) a. I don't like pizza. I don't like spaghetti, **either**. (Rullmann 2003)

b. I can name at least a half dozen now-dead couples...who've worked and suc-ceeded in the same fields in my country and yet somehow managed to stay married. And not because of societal pressures **either**. (Thomas 2021)

Future work can determine the extent to which the Antecedent, Conjunction, and Prejacent Conditions are shared with other additive expressions and uncover dimensions along which they vary within English and across languages.

Chapter 3

Refutational *too* as a polarity particle

3.1 Introduction

Research on English *too* has focused on the canonical additive use that has been the focus of this dissertation so far. However, *too* has another, less well-studied use, which Schwenter & Waltereit (2010) call the *refutational* use. The refutational use expresses disagreement, as shown in (1) and (2). The two uses are diachronically related, but whereas the additive use of *too* is attested in Old English, the earliest attestation of the refutational use in the *Oxford English Dictionary* is from the early twentieth century.

(1)   A: You didn't do your homework!

        B: I did **too**!

        (Schwenter & Waltereit 2010)

(2)   A: You ate all my cookies.

        B: I did not!

        A: You did **too**!

        (Rullmann 2003)

Schwenter & Waltereit investigate the diachronic development of refutational *too* by identifying bridging contexts in which additive *too* plausibly could have been reanalyzed as refutational *too*. However, the refutational use, in contrast to the additive use, has not yet

received a formal semantic analysis. In this chapter, I argue that refutational *too* should be analyzed as a polarity particle (like *yes* and *no*), but that it possesses a property that other polarity particles have not been reported to have: It is sensitive to the epistemic bias of the addressee. Building on earlier work on polarity particles by Farkas & Bruce (2010) and Roelofsen & Farkas (2015), this paper proposes a new polarity feature, [REFUTE], to account for the behavior of refutational *too*.

I begin by reviewing some previous research on polarity particles in Section 3.2. The behavior of refutational *too* will then be examined in Section 3.3 and analyzed in Section 3.6. Section 3.7 concludes.

3.2   Background: Polarity Features

Early work on responses to polar questions (e.g. Pope 1976; Sadock & Zwicky 1985) noted that *yes*, *no*, and their analogues in other languages require a salient antecedent sentence and are sensitive to its polarity. In particular, *yes* can occur both in positive sentences (as in (3-a) and (4-b)) and in negative sentences that confirm a negative antecedent (as in (4-a)), while *no* can occur both in negative sentences (as in (3-b) and (4-a)) and in positive sentences that deny a negative antecedent (as in (4-b)).

(3)   Peter passed the test.

    a.   Yes, he did. / #No, he did.

    b. #Yes, he didn't. / No, he didn't.

(4)   Peter didn't pass the test.

    a.   Yes, he didn't. / No, he didn't.

    b.   Yes, he DID. / No, he DID.

Roelofsen & Farkas (2015), refining the analysis of Farkas & Bruce (2010), take this class of particles, known as *polarity particles*, to realize two types of *polarity features*: absolute and relative. The absolute polarity features [+] and [−] presuppose that the polarity of the

sentence the particle occurs in (henceforth its *prejacent*)[1] is positive or negative, respectively. The relative polarity features [AGREE] and [REVERSE][2] presuppose that the polarity of the prejacent is the same or different, respectively, as the polarity of the antecedent. The following simplified versions of Roelofsen & Farkas's definitions of the polarity features will suffice for present purposes; the reader may consult Roelofsen & Farkas (2015) for further details.

(5) **Absolute polarity features:**

    a.   [+] presupposes that its prejacent is a declarative sentence with positive polarity.

    b.   [−] presupposes that its prejacent is a declarative sentence with negative polarity.

(6) **Relative polarity features:**

    a.   [AGREE] presupposes that the context provides a unique most salient antecedent proposition that is equivalent to the proposition expressed by the prejacent and has the same polarity.

    b.   [REVERSE] presupposes that the context provides a unique most salient antecedent proposition that is the negation of the proposition expressed by the prejacent and has the opposite polarity.

According to Farkas & Bruce (2010) and Roelofsen & Farkas (2015), *yes* can realize [AGREE] or [+], while *no* can realize [REVERSE] or [−]. This accounts for the data in (3) and (4).

Some languages are known to have polarity particles that realize the feature combination [REVERSE, +]—that is, they occur only in positive responses to negative antecedents. The best-known examples of [REVERSE, +] particles are French *si* and German *doch*, examples of which are shown in (7) and (8), respectively.

(7)   a.   A: Anne n'est pas partie. 'Anne didn't leave.'

---

[1]Note that in many cases the prejacent will be reduced by ellipsis, as in (3) and (4), or even entirely silent, as when *Yes* and *No* are used as standalone responses.

[2]Note that by calling the relative polarity features [AGREE] and [REVERSE], I am adopting the terminology of Roelofsen & Farkas (2015). Farkas & Bruce (2010) call those features [*same*] and [*reverse*].

B: Mais **si**. 'You are wrong, she did.'

b. A: Anne n'est pas partie? 'Didn't Anne leave?'

B: Mais **si**. 'Yes, she did.'

(Farkas & Bruce 2010)

(8) a. A: Anna kommt nicht mit ins Kino. 'Anna isn't coming along to the movies.'

B: **Doch!** Sie kommt schon. 'You are wrong. She's coming.'

b. A: Wollen Sie den Job nicht? 'Don't you want this job?'

B: **Doch!** Ich brauche das Geld. 'But I do. I need the money.'

(Farkas & Bruce 2010)

Farkas & Bruce (2010), Roelofsen & Farkas (2015), and other authors seem to assume that English does not have a [REVERSE, +], but it will be seen in the next section that the behavior of refutational *too* challenges that assumption.

3.3 Data

Some naturally-occurring examples of refutational *too* found in the Corpus of Contemporary American English (COCA; Davies 2008–) are shown in (9). (The speaker labels 'A' and 'B' are added for clarity.) This chapter focuses on data from American English, and judgments of all constructed examples that follow were checked with speakers of American English.[3] It should be noted that refutational *too* is strongly associated with children's speech (more on this in Chapter 5). When used by adults, it tends to sound playful or lighthearted and is not generally appropriate in formal contexts or in discussions of serious topics.

(9) a. A: You tripped me.

B: Did not.

A: Did **too!**

---

[3]The extent to which refutational *too* is attested in other varieties of English is a question for future research. Speakers of British English in attendance at *Sinn und Bedeutung 27* (2022) report the impression that it may be a dialectal feature of American English.

b. A: She doesn't know what she wants.

   B: I do **too**!

c. A: Peter Pan isn't real, and people don't fly!

   B: They do **too**!

d. A: No, the music [in Porgy and Bess] actually came together. I had trouble with
   the plot, but I guess Gershwin had nothing to do with that.

   B: He did **too**!

e. A: You have never looked better.

   B: I have **too** looked better.

f. A: We'll never fit.

   B: Will **too**!

g. A: No, you can't come in.

   B: Can **too**!

(COCA)

Note that although refutational *too* frequently and prototypically occurs in the elliptical construction *Do too!/Did too!*, it also occurs with other auxiliary verbs (such as *have, will,* and *can* in (9-e–g)), and it does not require verb phrase ellipsis (as demonstrated by (9-e)). Its distribution is, however, quite restricted: The clause in which it appears must be a main clause, must be declarative, and must have positive polarity. Its unacceptability in embedded clauses, interrogatives, and negative sentences is demonstrated by (10), (11), and (12), respectively.

(10)   a. A: You ate all my cookies!

          B: I did not!

          A: I (think/am sure) you did (#**too**)!

     b. A: People don't fly!

          B: I (think/am sure) they do (#**too**)!

(11)   A: I guess Gershwin had nothing to do with that.

     B: #Did he **too**? / #Did **too** he?

(12)   A: You ate all my cookies!

        B: I didn't (#**too**)! / I did (#**too**) not!

In addition, refutational *too* always immediately follows an auxiliary verb. Placing it in any other position in the examples above results in unacceptability. The syntactic distribution of refutational *too* is thus quite different from that of additive *too*, which typically (though not exclusively) appears in sentence-final position and can occur in questions, as in (13).

(13)   We're going to a movie. Do you want to come, **too**?

Refutational *too*'s distribution also differs from that of the canonical English polarity particles *yes* and *no*, which typically appear in sentence-initial position. *Too*'s inability to form responses by itself without an overt prejacent, as shown in (14), also sets it apart from *yes* and *no*.[4]

(14)   A: You didn't feed Fido.

        B: #Too!

3.3.1   *Too* as a polarity particle

Notwithstanding the syntactic differences between refutational *too* and the canonical English polarity particles,[5] I claim that refutational *too* is a polarity particle because it exhibits what I take to be the two key properties of polarity particles: anaphoric reference to a salient antecedent sentence (which is either equivalent to the particle's prejacent or the negation of it) and sensitivity to the polarity of that antecedent and/or its prejacent. To see that refutational *too* does indeed require an overt antecedent, consider the dialogue in (15). Even though it is clear that A believes B did not feed Fido, B cannot use *too* to disagree with that accusation since it was merely implicated by A, leaving it unavailable for anaphoric

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[4]I will not attempt to explain *too*'s syntactic behavior here, but see Sailor (2014) for an analysis of it.

[5]Farkas & Bruce (2010) report that the Romanian polarity particle *ba* also cannot occur by itself, so that does not seem to be a property shared by polarity particles in general. It is not clear how common this property is for polarity particles cross-linguistically.

reference.

(15)   A: Fido looks hungry.

         B: #I did too feed him!

Too's sensitivity to the polarity of its antecedent and prejacent is demonstrated in (16). As already pointed out, it requires a positive prejacent, which can be accounted for by taking it to realize the [+] polarity feature. In addition, it requires a negative antecedent, which can be accounted for by taking it to simultaneously realize the [REVERSE] feature. Accordingly, *too* is licensed in a wide range of [REVERSE, +] responses involving both declarative and interrogative antecedents, such as those shown in (16-a), but it is never licensed in [AGREE] or [−] responses, such as those in (16-b–c). Refutational *too* therefore seems to be a [REVERSE, +] polarity particle, just like French *si* and German *doch*.

(16)   **Context:** A and B have a dog, Fido, which B is supposed to feed every day. One day, A comes home and sees Fido lying next to his empty bowl, looking hungry.

         a.   (i)   **A:** You didn't feed Fido.   **B:** I did **too**!   [REVERSE,+]

              (ii)   **A:** You didn't feed Fido?   **B:** I did **too**!   [REVERSE,+]

              (iii) **A:** Did you not feed Fido?   **B:** I did **too**!   [REVERSE,+]

         b.   (i)   **A:** You fed Fido!   **B:** #I did **too**!   [AGREE, +]

              (ii)   **A:** Did you feed Fido?   **B:** #I did **too**!   [AGREE, +]

         c.   (i)   **A:** You didn't feed Fido.   **B:** #I didn't **too**!   [AGREE, -]

              (ii)   **A:** You fed Fido.   **B:** #I didn't **too**!   [REVERSE,-]

3.3.2   *Too*'s sensitivity to addressee bias

Refutational *too* being a [REVERSE, +] particle cannot be the whole story, however, as there are [REVERSE, +] responses that fail to license *too*. Some examples are shown in (17-a–d), where *too* is not acceptable but *yes* and *no* both are, as Farkas & Bruce's (2010) analysis predicts (though *yes* may be slightly more natural). Note that the superscripted ↑ in (17-b) and (17-c) indicates rising intonation on the tag question.

(17)   **[REVERSE,+] responses in which *too* is not licensed**

a. **Context:** B is organizing a party and is in charge of supplying all the non-alcoholic beverages for teetotalers. A and B are going through a list of people that are invited. B has no previous belief or expectation about their drinking habits.

    A: Jane and Mary do not drink.

    B: OK. What about John? Does he not drink (either)? (Romero & Han 2004)

    A: He does (#**too**)! / (Yes/no), he does drink.   [REVERSE, +]

b. **Context:** A and B are exploring a spooky abandoned house when they see a door slam for no apparent reason.

    A: This house isn't haunted... is it?$^\uparrow$

    B: It is (#**too**)! / (Yes/no), it is haunted.   [REVERSE, +]

c. **Context:** A and B are planning to go to the beach later today, but only if it's sunny. A has been working in a windowless room all day and has no idea what the weather is like. B comes in from outside.

    A: I hope we can still go to the beach. It's not raining, is it?$^\uparrow$

    B: It is (#**too**)! / (Yes/no), it is raining.   [REVERSE, +]

d. **Context:** A student is giving a presentation about France.

    Student: Marseille is the capital of France.

    Teacher: Paris isn't the capital of France?

    Student: It is (#**too**)! / (Yes/no), Paris is the capital of France. [REVERSE, +]

The *too* responses in (17) are all pragmatically odd because they seem to convey that the speaker (A in (17-a), B in (17-b–c), and the student in (17-d)) is disagreeing with the addressee, but in fact there is no conflict between the interlocutors' discourse commitments. In (17-a), A's use of *too* suggests that B believes that John does not drink, but in the given context B's utterance, a low-negation polar question, does not convey anything about B's beliefs with regard to the question of whether John drinks (see Romero & Han 2004 for discussion of such questions). In (17-b), B's use of *too* suggests that B thinks that A believes

the house is haunted, but the context does not provide any reason to think that A holds that belief. Rather, A's use of a tag question with rising intonation after a pause conveys that A wishes to confirm that the house is not haunted because A does not *want* the house to be haunted but suspects that it actually might be. Similarly, A's tag question in (17-c) does not convey that A *believes* that it is not raining. Instead, it seems to convey that A *desires* that it not be raining so that A and B can go to the beach. In (17-d), the rising declarative uttered by the teacher cannot be taken to convey that the teacher believes that Paris is not the capital of France, as the teacher can be assumed to know what city is the capital of France and therefore must have intended their utterance as a correction of the student's claim (see Farkas & Roelofsen 2017 for discussion of rising declaratives that fail to signal any bias toward their contents). In contrast, *too* is acceptable in the examples in (9) because each utterance containing *too* is a response to an assertion of the negation of *too*'s prejacent. This contrast distinguishes refutational *too* from [REVERSE, +] particles in other languages. German *doch*, for example, is acceptable in responses to questions that are epistemically unbiased, as in (18).

(18)   **Context:** A and B are planning to go to the beach later today, but only if it's sunny. A has been working in a windowless room all day and has no idea what the weather is like. B comes in from outside.
        A: Es regnet doch nicht, oder? 'It's not raining, is it?'
        B: Doch, es regnet! 'Yes, it is! / #It is too!'

However, *too* does not seem to require the addressee to be fully committed to the negation of its prejacent. This is demonstrated by (16-a-iii), repeated in (19), which seems to license *too* because A's question, especially when uttered in an accusatory tone, clearly conveys that A believes that B did not feed Fido.[6] However, by choosing to express the accusation

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[6]A reviewer for *Sinn und Bedeutung 27* pointed out that *too* seems to be unacceptable in (i) even though it occurs in a [REVERSE, +] response and A has expressed the bias that I argue *too* requires. The oddity of (i-B) seems to have something to do with the presence of an indefinite in the subject, as *too* is similarly odd in other sentences with indefinite subjects, such as (ii-B), and a search in COCA does not turn up any examples of refutational *too* with indefinite subjects.

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as a question instead of an assertion, A also conveys that they are not entirely certain that B did not feed Fido. (This choice may have a politeness motivation, as it softens the accusation somewhat.) *Too* is felicitous in B's response in spite of A's apparent uncertainty. This contrasts with (17-a), which also involves a low-negation polar question but fails to license *too*. Thus the acceptability of *too* in response to low-negation polar questions seems to depend on whether the question conveys an epistemic bias toward the negative answer on

(i)   A: No one fed Fido.
        B: #Someone did too!

(ii)   A: A dog has never been to space.
        B: #A dog has too!

Interestingly, however, refutational *too* is perfectly acceptable with indefinites in the predicate of the prejacent, as demonstrated by (iii)–(vi). I must leave the question of why refutational *too* is incompatible with indefinite subjects to future work.

(iii)   A: There is no dog that has been to space.
        B: There is too a dog that has been to space!

(iv)   A: There is no credit crunch.
        B: There is too a credit crunch! (https://economistsview.typepad.com/economistsview/2008/11/there-is-too-a.html)

(v)   A: Mary has no car.
        B: She does too have a car!

(vi)   A: That dog belongs to no one.
        B: He does too belong to someone!

The same reviewer also suggested that refutational *too* is unacceptable in responses to rhetorical questions such as *Are you never going to learn?* However, I do find *too* to be acceptable in such responses if appropriate context is provided, as in (vii).

(vii)   **Context:** A sees B eating a peanut butter and jelly sandwich for dinner for the third day in a row.
        A: Are you never going to learn to cook?
        B: I am **too**! I just haven't had time.

the part of the speaker (see Han 1998 Romero & Han 2004, Romero 2020, Goodhue 2021 for further arguments that low negation polar questions do not require such a bias).

(19) **Context:** A and B have a dog, Fido, which B is supposed to feed every day. One day, A comes home and sees Fido lying next to his empty bowl, looking hungry.
A: Did you not feed Fido?
B: I did **too**! [REVERSE, +]

The examples in (20) provide further evidence that even a weak bias toward the negation of the prejacent is sufficient to license *too*. In (20-a), A's rising-intonation tag question conveys that A believes, but is not certain, that Mary is not home. (Contrast this with the lack of bias conveyed by the tag questions in (17-b) and (17-c), and see Reese & Asher 2007 for discussion of the interpretation of tag questions.) In (20-b), A's use of *maybe* conveys the same belief and a similar lack of certainty.[7] In both cases, *too* is perfectly acceptable in B's response even though the antecedent expresses a weaker commitment than an outright assertion would.

(20) a. **Context:** Two children, A and B, are baking a surprise for their parents one evening when they run out of sugar. Their neighbor, Mary, sometimes loans things to them. She usually works late, but B saw her get home an hour ago. A does not know this.
B: Let's see if Mary can give us some sugar.
A: (But) she isn't home, is she?↑
B: She is **too**! [REVERSE, +]

b. **Context:** A and B knock on Mary's door and there is no answer for a couple of minutes. B saw her arrive and go inside an hour ago, but A does not know that.

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[7]Thanks to a reviewer from *Sinn und Bedeutung 27* for the dialogue in (20-b). The reviewer actually felt *too* to be unacceptable in response to *Maybe Mary isn't home* but did not suggest any particular context for the dialogue. Several American English speakers consulted found B's response in (20-b) to in fact be acceptable with the given context.

A: Maybe Mary isn't home.

B: She is **too**!   [REVERSE, +]

What seems to distinguish *too* from other polarity particles, then, is its sensitivity to the perceived epistemic bias of the addressee: Unlike *yes* and *no*, it appears that refutational *too* can only be used by a speaker who believes the addressee to be epistemically biased toward the negation of its host sentence. I take an interlocutor to be epistemically biased toward a proposition at a particular moment in discourse if at that moment they believe it to be more likely to be true than its negation.

As should be clear from the preceding discussion, listeners' inferences about interlocutors' biases result from a complex interplay of semantic and pragmatic factors including the literal meaning of utterances, prosody, and information available in the context. In (20-a), for example, A's bias toward Mary not being home is the result of A's pre-existing knowledge that Mary is not usually home on weekday evenings and is conveyed by A's rising-intonation tag question. But rising-intonation tag questions do not give rise to this kind of bias in all contexts, as demonstrated by (17-c). In (20-b), A's bias has a different source, namely the fact that Mary is not answering the door. The listener infers A's bias by assuming that a person's failure to answer the door is generally credible evidence that they are not home and that A will therefore be inclined to believe that Mary is not home. But of course sentences containing *maybe* do not always indicate this kind of bias. For instance, if it has been raining for a week, a speaker who has no information about the weather forecast and utters *Maybe it will be sunny tomorrow* does not express any belief about what tomorrow's weather will be like, but rather seems to express a wish for it to be sunny tomorrow. A great deal of the research on speaker bias and commitment has been dedicated to understanding the ways in which the conventional effects of various sentence forms interact with contextual factors to license inferences about speakers' epistemic states (see e.g. Malamud & Stephenson 2015; Gunlogson 2008; Jeong 2018; Reese & Asher 2007; Rudin 2018; Goodhue 2022). For the purposes of this chapter, I do not take any positions on what the conventional meaning of any particular sentence form might be. What I claim is that refutational *too* is felicitous only in contexts where the addressee can be inferred (based on their previous utterances and

other contextual information) to hold an epistemic bias against *too*'s prejacent.

At this point, one might wonder whether the [+] feature and the addressee bias requirement are sufficient to account for the distribution of refutational *too*, allowing the [REVERSE] feature to be left out of the analysis. After all, antecedents that have the required addressee bias tend to have negative polarity, so does the [REVERSE] feature actually rule out any antecedents that the bias requirement does not? I argue that refutational *too* does, in fact, realize [REVERSE] because it sounds unnatural in the [AGREE, +] responses in (21-a–b) even though the addressees in these examples have expressed the negative bias that *too* requires: In (21-a), A's use of *really* conveys that A believes the house is not haunted after all, and in (21-b), B's rising declarative conveys that B does not believe that Dana can bake. The fact that *too* is not acceptable with these antecedents therefore cannot be accounted for by the requirement that the addressee be epistemically biased against *too*'s prejacent.

(21)   a.   **Context:** A and B are exploring an abandoned house that a friend told them was haunted. They look for evidence of paranormal activity but don't find any.
             A: Is this house really haunted?
             B: It is (#**too**)!   [AGREE, +]

       b.   **Context:** A and B are discussing a birthday party that they are planning to host for their friend Cameron.
             A: Dana volunteered to bake the cake.
             B: (Really?) Dana can bake?
             A: He can (#**too**)!   [AGREE, +]

However, not all English speakers consulted agree with the judgment that (21-a–b) are unacceptable, and my own intuitions about them are not very crisp. Furthermore, even if these acceptability judgments are widely shared, the proposal that refutational *too* realizes the [REVERSE] feature is not the only possible way to account for them. Another possibility is that there is some minimum threshold of belief strength that the antecedent must convey in order to license refutational *too* but that the antecedents in (21) do not meet. Or, perhaps the acceptability of *too* can be shown to vary continuously and correlate with the strength of that belief. In either case, it might be possible to leave the [+] feature out of the analysis

and account for *too*'s behavior purely in terms of the addressee's publicly expressed beliefs. Experimental data are needed to rule out these alternatives.

3.4   Experiment 1: Methods

3.4.1   Experimental design

To more carefully probe the licensing conditions of refutational *too*, a large-scale experiment was conducted over the internet. The experiment was constructed using the Penn Controller for IBEX (Zehr & Schwarz 2018). Participants listened to a series of 10 disagreements between two characters, Claire and Dan, played by voice actors. Participants were told that Claire and Dan were a fictional couple who lived together, and that all of the disagreements happened on different days. Before hearing each audio clip, participants were asked to read a brief description of the conversational context. In every context, one of the two characters (henceforth Speaker 1) expects the other to have performed some domestic task but then encounters evidence that the task was not completed. Speaker 1 expresses their doubt as to whether Speaker 2 completed the task by uttering a sentence varying between one of five sentence forms (henceforth "antecedent types"): a falling negated declarative, a negative polar question, a positive polar question containing *really*, a positive polar question without *really*, or a reverse-polarity negative tag question. Speaker 2 then replies with one of two responses: *Yes, I did!* or *I did too!*

All of the contexts and antecedents constructed are shown in Table 3.1. The *Yes, I did!* responses serve as controls; they are assumed to be acceptable in all the contexts tested. The tag question antecedents were included to provide a baseline unacceptability rating, as *I did too!* is assumed to be unacceptable in response to all of them.

Context (written)	Antecedents (auditory)
[Speaker 2] told [Speaker 1] that [he/she] would feed their cat, Whiskers, before leaving for work today. But when [Speaker 1] comes home, [he/she] sees Whiskers meowing in front of his empty bowl.	You didn't feed Whiskers!
	Did you not feed Whiskers?
	Did you really feed Whiskers?
	Did you feed Whiskers?
	You fed Whiskers, right?
[Speaker 2] agreed to water the plants for a few days while [Speaker 1] was out of town. However, when [Speaker 1] comes home, the plants' leaves are drooping and the soil appears to be dry.	You didn't water the plants!
	Did you not water the plants?
	Did you really water the plants?
	Did you water the plants?
	You watered the plants, right?
[Speaker 2] made a soup for dinner. [Speaker 1] reminded [him/her] to add a pinch of salt. [Speaker 1] tastes the soup and finds it a bit bland.	You didn't add the salt!
	Did you not add the salt?
	Did you really add the salt?
	Did you add the salt?
	You added the salt, right?
Claire and Dan are hosting a party. [Speaker 2] said [he/she] would pick up a cake on the way home from work. [Speaker 1] gets home after [Speaker 2] and doesn't see a cake on the table.	You didn't pick up the cake!
	Did you not pick up the cake?
	Did you really pick up the cake?
	Did you pick up the cake?
	You picked up the cake, right?
Claire and Dan just bought a new bookshelf, and [Speaker 2] assembled it. [Speaker 1] told [him/her] to be sure to read the instructions, but it ends up looking a bit lopsided.	You didn't read the instructions!
	Did you not read the instructions?
	Did you really read the instructions?
	Did you read the instructions?
	You read the instructions, right?

Context (written)	Antecedents (auditory)
[Speaker 2] said [he/she] would wash the windows on the house, but [Speaker 1] notices some grime on a window.	You didn't wash this window!
	Did you not wash this window?
	Did you really wash this window?
	Did you wash this window?
	You washed this window, right?
The faucet on Claire and Dan's kitchen sink has been leaky lately. [Speaker 2] told [Speaker 1] that [he/she] would fix it, but [Speaker 1] turns on the faucet and finds that it's still a bit leaky.	You didn't fix this faucet!
	Did you not fix this faucet?
	Did you really fix this faucet?
	Did you fix this faucet?
	You fixed this faucet, right?
Claire and Dan have some overdue library books. [Speaker 2] said [he/she] would return them to the library today, but [Speaker 1] sees an automated overdue notice in [his/her] email.	You didn't return the library books!
	Did you not return the library books?
	Did you really return the library books?
	Did you return the library books?
	You returned the library books, right?
[Speaker 2] told [Speaker 1] [he/she] would mail a birthday card to their friend Avery, but when [Speaker 1] asks Avery about it, Avery says it hasn't arrived.	You didn't mail Avery's birthday card!
	Did you not mail Avery's birthday card?
	Did you really mail Avery's birthday card?
	Did you mail Avery's birthday card?
	You mailed Avery's birthday card, right?

Context (written)	Antecedents (auditory)
Claire and Dan are discussing a book that they were both supposed to read for a book club. The book club meeting is today, so they should have finished it by now, but [Speaker 2] doesn't seem to remember how it ended.	You didn't finish the book!
	Did you not finish the book?
	Did you really finish the book?
	Did you finish the book?
	You finished the book, right?

Table 3.1: Contexts and antecedents constructed for Experiment 1.

Each participant heard 10 dialogues—one for each of the 10 contexts in Table 3.1, presented in random order. Each participant encountered exactly two instances of each antecedent type, one followed by a *Yes, I did!* response and the other followed by an *I did too!* response. Participants were sorted into 20 groups in such a way that every possible combination of the two speakers, 50 antecedents, and two responses was tested.[8]

3.4.2 Construction of stimuli

The two characters were portrayed by professional voice actors, both adults, recruited on Voices,[9] an online marketplace for freelance voiceover work. Each actor was paid a $200 incentive for their participation.

Each actor was given a list of the dialogues to be recorded, with one line marked as their in each one, along with the corresponding description of the context. They were instructed to silently read each context and then utter the corresponding antecedent in an accusatory tone sounding overly angry or aggressive. They were then asked to utter each of the responses in a similar tone, as if they were responding to any of the antecedents.

The recording of stimuli was directed during a separate Zoom meeting with each actor.

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[8]Groups were not perfectly balanced due to limitations of how PCIbex handles group assignment, as well as the need to discard responses from some participants (see Section 3.4.5 below). In the final dataset, 6 groups contained 12 participants, 9 groups contained 13 participants, 4 groups contained 14 participants, and 1 group contained 15 participants.

[9]https://www.voices.com/

The actors recorded the stimuli during the session using their own recording equipment. The first actor's recordings were played to the second actors, who was instructed to copy the first actor's prosody. Recordings were checked afterward for consistency of prosody, and actors were asked to revise some of the recordings to ensure that prosody would be controlled as much as possible.

30 participants were recruited on Prolific for a pilot study in which they listened to some of the constructed dialogues, ratings the naturalness of each utterance, and were invited to leave comments about the speakers. Comments indicated that many participants found Dan's *Yes, I did!* response to be unnatural because it sounded excessively angry. The pitch contour in that recording was then manipulated in Praat to reduce the maximum pitch in the final syllable. Further piloting with another 25 participants found that almost all found the manipulated utterance to sound natural, though one participant remarked that "Dan has an odd tone shift on the word 'did' that sounds unnatural." The manipulated version was used in the main experiment.

3.4.3 Experimental tasks

After listening to each dialogue, participants were asked to provide four ratings. First, they rated the strength of Speaker 1's belief that Speaker 2 did not complete the task at issue, and then were asked how Speaker 2 would rate the strength of that belief. Then, participants were asked to rate their agreement with the two statements "What [Speaker 1] said was a natural thing to say in that situation" and "[Speaker 2]'s reply was a natural response to what [Speaker 1] said" on a scale of 1 to 5 (1=strongly disagree, 5=strongly agree). The latter rating is the acceptability judgment that is of primary interest for this study; the former was included to verify that all of the antecedents were felicitous. The screenshot in Figure 3.1 provides an illustrative example of what the participants saw after hearing each dialogue.

In addition to the wording of the acceptability judgment task shown in Figure 3.1, two other formulations of the statement about the acceptability of the response were piloted: "[Speaker 2]'s response sounded like something I would say in that situation" and "[Speaker 2]'s response was justified". The formulation that was ultimately selected is the one that yielded responses that were most consistent with the expected ratings for control stimuli.

Figure 3.1: The participant interface for Experiment 1, constructed in PCIbex.

3.4.4 Demographic questionnaire

At the end of the study, participants were asked (but not required) to provide their age, gender, and race/ethnicity, as well as the place they considered their hometown and a list of all the U.S. states or foreign countries they had lived in. They were also asked whether they had been speaking English since before the age of five and whether English was the language they most frequently spoke at home and at school while growing up.

3.4.5 Sample

300 participants were recruited on Prolific and paid $3.50 each for their participation. Participation was restricted to Prolific users who listed their nationality as American, but the

sample was not otherwise restricted and was not stratified. Responses from 13 participants were not recorded by the server. Of the 287 participants whose responses were received, eight were excluded because they either indicated that they had not been speaking English since before the age of five or did not respond to that question, and 19 were excluded because they failed a sound check at the beginning of the study.[10]

Of the 260 participants whose responses were analyzed, 253 indicated that English was the language they most frequently spoke at home while growing up (two indicated it was not, and five did not respond), and 257 indicated that English was the language they most frequently spoke at school while growing up (one indicated it was not, and two did not respond). 138 identified as men, 109 identified as woman, five identified as nonbinary, and eight did not provide a gender. Participants ages ranged from 18 to 75 years old, with a median of 35 (excluding 12 participants who did not provide their age). To report their race/ethnicity, participants were given a list of categories (including an "Other" option) and asked to check all that applied. Eight participants checked "Asian", 75 checked "Black, African, or African American", 15 checked "Hispanic or Latino", three checked "Middle Eastern, Arab, or North African", five checked "Native American, First Nation, or American Indian", none checked "Pacific Islander", 173 checked "White or European", and three checked "Other".

3.4.6 Analysis

Regression analysis was carried out by fitting cumulative link mixed effects regression models (with the logit link function) for each response variable using the ordinal package in R (Christensen 2023). Best-fit models were constructed using a step-up procedure: Starting from a null model including only random intercepts, fixed effects were added one-by-one and retained only if they significantly improved the fit ($\alpha < 0.5$). The effects tested for inclusion in the model are shown in Table 3.2. Random slopes corresponding to the main

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[10]The sound check asked participants to transcribe a recording of one of the actors saying, "You didn't feed Whiskers." The participants excluded from analysis were those whose responses did not include all of the words in the audio clip or included any words that were not homophonous to the words in the audio (e.g., *You didn't feel Whiskers*). Participants whose responses contained apparent misspellings but nonetheless indicated they had heard the audio clearly (e.g., *u didnt feed wiskers*) were not excluded.

effects included in each model were added to the model after testing of fixed effects was completed.

3.5 Experiment 1: Results

3.5.1 Naturalness ratings

The best-fit model of naturalness ratings of Speaker 2's responses are shown in Table 3.3. There are two significant main effects: *I did too* was less acceptable than *Yes, I did* ($p < 0.001$), and Dan's responses were less acceptable than Claire's ($p < 0.001$). As expected, there is also a significant interaction between Response and Antecedent Type: *I did too* is significantly less acceptable in response to *Did you...?*, *Did you really...?*, and *You..., right?* antecedents than in response to *You didn't...* antecedents ($p < 0.001$ for those three coefficients). *I did too* is not significantly less acceptable in response to *Did you not...?* antecedents than in response to *You didn't...* antecedents. This interaction is shown in Figure 3.2. There is also a significant interaction between Response and Speaker 2, with higher naturalness ratings for Dan's *I did too!* responses ($p < 0.001$).

Pairwise comparisons of estimated marginal means (computed for a latent continuous variable using the emmeans package) for each level of Response are shown in Figure 3.4. The naturalness of *Yes, I did* responses does not significantly differ between any of the antecedent types, as expected. *I did too* responses receive significantly lower naturalness ratings in response to *Did you...?*, *Did you really...?*, and *You..., right?* antecedents than in response to *You didn't...* antecedents (the baseline for acceptability), and they receive significantly higher naturalness ratings in response to *You didn't...* and *Did you not...?* antecedents than in response to *You..., right?* antecedents (the baseline for unacceptability).

3.5.2 Belief ratings

The best-fit model of ratings of Speaker 1's belief as to whether or not Speaker 2 completed the task in question are shown in Table 3.5. The effect of Antecedent Type is significant ($p < 0.001$ for all coefficients, reference level = *You didn't...*), as expected. Pairwise comparisons of

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estimated marginal means are shown in Table 3.6. All of the pairwise contrasts are significant except for the contrast between *Did you not...?* and *Did you really...?* antecedents. As expected, participants interpreted *You...., right?* to express the weakest degree of certainty that Speaker 2 did not complete the task, followed by *Did you...?* Also as expected, *You didn't...* was interpreted to express the strongest degree of certainty that Speaker 2 did not complete the task. Ratings of *Did you not...?* and *Did you really...?* both fell between *You didn't...* and *Did you...?*, but these results do not provide evidence that *Did you not...?* and *Did you really...?* express different degrees of certainty since the contrast between them is not significant.

3.5.3   Discussion

The Antecedent Types cluster into two groups according to the naturalness of *I did too!* as a response: *Did you really...?*, *Did you...?*, and *You..., right?* are associated with lower naturalness ratings for *too* than *You didn't...* (the baseline for acceptability), while *You didn't...* and *Did you not...?* are associated with higher naturalness ratings than *You..., right?* (the baseline for unacceptability). Within each of these clusters, none of the contrasts between Antecedent Types is significant, so there is no evidence that *too* exhibits an intermediate level of naturalness in any of the contexts under consideration. These results are consistent with the intuitions reported in Section 3.3: Refutational *too* is acceptable in responses to negative-polarity declaratives and negative polar questions in contexts in which the asker is inferred to be biased toward the negative answer, but it is not acceptable in responses to *really*-questions, positive polar questions, or *right* tag questions with positive-polarity host clauses.

The results do not provide evidence that this contrast can be explained by the relative strength of the belief expressed by the antecedent: Although *too* was found to be significantly less acceptable in response to *really*-questions than to negative polar questions, there was not a significant difference in evaluations of the strength of Speaker 1's belief between those two Antecedent Types. I therefore analyze refutational *too* as requiring its antecedent both to have negative polarity and to express a belief in the negation of *too*'s host sentence, as suggested in Section 3.3.

3.6   A new polarity feature

I propose to account for refutational *too*'s sensitivity to addressee bias by introducing a new polarity feature, [REFUTE], which presupposes that the addressee is at least tentatively committed to the negation of the prejacent, in a sense to be made precise below.

3.6.1   Proposal

Farkas & Bruce (2010) develop a pragmatic framework that treats discourse as a sequence of question and answer moves aimed at expanding the common ground, or body of information that interlocutors are jointly committed to. In doing so, they build on much previous work that represents context as a set of parameters that interlocutors have joint access to, à la Lewis's (1979) "conversational scoreboard". In their model of context, the discourse commitments of each interlocutor X are tracked by a set DC_X, similarly to earlier proposals such as Hamblin (1971) and Gunlogson (2008) that model each discourse participant's commitments separately. Following Roelofsen & Farkas (2015), I take DC_X to include all of the propositions that X has publicly committed to; then the intersection $\bigcap_X DC_X$ of the interlocutors' individual commitments is the common ground, i.e., the set of propositions to which the interlocutors are jointly committed (Stalnaker 1978).[11]

The other crucial component of context in Farkas & Bruce's model is the Table, which is a stack that defines the interlocutor's conversational goals. Discourse moves place sentences, along with their denotations, on the Table. A speaker can place a declarative on the Table in order to propose that it be added to the common ground; if the other interlocutors accept that proposal, it is added to their commitment sets. If a speaker instead places an interrogative on the Table, it serves as a Question Under Discussion that the interlocutors are expected to answer (cf. Ginzburg 1996; Roberts 2012).

I adopt this model of discourse as a starting point for the analysis, but as it stands it is not able to capture the kinds of weak bias that refutational *too* seems to be sensitive to. It

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[11]Note that Farkas & Bruce (2010) define DC_X slightly differently, taking it to include only those commitments of X that are not shared by the other interlocutors.

would clearly be inadequate to analyze *too* as requiring the negation of its prejacent to be one of the addressee's public discourse commitments since, as shown in the preceding section, refutational *too* does not require the addressee to be *fully* committed to the negation of its prejacent. Alternatively, in view of Rudin's (2018) proposal that rising declaratives place their content on the Table without committing the speaker to anything, one might attempt to analyze refutational *too* as requiring the negation of its prejacent to be on the Table. If falling declaratives, rising declaratives, biased questions, and sentences with tag questions could all be taken to place the semantic content of their sentence radicals on the Table, then this would account for much of the behavior of refutational *too*. This cannot be right, however, because it would predict *too* to be licensed by the rising declaratives in (17-d) and (21-b). In order to precisely specify the presupposition of [REFUTE], then, Farkas & Bruce's 2010 framework needs to be enriched so that it can track propositions toward which interlocutors have publicly expressed a bias but not a full commitment.

This can be done by adopting Malamud & Stephenson's (2015) notion of "projected commitments". Projected commitments "represent the expected next stage of the conversation" (Malamud & Stephenson 2015: 288). As such, an interlocutor's projected commitment set includes propositions which that interlocutor believes (and therefore expects to commit to in the future) but wishes to delay committing to for some reason, such as uncertainty or politeness considerations. Malamud & Stephenson (2015) introduce projected commitments in order to characterize the effects of certain kinds of tag questions and rising declaratives. According to them, a speaker who utters the declarative with a rising-intonation reverse-polarity tag question in (22-a) or the rising declarative in (22-b) projects a commitment to the proposition that Sue likes licorice.[12]

(22)　　a.　Sue likes licorice, doesn't she?

　　　　b.　Sue likes licorice?

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[12]Note that Malamud & Stephenson also claim that, in addition to adding a proposition to the speaker's projected commitment set, rising declaratives signal the presence of a "metalinguistic issue" (see Ginzburg 2012). Fully characterizing the semantic contribution of rising declaratives lies beyond the scope of this chapter, however, so I will not discuss metalinguistic issues here.

Malamud & Stephenson (2015) notate the set of projected commitments of an interlocutor A as DC_A^*, and they assume that the full commitments of A are also added to DC_A^* in addition to being added to the set DC_A of A's discourse commitments (so $DC_A \subseteq DC_A^*$).

In terms of projected commitments, then, the present proposal is that a particle with the [REFUTE] feature presupposes that the negation of the content of its prejacent is a member of the addressee's projected discourse commitments. The behavior of refutational *too* is then accounted for by taking it to be a [REVERSE, +, REFUTE] polarity particle, as shown in (23).

(23)   **Proposal:** Refutational *too* is a polarity particle realizing the feature combination

$$[\text{REVERSE}, +, \text{REFUTE}],$$

where [REFUTE] is a polarity feature carrying the following presupposition:

$$\neg\text{prejacent} \in DC_{Ad}^*.$$

Though I borrow Malamud & Stephenson's (2015) notion of projected commitments, I remain agnostic toward their analysis of rising declaratives and tag questions. They propose that rising declaratives and tag questions both add a proposition to the speaker's projected commitments. However, as Farkas & Roelofsen (2017) point out, rising declaratives (such as (17-d), for instance) can in fact convey a complete rejection of their contents, which suggests that the addition of a projected commitment is not a conventional effect of rising declaratives (see also Rudin 2022). The data in (17-b) and (17-c) seem to demonstrate that rising-intonation tag questions do not always give rise to projected commitments, either. I therefore do not assume any particular analysis of rising declaratives, tag questions, or any other sentence form, and the analysis proposed here does not depend on one. What I do assume is that any proposition p that a speaker publicly expresses any degree of belief in is immediately added to that speaker's projected commitment set. (And of course if the truth of p is entailed or presupposed by the speaker's utterance, then it is also added to the speaker's commitment set.)

It is worth pointing out that DC_A^* need not be limited to propositions that A sincerely believes. Conceptualizing the kind of bias that refutational *too* is sensitive to as a projected commitment allows us to abstract away from the addressee's actual doxastic state. Just as

interlocutors can choose to take information for granted in conversation without actually believing it (see e.g. Stalnaker 1998), they can also make projected commitments in order to adopt biases for the purposes of the conversation that do not represent their actual beliefs.[13] For example, in (24), A suggests that B would not mind washing the dishes as a strategy for requesting that B wash the dishes. A thereby projects a commitment to the proposition that B does not mind washing the dishes even though A is well aware that B actually does mind. This licenses *too* in B's response even though B knows that A knows that B does not like to wash the dishes. Similarly, in (25), A projects a commitment to the proposition that B does not like cookies, which can only be interpreted as a joke since B knows that A knows that B likes cookies. Even though A cannot be taken to believe that B does not like cookies, *too* is licensed in B's response.

(24) **Context:** A is B's parent and often requires B to wash the dishes. B, a young child, hates doing the dishes and frequently complains to A about it.
       A: You wouldn't mind washing these dishes, would you?
       B: I would **too**!

(25) **Context:** A made cookies for B because A knows that B likes cookies. B knows that A knows that B likes cookies.
       A: (teasing) I made some cookies today, but you don't like cookies, do you?
       B: I do **too**!

In the literature on rising declaratives and tag questions, there are a number of other notions besides projected commitments that have been proposed to analyze the discourse effects of those sentence forms and which might offer alternative ways to model the kind of bias to which refutational *too* is sensitive. I now briefly explore two of these possibilities—Gunlogson's (2008) "contingent commitments" and Farkas & Roelofsen's (2017) set of "evidenced possibilities"—before dispensing with them in favor of projected commitments for the present analysis.

Gunlogson's (2008) contingent commitments are commitments that a speaker incurs only

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[13]Thanks to Ashwini Deo for pointing this out.

if the addressee makes the same commitment. In other words, they are commitments that are contingent on the addressee's ratification and will be withdrawn if the addressee does not ratify them. For example, according to her, Max's commitment to the proposition that Laura got a haircut in (26) is contingent on Laura's confirmation of that fact.

(26)   **Context:** Laura has just entered the room, where Max sees her for the first time that day.
        Max: You got a haircut?

Contingent commitments are similar to projected commitments in that they are more tentative that actual commitments. However, not all of the antecedents that license refutational *too* seem to give rise to contingent commitments: In (20-b), A's utterance of *Maybe Mary isn't home* does not seem to be soliciting B's confirmation that Mary is not home, so it is not clear that A's suggestion that Mary is not home will be withdrawn if B does not confirm it. For example, B could respond by saying *Yeah, maybe not*, which would neither confirm nor deny that Mary is not home. This would neither result in *Mary isn't home* being added to the interlocutors' commitments nor result in A's tentative commitment being withdrawn. Instead, both interlocutors would be tentatively committed to Mary not being home, which can be modeled by taking *Mary is not home* to be a member of both interlocutors' projected commitment sets. There is no obvious way to characterize this kind of situation in terms of contingent commitments.

Farkas & Roelofsen (2017) propose yet another analysis of rising declaratives and tag questions, arguing that one of their effects is to add their contents to a set of propositions that the speaker has evidence for. Could *too* be analyzed as requiring the negation of its prejacent to be in the addressee's set of evidenced possibilities? This would make correct predictions about the dialogues in (20). According to Farkas & Roelofsen's conception of evidence, however, the context in (17-d) provides evidence (namely the student's assertion) that Marseille is the capital of France (cf. Farkas & Roelofsen 2017: example 56). They thus correctly predict that rising declaratives are licensed in such contexts, which is an advantage over Malamud & Stephenson's (2015) account since rising declaratives do not give rise to projected commitments in these contexts (as discussed above). The fact that refutational

too is not licensed in (17-d) is evidence that *too* is sensitive to projected commitments, not evidenced possibilities.

3.6.2 Remaining problems

One puzzle for future work is refutational *too* is licensed by some antecedents that are not explicitly negative, as in (27-a–b). The present analysis is not able to account for the acceptability of refutational *too* in such contexts since these are not [REVERSE] responses—at least according to Farkas & Bruce's (2010) and Roelofsen & Farkas's (2015) definitions of the polarity features, which only consider a sentence to be negative if it "has negation as its highest-scoping sentential operator" (p. 379). But note that *No, I did!* is an acceptable response to (27-a) and (27-b). Under the assumption (due to Farkas & Bruce 2010) that *no* always realizes either the [REVERSE] feature or the [−] feature (or both), the fact that *No, I did!* is acceptable in (27-a–b) suggests that these contexts should indeed be taken to satisfy the presuppositions of [REVERSE]. Indeed, Hofmann (2022, 2023) has shown more generally that such sentences do in fact make negative propositional antecedents accessible for anaphora, which she attributes to the fact that they give rise to negative discourse commitments (and see also Mohammadi & Romero (2024), who find that polarity particles in Farsi are sensitive to discourse commitments). But if such a discourse commitment is sufficient to make a negative propositional antecedent available, it is not clear why refutational *too* is not acceptable in (27-c), given that it does at least weakly commit A to the proposition that B did not water the plants—and *really* questions do license responses containing other anaphoric expressions that require negative antecedents, such as *neither* and *why not* in (28).

(27) **Context:** B was supposed to water the plants, but A sees that their leaves are droopy.

    a.   A: Yeah, sure, you watered the plants!
         B: I did **too!** / **No**, I did!

    b.   A: I doubt that you watered the plants.
         B: I did **too!** / **No**, I did!

    c.   A: Did you really water the plants?

B: #I did **too**! / #**No**, I did!

(28) **Context:** Bailey and Cameron had agreed to take turns watering Avery's plants during Avery's absence, but Avery returns and sees that their leaves are droopy.

Avery: Did you really water my plants?

Bailey: Neither did Cameron.

Bailey′: I can explain why not!

The explanation for the contrast between (27-a–b) and (27-c) may lie in the nature of the commitments incurred by A. The experimental results reported in this chapter did not find evidence that *really* questions convey a weaker epistemic bias than antecedents that do license *too*, but it may be that commitments differ in more subtle ways that are not captured by the simple speaker belief rating used in the experiment. Future work might then find that refutational *too* is licensed only by a particular kind of addressee commitment that has yet to be precisely characterized.

3.7   Conclusion

This chapter has argued that refutational *too* is a [REVERSE, +] polarity particle, but that it bears an additional polarity feature that has not been identified in previous work on response particles: [REFUTE], which requires the addressee to have a projected commitment to the negation of its prejacent. This raises the question of whether other languages also have [REFUTE] particles, and if so, whether [REFUTE] can be realized in other feature combinations besides [REVERSE, +, REFUTE]. Future cross-linguistic investigation can search for particles that realize the feature combinations [REVERSE, −, REFUTE], [AGREE, +, REFUTE], and [AGREE, −, REFUTE]. Some English speakers may in fact have a [REVERSE, −, REFUTE] particle: refutational *either*. Refutational *either* seems to be much less widespread among English speakers than refutational *too*, and I have no intuitions about its meaning. It has, however, been previously documented by Rullmann (2003), and naturally-occurring examples such as (29) can be found in COCA.

(29)   A: It's the Callaway house. Nobody's lived there for years. It's haunted.

B: It isn't **either**!   (COCA)

The existence of [REFUTE] also opens the possibility of an opposing feature, [CONFIRM], which would presuppose that its prejacent is a member of DC^*_{Ad}. Future work can also determine whether there are polarity particles that realize [CONFIRM] and if so, what feature combinations [CONFIRM] can occur with.

Another topic for future research is the relationship between the refutational use of *too* and its other uses. In view of the question-based analysis of the non-refutational uses of *too* in Chapter 2, one clear similarity between the uses is that they all signal that the speaker wishes to keep a previously addressed question open—in the canonical additive and argument-building cases so that an existing answer can be enhanced, and in the refutational case so that an existing answer can be replaced. The uses might thus be thought to have a unified semantics that involves keeping a question open for which a resolution has already been provided. Nonetheless, I do not propose a unified analysis because I do not see a straightforward way to prevent such an analysis from overgenerating.

For one thing, garden-variety additive *too* can be used to enhance an answer that has only been implicated, as discussed in Chapter 2, but refutational *too* cannot be used to reject such an answer. For example, the implicature that Lemmy only ate an apple in (30-a) (repeated from (7-c)) is sufficient to license the follow-up *Ritchie only had a fruit, too*. In contrast, this implicature cannot be denied using refutational *too*, as shown in (30-b-B). This is accounted for by the present analysis claiming that refutational *too* is a [REVERSE, +, REFUTE] particle, as the context does not satisfy the presuppositions of the [REVERSE] feature combination, which would require an overtly negative antecedent. (As a sanity check, note that *No*, which must realize [REVERSE] here since its host sentence is positive, is not felicitous in this kind of response, either.) On a unified semantic analysis, this difference in what the two uses require of their antecedents would need some sort of pragmatic explanation, and it is not apparent what that explanation could be. The same problem arises with *really* questions: The answers they suggest can be accepted with canonical *too* but not rejected with refutational *too*, as shown in (31).

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(30) a. For his breakfast, Lemmy had an apple. Ritchie only had a fruit, **too**. (Win-
          terstein 2011)

     b. A: For his breakfast, Lemmy had an apple.

         B: #He did too have more than an apple!

         B′: #No, he had more than an apple.

         B″: Yes, but he also toast.

(31) **Context:** Bailey and Cameron had agreed to take turns watering Avery's plants
      during Avery's absence, but Avery returns and sees that their leaves are droopy.

      Avery: Did you really water my plants?

      Bailey: Cameron did **too**! ($\rightsquigarrow$ Yes, I did water your plants.)

If a unified analysis is not called for, future work might at least further elucidate the diachronic connection between the uses. Schwenter & Waltereit (2010) suggest one pathway, which involves reanalysis of canonical *too* in bridging contexts like (32), which Schwenter & Waltereit draw from the 1871 novel *The American Baron* by James de Mille. Here *but he did too* could be interpreted either as denying *It was [...] not this one* (a refutational interpretation) or as claiming that both the Italian and the American saved A's life (a canonical additive interpretation), so the reanalysis of canonical *too* in this kind of context could yield a refutational use.

(32) A: The American$_j$ saved my life.

      B: It was the Italian$_i$ that saved your life, you know, not this one$_j$.

      A: But he$_j$ did **too**.   (Schwenter & Waltereit 2010)

However, it is not clear how refutational *too* would have acquired its particular sensitivity to addressee bias (i.e., the [REFUTE] feature) through this reanalysis rather than simply becoming a [REVERSE, +] particle. Further explication of the semantic relationship between the two uses is therefore needed. Typological work can also investigate whether additive particles have a cross-linguistic tendency to develop refutational uses over time.

3.8 Figures and tables
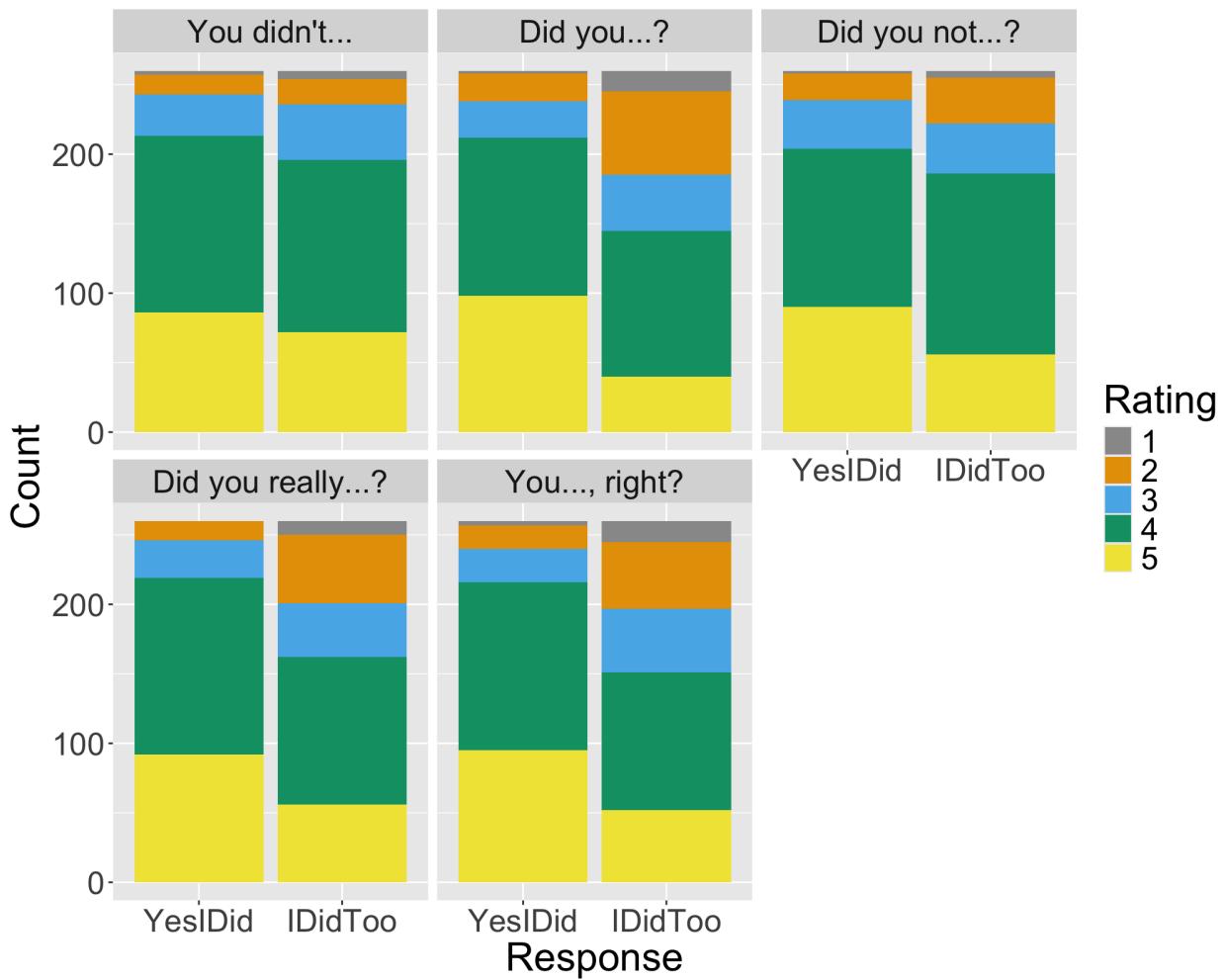
Figure 3.2: Naturalness ratings of responses in Experiment 1 by Response and Antecedent Type

Main effects	Levels (all treatment contrasts)	Reference level
Response	Yes, Too	Yes
Antecedent Type	You didn't..., Did you...?, Did you not...?, Did you really...?, You..., right?	You didn't...
Speaker 1	Claire, Dan	Claire
Speaker 2	Claire, Dan	Claire

Interactions

Response × Antecedent Type

Response × Speaker 2

Random effects

Intercepts

 Participant

 Context

Slopes

 Response × Participant

 Antecedent Type × Participant

 Speaker 2 × Participant

 Response × Context

 Antecedent Type × Context

 Speaker 2 × Context

Table 3.2: Fixed effects tested and random effects included in regression models for Exp. 1.

	Estimate	Std. error	Z-value	P-value	
Response					
Too	−1.005	0.252	−3.987	< .001	***
Antecedent Type					
Did you...?	0.093	0.239	0.392	0.695	
Did you not...?	−0.113	0.217	−0.521	0.603	
Did you really...?	0.157	0.251	0.626	0.532	
You..., right?	0.097	0.229	0.425	0.671	
Speaker 2					
Dan	−0.593	0.137	−4.312	< .001	***
Response × Antecedent Type					
Too × Did you...?	−1.456	0.276	−5.282	< .001	***
Too × Did you not...?	−0.322	0.274	−1.176	0.240	
Too × Did you really...?	−1.007	0.261	−3.861	< .001	***
Too × You..., right?	−1.136	0.262	−4.328	< .001	***
Response × Speaker 2					
Too × Dan	0.820	0.175	4.699	< .001	***
Threshold coefficients					
1|2	−6.630	0.325	−20.403		
2|3	−4.043	0.274	−14.752		
3|4	−2.715	0.262	−10.376		
4|5	0.632	0.250	2.530		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 3.3: Best-fit model of naturalness ratings of responses in Experiment 1.

Contrast	Estimate	Std. error	Z-ratio	P-value	
Response = Yes I Did					
You didn't... − Did you...?	−0.094	0.239	−0.392	0.995	
You didn't... − Did you not...?	0.113	0.217	0.521	0.985	
You didn't... − Did you really...?	−0.157	0.251	−0.626	0.971	
You didn't... − You..., right?	−0.097	0.229	−0.425	0.993	
Did you... − Did you not...?	0.206	0.203	1.015	0.849	
Did you... − Did you really...?	−0.064	0.231	−0.276	0.999	
Did you... − You..., right?	−0.004	0.232	−0.016	1.000	
Did you not... − Did you really...?	−0.270	0.215	−1.255	0.719	
Did you not... − You..., right?	−0.210	0.205	−1.026	0.843	
Did you really... − You..., right?	0.060	0.205	0.293	0.998	
Response = I Did Too					
You didn't... − Did you...?	1.363	0.234	5.826	< .001	***
You didn't... − Did you not...?	0.434	0.211	2.062	0.237	
You didn't... − Did you really...?	0.850	0.247	3.448	0.005	**
You didn't... − You..., right?	1.038	0.224	4.629	< .001	***
Did you... − Did you not...?	−0.928	0.196	−4.740	< .001	***
Did you... − Did you really...?	−0.513	0.222	−2.313	0.141	
Did you... − You..., right?	−0.325	0.223	−1.458	0.590	
Did you not... − Did you really...?	0.415	0.207	2.006	0.263	
Did you not... − You..., right?	0.604	0.197	3.062	0.019	*
Did you really... − You..., right?	0.188	0.196	0.962	0.872	

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 3.4: Pairwise contrasts between Antecedent Types by Response in the best-fit model of naturalness ratings.

	Estimate	Std. error	Z-value	P-value	
Antecedent Type					
Did you...?	2.908	0.202	14.399	< .001	***
Did you not...?	2.189	0.187	11.732	< .001	***
Did you really...?	2.466	0.188	13.133	< .001	***
You..., right?	3.686	0.222	16.630	< .001	***
Threshold coefficients					
1|2	0.734	0.203	3.622		
2|3	3.578	0.220	16.296		
3|4	5.123	0.234	21.931		
4|5	7.137	0.273	26.134		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 3.5: Best-fit model of belief ratings of Speaker 1 in Experiment 1.

Contrast	Estimate	Std. error	Z-ratio	P-value	
You didn't... − Did you...?	−2.908	0.202	−14.399	< .001	***
You didn't... − Did you not...?	−2.189	0.187	−11.732	< .001	***
You didn't... − Did you really...?	−2.466	0.188	−13.133	< .001	***
You didn't... − You..., right?	−3.686	0.222	−16.630	< .001	***
Did you...? − Did you not...?	0.719	0.125	5.764	< .001	***
Did you...? − Did you really...?	0.442	0.124	3.563	0.034	*
Did you...? − You..., right?	−0.779	0.127	−6.145	< .001	***
Did you not...? − Did you really...?	−0.277	0.123	−2.262	0.157	
Did you not...? − You..., right?	−1.498	0.138	−10.823	< .001	***
Did you really...? − You..., right?	−1.220	0.133	−9.172	< .001	***

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 3.6: Pairwise contrasts between Antecedent Types in the best-fit model of Speaker 1 belief ratings in Experiment 1.

Chapter 4

A brief history of indexicality

4.1 Indexicality from Peirce to Eckert and beyond

The forgoing chapters of this dissertation have examined the role that additives play in the public exchange of information by which interlocutors expand their common ground. This is not, however, the only role that additives play in discourse. They are also sociolinguistic variants, which is to say that they convey social information about speakers' identities, relationships to other interlocutors, and conversational stances. Chapters 6 and 7 will probe this dimension of their meaning through social perception experiments. To provide framework for that investigation, this chapter reviews the literature on a central theoretical notion in sociolinguistics and linguistic anthropology: Indexicality. I begin by tracing the history of indexicality from the work of Charles Sanders Peirce through linguistic anthropology and into sociolinguistics. I then turn to recent work by semanticists who have attempted to apply tools from formal semantics/pragmatics to the study of social meaning in order to develop a more unified theory of meaning. I point out a number of lacunae in this emerging line of inquiry, argue that some old ideas from Peirce can help to fill them, and suggest a few broad research questions to guide future work. These questions will then be taken up for the particular case of refutational *too* in Chapter 5.

In Peirce's theory of signs, every sign stands in a "triadic" relationship with what he called its "object" and its "interpretant". For present purposes, the "object" can be understood as the thing(s) in the world that a sign conveys information about. Any effect that

a sign has on an interpreter is an interpretant—a capacious notion that includes feelings, thoughts, actions, and ultimately changes in the interpreter's habits (see e.g. Peirce 1998: 409–418). The centrality of this triad to Peirce's thought distinguishes it from both Saussurean semiotics and model-theoretic semantics, which take meaning to involve a two-way correspondence between signifier and signified, or between an expression and an interpretation. The distinction between objects and interpretants gives the Peircean framework a great deal of power for theorizing about social phenomena. I cannot give a proper overview here, but see Parmentier (1994) and Kockelman (2005) for interesting (re-)interpretations, applications and extensions of Peirce's theory.

In anthropology, the term "sign vehicle" is often used where Peirce would use "sign". I use both terms interchangeably.

Indices, which are of primary interest for present purposes, are one of the three kinds of signs that make up Peirce's most famous trichotomy. Peirce formulated the definitions of these three types in various ways; my favorite is reproduced in (1).

(1)   a.   **Icons** "serve to represent their objects only in so far as they resemble them in themselves."

   b.   **Indices** "represent their objects independently of any resemblance to them, only by virtue of real connections with them."

   c.   **Symbols** "represent their objects, independently alike of any resemblance or any real connection, because dispositions or factitious habits of their interpreters insure their being so understood."

(Peirce 1998: 460–461)

The definition of an icon—a sign that resembles its object—is probably the most well-known and most straightforward, so little needs to be said about it here. Examples of icons include portraits, diagrams, maps, and onomatopoetic linguistic expressions. In the definition of an "index", what Peirce means by "real connections" is worth unpacking a bit. Peirce classifies as indices not only signs that are caused by objects (as smoke is an index of fire, for example) but also signs that direct attention to their objects (a pointing index finger, for example) and linguistic expressions that require their objects to be locatable in their context (pronouns, for

example; see e.g. Peirce 1998: 14–15). Peirce's "real connections", then, are usually understood as co-occurrence relationships: Indices are signs which co-occur with their objects.

Peirce's definition of "symbol" may be less familiar—and perhaps surprising given that in linguistics "symbolic" meaning is usually defined (following Saussure) to be "conventional" and "arbitrary". In modern-day formal semantics and pragmatics, the "conventional" or "semantic" meaning of a lexical expression is usually taken to be context-invariant, in contrast to context-dependent "pragmatic" inferences (or "conversational implicatures") that arise in particular contexts of use (more on this distinction in Section 4.2). For Peirce, however, symbols are interpreted by means of "dispositions or factitious habits". Linguistic conventions are indeed a kind of habit, and so semantic meaning is one kind of symbolism. But we should not take "habit" to be equivalent to "convention". Though the term is admittedly rather ill-defined in linguistics, conventions are usually taken to be shared throughout a particular speech community (see e.g. Lewis 1969), which habits need not be, so not all habits are conventions. It will also be useful later on to avoid some of the theoretical baggage that "convention" has acquired in formal semantics, such as the assumption that conventional meaning is context-invariant. I will use Peirce's notion of habit for that reason. But habits are not the only means of interpreting symbols: There are also "dispositions". The difference between a "disposition" and a "habit", according to Peirce, is that habits are learned (factitious), whereas dispositions are innate.[1] I therefore read Peirce's definition of symbolism to subsume what we call pragmatic inferences,[2] insofar as conversational implicatures are taken to be derived from general, universal principles of communication (usually Grice's (1975) famous Maxims or some variant thereof)—which I take to be a kind of disposition.[3]

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[1]"Habits differ from dispositions in having been acquired as consequences of the principle [...] that multiply reiterated behavior of the same kind, under similar combinations of percepts and fancies, produces a tendency,—the habit,—actually to behave in a similar way under similar circumstances in the future" (Peirce 1998: 413).

[2]Incidentally, the semantics/pragmatics distinction was first drawn by Morris (1938) based on a misreading of Peirce, who in fact never drew quite that distinction. See Dewey (1946) for a delightfully withering critique (though readers may find that Dewey's reading of Peirce also leaves quite a bit to be desired).

[3]I restrict the discussion here to linguistic signs, but note that Peirce's notion of a sign is extremely broad and not limited to language or even communication. For example, he also treats thoughts and other mental

A crucial feature of Peirce's theory that is sometimes overlooked is that indexicality, iconicity, and symbolism are not mutually exclusive: Peirce is very clear that most actually-occurring signs combine aspects of at least two. Consider, for instance, the weathervane (frequently discussed by Peirce; see e.g. Peirce 1998: 306). The object of a weathervane is the wind. It is an index because its movement is caused by the wind. At the same time, it also has an iconic aspect: The direction that it points resembles the direction of the wind. In fact, Peirce maintains that in order to convey any information about the actual world, a sign must have aspects of multiple types simultaneously.

Building on work by Roman Jakobson, (Silverstein 1976) introduced Peirce's notion of indexicality to linguistic anthropology in order to theorize the relationship between linguistic expressions and various social aspects of context. In Silverstein's formulation, indexicality is a relationship of co-occurrence: Indices "are those signs where the occurrence of a sign vehicle token bears a connection of understood spatio-temporal contiguity to the occurrence of the entity signaled" (Silverstein 1976: 27). Silverstein distinguishes between referential indices, which are implicated in the "referential", "denotational", or "propositional" meanings of utterances, and non-referential indices, which are not. Referential indices include pronouns, tense markers, and other expressions that Jakobson (1990) calls "shifters" and Kaplan (1989) calls "indexicals". Nonreferential indices include expressions in various languages that mark the gender of the speaker, the status of the addressee relative to the speaker, or other social aspects of context.

As an illustrative example of non-referential indexicality, consider Ervin-Tripp's (1976) study of English directives (discussed in Silverstein 2001 and Silverstein 2023). Ervin-Tripp and her students found that the form in which directives are expressed in American English depends on various social factors. Some examples of the types of directives they identified are shown in 4.1 along with the appropriateness conditions they reported for each one. Directives to subordinates, for example, are usually expressed with "need" statements or imperatives, while directives to superiors are usually expressed as requests for permission.

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phenomena as signs (see e.g. 1998: 402–403). At his most enigmatic he even insists that the laws of nature are symbols which might be "ideas or resolutions in the mind of some vast consciousness" (1998: 184). But that need not concern us here, obviously.

Directives to familiar equals might be expressed as imperatives or hints, while directives to strangers more often take the form of what they called "imbedded imperatives" (modalized questions containing the same sequence of words as the corresponding imperatives). Hence the forms in (2), although they are all ways of expressing directives, co-occur with in different social features of context—that is, they index different things. Silverstein (2003, 2010) calls such a set of functionally equivalent forms that have different indexical values a "pragmatic paradigm".

Directive type	Example	Social features of context
Need statements	I need you to open the window.	To a subordinate.
Imperatives	Open the window.	To a subordinate or familiar equal.
Imbedded imperatives	Could you open the window?	To someone unfamiliar or of different rank.
Permission directives	May I ask you to open the window?	To a superior or someone unfamiliar.
Question directives	Do you feel a draft?	Non-compliance possible.
Hints	It's a bit stuffy in here.	Non-compliance possible, or routine task.

Table 4.1: Appropriateness conditions of English directives (adapted from Ervin-Tripp 1976).

Silverstein (2003) introduced the notion of "orders of indexicality": Any form that functions as an index ("nth-order indexicality", for any n) can (and will) continuously be put to new uses and reinterpreted in interaction, giving rise to new meanings ("$n+1$st-order indexicality"). This process is driven by ideology (or "ethno-metapragmatics", as Silverstein likes to say) and is unlimited—infinitely many new meanings are "always already immanent" in any index (Silverstein 2003: 194). One example Silverstein uses to illustrate this is the history of second-person pronouns in English. English previously possessed distinct singular and plural second-person pronouns: *thou* and *you*, respectively. As in many other languages, the plural form came to be used to express deference. According to Silverstein, such displacement of

singular forms by plural forms cross-linguistically is generally understood by language users to iconically "figurate" social distantiation between interlocutors. In the 17th-century, however, Quaker communities in England began to reinterpret *you*, on the basis of its "literal" denotation, as conveying that the addressee "counts as more than one" person. Since equality was of paramount value for their religious community, they began to eschew *you* in favor of *thou*. Hence *thou* began an index of egalitarianism and solidarity among Quakers. Outside of the Quaker community, however, *thou* began to fall out of use, and so *thou* became an index of Quaker affiliation (see Silverstein (1985) for further elaboration and historical background).

While linguistic anthropologists were examining social meaning in micro-interactions, sociolinguists beginning in the 1960s were investigating how linguistic variation is stratified by macro-social groupings. Labov (1966) famously observed, for example, that workers in working-class New York City department stores were less likely to pronounce "fourth floor" with postvocalic [r] than workers in upper-class department stores. The variables of interest in such work are "different ways of saying the same thing"—that is, forms that are semantically equivalent—whose frequency of use varies between different groups of speakers (see Labov 1978 for further discussion). In contrast, the alternating variants in 4.1 are not semantically equivalent. They can, nonetheless, be viewed as tokens of the same type insofar as they all perform the same pragmatic function—issuing a directive.

Decades later, sociolinguists began to turn their attention toward mean-making. Following Eckert (2008), Silverstein's understanding of indexicality has played a central role in that line of inquiry. Retheorizing her previous work on sociolinguistic variation in a suburban Detroit high school (Eckert 2000) as well as other authors' work, Eckert (2008) finds many instances of $n + 1$st-order reinterpretation. For example, in the suburban Detroit high school Eckert (2000) famously studied, the social groups in the school recombined and reconstrued existing indexical meanings (a process known as "bricolage"; see Hebdige 1984) in order to create and continually re-create distinct linguistic styles. This often involved reinterpreting forms associated with particular social groups as indices of qualities ideologically related to those groups. The "urban-oriented, school-alienated kids" (the "burnouts"), for example, tended to adopt forms associated with urban Detroit in order to index qualities they thought

to be associated with urban kids they identified with. Similarly, Campbell-Kibler (2007, 2008) found that variants of (ING) in American English were associated with a range of ideologically related speaker qualities, and which depended on other aspects of speakers' identity and style. The *-ing* variant, for example, can be evaluated as intelligent and articulate, or as pretentious and annoying. Eckert (2008) thus proposes that we think of the meaning of any sociolinguistic variant as an "indexical field, or constellation of ideologically related meanings, any of which can be activated in the situated use of the variable." This was part of a turn in sociolinguistics (named the "Third Wave" of sociolinguistic variation research by Eckert (2012)) toward examining how speakers agentively use linguistic variation to make meaning, construct identities, and maintain or subvert systems of social classification (see e.g. Bucholtz & Hall 2005; Zhang 2005; Moore 2004; Kiesling 1998, 2009; Johnstone et al. 2006; Podesva 2007; King 2014, 2021; Zimman 2013; Pharao et al. 2014; Mendoza-Denton 2008).

Third-wave variation research has utilized a range of methodological approaches, including ethnographic methods, sociolinguistic interviews, and web- or lab-based experiments. What third-wave studies have in common is a focus on meaning, generally concerning speakers' identities, personal qualities, attitudes, social group membership, and conversational stances. This sort of meaning is often referred to as "social meaning" in linguistics. The same term is also used by linguists to refer to various other kinds of meaning that are not traditionally considered to be within the scope of semantics/pragmatics because they are difficult to abstract out of their social context: Slurs/hate speech, dogwhistles, politeness phenomena, etc. Some such meanings (those of slurs, for example) are also in some sense "semantic" insofar as they are conventionally and transparently associated with lexical items. It is therefore not entirely clear where to draw the boundary between "semantics/pragmatics" and "social meaning", so for clarity I will generally try to avoid it by using more specific terms. (Not to mention that all linguistic meaning is "social" insofar as it arises in, and changes as a result of, communicative interaction!) The meanings that are documented as evaluations of speaker qualities in social perception experiments (as will be done in Chapter 6) will be referred to here as "speaker quality indices". On those occasions when I do use the term "social meaning", it should be taken to mean "any kind of meaning that people who think of themselves as

semanticists are not traditionally interested in."

4.2 Between semantics and sociolinguistics: An interface or a rift?

In recent years, a number of semanticists have turned their attention toward the sorts of meaning that are of interest to third-wave variationists. Indeed, Eckert herself has exhorted us that "it is time to integrate the study of variation with the study of meaning in language more generally" (Eckert 2011: 4–5; see also Eckert 2019). This dissertation aims to contribute to the development of that more integrated theory, so I turn now to reviewing the work that has so far been undertaken toward that end. Before continuing, it is worth spelling out some of the tensions between fields that crop up in the course of that inter-disciplinary dialogue and can easily lead to miscommunication.

All formal semantic and pragmatic analysis rests on at least two basic assumptions. The first is that a distinction can be drawn between synchrony and diachrony. Thus synchronic meaning can be analyzed without any consideration of language change. This assumption was inherited from Saussurean structural linguistics (see Saussure 1983). The second basic assumption, already mentioned in Section 4.1 is that a distinction can be drawn between aspects of meaning that are context-invariant and those that are context-dependent. Accordingly, semanticists assume that every expression has a stable core meaning that is the same in every possible context of use. Context dependence is usually accounted for in two ways:

1. Free variables in the semantics are assigned values by the context (see e.g. Heim's (1982) account of pronominal anaphora), which is usually represented as a tuple of parameters that are available for such assignment (Lewis's (1979) conversational scoreboard).

2. Following Grice (1975), pragmatic inferences that enrich the semantic/conventional meaning of what was said are derived via reasoning according to general, communicative principles assumed to be universal (usually Grice's Maxims and overarching Cooperative Principle).

Both of these strategies are ultimately motivated by Grice's (1978) Modified Occam's Razor: "Senses are not to be multiplied beyond necessity"—in other words, on grounds of parsimony, a unified semantic analysis is generally to be preferred, *ceteris paribus*, over an analysis positing that any lexical items have multiple senses.[4] The context-independent semantic core of an expression is usually said to be "conventional"—and semanticists generally assume that linguistic conventions are context-invariant. Semantics is also often characterized as truth-conditional and compositional, though the conflation of these four characterizations (context-independent, conventional, truth-conditional, and compositional) is well-known to be problematic (see Gutzmann 2014 and McNally 2013 for overviews) and is problematized by such proposals as Grice's (1975) "conventional implicatures", Lasersohn's (1999) "pragmatic haloes", Potts's (2007) "expressive dimension", Chierchia et al.'s (2012) "grammaticalized implicatures", and Lauer's (2013) non-cancellable "Need a Reason implicatures". In sum, a great deal of complexity and nuance have been added to the picture presented here, but even if there is little agreement about where exactly to draw the boundary between semantics and pragmatics, the assumption that a context-independent core meaning can, in principle, be identified for any lexical expression remains the starting point for semantic analysis.

Neither of these assumptions is tenable for social meaning. Many of the interesting phenomena in sociolinguistics involve speakers putting existing meanings to new uses or recombining them in new ways, as shown in the studies mentioned above. If we abstract away from language change, then, we miss most of what is interesting about social meaning. And since we often do not have clear or accurate intuitions about the meanings of sociolinguistic variants (Silverstein 2001, *inter alia*) and social meaning depends greatly on the identities of the interlocutors and other social features of context, it is never safe to assume to that any

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[4]Whether such an analysis is really more parsimonious than polysemy depends on one's theoretical commitments and aesthetic preferences. (Thanks to Kathryn Campbell-Kibler for pointing this out to me.) It might therefore be objected that for formal pragmatics to have any real explanatory power, it would need to be able to explain observed regularities within and across languages. See Roberts (2017: 2) for examples of pragmatic phenomena that have been claimed to be universal and accounted for by standard pragmatic theory. But then see Szabó & Thomason (2018: 207–211) for one argument against the empirical adequacy of Gricean theories of implicature, and see Ochs Keenan (1976), Silverstein (2010), and Duranti (2015) for anthropological critiques of the idea that Grice's maxims are universal.

aspect of social meaning is context-independent. This does not mean that social meaning is never subject to stable conventions that are shared by large groups of speakers, but such claims need to be verified empirically.

4.2.1 Is speaker-quality indexicality a variety of implicature?

We shall see that one of the primary challenges at this "socio-semantics" interface (as Beltrama & Staum Casasanto (2017) called it) is that it is very difficult to manipulate the variables of interest in a controlled way. A primary method for probing speaker quality indexicality experimentally is the matched guise technique, in which listeners are asked to evaluate speakers of utterances that are manipulated to contrast with each other in controlled ways (see e.g. Lambert et al. 1960; Campbell-Kibler 2007, 2011; Labov et al. 2011; Pharao et al. 2014; Levon 2014). Ideally, the contrasting stimuli should differ in only one respect, while all other variables are controlled. That way, any significant differences between responses to those stimuli can be attributed to the single manipulated variable. For example, Campbell-Kibler (2007, 2008, 2009) manipulated tokens of *-ing* in Praat in order to create minimal pairs like (2) that differ only in whether *-ing* is realized as [ŋ] or [n].

(2)   a.   I'm planning on going to grad school.
      b.   I'm plannin' on goin' to grad school.

However, much of the research aiming to bring together semantics and sociolinguistics concerns contrasting variants that, unlike a classical Labovian envelope of variation, are not semantically equivalent and whose semantics might therefore be hypothesized to contribute to their social meaning.[5] But if two variants that are observed to have different indexical values contrast in both form *and* literal meaning, it may not be possible to tell which contrast is responsible for the effect.

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[5]I focus here on speaker-quality indexicality, so I will not discuss work in semantics/pragmatics that concerns other kinds of "social meaning", such as work on slurs, dogwhistles, or honorifics. And another line of inquiry that will not be discussed here focuses on how social information might factor into semantic/pragmatic inference processes; see e.g. Mahler (2022), Beltrama & Schwarz (2022), Beltrama & Schwarz (2024b), Beltrama & Schwarz (2024a).

To illustrate, consider Beltrama & Staum Casasanto's (2017) study on *totally*. They identify two variants of *totally* that both convey that some gradable property holds to a maximal degree but target different kinds of scales: (1) "lexical *totally*", which targets a scale associated with lexical material in the sentence, and (2) "speaker-oriented *totally*", which targets a scale of speaker commitment. Lexical *totally* is interchangeable with *completely*, while speaker-oriented totally is similar to the use of *so* that Irwin (2014) calls "drama *so*" (but see Beltrama (2018b) for a semantic analysis of speaker-oriented *totally*). Examples of these uses of *totally* are shown in (3) and (4).

(3)   Lexical *totally*:

    a.   The bus is **totally** full.

    b.   She **totally** agrees with me.

(4)   Speaker-oriented *totally*:

    a.   You should **totally** click on that link! It's awesome.

    b.   Everything is **totally** great in Rio.

Beltrama & Staum Casasanto conducted a social perception experiment in which participants were asked to read written stimuli containing *totally*, *completely*, *really*, or no intensifier with bounded, unbounded, or "intermediate" (a.k.a. "extreme"; see Morzycki (2012)) adjectives. The interpretation of *totally* is determined by the nature of the adjective: Lexical *totally* occurs with bounded adjectives, speaker-oriented *totally* occurs with unbounded adjectives, and either interpretation is available with intermediate adjectives. They found that in comparison to the other modifiers, stimuli with speaker-oriented *totally* received significantly higher ratings for speaker attributes associated with solidarity (friendliness, coolness, outgoingness, excitability), lower ratings for attributes associated with status (articulateness, maturity, intelligence, seriousness), and lower ratings of perceived age.

It is not entirely clear to what cause we should attribute this effect. The observed contrast between lexical *totally*, speaker-oriented *totally*, and bare adjectives, exemplified in (5), could be explained by an indexical meaning associated with either speaker-oriented *totally* in particular or with speaker-oriented intensification in general. We also cannot rule out the

possibility that the contrast between *bald* and *tall* somehow plays a role, though that seems unlikely.

(5)   a.   John is bald.   (bare bounded adjective)

       b.   John is totally bald.   (lexical *totally*)

       c.   John is tall.   (bare unbounded adjective)

       d.   John is totally tall.   (speaker-oriented *totally*)

As Beltrama & Staum Casasanto point out, if the effect is caused by speaker-oriented intensification in general, then drama *so* should also give rise to it. It would not be possible to use adjectives to test for a contrast between speaker-oriented *totally* and drama *so* because *so* does not usually receive that interpretation in combination with adjectives (e.g. the most salient interpretation of *John is so tall* is more like *John is very tall* than *John is totally tall*). One could, however, compare speaker evaluations of sentences like the following:

(6)   a.   You should click on that link!

       b.   You should **totally** click on that link!

       c.   You should **so** click on that link!

       d.   You should **definitely** click on that link!

If the social meanings that Beltrama & Staum Casasanto (2017) observed are indexical meanings of speaker-oriented intensification in general, then they should arise in both (6-b) and (6-c) but not (6-a) and (6-d). On the other hand, if they are indexical meanings of speaker-oriented *totally* in particular, then they should only arise in (6-b). If speaker-oriented *totally* and drama *so* could be shown to index similar speaker qualities, that would raise the question of whether the relationship between speaker-oriented intensification is completely arbitrary, or if there might be a reason to expect expressions with that semantic property to index those qualities. A number of studies have explored related questions by proposing that particular speaker-quality indexical meanings might be derived somehow from semantics.

Acton & Potts (2014) proposed one such an analysis of the social meaning of demonstratives, using Sarah Palin, who is a particularly prolific user of demonstratives, as a case study.

Drawing on corpus data as well as televised commentary on Palin's speech style, Acton & Potts demonstrate that referentially unnecessary demonstratives can be used to foster a sense of closeness, warmth, and solidarity between interlocutors. This effect can also backfire, however: Listeners who disagree with Palin's political views may perceive her to be disingenuous or presumptuously over-familiar. Some examples of demonstratives that have this effect are shown in (7). All of them are "unnecessary" in the sense that they could be replaced with *the* (or omitted entirely in the case of (7-b)) without changing the propositional meaning of the sentence or causing infelicity.

(7) a. **That** left front tire is pretty worn.   (Lakoff 1974)

  b. **That** Henry Kissinger sure knows his way around Hollywood! (Lakoff 1974)

  c. Sarah Palin: Two years ago, remember, it was John McCain who pushed so hard with the Fannie Mae and Freddie Mac reform measures. He sounded **that** warning bell.   (Liberman 2010)

  d. Sarah Palin: I think Americans are craving something new and different and **that** new energy and **that** new commitment that's going to come with reform. (Liberman 2010)

Acton & Potts propose that demonstratives have this social meaning because they presuppose a shared perspective, and emotional closeness, warmth, solidarity, etc. are natural consequences of having a shared perspective. If this is right, we would expect other deictic expressions to have similar effects. Although Acton & Potts's study does not establish whether this is the case, it is certainly plausible, and they do provide preliminary evidence that Palin seems to use first-person plural pronouns to much the same effect as demonstratives, as in (8). And I would hypothesize that temporal indexicals such as *today* and *now* also exhibit the same behavior; consider (9), overheard on several occasions at a coffee shop in Columbus, Ohio.

(8) Palin: **Let's** do what **our** parents told **us** before **we** probably even got **that** first credit card: don't live outside of **our** means.

(9) (Every time a group of customers approaches the counter)

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Barista: Hello, friends! What can I get started for **us today**?

The barista's gratuitous use of *us* and *today* seem to contribute to the presentation of an exaggeratedly warm and friendly persona to customers. If a wide range of referentially unnecessary deictic expressions can be shown to have a similar effect in English or even cross-linguistically, then there may indeed be a general principle according to which such deixis signals solidarity.

Acton & Potts (2014) do not explicitly draw a connection between Gricean implicature and the social meanings they consider, but other studies have offered proposals that are more Gricean in nature. Acton (2014, 2019) proposes a Gricean analysis of the social meaning of the English definite article *the*. He shows that *the*-plurals have a distancing and monolithizing effect relative to bare plurals. For example, (10-a) seems to portray Americans as a monolith that the speaker is not a part of, but (10-b) does not have this effect.

(10)   a.   The Americans love cars.

       b.   Americans love cars.

Acton analyzes this effect as a conversational implicature: The speaker who utters (10-a) could have instead uttered the more-informative *We Americans love cars* (thus better satisfying the Maxim of Quantity) without any additional utterance cost, so the listener reasons that the speaker had a reason not to use *we*—the most likely reason being that the speaker is not an American. The reason that (10-b) does not give rise to this inference is that *We Americans love cars* has a higher utterance cost than (10-b) (it is longer), so the speaker's choice to use (10-b) is explained by the speaker's adherence to the Maxim of Manner.[6] One thing that is not clear on this analysis is why the alternative *You Americans love cars* is not also under consideration; if it were, it should give rise to the opposite inference—that the speaker *is* an American—so by itself the Gricean story does not explain why this inference does not arise.

Acton (2019) has inspired further work exploring the role of Gricean principles in "social

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[6]I focus on the distancing effect here since it conveys information about the speaker's identity. The monolithizing effect is less relevant for present purposes since it does not pertain to speaker quality indexicality.

meaning." Beltrama et al. (2023) documented social inferences associated with contrasting degrees of numerical precision: "Explicitly precise" variants involving non-round numerals, round numerals, and "explicitly approximate" variants with the approximator *about* (see also Beltrama 2018a). These are shown in (11).

(11)   a.   The trip to the airport takes forty-nine minutes.   (explicitly precise)

          b.   The trip to the airport takes fifty minutes.   (round numeral)

          c.   The trip to the airport takes about fifty minutes.   (explicitly approximate)

They found that explicitly precise variants index Status attributes (intelligent, articulate, confident, trustworthy) and Anti-Solidarity attributes (pedantic, uptight), while explicitly approximate variants index Solidarity attributes (friendly, cool, laid-back, likable). Round numeral variants did not consistently pattern with either of the other two. They also manipulated the context and found that the effects varied slightly depending on whether the form occurred in the context of courtroom testimony, persuasion, small talk with a stranger, or bonding with a new friend. The clearest effect of context was that the positive effect of precise variants on Status attribute ratings was particularly pronounced in the context of court testimony. The authors conclude that "social and pragmatic inferences are similarly grounded in interlocutors' reasoning about what communicative goals the speaker is aiming to achieve in a context, and what alternatives could have been deployed to fulfill that goal." (Solt et al. (2025) later made some refinements to Beltrama et al.'s (2023) methodology and reached a similar conclusion.)This seems plausible, but it is not entirely clear whether the indexical meaning Beltrama et al. (2023) observed are associated with (im)precision *per se*, or if the particular expressions chosen might also play a role. I would hypothesize, for instance, that certain approximators such as *approximately* or *circa* could index intelligence and other status-related attributes because they seem to belong to a more academic register than *about*. If this is right, then reasoning about the speaker's fulfillment of communicative goals might play only a secondary role.

Burnett (2019, 2023) goes the furthest in suggesting that speaker quality indexicality can be understood along the lines of Gricean implicature. Aiming for "the unification of variationist sociolinguistics and game-theoretic pragmatics" (2019: 420), she seeks to model

speaker quality indexicality using game-theoretic models of scalar implicature developed in the Rational Speech Act framework (see Goodman & Frank 2016 and Degen 2023 for overviews). Such models formalize the standard Gricean account of such implicatures: A "pragmatic listener" chooses an interpretation by reasoning about how a "literal speaker" would have chosen an utterance by reasoning about how the utterance would be interpreted by a "literal listener" who does no pragmatic reasoning. In the case of scalar implicatures, this reasoning involves comparing the relative informativity of alternative utterances that are asymmetrically entailing: Speakers are expected to be optimally informative (Grice's Maxim of Quantity), so if a speaker makes a weaker claim than they could have (e.g. *Some of the students passed the test* rather than *All of the students passed the test*), the pragmatic listener reasons that if the stronger alternative were true, then asserting it would have been the optimal choice for a literal speaker, so it is likely that the stronger alternative is in fact false. Burnett justifies her adoption of these models by asserting that "persona/identity construction through language is driven (in part) by informativity: the speaker is trying to give the listener the most information possible about their desired persona, and the listener assumes that the speaker is giving them (intentionally or not) the most information about the kind of person that they are." This is no doubt true, but it is not entirely clear why we should conclude from it that speaker quality indexicality is governed by Gricean principles. This question will be revisited in Chapter 5.

Building on Burnett's work, Qing & Cohn-Gordon (2019) and Henderson & McCready (2020) make some refinements to her model in order to model the effects of sequences of utterances, and Cohn-Gordon & Qing (2019) use RSA models of metaphor to model the extension of nth-order indexical meanings to $n+1$st order ones. Insofar as any of these models make correct predictions, they are qualitative predictions based on hypothetical model inputs. Whether an empirical basis for such models can be found remains an open question; future work might seek to test them using experimental data.

4.2.2   Key questions

The foregoing literature review reveals some lacunae in efforts to bring sociolinguistics and semantics/pragmatics into closer dialogue. In particular, I suggest that two key questions

are in need of closer attention.

The first question is: For any given speaker-quality index, **what is the sign vehicle**? This question is easy to overlook because it usually only becomes non-trivial when we are looking for interplay between semantics and speaker-quality indexicality. In semantics, sign vehicles are simply lexical items and the sentences composed of them; in sociophonetics, sign vehicles are usually particular realizations of phonemes or morphemes (such as the frontedness of /s/ or the final segment of *-ing*). But we have seen a number of indices above for which the sign vehicle is less clear: The speaker qualities associated with speaker-oriented *totally*, for example, might be indexed by the speaker-oriented use of *totally* in particular or by speaker-oriented intensification in general, the familiarity associated with demonstratives might be indexed by demonstrative pronouns in particular or by deixis in general, and the speaker qualities associated with precision might be indexed by precision in general or by the particular forms used to express it. To establish that a semantic property such as speaker-oriented intensification indexes a speaker quality, one would ideally want to show that a wide range of expressions with that property are associated with similar speaker quality ratings.This will not always be possible, as there may not be very many expressions in a language that have the semantic property of interest. Speaker-oriented *totally* and drama *so* might be the only speaker-oriented intensifiers in English, for example.

The second question is: If a semantic property is found to be a sign vehicle for a speaker-quality index, **what role, if any, do general pragmatic principles play in determining the indexical value?** As discussed above, the default assumption in semantics is that an explanation in terms of general principles is preferable to one that involves arbitrary conventions. But social meaning is highly contingent on ideology and cultural context, so there is no *a priori* reason to think that any explanation we can come up with to explain the connection between a semantic property and a speaker quality index reflects general principles. The best evidence that such an explanation is really based on general principles, rather than a just-so story, would be that it explains a cross-linguistic regularity. But the continuous process of ideologically-motivated emergence and reinterpretation of social meaning should be expected to produce patterns and regularities that are neither as rigid as semantic conventions nor determined by general pragmatic principles.

4.3 Returning to Peirce

To conclude, I would like to suggest that recovering a few ideas from Peirce might aid us in addressing the foregoing issues and developing a more integrated theory of linguistic meaning. I must leave a more thorough exploration of Peirce's thought to future work, but for now I would simply like to suggest that two notions from Peirce's two lesser-known trichotomies can help us to think more clearly about phenomena in the space between formal semantics/pragmatics and sociolinguistics. I rely here primarily on the writings on semiotics that he produced between 1903 and 1907, especially his *Syllabus of Certain Topics of Logic*, and the posthumously published manuscripts "New Elements" and "Pragmatism" (selections 20–21, 22, and 28 in Peirce 1998). Since Peirce's output is vast, fragmentary, and not entirely self-consistent due to the continuous evolution of his thought over the course of his life, many different interpretations of Peirce are available in the secondary literature, not all of them consistent with mine. I have nonetheless benefitted from Stjernfelt's (2015) interpretation of Peirce's writings on dicisigns, and his reading generally accords with my own, so I direct the interested reader there for further information.

The first Peircean notion I would like to adopt is that of the **legisign**. Legisigns are general types that function as signs. "Sinsigns", by contrast, are sign tokens (instances of signs in the actual world).[7] Legisigns can function as signs only when they are instantiated by sinsigns, and sinsigns that instantiate legisigns are called "replicas". Linguistic signs are generally legisigns: In order to interpret an utterance token (sinsign), the listener must identify the sign type (legisign) that the utterance replicates. The first question in Section 4.2.2 can then be made more precise: What legisign does a given index token instantiate? For instance, does *totally* function as index because it replicates the speaker-oriented use of *totally*, or because it replicates speaker-oriented intensification more generally?

The second Peircean notion I would like to adopt is the **dicisign** (or "dicent sign"). Dicisigns are signs that convey "information"[8]—which, for Peirce, means that, like propositions,

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[7]Legisigns and sinsigns form a trichotomy together with "qualisigns", which need not concern us here but are defined as properties that function as signs and also, like legisigns, must be instantiated by sinsigns.

[8]Note that this has nothing to do with the information-theoretic definition of "information".

they can have truth values. The weathervane considered at the beginning of this chapter is a dicisign, as it conveys information about the wind. Peirce defines a proposition simply to be "a dicisign that is a symbol" (Peirce 1998: 282). The notion of a dicisign, then, is a generalization of our usual notion of a proposition—that is, all propositions are dicisigns, but not all dicisigns are propositions (see Stjernfelt 2015). One example of a dicisign that is not a proposition is a portrait that is labeled with its subject's name. By depicting a particular person, such a portrait conveys information, namely information about the characteristics of the person depicted, which may be taken to be true or false. But note that there is no proposition that can capture all of the information conveyed by a portrait—a picture is worth unboundedly many propositions, after all (as the saying goes). Signs that do not convey information, on the other hand, are what Peirce calls "rhemes".[9] An unlabelled portrait is a rheme because if the identity of its subject is not known, then it does not convey any information about any particular person, so there is no sense in which it can be true or false.

Just as every proposition contains a predicate, so every dicisign contains a rheme. That rheme may be iconic, as in the weathervane and the labelled portrait, or it may be symbolic, as in an ordinary proposition. But for Peirce there is always something intuitively iconic about the meaning of a predicate, since it evokes qualities, thereby "exciting in the mind some image" (Peirce 1998: 281). (Another way Peirce puts it is that the interpretant of a predicate "represents it as an Icon" (Peirce 1998: 283).) In addition to containing such a rheme, a dicisign must also have an indexical aspect, which identifies its object. A weathervane, as already discussed, is indexical because it is caused by the wind, which is therefore its object. The label on a portrait is technically a symbol, not an index, but a proper name always has an indexical aspect insofar as it points to an individual.[10] Thus indexicality is what anchors

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[9]Dicisigns and rhemes form a trichotomy together with "arguments". Arguments need not concern us here, but Peirce defines them as signs that not only convey information but also provide evidence for their own truthfulness. He famously subdivided arguments into the three classes deduction, induction, and abduction.

[10]Peirce's take on proper names is that "a proper name, when one meets with it for the first time, is existentially connected with some percept or other equivalent individual knowledge of the individual it names. It is *then*, and then only, a genuine Index. The next time one meets with it, one regards it as an Icon of that Index. The habitual acquaintance with it having been acquired, it becomes a Symbol whose

dicisigns to the world, and without it no sign could convey information about the world.

Speaker quality indices are both dicisigns and legisigns—that is, they are dicent indexical legisigns. My suggestion is that thinking of them in Peircean terms can help those of us trained as semanticists to come to grips with the indeterminacy and instability that are hallmarks of everything we think of as "social meaning". The object of any speaker quality index that we measure in a social perception experiment is the speaker, as it is caused by the speakers and conveys information about them.[11] As dicisigns, they necessarily contain not only an index but also a symbolic or iconic rheme—usually a symbolic one, though of course it is well-known that these rhemes are often re-interpreted as icons (see Irvine & Gal 2000). That is, what particular speaker qualities a given index ascribes to a speaker depends on a kind of linguistic "convention" (in Silverstein-ese, indices are "meta-pragmatically regimented" (1993; 2003))—but recall that for Peirce, symbols are interpreted not by static, context-invariant conventions but by mutable habits of interpretation.

Without wishing to make any specific claims about sociolinguistic cognition, Peirce's intuition that rhemes evoke mental icons may be helpful as a guiding metaphor: The meaning of speaker quality indices has a sort of image-like quality, in that it is ineffable. Just as no proposition can capture all of the information conveyed by a portrait, the ratings we elicit in an experimental setting can never fully capture the meaning of a speaker quality index. Indeed, sociolinguistic variants or registers are sometimes said to index "characterological figures" (see Agha 2003).

Interpretant represents it as an Icon of an Index of the Individual named" (Peirce 1998: 286). Cf. Kripke's (1980) causal theory of reference!

[11]To be sure, I do not claim that all of the social meaning studied in sociolinguistics and linguistic anthropology involves indexical dicisigns whose object is a speaker. The broader picture is much, much more complicated. Such indices might also, for example, be taken to have a social category (a gender, for example) as their object, with the speaker serving as an iconic rheme providing information about what members of the category are like. The tension between these two flows of information might be part of the process by which the boundaries of social categories evolve and are contested. But this is not what we observe in a social perception experiment.

Chapter 5

Refutational *too* as a speaker-quality index

5.1   Refutational *too* in metapragmatic discourse

The refutational use of *too* is often said to sound childish or claimed to be typical of children's speech. This can be seen in the comments in (1), which were collected from internet forums for English learners in which English-speaking users offer answers to questions about English usage. In addition to the common judgment that refutational *too* sounds childish, some commenters also consider it to be prescriptively incorrect or believe that it originates in American English.

(1)   a.   "'Did so' is better and more common I think, but either way it's playground 'children's' language so you can't exactly expect it to be logical or 'correct' even."[1]

   b.   "'You did too' is very typical or certainly was whilst I was growing up. It does have a childish sort of register though." [2]

   c.   "'Did too' is a sort of slang way of saying 'yes, you did', but it's quicker, so in an argument people often tack 'too' onto the end of an affirmative. I think children

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[1] https://www.reddit.com/r/ENGLISH/comments/1faqo2y/comment/llvixto/

[2] https://www.reddit.com/r/ENGLISH/comments/1faqo2y/comment/llv3zcx/

started it, but you can hear lots of people saying it." [3]

    d.   "'Did too!' sounds very American to me. 'Did so!' is what kids from Ireland, and I believe the UK, would say." [4]

    e.   "It's correct, but is specifically limited to the context of children (occasionally adults behaving childishly) arguing." [5]

These statements are examples of what Silverstein (1993) calls "explicit metapragmatic discourse"—commentary about the appropriate use of linguistic expressions and the evaluation of speakers who use them. It is well known that such commentary does not always accord with actual norms of use and interpretation, of which language users generally have little awareness (see e.g. Silverstein 2001). This chapter presents a social perception experiment aimed at documenting what American English speakers actually infer about users of refutational *too*, and how those inferences vary depending on context.

This section lays out the specific research questions to be addressed, Section 5.2 explains the experimental methods, Section 5.3 presents the results, and Section 5.4 explores their theoretical implications.

5.1.1   Research questions

The present study turns the broad research questions laid out in the preceding chapter toward the specific case of refutational *too*.

What speaker qualities are indexed by refutational *too* in American English?

Assertions containing refutational *too* (e.g. *I did too!*) form a pragmatic paradigm (see Chapter 5 and Silverstein 2003, 2010) with other minimally contrasting sentences that a speaker could use to express the same disagreement. Refutational *too* functions as a speaker-quality index insofar as the speaker qualities indexed by *too* sentences contrast with those indexed

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[3]https://forum.wordreference.com/threads/did-not-did-too.1676099/#post-8411307

[4]https://forum.wordreference.com/threads/did-not-did-too.1676099/#post-8417714

[5]https://forum.wordreference.com/threads/did-not-did-too.1358368/#post-6900161

by other sentences in the paradigm, such as those shown in (2), when used in the same context.

(2)   A: You didn't water the plants!

       B: I did TOO!

       B′: I did SO!

       B″: Yes, I did!

       B‴: I certainly did!

The metapragmatic commentary in (1) motivate the hypothesis that speaker B will be evaluated as more childish if they utter (2-B) than if they utter (2-B′), (2-B″), or (2-B‴).

    The speaker qualities indexed by each of these variants might be expected to vary depending on many features of the context. The present study will manipulate the age and gender of the speakers and examine three different kinds of disagreement, illustrated in (3), that contrast according to whether the second speaker's disagreement benefits the self-image of the first speaker, the second speaker, or neither.

(3)   **Denial of accusation:**

       A: You didn't water the plants!

       B: I did too!   (serves B)

(4)   **Denial of self-deprecation:**

       A: I didn't look good in that hat.

       B: You did too!   (serves A)

(5)   **Denial of trivial false statement:**

       A: Whales aren't mammals!

       B: They are too!   (serves neither)

What sign type (legisign) serves as the sign vehicle?

As discussed in Chapter 3, refutational *too* is licensed only in assertions that disagree with the publicly-expressed beliefs of an addressee, as in (5). It is not licensed when this conflict

with the addressee is absent, as in responses to unbiased polar questions, such as (6-B). The variant of *so* used in (5-B′) carries the same requirement, as demonstrated by the infelicity of (6-B′). I will therefore refer to this use of *so* as "refutational *so*" and the class of particles that share this requirement as "refutational particles". We can view refutational particles as indices of disagreement. Not that *yes* and *certainly* are not refutational particles, as they are licensed in (6-B″) and (6-B‴). Thus the members of this pragmatic paradigm do not all have exactly the same semantics.

(6)   A: Did you water the plants?

      B: #I did TOO!

      B′: #I did SO!

      B″: Yes, I did!

      B‴: I certainly did!

As discussed in Chapter 4, a token ("sinsign", to use Peirce's term) of a conventional linguistic sign can only be interpreted when it is understood to be an instantiation ("replica") of a sign type ("legisigns"). When the variants within a pragmatic paradigm have different semantic characteristics, it may not be a trivial task to determine which legisign each variant instantiates. There are three legisigns that a token of refutational *too* can instantiate:

1. The lexical item $too_{\text{refutational}}$

2. The class of refutational particles

3. Disagreement as a type of discourse move

Any of these legisigns can be hypothesized to index speaker qualities. Those three hypotheses make different predictions:

1. If sentence tokens containing refutational *too* index speaker qualities by virtue of instantiating disagreeing discourse moves, then those qualities will be indexed by all of the variants in the paradigm.

2. If they index speaker qualities by virtue of containing a refutational particle, then those

qualities will also be indexed by sentence tokens containing *so* (but not necessarily by those containing *yes* or *certainly*).

3. If they index speaker qualities by virtue of containing the lexical item *too*, then those speaker qualities will not necessarily be indexed by any of the other variants in the paradigm.

What roles do conventions and general pragmatic principles play?

If speaker quality ratings are found to differ between variants and between contexts, then possible pragmatic derivations of those differences can be explored. If the data are consistent with the hypothesis that the class of refutational particles functions as a legisign, then possible connections between the semantics of refutational particles and the speaker qualities indexed can be explored.

5.2   Experiment 2: Methods

A large-scale social-perception experiment was conducted over the internet to address the foregoing research questions.

5.2.1   Experimental design

Participants listened to a series of disagreements between four characters: Joe and Susan, a middle-aged married couple, and Chloe and Danny, 10-year-old twins. Instructions stated that the speakers were members of a family on a children's TV show.

The experiment was constructed using the Penn Controller for IBEX (Zehr & Schwarz 2018). Each participant listened to 12 dialogues in which one of the four speakers makes an assertion (henceforth referred to as the "antecedent") and then one of the others responds by disagreeing. Three different kinds of antecedents were constructed:

- **Accusation:** Speaker 1 accuses speaker 2 of not doing a chore that speaker 2 was supposed to do.

- **Self-deprecation:** Speaker 1 says something self-deprecating.

- **Trivia:** Speaker 1 denies some trivial piece of information to which speaker 2 is committed.

Before listening to each dialogue, the participant read a brief written description of the conversational context. All of the contexts and antecedents constructed are shown in Table 5.1.

Antecedent type	Context (written)	Antecedent (auditory)
Accusation	[Speaker 2] was supposed to feed the cat, Whiskers, this morning, but [Speaker 1] sees Whiskers meowing next to his empty bowl.	You didn't feed Whiskers!
	[Speaker 2] was supposed to water the plants in the house, but [Speaker 1] notices that their leaves are droopy.	You didn't water the plants!
	The family is about to have dinner. [Speaker 2] brings a bottle of salad dressing in from the kitchen. [Speaker 1] notices that the bottle says, "Shake well before opening."	You didn't shake that salad dressing!
	[Speaker 2] was supposed to sweep the kitchen floor, but [Speaker 1] notices some crumbs on it.	You didn't sweep the kitchen!
Self-deprecation	[Speaker 1] just finished playing a song on the piano while [Speaker 2] listened.	I didn't play that very well.
	[Speaker 1] made some lemonade. [Speaker 2] pours a glass.	I didn't get the recipe right for this lemonade.
	The family has just finished playing a game of Monopoly. [Speaker 2] won, and [Speaker 1] came in second place.	I didn't play well.
	The family is out shopping. [Speaker 2] points out an interesting hat for sale. [Speaker 1] tries it on and then puts it back on the shelf.	I didn't look good in that hat.
Trivia	[Speaker 2] has just explained to [Speaker 1] that dolphins are technically mammals because they have hair.	Dolphins aren't mammals!
	[Speaker 2] has just explained to [Speaker 1] that cucumbers are technically fruits (not vegetables) because they have seeds.	Cucumbers aren't fruits!
	[Speaker 2] has just explained to [Speaker 1] that biologists consider birds to be dinosaurs.	Birds aren't dinosaurs!
	[Speaker 2] has just explained to [Speaker 1] that tomatoes are technically berries because they are fruits without pits.	Tomatoes aren't berries!

Table 5.1: Contexts and antecedents constructed for Experiment 2.

Speaker 2's responses varied as to whether they contained *too*, *so*, *yes*, or *certainly*. All responses contained pronominal subjects, which were always first-person singular in responses

to accusations, second-person singular in responses to self-deprecation, and third-person plural in responses to trivia. The full range of responses for each antecedent type are shown in Table 5.2.

Antecedent type	Responses (auditory)
Accusation	I certainly did!
	I did so!
	I did too!
	Yes, I did!
Self-deprecation	You certainly did!
	You did so!
	You did too!
	Yes, you did!
Trivia	They certainly are!
	They are so!
	They are too!
	Yes, they are!

Table 5.2: Responses constructed for Experiment 2.

Every participant heard each antecedent and each response exactly once. Participants were divided into 48 groups in such a way that every possible combination of the four speakers, three antecedent types, and four response types was tested.[6] Stimuli were presented in random order.

5.2.2 Construction of stimuli

The four characters were portrayed by professional voice actors, all adults, recruited on Voices,[7] an online marketplace for freelance voiceover work. Each actor was paid $200 for their participation.

All actors were given the list of antecedents to be recorded, along with the corresponding description of the context. They were instructed to silently read each context and then utter

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[6]Groups were not perfectly balanced due to limitations of how PCIbex handles group assignment, as well as the need to discard responses from some participants (see Section 5.2.5 below). In the final dataset, most of the groups (34 out of 48) contained three participants, but eight groups contained four and six groups contained only two.

[7]https://www.voices.com/

the corresponding antecedent in a slightly annoyed tone that they might use with a family member without sounding overly angry or aggressive. They were then asked to utter each of responses in a similar tone, as if they were responding to one of the antecedents. The two actors performing children's voices were instructed to perform the voice of a child as realistically as possible; the two actors performing adult voices were instructed to use a mock-childish tone.

The recording of stimuli was directed during a separate Zoom meeting with each actor. The actors recorded the stimuli during the session using their own recording equipment. The first actor's recordings were played to the other actors, who were instructed to copy the first actor's prosody. Recordings were checked afterward for consistency of prosody, and actors were asked to revise some of the recordings to ensure that prosody would be controlled as much as possible.

5.2.3   Social perception task

After listening to each dialogue, participants were asked to rate the degree to which speaker 2 exhibited various qualities on a scale of 1 to 5 (1=not at all, 5=extremely). Those qualities included "childish" and "mature" in view of the prevalence of metalinguistic commentary associating refutational *too* with childishness. To identify other dependent variables of interest, 20 participants were recruited on Prolific for a pilot study in which they were presented with some of the constructed dialogues and asked to list 3–5 words describing how the second speaker in each dialogue (the utterer of the response) sounds. From those responses, speaker qualities hypothesized to be associated with refutational *too* were selected to generate the following list of speaker qualities for use in the experiment: childish, mature, intelligent, playful, cheerful, polite, kind, aggressive, defensive, calm, feminine, and masculine. Qualities were chosen with the expectation that ratings for some of them would (directly or inversely) correlate with one another and thereby increase confidence that participants' interpretations of the terms are consistent with theoretical expectations.

5.2.4   Demographic questionnaire

At the end of the study, participants were asked (but not required) to provide their age, gender, and race/ethnicity, as well as the place they considered their hometown and a list of all the U.S. states or foreign countries they had lived in. They were also asked whether they had been speaking English since before the age of five and whether English was the language they most frequently spoke at home and at school while growing up.

5.2.5   Sample

200 participants were recruited on Prolific and paid \$3.50 for their participation. Participation was restricted to Prolific users who listed their nationality as American, but the sample was not otherwise restricted and was not stratified.

Responses from 15 participants were not recorded by the server. Of the 185 participants whose responses were received, four were excluded because they indicated they had not been speaking English since before the age of five, 15 were excluded because logs indicated that some of the sound files in the experiment failed to load for them, and 20 were excluded because they failed a sound check at the beginning of the study.[8]

Of the 146 participants whose responses were analyzed, 142 indicated that English was the language they most frequently spoke at home while growing up (three indicated that it was not, and one did not respond), and 139 indicated that English was the language they most frequently spoke at school while growing up (seven did not respond). 81 identified as men, 61 identified as women, one identified as nonbinary, and three did not provide their gender identity. Participants ranged in age from 18 to 77, with a median of 35 (excluding seven participants who did not provide their age). To report their race/ethnicity, participants were given a list of categories (including an "Other" option) and asked to check all that applied.

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[8]The sound check asked participants to transcribe a recording of one of the actors saying, "I did too!" The participants excluded from analysis were those whose responses did not include all three of the words in the audio clip or included any words that were not homophonous to the words in the audio (e.g., *I did do* instead of *I did too*). Participants whose responses merely contained apparent misspellings (e.g., *I did to* or *I did two*) were not excluded, however.

Nine participants checked "Asian", 48 checked "Black, African, or African-American", 10 checked "Hispanic or Latino", 1 checked "Middle Eastern, Arab, or North African", 2 checked "Native American, First Nation, or American Indian", none checked "Pacific Islander", 82 checked "White or European", and 1 checked "Other".

5.2.6   Analysis

Using the psych package in R (Revelle 2024), exploratory factor analysis was conducted via maximum likelihood estimation with varimax rotation and polychoric correlations (see Revelle 2011). Regression analysis was then carried out by fitting cumulative link mixed effects regression models (using the logit link function) for each response variable using the ordinal package (Christensen 2023). To preserve the ordinal nature of the response variables, no variables were combined following factor analysis; separate regression models were constructed for each of the 12 response variables.

Best-fit models were constructed using a step-up procedure: Starting from a null model including only random intercepts, fixed effects were added one-by-one and retained only if they significantly improved the fit ($\alpha = 0.5$). The effects tested for inclusion in the model are shown in Table 5.4. Random slopes corresponding to the main effects included in each model were added to the model after testing of fixed effects was completed and retained so long as they did not prevent model convergence. Random slopes involving speaker 2 had to be excluded from the models for Aggressive and Masculine in order to obtain model convergence, but no other random effects had to be excluded on this basis. Random slopes involving Speaker 1 were not included because the fixed effect of Speaker 1 was rarely significant and not of theoretical interest.

5.3   Experiment 2: Results

5.3.1   Factor analysis

Factors were extracted until the chi-square statistic of the residual matrix was not significant ($\alpha = 0.05$). This resulted in the retention of five factors. Factor loadings are shown in Table

5.5. The factor structure is largely unsurprising and indicates that participants interpreted the speaker quality adjectives as expected:

- *Polite* and *Kind* correlate with Factor 1 (loadings 0.762 and 0.688, respectively).

- *Mature* correlates positively with Factor 2 while *Childish* correlates negatively (loadings -0.770 and 0.834, respectively).

- *Feminine* correlates positively with Factor 3 while *Masculine* correlates negatively (loadings 0.877 and -0.976, respectively).

- *Playful* and *Cheerful* correlate with Factor 4 (loadings 0.812 and 0.659, respectively).

- *Defensive* and *Aggressive* correlate with Factor 5 (loadings 0.604 and 0.689, respectively).

- The loadings for *Intelligent* and *Calm* paint less clear of a picture, but both correlate most strongly with Factor 1 (loadings 0.531 and 0.588, respectively), indicating that speakers perceived to be kind and polite tend to also be perceived as intelligent and calm.

Since the data do not satisfy the independence assumption for factor analysis, factor analyses were also conducted separately for each level of Antecedent Type and Speaker 2. No qualitative differences in factor structure were found between Antecedent Types. Minor differences were found between speakers:

- For Chloe, *Playful* and *Cheerful* load onto Factor 1 (loadings: 0.656 and 0.800, respectively) with Kind and Polite, resulting in a four-factor structure.

- For Danny, *Aggressive* correlates better with Factor 1 (loading: -0.763) than with Factor 5 (loading: 0.251), while *Defensive* does not correlate well with any factor (all loadings < 0.500).

- For Joe, *Defensive* and *Aggressive* correlate negatively with Factor 1 (loadings: -0.694 and -0.820), resulting in a four-factor structure.

- For Susan, *Cheerful* correlates better with Factor 1 (loading: 0.552) than Factor 4 (loading: 0.525).

In sum, the correlations between *Playful* and *Cheerful* and between *Defensive* and *Aggressive* are not stable across all speakers. Regression models for those qualities should be interpreted with attention to differences between speakers since participants may not have interpreted the terms uniformly across the four speakers. The correlations that are stable across all four speakers are the positive correlation between *Polite* and *Kind*, the negative correlation between *Childish* and *Mature*, and the negative correlation between *Masculine* and *Feminine*.

5.3.2 Regression analysis

Overview of significant results

The results of regression analysis are presented in detail in Sections 5.3.2–5.3.2. The main predictors of interest are Response Type and its interactions with Antecedent Type and Speaker 2. Response type is found to have a significant effect ($\alpha = 0.05$) on ratings of four speaker qualities: Childish, Mature, Playful, and Intelligent. In particular, coefficients for *too* are positive and significant in the models for Childish and Playful, and they are negative and significant in the models for Mature and Intelligent, indicating that *too* is associated with higher ratings of childishness and playfulness and lower ratings of maturity and intelligence. (More precisely, *too* decreases the cumulative odds associated with each threshold on the Childish and Playful scales—and increases them for the Mature and Intelligent scales— significantly more than the grand mean of the amounts by which the other response types do.) In addition, the coefficient corresponding to *so* in the model for Childish is positive and significant, meaning that *so* is also associated with higher Childish ratings. Although the model coefficients for *so* are not significant in all of the models in which coefficients for *too* are significant, post-hoc pairwise comparisons using the emmeans package in R (Lenth 2025) do not reveal very many significant contrasts between *too* and *so*.

There are significant interactions between Response Type and Antecedent Type in the models for the speaker qualities Aggressive, Defensive, and Kind. In responses to accusations,

too and *so* responses are associated with lower ratings of aggression and defensiveness and higher ratings of kindness; in responses to self-deprecation, *too* responses are associated with higher ratings of aggression and defensiveness and lower ratings of kindness.

For some speaker qualities, a significant interaction between Response Type and Speaker 2 is observed. However, each of these effects is driven by no more than one of the four speakers, so no clear effect of speakers' age or gender is apparent.

Exploratory analysis of demographic variables found no significant effects, so demographic variables are not included in the models that follow.

Childish

The best fit model of the variable *Childish* is shown in Table 5.6. As hypothesized, the effect of Response Type is significant ($p < 0.02$ for all coefficients), with coefficients for *Too* and *So* highest. Ratings of childishness by response type are shown in Table 5.1. Pairwise comparisons of estimated marginal means (computed for a latent continuous variable using the emmeans package) for each level of Response Type are shown in Figure 5.7. *Too* and *so* are both associated with significantly higher childishness ratings than *Yes* and *Certainly*, while the contrast between *Too* and *So* is not significant.

Other significant effects are of less theoretical interest. The effect of Speaker 2 is significant ($p < 0.001$ for all coefficients), with the two child characters unsurprisingly rated much more childish than the adults. The effect of Antecedent Type is also significant ($p < 0.01$ for both coefficients), with responses to self-deprecation rated less childish than responses to accusations or trivia. In addition, the interaction between Speaker 2 and Antecedent Type has one significant coefficient (Chloe $\times$ Accusation: $p = 0.006$), indicating that Chloe's responses to accusations are perceived to be particularly childish.

Mature

The best-fit model of the variable *Mature*, shown in Table 5.8 is consistent with *Mature* being an antonym for *Childish*, as expected in view of the negative correlation between *Mature* and *Childish* reported in Section 5.3.1. Response Type again has a significant effect ($p < 0.001$ for *Too* and *Certainly*), with coefficients for *Too* and *So* lowest. Ratings of maturity by

Response Type are shown in 5.2. Pairwise comparisons of estimated marginal means for each level of Response Type are shown in Figure 5.9. *Too* is associated with significantly lower maturity ratings than any of the other Response Types—including *So*, in disagreement with the results for Childish above. At the same time *So* does show a significant contrast with *Certainly*, though not with *Yes*.

The effects of Speaker 2 and Antecedent Type, as well as the interaction between them, are significant and exhibit trends analogous to those that were observed for Childish above: The children are rated less mature than the adults, responses self-deprecation are rated more mature than responses to accusations or trivia, and Chloe's responses to accusations are rated particularly immature. The interaction between Antecedent Type and Response Type is also included in the model because it significantly improved model fit. None of its coefficients are significant, however.

Playful

The best-fit model of playfulness ratings is shown in Table 5.10. The effect of Response Type is significant with *Too* having the highest coefficient. None of the pairwise contrasts between Response Types is significant, however, so it is not clear whether *So* has a different effect on playfulness ratings than *Too*. Ratings by Response Type are shown in Figure 5.3, and pairwise comparisons of estimated marginal means are shown in Table 5.11.

Antecedent and Speaker 2 also have significant effects. Responses to accusations are associated with lower ratings of playfulness than responses to self-deprecation or trivia, and Danny and Joe are rated less playful than Chloe and Susan.

Cheerful

Response Type does not have a significant effect on cheerfulness ratings, nor does it exhibit significant interactions with Speaker 2 or Antecedent Type. The model is shown in Table 5.12. Speaker 2 and Antecedent Type have significant effects similar to those in the model for Playful: Accusation contexts, Danny, and Joe are associated with lower ratings.

Intelligent

The best-fit model for the variable Intelligent is shown in Table 5.13. Response Type has a significant effect (coefficients for *Too* and *Certainly*: $p = 0.010$), where *Too* is associated with lower ratings of intelligence. However, the interaction between Response Type and Speaker 2 is also significant, with Chloe's *too* responses rated *more* intelligent rather than less ($p < 0.001$). Intelligence ratings by Response Type and Speaker 2 are shown in Figure 5.4. The pairwise contrast between *Too* and *So* is not significant for any speaker, as shown in Table 5.14.

The effect of Speaker 2 is again significant, with Danny receiving lower intelligence ratings ($p < 0.001$). Antecedent Type also has a significant effect: Responses to accusations are associated with the lowest intelligence ratings and responses to self-deprecation with the highest ($p < 0.001$ for both coefficients).

Aggressive

The best-fit model for Aggressive ratings is shown in Table 5.15. Response Type is not significant as a main effect, but its interaction with Antecedent Type is significant: *Too* and *So* are both associated with decreased ratings of aggression in responses to accusations ($p < 0.01$ for both coefficients), but not in responses to the other antecedent types. In addition, coefficients corresponding to *Too* in responses to self-deprecation and *Certainly* in responses to accusations are positive and significant ($p < 0.04$ for both coefficients). This can be seen in Figure 5.5.

Speaker 2 has a significant effect, with Danny receiving higher ratings of aggression ($p < 0.001$), and Response Type does also, with responses to accusations rated most aggressive and responses to self-deprecation rated least aggressive ($p < 0.001$ for both coefficients).

Defensive

Results for the variable Defensive largely mirror those for Aggressive: The interaction between Response Type and Antecedent Type is significant ($p < 0.04$ for all coefficients except Self-deprecation $\times$ So), with *Too* and *So* associated with decreased defensiveness in responses to

accusations. This interaction is illustrated in Figure 5.6, and the best-fit model is shown in Table 5.16. The interaction between Speaker 2 and Response Type is also significant, with Joe's *so* responses and Danny's *too* responses receiving especially low defensiveness ratings ($p = 0.047$ and $p = 0.024$, respectively). The effects of Speaker 2 and Antecedent Type are also significant and similar to their effects on Aggressive.

Kind

The best-fit model of kindness ratings is shown in Table 5.17. The interaction between Antecedent Type and Response Type is significant with *Too* and *So* associated with higher ratings in responses to accusations ($p < 0.03$ for both coefficients). In addition, *Too* is associated with lower kindness ratings in responses to self-deprecation ($p = 0.028$). (This mirrors the effect of this interaction on Aggressive discussed above.) This interaction is illustrated in Figure 5.7. Speaker 2 also has a significant effect, with Danny rated less kind than the other speakers ($p < 0.001$), and Antecedent Type has a significant effect ($p < 0.001$ for both coefficients), with responses to accusations rated least kind and responses to self-deprecation rated most kind.

Polite

The best-fit model for politeness ratings is shown in Figure 5.18. Although Polite was found to be correlated with Kind (see Section 5.3.1, the interaction that had a significant effect on kindness ratings is not significant here. Antecedent Type has the expected effect ($p < 0.001$ for both coefficients), with responses to accusations rated the least polite and responses to self-deprecation rated the most polite. The effect of Speaker 2 is also significant and similar to its effect on kindness, with Danny rated less kind ($p < 0.001$).

Masculine

The best-fit model of masculinity ratings is shown in Table 5.19. Neither Response Type nor its interaction with Antecedent Type has a significant effect, but the interaction between Speaker 2 and Response Type is significant, with Joe rated less masculine when using *Too* and more masculine when using *Certainly* ($p < 0.001$ for both coefficients). This can be seen

in Figure 5.8. This effect is reversed for Danny: His *Certainly* responses are associated with lower masculinity ratings ($p = 0.005$), while his *Too* responses are associated with higher masculinity ratings ($p = 0.047$), though the magnitude of the difference is lower for him than for Joe. Speaker 2 also has a significant effect ($p < 0.001$ for all coefficients), with Joe unsurprisingly rated the most masculine.

Feminine

Only Speaker 2 has a significant effect on femininity ratings, with Chloe and Susan unsurprisingly rated more feminine than Danny and Joe. The best-fit model is shown in Table 5.20.

Calm

The best-fit model of calmness ratings is shown in Table 5.21. Speaker 2 has a significant effect ($p < 0.01$ for all coefficients), with Susan rated the least calm and Danny the most. Antecedent Type also has a significant effect ($p < 0.001$ for both coefficients), with responses to accusations rated the least calm and responses to self-deprecation the most. Response Type does not have a significant effect, but the interaction between Speaker 2 and Response Type has two significant coefficients: Chloe's *So* responses are associated with increased calmness ratings ($p = 0.025$), and so are Danny's *Too* responses.

5.4 Discussion

5.4.1 Identifying the sign vehicle

The foregoing results provide evidence that refutational *too* and refutational *so* index at least some of the same speaker qualities: Across all of the contexts tested, *too* and *so* were both associated with higher ratings of childishness than *yes* or *certainly*, and in responses to accusations, *too* and *so* were both associated with higher ratings of kindness and lower ratings of aggression and defensiveness. These similarities between *too* and *so* lend credence to the hypothesis that the *class* of refutational particles—as a sign type (Peircean legisign) instan-

tiated by tokens (sinsigns) of *too* and *so*—functions as the sign vehicle for these meanings. However, the possibility that *too* and *so* have similar meanings purely by accident cannot be ruled out. Since the inventory of refutational particles in English does not appear to include any other expressions besides *too* and *so*, the hypothesis may not have any other testable predictions for English.

The data are inconclusive as to whether refutational *too* has any indexical meaning that is not shared with refutational *so*. On the one hand, *too* but not *so* was associated with significantly higher ratings of playfulness and lower ratings of maturity and intelligence than *yes* and *certainly*, which suggests that *too* and *so* have different effects on listener evaluations of those speaker qualities. On the other hand, none of the differences between ratings of those speaker qualities for *so* responses and for *too* responses were found to be significant, which means the data do not provide evidence against the null hypothesis that *too* and *so* have the same effect.

A limitation of this study is that prosody cannot be fully controlled across the response types tested since particles are required to appear in different syntactic positions: *Yes* can occur only sentence-initial position, *certainly* is most natural in preverbal position, and *too* and *so* can occur only in sentence-final position. This naturally raises the question of whether differences observed between the response types are due to the choice of particle or to the prosody. *Too* and *so* responses, at least, can be produced with similar prosody, but since they carry a distinctive rising pitch contour and heavy stress that might be expected to contribute to their perceived childishness, one might wonder whether the sign vehicle for the indexical meanings associated with both *too* and *so* is their shared semantics or by their shared prosody. Disentangling these two variables appears to be impossible, however, as to my knowledge there are no other expressions in English besides *too* and *so* that can carry that prosody, and *too* and *so* sound unnatural without it. Since that distinctive prosody is part and parcel of what it means to be an English refutational particle, the sign type of "refutational particle" that is here hypothesized to be a sign vehicle should be taken to include both the characteristic semantics and prosody of such particles.

If both of the English refutational particles index childishness, then it is worth asking whether this is entirely coincidental, or if there might be something about the semantics

of such particles that would make them especially well-suited to acquiring that meaning. Some work in anthropology has found evidence of similar phenomena: In a global survey of norms of kin address in 80 speech communities, for instance, Fleming & Slotta (2018) found no communities in which kin terms are normatively used to address junior kin but proper names are normatively used to address senior kin. They argue that kin terms are semantically predisposed to serve an honorific function, while proper names are semantically predisposed to serve a non-honorific or even anti-honorific function, resulting in the cross-linguistic regularity that when norms of kin address are not symmetrical, it is senior kin who are addressed with kin terms and junior kin who are addressed with names. They conclude that "while semantic meaning does not determine pragmatic meaning, it does afford certain possibilities and inhibit others."[9]

It may well be a historical accident that *too* and *so* both index childishness. However, given that direct expressions of disagreement are often considered to be impolite and that children have a well-known tendency to violate social norms, such expressions of disagreement might naturally be viewed as childish. One might speculate, then, that it would be particularly easy for refutational particles—which not only occur in disagreements but conventionally index them—to become indices of childishness. In other words, the semantics of refutational particles might afford indexing childishness because childishness is close to direct disagreement in an "indexical field" (see Eckert 2008). In the absence of additional refutational particles in English, cross-linguistic investigation would be needed test this hypothesis.[10] Whether or not refutational particles in other languages could become indices of childishness in this way would of course depend on culturally contingent ideology about children. Intriguingly, however, some speakers of German report that a particular use of the

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[9] In their use of the term "afford", Fleming & Slotta are following in the footsteps of other anthropologists (e.g. Kockelman 2006; Sidnell & Enfield 2012) who have borrowed the notion of an "affordance" from Gibson's (1979) theory of visual perception. For Gibson, "affordances" are opportunities for action provided by the physical environment, which are taken up for interpretation by organisms that perceive them. Note also that in anthropology "pragmatics" is very broadly construed; the "pragmatic meaning" that Fleming & Slotta have in mind here would usually be called "social meaning" by semanticists.

[10] As pointed out in Chapter 4, some English speakers do have one other refutational particle: Refutational *either*. It is not clear how widespread refutational *either* is, though.

German particle *wohl* that is very similar in meaning to refutational *too*[11] also sounds child-ish. For example, one popular blog for German learners (not written by linguists) claims that this use of *wohl*, exemplified in (7), is "only used in contexts of debating whether something is true or not, and it sounds quite childish."[12]

(7)   a.   A: Frau Schmidt hat gesagt, dass ich viel   besser in Mathe bin als   du.
                A: Ms. Schmidt has said   that I   much better in math am than you
                A: 'Ms. Schmidt said that I'm much better at math than you.'

        b.   B: Hat sie nicht.
                B: has she not
                B: 'She did not.'

        c.   B: Hat sie **wohl**.
                B: has she WOHL
                B: 'She did too!'[13]

It goes without saying that the indexical value of any sociolinguistic variant is highly contingent on the ideologies of the speech communities that use it. However, if future work can identify refutational particles that index childishness in geographically disparate and typologically unrelated languages, the regularity would require an explanation and might suggest that refutational particles have certain semantic affordances that yield the same in-dexical meaning across cultures when interpreted under certain widespread (if not universal) assumptions about children.

5.4.2   Ideology, convention, and pragmatic enrichment

The observed interactions between Response Type and Antecedent Type have implications for how we understand how theories of semantics and pragmatics fit into the broader land-scape of linguistic semiosis.

The finding that refutational *too* and *so* index childishness/immaturity, playfulness, and

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[11] *Wohl* has many uses in German but is not an additive particle, so for the most part its behavior (apart from the refutational use in (7)) is not at all analogous to *too*. My comments about it here pertain only to this use.

[12] https://yourdailygerman.com/dictionary/?s=Wohl

[13] https://yourdailygerman.com/meaning-wohl/

lack of intelligence across the contexts in the experiment points to something like a conventionalized "core" meaning—though it is important to emphasize that the three Antecedent Types tested certainly cannot be taken to be representative of all the contexts in which refutational *too* could possibly be used, so no generalizations should be drawn to any other contexts besides the ones tested. There may be some contexts in which some or all of the indexical meanings reported here fail to arise. The degree to which these meanings might be context-independent is therefore unclear.

It is tempting to speculate that refutational particles first came to index childishness/immaturity as a result of frequent use by children, and that it consequently came to index playfulness and low intelligence due to those qualities' ideological association with childishness—i.e., their proximity to childishness in an indexical field. Perhaps the refutational uses of *too* and *so* originated in children's speech and has remained an index of children's characteristics ever since. If that were true, we might call immaturity a first-order indexical meaning and the other related qualities second-order meanings. The history of refutational *too* remains obscure, however, so there is no evidence that it was actually innovated by children. Moreover, since ratings of childishness, immaturity, playfulness, and immaturity were not found to vary across the contexts tested, the results of this experiment do not provide evidence that any of them should be taken to be more "core" (that is, less context-dependent, more conventionalized) than any of the others. And there is another way that refutational particles could have come to index childishness, namely the possibility discussed in Section 5.4.1, which is that childishness is a second-order meaning resulting from reinterpretation of first-order indices of disagreement.

The results reported here do suggest, at least, that childishness, playfulness, and lack of intelligence are nth-order indexical meanings (for some unknown n), which give rise to emergent, interactional $n+1$st-order meanings that vary between the conversational contexts in the experiment. In responses to accusations, the effect of *too* (and *so* as well) seems to be one of softening: Speakers were evaluated to be kinder, less aggressive, and less defensive when using *too* and *so* in responses to accusations than when using *yes* or *certainly*. In responses to self-deprecation, on the other hand, *too* was found to have the opposite effect: Speakers were rated to be less kind, more aggressive, and more defensive when using *too*

than when using *yes* or *certainly*. (The results for *so* were inconclusive in these contexts.) In responses to trivia, no $n + 1$st-order meanings were observed. These results are summarized in Table 5.3.

Responding to:	Accusations	Self-deprecation	Trivia
nth-order	Childish, playful, unintelligent		
$(n+1)$st-order	Non-aggressive Non-defensive Kind	Aggressive Defensive Unkind	(None observed)

Table 5.3: Indexical meanings of refutational *too* observed in Experiment 2.

We might hypothesize that these differences in how refutational *too* is interpreted have something to do with the differing social stakes of the three kinds of disagreement. In the accusation contexts, the interlocutors are engaged in a conflict that could result in various negative consequences for both of them (retaliation from the other, loss of reputation, damage to their relationship, etc.). In the self-deprecation contexts, there is no conflict: Speaker 2 is being kind to Speaker 1, which can be expected to have positive consequences for their relationship if successful. In the trivia contexts, there is again a conflict, but its stakes are very low, so it might be expected not to escalate into a serious interpersonal problem.

Before proceeding with an analysis of the contrasts observed between the Antecedent Types, it should be acknowledged that the topic of conversation could not be fully controlled in the experiment, as the three antecedent types require different topics. One of the accusation antecedents, for example, was about watering plants, but watering plants would not have been a natural topic for self-deprecation or trivia. Topics were controlled as much as possible by constructing all of the dialogues around ordinary domestic situations within a family, and there is no obvious way in which the variation in topics might have confounded the results, but the results concerning Antecedent Type should nonetheless be interpreted with some caution. If future research can replicate these results with a wider range of conversational topics, confidence in the conclusions would be increased.

Under the standard assumptions of (neo-)Gricean pragmatics, the data are rather puzzling. Grice's (1975) Cooperative Principle posits that speakers generally aim to be maximally perspicuous and maximally informative (in accordance with the maxims of Manner

and Quantity, respectively). When speakers choose to use forms that are less perspicuous or less informative than the available alternatives, the listener attempts to infer an explanation for that choice, which results in an implicature. *I did too!* and *I did so!* are in no way less perspicuous or informative than *Yes, I did!* and *I certainly did!*—if anything, the former are more informative since they, but not the latter, index the addressee's disagreement.[14] Thus, the inference that a speaker using refutational *too* or *so* is childish, playful, and unintelligent cannot be analyzed as a classical Gricean implicature. We might then look to the politeness theory of Brown & Levinson (1987) for a solution. According to that theory, disagreements threaten the addressee's "positive face" because they thwart the addressee's desire to be liked and approved. Speakers are typically expected to mitigate such face-threats by being "indirect"[15]—that is, by deviating from the forms that traditional Gricean pragmatics takes to be maximally cooperative. Under these assumptions, *I did too!* and *I did so!* are relatively face-threatening ways to express disagreement. The inference that the speaker is childish might then be taken to follow, if expressing disagreement in relatively a direct, face-threatening way is taken to be a childish thing to do. But this story cannot explain the $n + 1$st-order meanings associated with responses to accusations: In those contexts, *too* and *so* were rated more kind, less aggressive, and less defensive than *yes* and *certainly*. This is unexpected under the assumption that *too* and *so* exacerbate face threat!

One possible explanation for this softening effect in accusation contexts is that since *too* and *so* index childishness, speakers who use *too* and *so* in those contexts are understood to be adopting a childish persona in order to reduce the risk that the addressee feels hurt or threatened by the speaker's disagreement. Such a strategy would be making use of an ideological link from childishness to qualities of children that make them non-threatening, such as helplessness, innocence, and meekness. More precisely, the extension of the *n*th-

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[14]Since *too* and *so* do not have an at-issue content, it is not clear whether they should actually be taken to be more informative for Gricean purposes. Alternatively, if one is inclined to classify the content of refutational particles as a presupposition, *too* and *so* might be taken to better satisfy Heim's *Maximize Presupposition!* principle than the other alternatives.

[15]I place "indirect" in scare-quotes in view of Silverstein's (2010) argument that the Gricean conception of indirectness may not be valid cross-culturally.

order meaning of childishness to the $n+1$st-order meanings of kindness, non-aggression, and non-defensiveness might be derived via the reasoning shown in (8).

(8) **Context:** Speaker 2 denies an accusation made by Speaker 1.

    a. Speaker 1 may now feel threatened because Speaker 2 might be expected to feel defensive and react unkindly and aggressively.

    b. But Speaker 2 chose to express their denial in a way that is childish and playful.

        (i) Children are generally not threatening because they are generally small, meek, and helpless.

        (ii) People who are behaving playfully are usually neither seriously hurt nor seriously intending to cause harm.

    c. It follows that by trying to sound childish and playful, Speaker 2 probably intends to reassure Speaker 1 that they are not seriously hurt by the accusation and not a threat.

    d. This shows that Speaker 2 is being kind, non-aggressive, and non-defensive.

A possible explanation for the observed inversion of these meanings in responses to self-deprecation is that speakers who sound playful and unintelligent are taken less seriously. While this could contribute to the softening of an utterance that could be perceived as aggressive, being taken less seriously when performing an act of kindness would mean coming across as less kind. Some reasoning that could derive the kindness-reducing effect of *too* in responses to accusations is shown in (9).

(9) **Context:** Speaker 2 denies something self-deprecating that Speaker 1 said.

    a. Speaker 2 appears to be trying to support Speaker 1's self-esteem. This is kind.

    b. But Speaker 2 chose to express that support in a way that sounds unintelligent and playful.

        (i) A speaker who is unintelligent may be likely to be wrong.

        (ii) A speaker who is being playful may not mean what they say.

    c. Thus Speaker 2's reliability and sincerity should be doubted.

d. If Speaker 2 is not reliable or sincere, then their disagreement does not support Speaker 1's self-esteem after all.

e. Therefore, Speaker 2 is not being as kind as they would have been if they had not used refutational *too*.

f. Expressing disagreement in a way that is not particularly kind is an aggressive and defensive thing to do. Thus Speaker 2 is also being aggressive and defensive.

The derivations in both (8) and (9) rely on the assumption that Speaker 1 will have an emotional response to Speaker 2's disagreement—a negative response in the former and a positive response in the latter. The absence of any of these $n + 1$st-order meanings in the trivia context, then, is exactly what one would expect given that the trivia antecedents were designed not to suggest any significant emotional investment on the part of Speaker 1.

Interestingly, no systematic differences were found between the adult speakers and the children. Although a few significant interactions between Response Type and Speaker 2 were observed, this effect was always driven by only one of the speakers. I refrain from drawing any conclusions from the statistical significance of such effects because the prosody of the stimuli was not completely controlled between voice actors. Although care was taken to ensure that each actors' prosody was as similar to the others as possible, the actors were not able to copy each others' utterances exactly. And it goes without saying that the actors had different voices. It is therefore possible that differences observed between individual speakers are due to uncontrolled variables such as pitch and voice quality.

Notwithstanding that limitation, the fact that refutational *too* and *so* were largely found to index the same speaker qualities for the adults and the children suggests that insofar as they index childishness/immaturity, they are understood not so much as markers of group membership (that is, of actually *being* a child), but rather as evoking particular qualities of children. This rubs against Cohn-Gordon & Qing's (2019) hypothesis that "second order" reinterpretations of "first order" childlike language might be triggered by the observation that the speaker is *not* a child, in the same way that, on the Gricean understanding of metaphor, the non-literal interpretations of metaphors are triggered by the patent falsity of the literal meaning. They speculate that this sort of reasoning might be in play with speaker quality

indices more generally, such as when Eckert's (2000; 2008) "burnouts" in white, suburban Detroit use "urban" forms not to stake a claim to being from the inner-city, which they see as being "dominated by scary African Americans", but rather to index qualities that they take to be characteristic of kids from the city: toughness, autonomy, street smarts. If this were the right analysis for *too* and *so*, however, we would expect the $n + 1$st-order meanings only to emerge for the adult speakers since the use of a childish variant by a child would not prompt the reasoning that Cohn-Gordon & Qing take to be necessary to produce the $n + 1$st-order meanings. The listener would simply assume that children use childish variants because they are children—no further explanation needed. To the contrary, the results of this study suggest that even when used by children, *too* and *so* are understand to be used not to stake a claim to being a child, but rather to take a conversational stance—one that seems to ameliorate conflict in responses to accusations but perhaps undermines the speaker's own apparent goals in responses to self-deprecatory statements. It is important to note, however, that although pilot studies indicated that participants understood that Chloe and Danny's voices were intended to be child characters, it was surely apparent to participants that the voices were not actual children. How this might have affected evaluations of the speaker qualities under consideration is unclear, and so it is possible that an experiment using actual children's voices might detect differences between adults and children that were not detected here.

(8) and (9) explain the observed results in a relatively parsimonious way. This analysis is entirely post hoc, however, and the experimental results under consideration here do not provide any motivation to prefer it over any other plausible analysis. As such, it should be regarded as a hypothesis pending attempted falsification. One testable prediction of this hypothesis is that *too* should reduce ratings of speakers' aggression and defensiveness and in any context where disagreement is potentially threatening to an addressee, and it should increase them in any context where disagreement benefits the addressee. Future work could test this prediction in different contexts than the ones considered here.

As discussed in the preceding chapter, some researchers have attempted to model the context dependence of social indexicality by treating social indexical meanings as pragmatic inferences derived according to general principles—a basically Gricean approach, even if

the principles in question differ substantially from Grice's Maxims. This kind of approach assumes that sociolinguistic variants have a conventionalized core meaning that is context-independent (much like literal semantic meaning), and that any deviation from this core is a consequence of general communicative principles applied to local contextual conditions. The nth-order indexical meaning of *too* observed here does indeed seem to be a kind of conventional core meaning insofar as it is stable across at least the limited range of contexts constructed for the experiment. Moreover, there are plausible chains of inference (in (8) and (9)) that could enrich that core meaning to yield the observed $n + 1$st-order meanings in the contexts where they arise, in much the same way that conversational implicatures are taken to be calculable by reasoning about a speaker's communicative intentions.

In important respects, however, these inferences are not like conversational implicatures. For one thing, although (8) seems to proceed from the Gricean assumption that Speaker 2 is being cooperative, (9) reaches the conclusion that Speaker 2 is *not* being fully cooperative (not entirely reliable or sincere)—not a possible result in a Gricean framework! Some form of the Cooperative Principle might be able to be maintained if Speaker 2 could be taken to *intend* to convey unkindness/aggression/defensiveness in (9) (however uncooperative that may ultimately be), but the data do not support such an analysis: Even though they were evaluated as less kind, more aggressive, and more defensive than the other responses to self-deprecation, *too* responses to self-deprecation were nonetheless evaluated as much more kind, less aggressive, and less defensive than any of the responses to accusations or trivia. Thus Speaker 2 cannot be taken to have intended to sound unkind/aggressive/defensive; overall, Speaker 2 was consistently perceived to be very kind in that context, but the use of *too* seems to undermine their own apparent goals.

More to the point, the reasoning sketched out above is based not on general pragmatic principles but rather on assumptions—ideology—about what people are like and how the (social) world works. As Eckert (2008) puts it, "The emergence of an $n + 1$st indexical value is the result of an ideological move, a sidestepping within an ideological field" (see also Silverstein 1998, 2003). Such ideology is subject to a great deal of variation between cultures and between speakers within any given culture.[16]

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[16]It should be noted that even ostensibly non-ideological communicative principles such as Grice's Maxims

As one illustration of cross-cultural variation in the possibilities for reinterpretation of indices of childishness, consider *sajiao*, the mock-childish register that is stereotypically used by young Chinese women to perform exaggerated cuteness, sweetness, and submissiveness in order to flirt with men, to elicit sympathy or tenderness from romantic partners, and to persuade or manipulate them to do things (see e.g. Qiu 2013; Abidin 2016; Chan 2022; Yang 2023). One thing that refutational *too* and *sajiao* seem to have in common is the paradoxical use of directness to lower the stakes of potentially face-threatening conflicts. In an ethnographic study, Yueh (2013) identifies directness as a common feature of *sajiao* performance, illustrating with the example of a Taiwanese Mandarin-speaking man who asks a woman for help by producing an imperative—translated as "Come to help me"— in a high-pitched, childish tone rather than a more polite, "indirect" form ("Can you help me?"). According to Yueh's interpretation, "With the assistance of the childish tone, the direct statement sounded like begging, rather than commanding. [...] The man did not order the woman from the perspective of an authoritative position, but took a lower position to elicit the woman's help." The childishness conveyed by refutational *too* seems to subvert the potentially threatening nature of direct disagreement in a very similar way.

On the other hand, *sajiao* is much more strongly associated with femininity than refutational *too* is. The results of this study do provide one piece of evidence that refutational *too* might be perceived as somewhat feminine: *Joe* was rated less masculine when using *too*. This is unsurprising given that middle-class, white, American mothers speaking to their children are the stereotypical users of the childlike register known as "motherese", "baby talk", or "child-directed speech" (see e.g. Ochs 1992). In view of Susan's gender and role as a mother, participants might find Susan's use of refutational *too* to be unremarkable, whereas Joe's use of it might seem more incongruous, causing him to be evaluated as less masculine. There was no analogous effect on femininity ratings, though, and the fact that *too* increased Danny's masculinity ratings is difficult. And, again, no firm conclusions should be drawn from effects driven by a single speaker. The relationship between refutational *too* and femininity therefore appears to be weak.

may not actually be as universal as they are often assumed to be. See Ochs Keenan (1976), Silverstein (2010), and Duranti (2015) for anthropological critiques.

In China and Taiwan, on the other hand, *sajiao* is strongly feminized in popular discourse: The ideal woman is portrayed in media as one who "knows how to *sajiao*" (Chan 2022). According to Yueh (2013), even though adult men also use it, *sajiao* is subject to a naturalizing discourse according to which it is supposed to be a manifestation of innate characteristics of both children and women, and thus a woman's femininity can be called into question if her *sajiao* is perceived to be unnatural or affected. The metapragmatic discourse around refutational *too*, by contrast, focuses on its perceived association with children rather than women. Moreover, whereas *sajiao* is valued as a component of the ideal feminine gender performance, the use of childishness to claim a feminine identity or to flirt is not likely to be intelligible in an American English-speaking cultural context (Qiu 2013). Indeed, refutational *too* is sometimes denigrated in American metapragmatic discourse as being "incorrect", "illogical", or inappropriate for adults to use (as seen in (1)).

This just goes to show that the possible $n + 1$st-order indexical meanings that can result from reinterpretaion an nth-order index are constrained by ideology: The possibilities for understanding childishness in context are different in China and Taiwan than they are in the United States. As is well-known in linguistic anthropology and sociolinguistics, however, ideology does not determine which meanings will actually arise (see e.g. Silverstein 2003; Eckert 2008; Keane 2018)—which is challenging for those of us who would like to build deterministic formal pragmatic theories that can make testable predictions. There is no pragmatic principle that can explain why denying an accusation with refutational *too*, or any other expression indexing childishness for American English speakers, would be perceived as kind and non-aggressive rather the opposite. Nor is this a necessary consequence of American English speakers' shared ideology about childhood: Temper tantrums are a well-known feature of childhood, after all. Indeed, childishness is often linked to aggression and violence in popular discourse: Consider the notion of a "manchild"—an emotionally stunted adult man whose selfishness and social incompetence may pose a threat to the people around him. For example, the far-right demagogue Donald Trump, who was recently elected president of the United States for a second time, is often described as a manchild by those who consider him to be dangerous. Some examples of this that demonstrate this ideological link between childishness and the threat of violence are shown in (10).

(10) a. **Manchild** President Bragging on Twitter About Nuclear Weapons[17]

b. [Trump] glories in the way the world hangs on his every move, as the world must when its largest economy is controlled by a grudge-bearing **manchild** with guns who governs by decree.[18]

c. Trumps a petulant **manchild**. Stomping his feet and threatening everything and everyone he can.[19]

d. **'Manchild'** Donald Trump poses security danger to US, Alex Salmond claims[20]

One might wonder, then, if childlike linguistic forms could be interpreted as threatening or aggressive by some listeners in some contexts. It should be acknowledged that the regression analysis performed here masks a great deal of variation between participants, so the possibility that some participants did, in fact, draw a "manchild" interpretation of *too* and *so* cannot be ruled out. The participants' responses did not cluster in any discernible way, however, so it is not possible to identify discrete groups of responses that might correspond to distinct interpretations. But the fact that the data ultimately coalesce around a nonthreatening interpretation rather than a manchild interpretation defies principled explanation and must therefore come down to conventions and norms of the speech community.

5.5 Conclusion

In a limited way, the social indexical meaning of refutational *too* conforms to some of the basic assumptions of formal semantics/pragmatics: One set of meanings (the speaker qualities childish, playful, and unintelligent) was observed not to vary across the contexts examined, while other meanings were found to vary between the contexts and appeared to be derivable from the context-invariant core meaning, just as conversational implicatures enrich literal

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[17]https://www.youtube.com/watch?v=YUHwalNFO-U

[18]https://www.theguardian.com/commentisfree/2025/apr/02/perilous-chaotic-donald-trump-liberation-day-fix-world-broken-economy

[19]https://bsky.app/profile/moveoverandforward.bsky.social/post/3llj7qvg44k25

[20]https://www.irishnews.com/news/worldnews/2016/09/07/news/-manchild-donald-trump-poses-security-danger-to-us-alex-salmond-claims-685760/

semantic meaning.

However, the meanings examined in this chapter cannot be derived by the kind of deterministic reasoning from general communicative principles and particular contextual conditions that is assumed to give rise to conversational implicatures. What we have instead is a complicated interplay of ideology, convention, and context. When a speaker uses an nth-order index, a wide range of ideologically-motivated $n + 1$st-order interpretations (an "indexical field", as Eckert would have it) are available ("always already immanent", as Silverstein would have it). Just as conversational implicatures are context-dependent, context may render some of these reinterpretations more plausible than others: It would be difficult to interpret *too* as signaling non-aggression, for example, in a context where the speaker is not at risk of being perceived as aggressive in the first place, as when denying self-deprecation. Which interpretation any given listener actually draws in a particular context may be highly unpredictable. Nonetheless, conventions emerge in the course of interaction ("habits of interpretation", as Peirce would have it) that produce observable regularities across contexts. Insofar as they are ideologically motivated, such conventions may not be fully arbitrary in the way that conventional semantic meaning is supposed to be. Consequently, they can always be given post-hoc pseudo-Gricean derivations. But unless a regularity in interpretation is observed across disparate speech communities, there is no reason to think that any general communicative principle (Gricean or otherwise) could explain why any particular interpretation should have arisen rather than any other. I therefore submit that social indexicality cannot be subsumed under any formal theory of rational communication (*pace* Burnett 2019, 2023).

I do not expect that this conclusion will be particularly novel to most researchers who specialize in social meaning. What this chapter has aimed to do is to more clearly delineate the domain in which the idealizations standardly made in formal semantics/pragmatics are reasonable, and to elucidate some of the ways that those idealizations can break down. To build a more unified theory, we might view semantics/pragmatics as dealing with limiting cases of more general semiotic phenomena: Conventions that are maximally stable, interpretive processes that are maximally deterministic, signs that are maximally discrete, etc. That unification will require us to bring the literatures of semantics/pragmatics, sociolinguistics,

anthropology, and philosophy into deeper dialogue with each other.

5.6   Figures and tables

Main effects	Levels
Response Type	Certainly, So, Too, Yes (sum contrast)
Antecedent Type	Accusation, Self-deprecation, Trivia (sum contrast)
Speaker 1	Chloe, Danny, Joe, Susan (sum contrast)
Speaker 2	Chloe, Danny, Joe, Susan (sum contrast)

Interactions
Response Type × Antecedent Type
Response Type × Speaker 2
Antecedent Type × Speaker 2

Random effects
Intercepts
Participant
Antecedent
Slopes
Response Type × Participant
Antecedent Type × Participant
Speaker 2 × Participant
Response Type × Antecedent
Speaker 2 × Antecedent

Table 5.4: Fixed effects tested and random effects included in regression models for Exp. 2.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Feminine	0.103		0.877	0.113	
Masculine		0.134	−0.976		0.139
Polite	0.762	0.216		0.264	−0.369
Childish	−0.111	−0.770			0.267
Intelligent	0.531	0.430		0.223	
Playful	0.203			0.812	−0.113
Calm	0.588	0.346		0.270	−0.393
Mature	0.381	0.834		0.133	−0.123
Cheerful	0.464	0.140		0.659	−0.249
Defensive	−0.197	−0.226		−0.244	0.604
Aggressive	−0.417	−0.169			0.689
Kind	0.688	0.203		0.341	−0.379
Sum of squared loadings	2.323	1.799	1.757	1.507	1.463
Proportion of variance	0.194	0.150	0.146	0.126	0.122
Cumulative variance	0.194	0.343	0.490	0.616	0.738

Table 5.5: Factor loadings for Exp. 2. Loadings with magnitude < 0.100 are omitted. Loadings with magnitude > 0.600 are underlined.
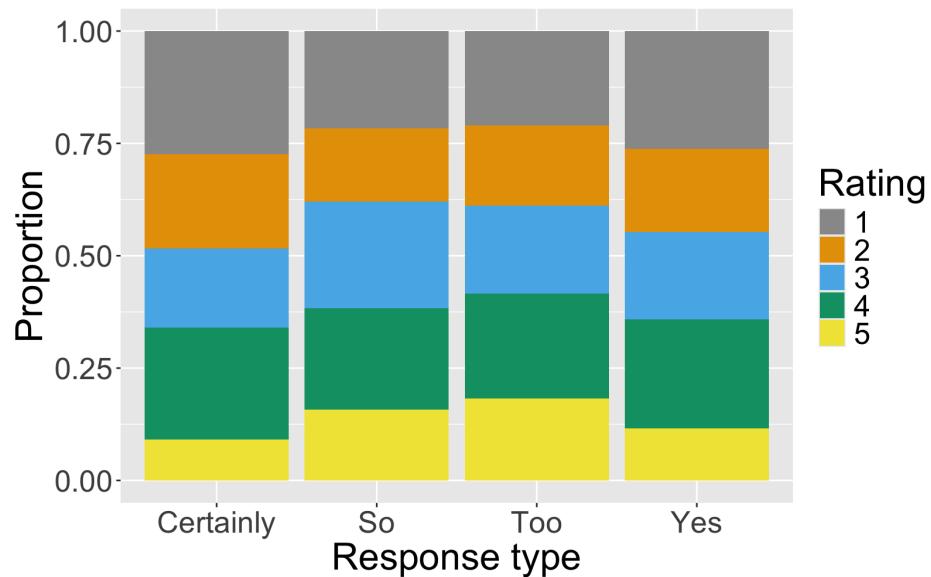
Figure 5.1: Ratings of childishness by response type.

Childish

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	1.599	0.151	10.582	< .001	***
Danny	1.361	0.153	8.891	< .001	***
Joe	−1.195	0.152	−7.849	< .001	***
Antecedent Type					
Accusation	0.320	0.107	3.007	0.003	**
Self-deprecation	−0.640	0.111	−5.744	< .001	***
Response Type					
Certainly	−0.430	0.107	−4.004	< .001	***
So	0.247	0.097	2.541	0.011	*
Too	0.370	0.120	3.075	0.002	**
Speaker 2 × Antecedent Type					
Chloe × Accusation	0.389	0.143	2.731	0.006	**
Danny × Accusation	0.038	0.177	0.217	0.829	
Joe × Accusation	−0.229	0.184	−1.244	0.213	
Chloe × Self-deprecation	0.170	0.144	1.185	0.236	
Danny × Self-deprecation	−0.143	0.170	−0.844	0.399	
Joe × Self-deprecation	−0.138	0.184	−0.749	0.454	
Threshold coefficients					
1|2	−2.096	0.134	−15.587		
2|3	−0.608	0.120	−5.048		
3|4	0.883	0.122	7.230		
4|5	3.227	0.160	20.199		

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 5.6: Coefficients of the best-fit model of childishness ratings.

Contrast	Estimate	Std. error	Z-ratio	P-value	
Certainly − So	−0.678	0.165	−4.117	0.0002	***
Certainly − Too	−0.802	0.191	−4.204	0.0002	***
Certainly − Yes	−0.245	0.170	−1.442	0.4733	
So − Too	−0.123	0.180	−0.683	0.9037	
So − Yes	0.434	0.155	2.795	0.0267	*
Too − Yes	0.557	0.187	2.972	0.0156	*

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 5.7: Pairwise comparisons between Response Types in the best-fit model of childishness ratings.
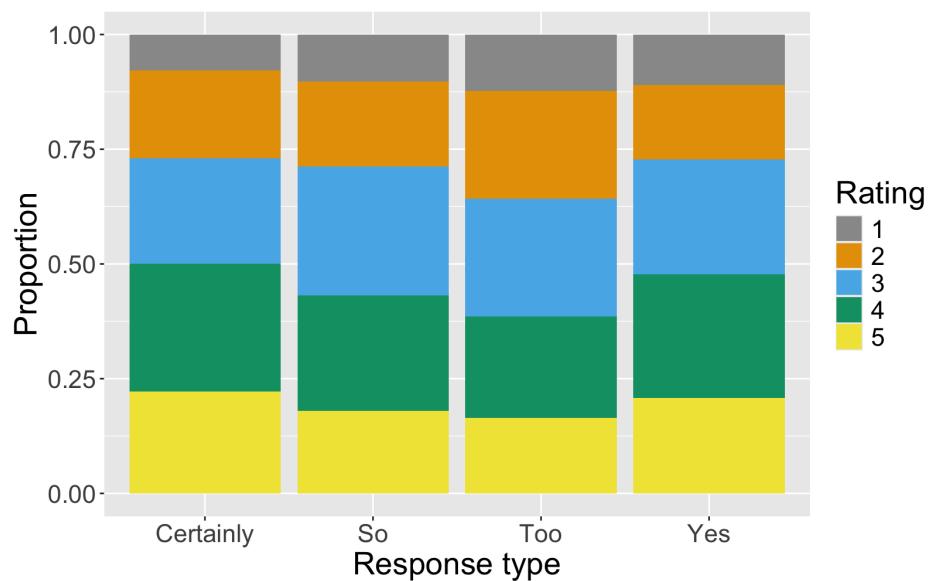
Figure 5.2: Maturity ratings by response type.
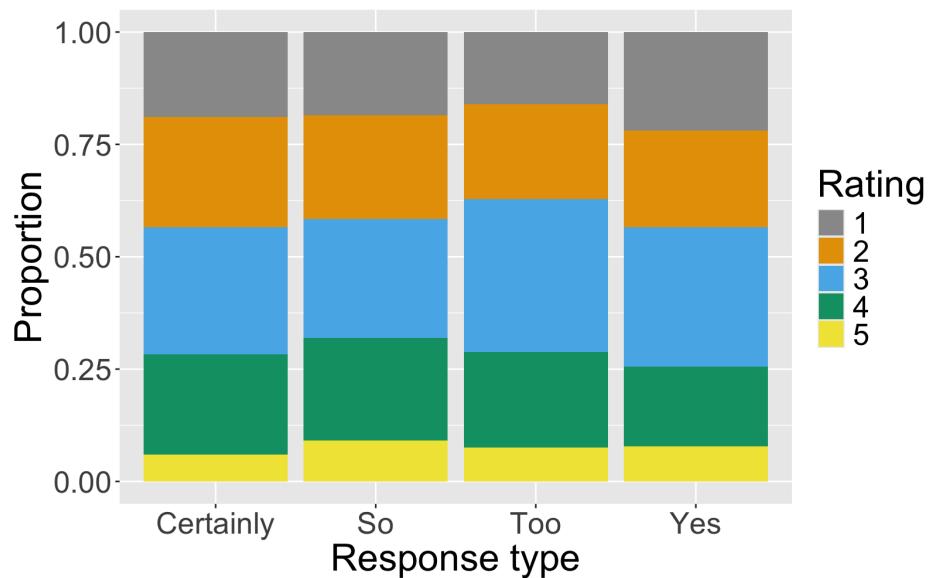
Figure 5.3: Playfulness ratings by response type.

Mature

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	−1.285	0.150	−8.568	< .001	***
Danny	−1.300	0.122	−10.693	< .001	***
Joe	1.059	0.131	8.112	< .001	***
Antecedent Type					
Accusation	−0.508	0.087	−5.861	< .001	***
Self-deprecation	0.823	0.100	8.223	< .001	***
Response Type					
Certainly	0.368	0.104	3.547	< .001	***
So	−0.045	0.088	−0.517	0.605	
Too	−0.460	0.088	−5.249	< .001	***
Speaker 2 × Antecedent Type					
Chloe × Accusation	−0.412	0.152	−2.705	0.007	**
Danny × Accusation	0.076	0.132	0.580	0.562	
Joe × Accusation	0.161	0.145	1.110	0.267	
Chloe × Self-deprecation	−0.009	0.151	−0.061	0.951	
Danny × Self-deprecation	−0.105	0.130	−0.810	0.418	
Joe × Self-deprecation	0.107	0.147	0.724	0.469	
Antecedent Type × Response Type					
Accusation × Certainly	−0.091	0.139	−0.656	0.512	
Self-deprecation × Certainly	−0.039	0.140	−0.279	0.780	
Accusation × So	0.201	0.124	1.627	0.104	
Self-deprecation × So	0.059	0.125	0.468	0.640	
Accusation × Too	0.192	0.124	1.546	0.122	
Self-deprecation × Too	−0.243	0.124	−1.960	0.050	
Threshold coefficients					
1|2	−3.771	0.185	−20.437		
2|3	−1.522	0.140	−10.899		
3|4	0.412	0.131	3.153		
4|5	2.533	0.153	16.518		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.8: Coefficients of the best-fit model of maturity ratings.

Contrast	Estimate	Std. error	Z-ratio	P-value	
Certainly − So	0.413	0.161	2.570	0.0498	
Certainly − Too	0.828	0.159	5.207	< .0001	***
Certainly − Yes	0.230	0.161	1.427	0.4821	
So − Too	0.415	0.139	2.980	0.0153	*
So − Yes	−0.183	0.140	−1.305	0.5595	
Too − Yes	−0.598	0.142	−4.212	0.0001	***

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.9: Pairwise comparisons between Response Types in the best-fit model of maturity ratings.

Playful

	Estimate	Std. error	Z-value	P-value	
Antecedent Type					
Accusation	−1.161	0.108	−10.740	< .001	***
Self-deprecation	0.945	0.102	9.255	< .001	***
Speaker 2					
Chloe	0.456	0.111	4.126	< .001	***
Danny	−0.189	0.118	−1.598	0.110	
Joe	−0.314	0.100	−3.130	0.002	**
Response Type					
Certainly	−0.093	0.092	−1.017	0.309	
So	0.116	0.123	0.942	0.346	
Too	0.190	0.089	2.124	0.034	*
Threshold coefficients					
1|2	−2.517	0.194	−12.978		
2|3	−0.479	0.174	−2.756		
3|4	1.660	0.181	9.162		
4|5	4.085	0.227	18.015		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.10: Coefficients of the best-fit model of playfulness ratings.

Contrast	Estimate	Std. error	Z-ratio	P-value
Certainly − So	−0.2090	0.182	−1.148	0.6594
Certainly − Too	−0.2831	0.144	−1.961	0.2028
Certainly − Yes	0.1193	0.162	0.735	0.8832
So − Too	−0.0741	0.159	−0.465	0.9667
So − Yes	0.3283	0.221	1.489	0.4444
Too − Yes	0.4024	0.180	2.233	0.1143

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 5.11: Pairwise comparisons between Response Types in the best-fit model of playfulness ratings.

Cheerful

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	0.541	0.102	5.287	$< .001$	***
Danny	−0.499	0.095	−5.281	$< .001$	***
Joe	−0.265	0.099	−2.663	0.008	**
Antecedent Type					
Accusation	−1.414	0.146	−9.707	$< .001$	***
Self-deprecation	1.455	0.150	9.708	$< .001$	***
Threshold coefficients					
1|2	−3.198	0.197	−16.237		
2|3	−1.199	0.175	−6.844		
3|4	0.852	0.173	4.934		
4|5	3.117	0.195	16.019		

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 5.12: Coefficients of the best-fit model of cheerfulness ratings.
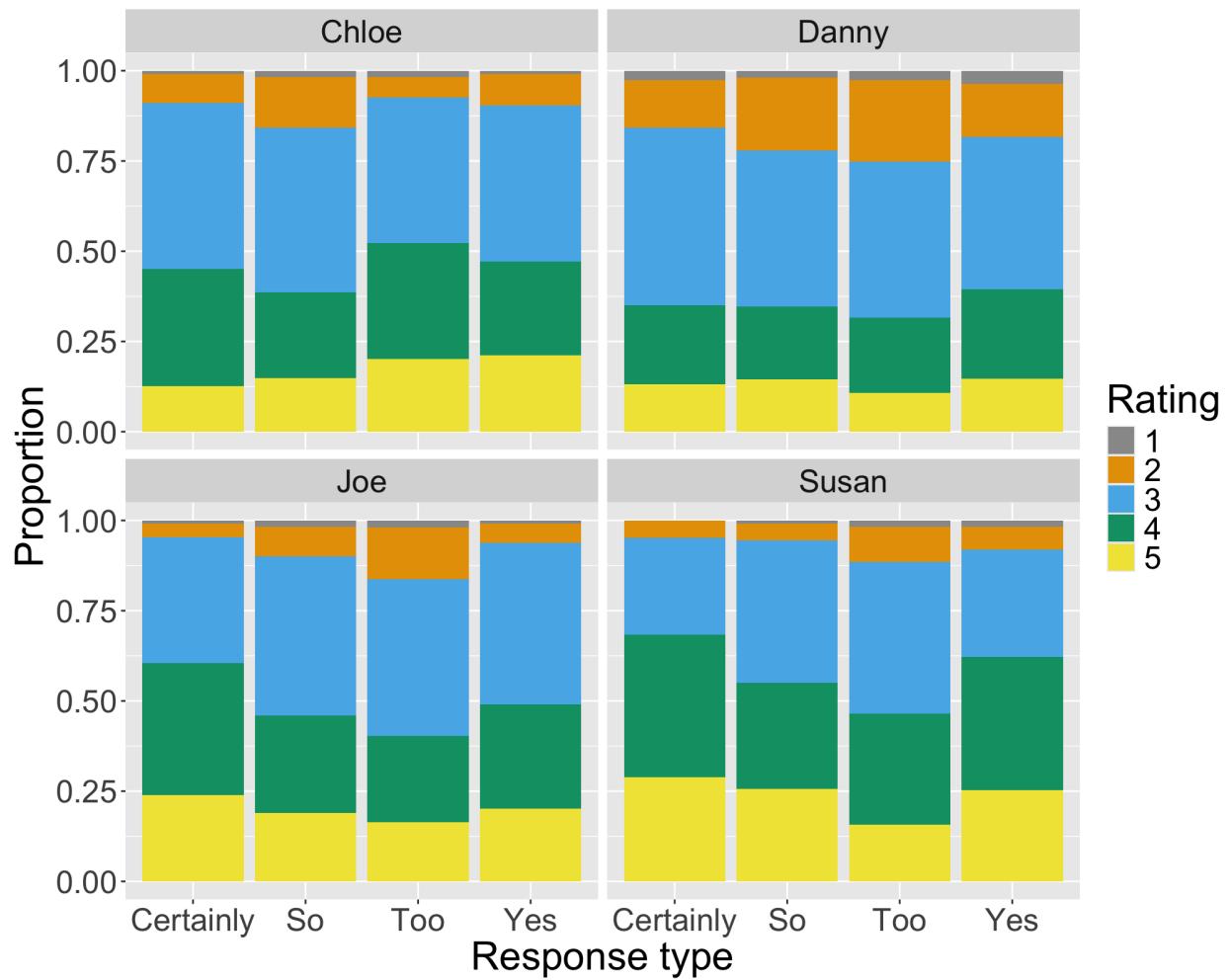
Figure 5.4: Intelligence ratings by response type and speaker.

Intelligent

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	-0.028	0.121	-0.230	0.818	
Danny	-0.787	0.127	-6.205	$< .001$	***
Joe	0.162	0.119	1.361	0.174	
Antecedent Type					
Accusation	-0.642	0.122	-5.250	$< .001$	***
Self-deprecation	0.491	0.134	3.656	$< .001$	***
Response Type					
Certainly	0.286	0.111	2.581	0.010	**
So	-0.134	0.123	-1.093	0.275	
Too	-0.318	0.123	-2.581	0.010	**
Speaker 2 $\times$ Response Type					
Chloe $\times$ Certainly	-0.374	0.155	-2.420	0.016	*
Danny $\times$ Certainly	-0.167	0.157	-1.064	0.287	
Joe $\times$ Certainly	0.287	0.157	1.831	0.067	
Chloe $\times$ So	-0.265	0.157	-1.693	0.091	
Danny $\times$ So	0.089	0.164	0.543	0.587	
Joe $\times$ So	0.049	0.157	0.316	0.752	
Chloe $\times$ Too	0.597	0.159	3.761	$< .001$	***
Danny $\times$ Too	0.088	0.160	0.552	0.581	
Joe $\times$ Too	-0.257	0.161	-1.599	0.110	
Threshold coefficients					
1|2	-5.940	0.300	-19.797		
2|3	-3.280	0.202	-16.224		
3|4	0.070	0.171	0.407		
4|5	2.476	0.190	13.031		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.13: Coefficients of the best-fit model of intelligence ratings.

Contrast	Estimate	Std. error	Z-ratio	P-value	
Speaker 2 = Chloe					
Certainly − So	0.3118	0.318	0.980	0.7610	
Certainly − Too	−0.3672	0.318	−1.153	0.6565	
Certainly − Yes	−0.2955	0.296	−1.000	0.7494	
So − Too	−0.6790	0.323	−2.105	0.1515	
So − Yes	−0.6073	0.315	−1.927	0.2165	
Too − Yes	0.0716	0.320	0.224	0.9960	
Speaker 2 = Danny					
Certainly − So	0.1650	0.331	0.499	0.9594	
Certainly − Too	0.3497	0.321	1.090	0.6959	
Certainly − Yes	−0.0356	0.300	−0.118	0.9994	
So − Too	0.1847	0.339	0.545	0.9478	
So − Yes	−0.2005	0.322	−0.623	0.9246	
Too − Yes	−0.3853	0.319	−1.209	0.6209	
Speaker 2 = Joe					
Certainly − So	0.6587	0.323	2.039	0.1738	
Certainly − Too	1.1493	0.331	3.468	0.0029	**
Certainly − Yes	0.4872	0.289	1.685	0.3317	
So − Too	0.4906	0.330	1.488	0.4448	
So − Yes	−0.1715	0.306	−0.560	0.9439	
Too − Yes	−0.6621	0.315	−2.100	0.1530	
Speaker 2 = Susan					
Certainly − So	0.5474	0.333	1.646	0.3529	
Certainly − Too	1.2856	0.327	3.931	0.0005	***
Certainly − Yes	0.3251	0.311	1.046	0.7224	
So − Too	0.7382	0.328	2.253	0.1094	
So − Yes	−0.2223	0.315	−0.705	0.8952	
Too − Yes	−0.9605	0.313	−3.070	0.0115	*

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.14: Pairwise comparisons between Response Types by Speaker 2 in the best-fit model of intelligence ratings.
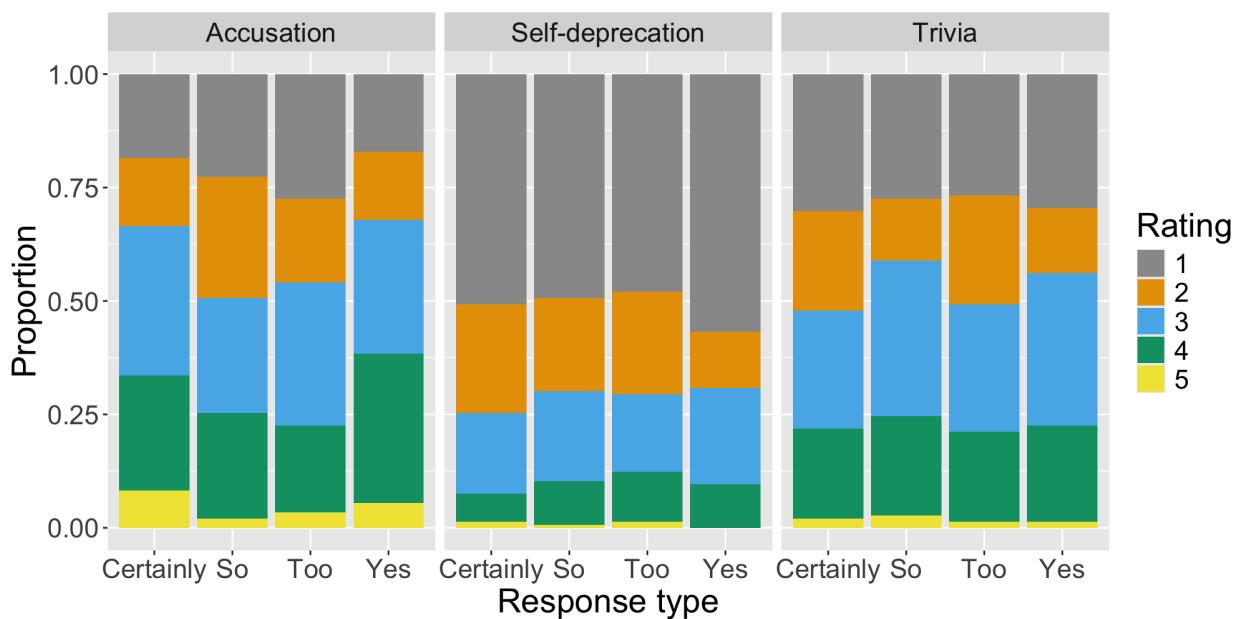
Figure 5.5: Aggression ratings by response type and antecedent type.
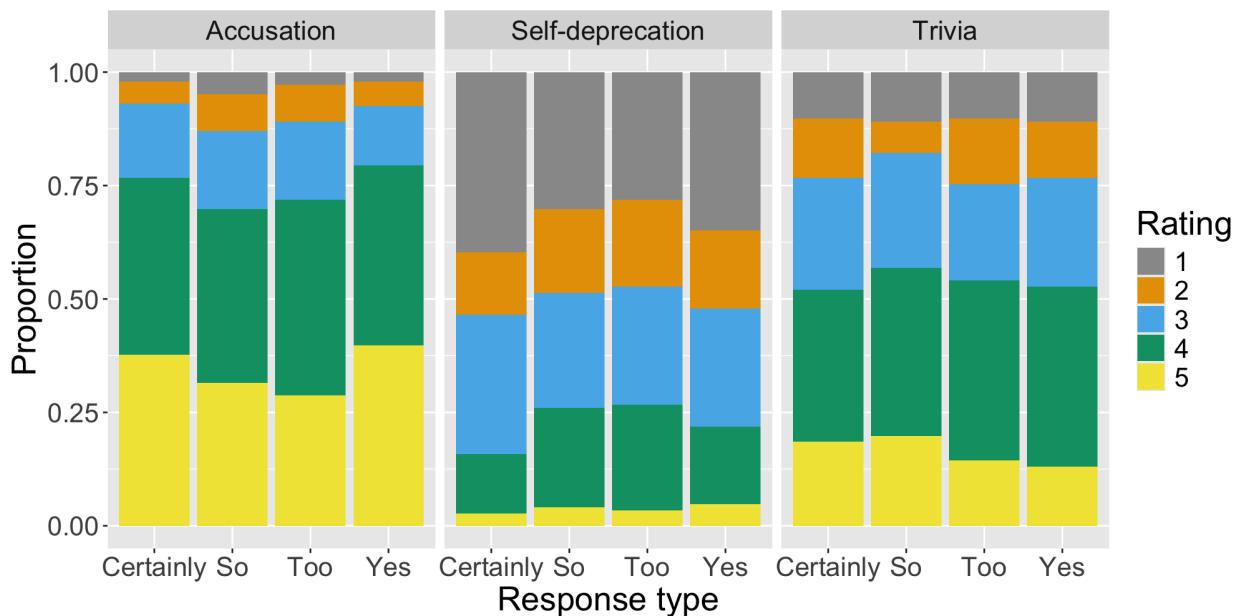
Figure 5.6: Defensiveness ratings by response type and antecedent type.

Aggressive

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	0.101	0.085	1.179	0.238	
Danny	0.477	0.085	5.635	$< .001$	***
Joe	-0.108	0.086	-1.260	0.208	
Antecedent Type					
Accusation	0.902	0.091	9.858	$< .001$	***
Self-deprecation	-1.227	0.115	-10.678	$< .001$	***
Response Type					
Certainly	0.051	0.093	0.548	0.584	
So	-0.010	0.088	-0.110	0.913	
Too	-0.149	0.093	-1.603	0.109	
Antecedent Type $\times$ Response Type					
Accusation $\times$ Certainly	0.292	0.120	2.430	0.015	*
Self-deprecation $\times$ Certainly	-0.078	0.125	-0.619	0.536	
Accusation $\times$ So	-0.338	0.118	-2.876	0.004	**
Self-deprecation $\times$ So	0.127	0.124	1.024	0.306	
Accusation $\times$ Too	-0.336	0.121	-2.777	0.005	**
Self-deprecation $\times$ Too	0.273	0.128	2.133	0.033	*
Speaker 2 $\times$ Response Type					
Chloe $\times$ Certainly	0.154	0.151	1.019	0.308	
Danny $\times$ Certainly	-0.266	0.151	-1.757	0.079	
Joe $\times$ Certainly	-0.051	0.155	-0.325	0.745	
Chloe $\times$ So	-0.282	0.151	-1.869	0.062	
Danny $\times$ So	0.263	0.153	1.715	0.086	
Joe $\times$ So	-0.055	0.150	-0.365	0.715	
Chloe $\times$ Too	-0.208	0.152	-1.363	0.173	
Danny $\times$ Too	-0.124	0.150	-0.823	0.411	
Joe $\times$ Too	0.040	0.154	0.257	0.797	
Threshold coefficients					
1|2	-1.086	0.160	-6.777		
2|3	0.289	0.158	1.825		
3|4	2.229	0.169	13.175		
4|5	5.313	0.250	21.246		

$^{***}p < 0.001;\ ^{**}p < 0.01;\ ^{*}p < 0.05$

Table 5.15: Coefficients of the best-fit model of aggression ratings.

Defensive

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	0.116	0.096	1.204	0.229	
Danny	0.680	0.104	6.523	< .001	***
Joe	−0.240	0.102	−2.356	0.018	*
Antecedent Type					
Accusation	1.722	0.142	12.108	< .001	***
SelfDeprecation	−2.011	0.161	−12.492	< .001	***
Response Type					
Certainly	−0.083	0.100	−0.832	0.405	
So	0.063	0.103	0.611	0.541	
Too	−0.042	0.087	−0.475	0.635	
Antecedent Type × Response Type					
Accusation × Certainly	0.271	0.125	2.159	0.031	*
Self-deprecation × Certainly	−0.311	0.125	−2.480	0.013	*
Accusation × So	−0.301	0.127	−2.368	0.018	*
Self-deprecation × So	0.083	0.126	0.657	0.511	
Accusation × Too	−0.261	0.124	−2.103	0.035	*
Self-deprecation × Too	0.317	0.124	2.558	0.011	*
Speaker 2 × Response Type					
Chloe × Certainly	0.066	0.157	0.421	0.674	
Danny × Certainly	0.050	0.159	0.316	0.752	
Joe × Certainly	−0.047	0.162	−0.291	0.771	
Chloe × So	−0.109	0.159	−0.685	0.494	
Danny × So	0.227	0.164	1.381	0.167	
Joe × So	−0.316	0.159	−1.985	0.047	*
Chloe × Too	−0.172	0.156	−1.104	0.270	
Danny × Too	−0.355	0.158	−2.250	0.024	*
Joe × Too	0.199	0.159	1.256	0.209	
Threshold coefficients					
1|2	−3.028	0.169	−17.879		
2|3	−1.715	0.146	−11.746		
3|4	0.030	0.134	0.228		
4|5	2.716	0.163	16.692		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.16: Coefficients of the best-fit model of defensiveness ratings.
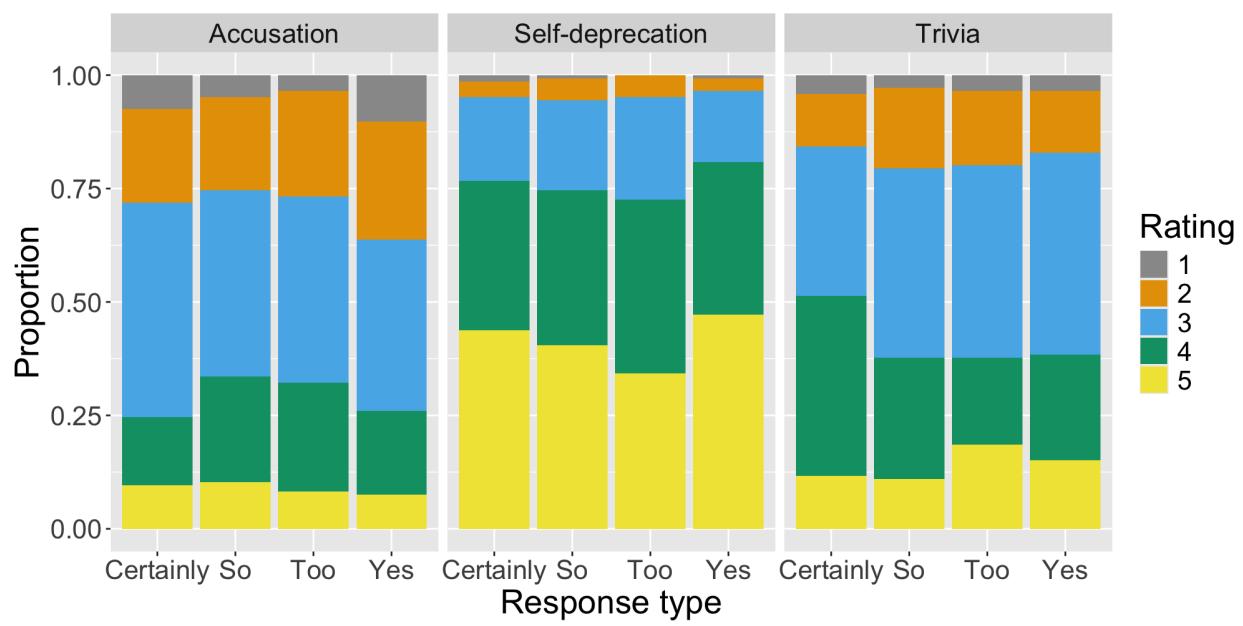
Figure 5.7: Kindness ratings by response type and antecedent type.

Kind

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	0.165	0.087	1.907	0.057	
Danny	−0.582	0.087	−6.668	< .001	***
Joe	0.085	0.087	0.979	0.328	
Antecedent Type					
Accusation	−1.310	0.113	−11.582	< .001	***
Self-deprecation	1.792	0.147	12.166	< .001	***
Response Type					
Certainly	0.082	0.089	0.927	0.354	
So	−0.002	0.089	−0.023	0.982	
Too	−0.064	0.086	−0.748	0.454	
Antecedent Type × Response Type					
Accusation × Certainly	−0.136	0.116	−1.171	0.242	
Self-deprecation × Certainly	−0.067	0.121	−0.554	0.580	
Accusation × So	0.254	0.115	2.198	0.028	*
Self-deprecation × So	−0.072	0.121	−0.597	0.550	
Accusation × Too	0.253	0.115	2.208	0.027	*
Self-deprecation × Too	−0.262	0.120	−2.194	0.028	*
Threshold coefficients					
1|2	−5.141	0.236	−21.781		
2|3	−2.736	0.170	−16.072		
3|4	−0.061	0.148	−0.414		
4|5	2.308	0.166	13.936		

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 5.17: Coefficients of the best-fit model of kindness ratings

Polite

	Estimate	Std. error	Z-value	P-value	
Antecedent Type					
Accusation	−1.252	0.109	−11.470	< .001	***
Self-deprecation	1.601	0.144	11.119	< .001	***
Speaker 2					
Chloe	0.079	0.100	0.788	0.431	
Danny	−0.633	0.108	−5.881	< .001	***
Joe	0.201	0.099	2.032	0.042	*
Speaker 1					
Chloe	0.142	0.136	1.047	0.295	
Danny	−0.037	0.111	−0.337	0.736	
Joe	0.149	0.104	1.426	0.154	
Threshold coefficients					
1|2	−5.138	0.244	−21.074		
2|3	−2.642	0.179	−14.779		
3|4	−0.288	0.159	−1.815		
4|5	2.123	0.172	12.321		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.18: Coefficients of the best-fit model of politeness ratings
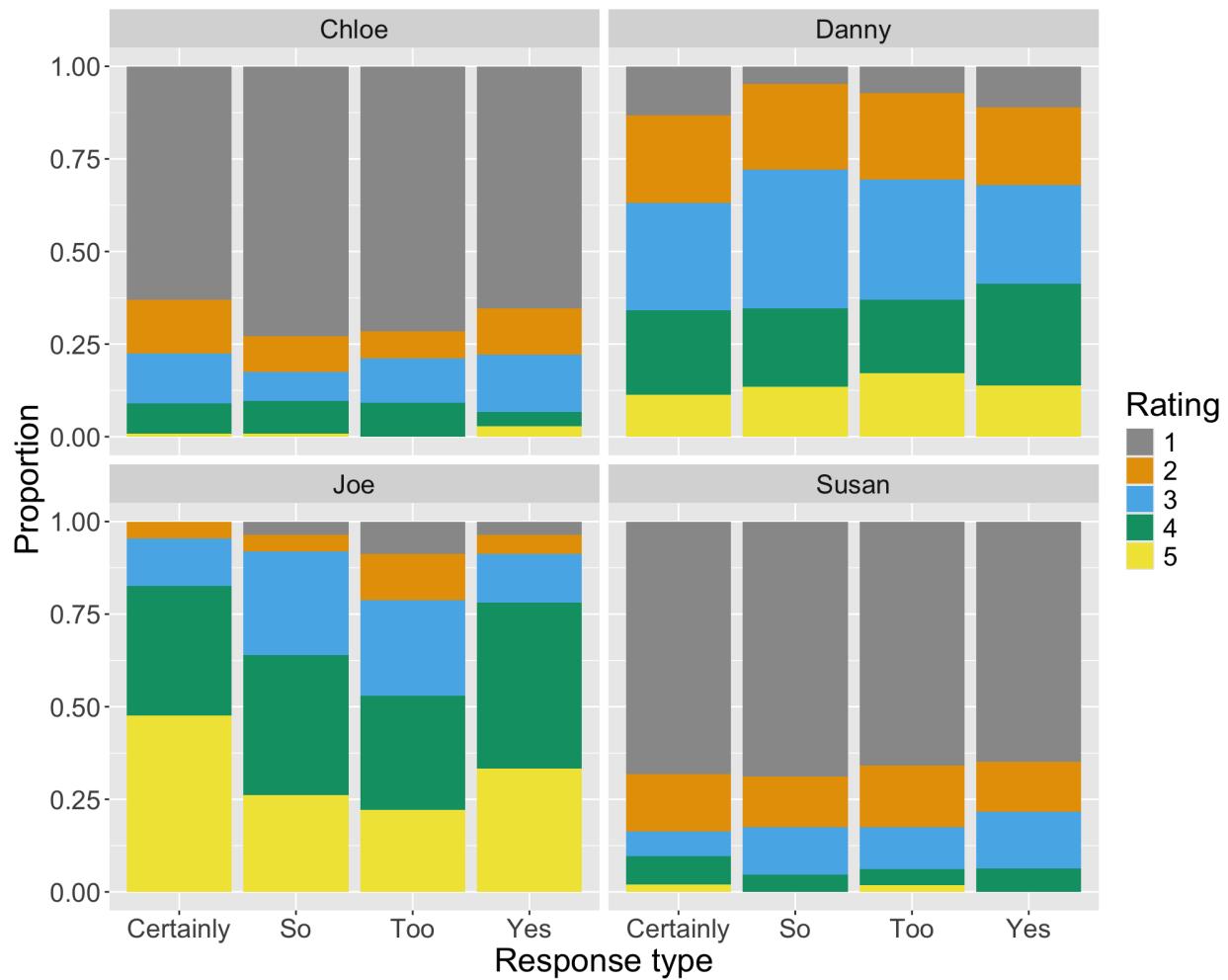
Figure 5.8: Masculinity ratings by response type and speaker.

Masculine

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	−1.739	0.099	−17.523	< .001	***
Danny	1.051	0.082	12.761	< .001	***
Joe	2.441	0.101	24.198	< .001	***
Response Type					
Certainly	0.201	0.110	1.834	0.067	
So	−0.123	0.093	−1.325	0.185	
Too	−0.211	0.109	−1.939	0.053	
Speaker 2 × Response Type					
Chloe × Certainly	0.051	0.153	0.330	0.742	
Danny × Certainly	−0.386	0.137	−2.830	0.005	**
Joe × Certainly	0.525	0.145	3.630	< .001	***
Chloe × So	−0.083	0.160	−0.517	0.605	
Danny × So	0.222	0.139	1.589	0.112	
Joe × So	−0.136	0.141	−0.967	0.334	
Chloe × Too	0.007	0.165	0.045	0.964	
Danny × Too	0.278	0.140	1.989	0.047	*
Joe × Too	−0.475	0.146	−3.258	< .001	**
Threshold coefficients					
1|2	−0.989	0.108	−9.178		
2|3	0.076	0.105	0.719		
3|4	1.500	0.113	13.325		
4|5	3.258	0.137	23.802		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.19: Coefficients of the best-fit model of masculinity ratings.

Feminine

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	2.714	0.205	13.270	< .001	***
Danny	−1.770	0.166	−10.648	< .001	***
Joe	−3.584	0.235	−15.252	< .001	***
Threshold coefficients					
1|2	−3.039	0.142	−21.383		
2|3	−1.521	0.126	−12.082		
3|4	0.163	0.122	1.332		
4|5	2.587	0.134	19.257		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.20: Coefficients of the best-fit model of femininity ratings.

Calm

	Estimate	Std. error	Z-value	P-value	
Speaker 2					
Chloe	−0.356	0.126	−2.832	0.005	**
Danny	−0.951	0.132	−7.203	< .001	***
Joe	0.527	0.150	3.514	< .001	***
Antecedent Type					
Accusation	−1.030	0.102	−10.056	< .001	***
SelfDeprecation	1.166	0.123	9.480	< .001	***
Response Type					
Certainly	0.074	0.108	0.686	0.493	
So	−0.108	0.095	−1.135	0.256	
Too	0.021	0.109	0.196	0.845	
Speaker 2 × Response Type					
Chloe × Certainly	−0.055	0.148	−0.370	0.711	
Danny × Certainly	−0.238	0.151	−1.580	0.114	
Joe × Certainly	0.197	0.156	1.261	0.207	
Chloe × So	0.337	0.151	2.239	0.025	*
Danny × So	−0.163	0.154	−1.063	0.288	
Joe × So	0.075	0.149	0.501	0.616	
Chloe × Too	0.214	0.152	1.407	0.159	
Danny × Too	0.350	0.153	2.296	0.022	*
Joe × Too	−0.228	0.157	−1.455	0.146	
Threshold coefficients					
1|2	−4.711	0.230	−20.483		
2|3	−1.783	0.165	−10.817		
3|4	0.184	0.155	1.188		
4|5	2.484	0.174	14.284		

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5.21: Coefficients of the best-fit model of calmness ratings

Chapter 6

Conclusion

6.1 Summary

This dissertation has taken a broad view of the meaning of English additive expressions. I began with the semantics of *too*, proposing an analysis that provides greater empirical adequacy than previous approaches by accounting for what I have been calling the argument-building use of *too*—shown once again in (1).

(1)   a.   Ernie who's been raising or helping to raise somebody's children [...] since she was maybe thirteen years old, just naturally took Iree in with no authority but her own. [...] Good thing she did **too** because something happened in the birthing time of Iree and she's got epilepsy [...]   (COCA)

    b.   (Online forum discussion) i have never gotten a ticket but i know a cpl people who have.. i guess the fine is a hefty one **too**. depending on what im driving, i chance it.   (COCA)

    c.   A room just opened up at this hotel. [...] It looks kind of fancy, **too**.   (COCA)

The core of the analysis, which incorporates ideas from probabilistic pragmatics into Inquisitive Semantics, is that there exists a resolution to some Relevant Question for which the antecedent and prejacent of *too* together argue more strongly than the antecedent does alone. Rather than claiming that additives stand in a particular relation to *the* Current Question

Under Discussion or a particular salient set of focus alternatives, I argued that additives are licensed so long as *any* suitable question is relevant in the context, regardless of whether that question can uniquely be claimed to be the Current Question Under Discussion (or a Question Under Discussion at all). This circumvents previous analyses' need to identify a uniquely salient Question Under Discussion or set of focus alternatives, which is generally not feasible for the argument-building use. In order to account for cases in which the antecedent appears to be merely implicated, hinted at, or retrieved from background information, I argued that the antecedent of an additive should be taken to be a fact about the context (the fact that an utterance was made, that a non-linguistic event occurred, or that some piece of information is in the common ground) rather than the semantic content of an utterance.

This semantic core constitutes a general analysis of additivity that can now be extended to other additives in English and in other languages. The meanings of the English positive-polarity additives were already seen to vary around this core:

- Non-initial additives require the antecedent to Answer the same RQ that the antecedent and prejacent answer together. On this analysis, the difference between the canonical additive use and the argument-building use is that the argument-building use involves an antecedent that Evidences the same resolution that its conjunction with the prejacent does, while the canonical additive use involves an antecedent that Evidences a different resolution.

- Sentence-initial *also* only requires the antecedent to be Relevant, not necessarily an Answer.

- *As well* requires the antecedent to provide a different resolution than the antecedent and prejacent provide together. Thus it does not have an argument-building use.

I then turned to refutational *too*, shown again in (2). Adopting Farkas & Bruce's (2010) and Roelofsen & Farkas's (2015) approach to polarity particles, I analyzed refutational *too* as a [REVERSE, +] polarity particle, which is to say that it occurs only in positive responses to negative antecedents—like French *si* or German *doch*, shown in (3).

(2)   A: You didn't do your homework!

B: I did **too**!

(Schwenter & Waltereit 2010)

(3)   [REVERSE, +] particles

    a.   French:

        A: Anne n'est pas partie. 'Anne didn't leave.'

        B: Mais **si**. 'You are wrong, she did.'

    b.   German:

        A: Anna kommt nicht mit ins Kino. 'Anna isn't coming along to the movies.'

        B: **Doch!** Sie kommt schon. 'You are wrong. She's coming.'

(Farkas & Bruce 2010)

I also argued, however, that refutational *too* bears an additional polarity feature that has not been identified in previous work on response particles: [REFUTE], which requires the addressee to have a projected commitment to the negation of its prejacent. The evidence for this is that refutational *too* is not licensed in responses to negative antecedents that do not give rise to such a projected commitment—such as epistemically unbiased negative questions like the one in (4-A).

(4)   **Context:** A and B are planning to go to the beach later today, but only if it's sunny. A has been working in a windowless room all day and has no idea what the weather is like. B comes in from outside.

    A: I hope we can still go to the beach. It's not raining, is it?$^\uparrow$

    B: It is (#**too**)! / (Yes/no), it is raining.   [REVERSE, +]

The oddity of *too* in (4) could be accounted for by the [REFUTE] feature alone, without needing to stipulate a requirement for negation in the antecedent. Nonetheless, I analyzed refutational *too* as realizing both the [REVERSE] and [REFUTE] features—more precisely, as a [REVERSE, +, REFUTE] particle—because *too* is not acceptable in responses to antecedents like (5-A), which gives rise to the projected commitment required by [REFUTE] but does not contain negation. This intuition was confirmed with data from a large-scale experiment.

(5)   B agreed to water the plants for a few days while A was out of town. However, when
        A comes home, the plants' leaves are drooping and the soil appears to be dry.

        A: Did you really water the plants?   (Accusatory tone)

        B: #I did **too**!

The final portion of this dissertation turned to an examination of refutational *too* as a speaker-quality index. The results of the reported social perception experiment were consistent with the widespread judgment in explicit metapragmatic discourse that refutational *too* sounds "childish": Across the contexts examined, speakers using refutational *too* (as well as refutational *so*) were rated as sounding significantly more childish (as well as more playful and less intelligent) than speakers expressing disagreement by saying *Yes, I did!* or *I certainly did!*. Other meanings were found to vary between contexts, however: In responses to accusations, such as (6-a), speakers were rated as sounding kinder, less aggressive, and less defensive when using refutational *too*, while in responses to self-deprecation *too* had precisely the opposite effect, yielding lower ratings of kindness and higher ratings of aggressiveness and defensiveness.

(6)   a. **Accusation:**

            A: You didn't water the plants!

            B: I did **(too/so)**!

        b. **Self-deprecation:**

            A: I didn't look good in that hat.

            B: You did **(too/so)**!

        c. **Trivia:**

            A: Whales aren't mammals!

            B: They are **(too/so)**!

On the one hand, the stability of childishness, playfulness, and unintelligence across contexts looks something like a conventionalized "core" meaning of the kind usually dealt with in semantics, while the other, more context-dependent meanings appear to be derived from that core in a way that might appear to involve something like the enrichment of literal mean-

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ing by conversational implicature. On the other hand, the observed meanings were noted to be rather surprising under the usual neo-Gricean understanding of politeness (see Brown & Levinson 1987), which would lead us to expect that *I did too!*, being more direct than *Yes I did!*, would be perceived as less polite and therefore unkind, aggressive, and defensive. What seems to be happening is that the ideological associations of childhood (that children are helpless, playful, non-threatening, etc.) override any such implicature in the accusation context, instead giving rise to the inference that the speaker is behaving in a (mock-)childish way in order to seem non-threatening. In the self-deprecation contexts, in contrast, this effect seems to backfire: Since the refuter's utterance benefits the addressee's self-esteem, the association of childishness with playfulness and low intelligence reduces the *too*-user's credibility, thus making *I did too!* sound less kind than *Yes, I did!* or *I certainly did!* By considering the mock-childish Mandarin register *sajiao* and the notion of a "manchild" in US-American political discourse, I explored some ways in which the ideological associations of childishness that are in play here are contingent on both culture and linguistic convention. The upshot is that the derivation of the inferences observed in the experiment does not proceed according general communicative principles (Gricean or otherwise) but rather depends on a complex interplay between ideology, convention, and context that is not readily captured by existing formal modeling techniques.

6.2 Directions for future work

6.2.1 The semantics of additivity

In addition to the positive-polarity, non-scalar additives on which this dissertation has concentrated, English also has a negative-polarity additive particle, *either*, which has a distribution nearly complementary to *too*'s—see (7).

(7)   a.   My first book is coming out in August. I never sought traditional publishing. Still, I have a great editor, proofreader, cover artist and layout person. And, my book will be available in print and e-book on the same day. What I don't know, of course, is how that book will do. But, I wouldn't know that if it was being

traditionally published, **(either/#too)**.   (COCA)

b. GOP voters dislike [Claire] McCaskill so much they're not going to vote for her no matter what their nominee does. Independent voters haven't moved at all **(either/#too)**.   (COCA)

Like *too*, *either* appears to have an argument-building use. Consider (8-b), an example from COCA originally reported by Thomas (2021) and shown here with more context. *Either* appears here in a comment on a blog post that reviews the film *A Star Is Born* with heavy irony. The post criticizes what the author takes to be the film's message by sarcastically asserting that is impossible for two people who are well-known in the same industry to be happily married to one another. The sarcasm is underscored by a link to a Google image search for Joanne Woodward and Paul Newman (well-known, successful actors whom the author presumably takes to have been happily married) and an exhortation to commenters to only name such "non-existent" couples if they are already dead, so as not to jinx them. One commenter, who may have missed the joke, replies with (8-b). Here the assertion that the commenter can name at least a dozen such couples is meant to evidence the conclusion that couples in the same field can, in fact, be happily married. The host sentence of *either* then strengthens the argument that those marriages are in fact happy ones. Just as was seen with the argument-building use of *too*, there is no structural parallelism between the antecedent and host sentence of *either* here, so consideration of focus alternatives will not go any way toward explaining why *either* is licensed in this context.

(8) (from a sarcastic blog post titled "Lessons from Hollywood: Never Marry Someone in the Same Industry as You")

a. **Blogger:** [The lesson from the film *A Star Is Born* is:] Never get involved with someone who's in your industry. Only one of you can be successful. There has never—in the history of the world—been a couple who were both well-known in their industry and had a happy marriage. Seriously I am sitting here trying to think of a single example and I'm failing. [The word "single" links to a Google image search for Joanne Woodward and Paul Newman.] Well, phew. I'd hate

to think that anything I learned from Hollywood was not true. If you feel the urge to name some of these non-existent couples you're only allowed to name dead ones. Or at least one of them dead. Otherwise they will break up within the week. Please, no jinxing happy relationships! Not that there are any happy artistic relationship.

b. **Commenter:** I don't really know much about the personal lives of Hollywood stars or other American artists, but I can name at least a half dozen now-dead couples (probably unfamiliar to everyone here) who've worked and succeeded in the same fields in my country and yet somehow managed to stay married. And not because of societal pressures **either**.

The theory of additivity proposed in Chapter 2 can be extended in future work to account for *either*'s argument-building use. However, a satisfactory analysis of *either* must also account for its rather peculiar distribution, a puzzle which has eluded resolution in previous work (e.g. Rullmann 2003; Levinson 2008; Ahn 2015). *Either* has sometimes been taken to belong to a class of "strong" or "strict" NPIs (e.g. Gajewski 2011; Giannakidou 2011) because it fails to be licensed in some contexts that license canonical "weak" NPIs such as *any* and *ever*. Examples of such contexts include the antecedents of conditionals and the prejacent of *only*, as shown in (9). However, as has been pointed out by Rullmann (2003) and Hoeksema (2012), *either* cannot straighforwardly be classified as a strong NPI because it is licensed in contexts that do not license other strong NPIs such as *in years* or *one bit*, as shown in (9).

(9) a. If you **ever** go to Brussels, you should buy me some Belgian chocolates.
        I never go to Amsterdam. #If I go to Brussels **either**, I will buy you some Belgian chocolates.

    b. Only John has **ever** been to Brussels.
        Of the people in this room, only John has ever been to Amsterdam. #Only John has been to Brussels **either**.

    (cf. Rullmann 2003)

(10) a. Not everyone in the White House liked the decision **either**. (Hoeksema 2012)

#Not every student in this class has been to Amsterdam **in years**.

#Not everyone at this party is enjoying it **one bit**.

b.   Almost no students failed the midterm exam. Almost no students failed the final exam, **either**.

#Almost no students have failed this test **in years**.

#Almost no one at this party is enjoying it **one bit**.

Either also has a refutational use—see (11)—though it seems to be less widespread than refutational *too*, as many (but not all) English speakers consulted report not having any familiarity with it. Future work can ascertain whether refutational *either* is simply the negative counterpart of refutational *too*—and thus a [REVERSE, −, REFUTE] particle—or if it has its own distinctive semantic characteristics. Future work might also investigate whether other languages also have [REFUTE] particles, what feature combinations [REFUTE] can occur in, and whether there might be a [CONFIRM] feature requiring doxastic alignment between interlocutors rather than conflict.

(11)   A: It's the Callaway house. Nobody's lived there for years. It's haunted.

B: It isn't **either**!   (COCA)

The existence of refutational *either* raises the question of whether there might be a general tendency for additive particles to develop refutational uses. Indeed, Schwenter & Waltereit (2010) suggest that Danish has additive particles—such as *også* in (12-a)—that have something like a refutational use, and Schmitz et al. (2018) report that the additive *ook* in Dutch can be used to express disagreement in certain contexts, such as (12-b), though unlike *too* it cannot be used to reject a claim that has been directly asserted. Future work might look for additives that can be used to express disagreement in other languages beyond Germanic. Such uses might shed light on how *too*'s refutational use could have developed from its original additive use.

(12)   a.   **Danish**

A: Hvorfor har du ikke ringet til Ole? 'Why haven't you called Ole?'

B: Det har jeg (da) **også** gjort. 'I have **too**!'

b. **Dutch**

Father: Moet je geen huiswerk maken? 'Shouldn't you be doing your homework?'

Son: Dat doe ik **ook**! 'That's what I'm doing!'

The present analysis might also be extendable to the scalar additive *even*, which conveys that its host sentence is evaluated to be very high or very low on a scale (see e.g. Rooth 1985; Kay 1990; Guerzoni 2004; Giannakidou 2007; Greenberg 2017). Scalar additives have often been analyzed (though not without controversy) as having an additive presupposition (e.g. Horn 1969; Karttunen & Karttunen 1977; Rooth 1985; Kay 1990; and see e.g. Gast & van der Auwera 2011 and Greenberg 2016 for discussion) and have already received at least one analysis in Bayesian argumentation theory (Winterstein et al. 2018) that is similar in spirit to the analysis of non-scalar additives developed here.

(13)   Not only did Mary win her first round match, she **even** made it to the semi-finals. (Kay 1990)

Winterstein et al. (2018) argue that the host sentence of a scalar additive must be argumentatively stronger than an antecedent. (And see Pistoia-Reda & McNally (2022) for an analysis that offers improved empirical adequacy with a more general notion of "rhetorical strength" that subsumes Winterstein et al.'s argumentative strength.) The present analysis of *too* is different because it compares the strength of the antecedent to the strength of the antecedent and host sentence *together* rather than the host sentence alone, but a reviewer for *Semantics & Pragmatics* suggests that together these two analyses might shed light on the diachronic tendency for non-scalar additives to develop scalar uses.

6.2.2 Additives as speaker-quality indices

This dissertation also provides a starting point for future investigation of the social meaning of other additive expressions. Refutational *either* may index different speaker qualities than refutational *too*. Many English speakers (including this author) have little familiarity with refutational *too*, so any investigation of its social meaning would need to begin by identifying

what population of speakers uses it. It may, for instance, be a feature of particular dialects or be falling out of use and thus primarily used by older speakers. It is not clear to me whether it should generally be expected to sound childish, but a social perception experiment analogous to the one carried out for *too* might provide evidence for or against the hypothesis that refutational particles have a tendency to index childishness.

The social evaluation of the canonical uses of additive particles is also a worthy topic for future study. A quantitative corpus analysis by Gast (2006) found some evidence that *too* is more typical of informal styles than *also* is, but to my knowledge no social perception studies of *too* and *also* have been conducted. I would hypothesize that *too*, *also*, and *as well* index different speaker qualities and that those qualities vary depending on the syntactic placement of the particle. Consider the alternatives in (14), for example. Not only does *too* sound more casual than *as well* (with *also* perhaps falling somewhere in between), but the sentence-medial positioning of *too* and *as well* in (14-b) and (14-f) sounds rather formal or academic, whereas *also* does not seem to have that stylistic effect in the same position. A social perception experiment could characterize these differences more precisely.

(14) a. Avery plays the cello. Bailey plays an instrument, **too**.
      b. Avery plays the cello. Bailey, **too**, plays an instrument.
      c. Avery plays the cello. Bailey plays an instrument, **also**.
      d. Avery plays the cello. Bailey **also** plays an instrument.
      e. Avery plays the cello. Bailey plays an instrument **as well**.
      f. Avery plays the cello. Bailey, **as well**, plays an instrument.

A difference between these alternatives is that sentence-medial *too* and *as well* always associate with the immediately preceding constituent, whereas sentence-final *too*, sentence-final *as well*, and *also* in either position may associate with a focused constituent anywhere in the sentence. One might then wonder if the formal/academic tone of sentence-medial *too* and *as well* has anything to do with the way that they more precisely pick out an associate. This would resonate with Beltrama et al.'s (2023) finding that being precise can make speakers sound intelligent and uptight.

6.2.3 Toward a unified theory of meaning?

The study of linguistic meaning is divided between fields that are difficult to bring into dialogue because they have emerged from different intellectual traditions and make very different theoretical assumptions. The meanings of interest to formal semantics/pragmatics are generally taken to be intended by speakers (following Grice 1957), accessible to introspection, shared by large communities of language users, and unable to change (at least over the course of a single conversation). As discussed in Chapter 4, all formal semantic/pragmatic analysis depends on a distinction (following Grice 1975) between context-independent "conventional" meaning and context-sensitive meaning derived from the application of general pragmatic principles to utterances in particular contexts. In contrast, the "social" meanings of interest in sociolinguistics and linguistic anthropology tend to be ineffable, escape language users' full awareness and control, undergo rapid, unpredictable change, and vary substantially between members of the same language community. Consequently, the distinction between conventional and context-dependent meaning that is foundational for semantics cannot be straightforwardly maintained in sociolinguistics because context-independent core meanings are difficult to identify, and context-dependence arises for reasons other than general communicative principles (as seen, for example, in the results of the experiment in Chapter 5).

Thus the phenomena that different fields call "meaning" might seem so disparate that one would be justified in wondering whether we can really call them the same thing. Everyone knows, of course, that the assumptions of formal semantics are merely idealizations, and they are necessary to facilitate the use of formal tools to model natural language meaning phenomena. But it is not always clear where the domain of applicability of those idealizations ends, or how the fields' theories of meaning are supposed to fit together. In recent years, some experts have begun calling for more integrated approaches, notably Eckert (2011, 2019), who led and named the "Third Wave" turn in sociolinguistics toward a focus on mean-making.

As discussed in Chapter 4, a number of researchers have taken up this call. One area where it is clear that expertise from semantics and sociolinguistics can work together to enrich our understanding of linguistic meaning is the study of speaker qualities indexed by

semantic features of linguistic expressions. The germinal examples of this kind of work are Acton & Potts's (2014) study of English demonstratives and Beltrama & Staum Casasanto's (2017) study of *totally*. Both of these identify a plausible indexical link between particular speaker qualities and a semantic property—the presupposition of a shared perspective in the case of demonstratives, and speaker-oriented intensification in the case of *totally*. To obtain stronger evidence that the speaker qualities in question are really associated with the claimed semantic property rather than the particular lexical expression (*that* or speaker-oriented *totally*, respectively), one would ideally want to compare expressions sharing that property to each other and also to other expression that are semantically distinct but perform similar functions (i.e., expressions that form a pragmatic paradigm).

Thus I compared listeners' evaluations of refutational *too* to those of refutational *so* as well as to those of other ways of expressing disagreement that do not carry a semantic requirement for disagreement in the context. In view of the finding that *I did too!* and *I did so!* did not yield significantly different ratings of childishness but did both yield significantly higher ratings of childishness than *Yes, I did!* or *I certainly did!*, it is plausible that *too* and *so* index childishness by virtue of having the semantic property that sets them apart from *yes* and *certainly*, namely that they require disagreement between the interlocutors. I suggested that Peirce's notion of a legisign (or sign type) is useful for thinking about this distinction: In Peircean terms, we can hypothesize that the semantic profile of the class of refutational particles—not the particular lexical item refutational *too* or *so*, nor the act of disagreement in general—is the legisign that serves as the sign vehicle for childishness.

Some authors working to bridge theories of meaning have sought to derive social indexical meanings along Gricean lines as resulting from an interaction between general communicative principles, context, and context-independent conventional meaning. Burnett (2019, 2023) is the most ambitious, aiming to develop a Bayesian game-theoretic "framework for formalizing sociolinguistic theories" (2023: 11) that would subsume social indexicality under an essentially Gricean theory of implicature. Other authors (e.g. Acton 2014, 2019; Beltrama et al. 2023; Solt et al. 2025) have sought to apply Gricean principles in a more limited way to explain particular inferences about speaker qualities. I concluded on the basis of the experimental results in Chapter 5, however, that this is not feasible for the observed meanings

of refutational *too*, and indeed that the usual division between "conventional" and context-dependent meaning is not tenable in the domain of speaker quality indexicality, as much of the context sensitivity observed cannot be accounted for by general pragmatic principles.

Whereas much of the work in this domain so far has focused on extending the theoretical apparatus of formal semantics/pragmatics to incorporate "social" phenomena, it seems to me that properly integrating our theories of meaning will require deeper contemplation as to what the limitations of that theoretical apparatus are, where exactly the usual assumptions of formal semantics/pragmatics break down, and where the gaps between the theories lie. Anthropologists have already undertaken a fair bit of work in this vein, but unfortunately that work has largely escaped the attention of linguists and philosophers of language.[1] Refreshingly, Beaver & Stanley (2023) have recently taken encouraging steps to rectify this oversight. By incorporating various insights from sociolinguistics, pyschology, and anthropology, they make a persuasive case for loosening many of the idealizations that are standard in formal semantics. They propose thinking about meaning in terms of how utterances change the probability that particular features of context are present—a notion they call "resonance". For them, the function of speech is to "attune" people to these resonances, that is, to facilitate behavior that is predictable from the resonances of utterances. Though they do not rely on Peirce, Silverstein, or others working in the framework of Peircean semiotics, their "resonance" bears a strong resemblance to Peircean indexicality: The resonances of an expression are those features of context that it tends to co-occur with—which the expression could also be said to index. Further dialogue between these intellectual traditions might therefore be extremely fruitful.

I have chosen to couch my own thinking about social meaning in Peircean terms, and I suggest that in future work Peircean semiotics could help to bridge the gap between semantics and sociolinguistics, especially if we further explore the logical aspects of Peirce's work that for the most part have not been taken up in anthropology and sociolinguistics. Although Peirce's theory of signs is cited primarily in anthropology and sociolinguistics,[2]

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[1]See e.g. Duranti (2015) on Rosaldo's (1982) attempt at dialogue on speech act theory with John Searle, who took two decades to respond.

[2]There are certainly historical, sociological, and ideological reasons that analytic philosophy and linguistic

Peirce himself was primarily concerned with the study of logic, which he took to be inextricably bound up with semiotics (see e.g. Peirce 1998: 10, 327, 460–461). The framework he developed for thinking about meaning is an extremely general and expansive one, and it has in fact influenced not only the study of "social meaning" but also the development of formal logic and natural language semantics. The term "indexical", for example, is applied to demonstratives, temporal adverbials, and other deictic expressions in semantics and the philosophy of language following the influential work of Kaplan (1989).[3] And indeed Silverstein (1976), in distinguishing between "referential" and "non-referential" indices, also acknowledges that such expressions were indexical for Peirce.

If I might be permitted to conclude by going out on a theoretical limb, I would like to suggest that rather than trying to fit "social meaning" into the conceptual schema of formal semantics/pragmatics by, say, viewing inferences about speaker qualities as conversational implicatures (Burnett 2019, 2023) or secondary entailments (Smith et al. 2010), we might instead view semantic phenomena as instantiations of the broader semiotic phenomena that are the object of study for linguistic anthropology and Third Wave sociolinguistics. Peirce's theory of signs, along with its elaboration by Silverstein and others, may offer the means to do this. We might, for example, view Gricean conversational implicature as one case of the extension of nth-order indexical meanings to $n + 1$st-order ones: If we think of assertions as indexing speaker commitments, then Grice's maxims provide the ideological link from those commitments to an $n + 1$st-order pragmatic enrichment. And Peirce's notion of an indexical dicisign (an indexical sign that has informational content without necessarily being a proposition, which in Chapter 4 I suggested might help semanticists to keep the indeterminacy of "social" meanings in view) allows us to view speaker quality indexicality, additivity, and Kaplanian indexicality as special cases of the same phenomenon. They are all indexical dicisigns because they co-occur with an object in their context about which they provide or

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semantics have shown little interest in Peirce's thought, but I will not attempt to unpack them here.

[3]Kaplan (1989: 490) writes of his choice of terminology, "I prefer the term 'indexical' (which, I believe, is due to Pierce [*sic*])." This circumspect and misspelled attribution does not inspire confidence that Kaplan ever actually read Peirce, so although it is clear that Kaplan was aware of the term's provenance, I am uncertain where exactly he picked it up.

presuppose information: Speaker quality indices provide information about speakers, additives provide information about their antecedents, and pronouns provide information (gender and number, for example) about their referents.

At the same time, the English additives examined in this dissertation (especially *too*) open a window onto the range of ways that indexical dicisigns can behave in natural language and should motivate some refinement of Silverstein's distinction between "referential" and "non-referential" indices. All additives have the potential to be indexical dicisigns in at least two different ways simultaneously: They provide information about the speaker (as seen with refutational *too* in Chapter 5), and they provide information about an antecedent that the listener is to retrieve from the context (as seen for the canonical positive-polarity additives in Chapter 2 and for refutational *too* in Chapter 3). The former is what is usually called non-referential indexicality following Silverstein (1976), but the latter is more difficult to classify: It is not referential indexicality, as additives do not denote their objects, but it is also not exactly what Silverstein had in mind for non-referential indexicality, as it seems to be semantic in nature: Unlike what we think of as "social" meanings, the relationship between the host sentence and antecedent of an additive is specified by relatively stable and determinate linguistic conventions that are amenable to modeling with mathematical tools (as was done in Chapters 2 and 3). Silverstein's dichotomy of referential and non-referential indices could therefore benefit from some refinement.[4] Furthermore, additive and refutational *too* seem to pick out their antecedents in different ways: Whereas refutational *too* rather rigidly requires an explicit antecedent of a very particular kind (both negative and giving rise to a projected commitment that creates an interactional conflict), we have seen that additive *too* has a much more flexible relationship to its context, sometimes accessing antecedents that merely implicate or hint at an answer to a question—or even go unspoken. Silverstein's classification of indices might be enriched by considering the ways in which the objects of indices are determined (by e.g. causality, convention, pragmatic reasoning, etc.). I must leave this more precise taxonomization of indexical dicisigns to future work, but what seems clear is that building a unified theory of linguistic meaning will require bringing semantics/pragmatics,

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[4]Not to mention that dichotomies are distinctly un-Peircean, as Peirce always (perhaps somewhat obsessively) favored trichotomies.

sociolinguistics, anthropology, and philosophy into more intensive dialogue.

Bibliography

Abidin, Crystal. 2016. Agentic cute (ˆ.ˆ): Pastiching East Asian cute in Influencer commerce. *East Asian Journal of Popular Culture* 2(1). 33–47.

Abrusán, Márta. 2014. On the focus-sensitive presupposition triggers *too, again, also, even*. *Sinn und Bedeutung* 18.

Acton, Eric. 2014. *Pragmatics and the social meaning of determiners*. Palo Alto, CA: Stanford University PhD thesis.

Acton, Eric. 2019. Pragmatics and the social life of the English definite article. *Language* 95(1). 37–65.

Acton, Eric K. & Christopher Potts. 2014. That straight talk: Sarah Palin and the sociolinguistics of demonstratives. *Journal of Sociolinguistics* 18(1). 3–31.

Agha, Asif. 2003. The social life of cultural value. *Language and Communication* 23. 231–273.

Ahn, Dorothy. 2015. The semantics of additive *either. Sinn und Bedeutung 19* 20–35.

Amsili, Pascal & Claire Beyssade. 2006. Compulsory presupposition in discourse. *Constraints in Discourse* 2.

Amsili, Pascal, Emilia Ellsiepen & Grégoire Winterstein. 2016. Optionality in the use of *too*: The role of reduction and similarity. *Revista de ABRALIN* 15(1). 229–252.

Anscombre, Jean-Claude & Oswald Ducrot. 1983. *L'argumentation dans la langue.* Brussels: Mardaga.

Bade, Nadine. 2014. Obligatory implicature and the presupposition of "too". *Sinn und Bedeutung* 18. 42–59.

Bade, Nadine. 2016. *Obligatory presupposition triggers in discourse: Empirical investigations of the theories* Maximize Presupposition *and* Obligatory Implicatures. Tübingen: Eberhard Karls Universität PhD dissertation.

Bade, Nadine & Sonja Tiemann. 2016. Obligatory triggers under negation. *Sinn und Bedeutung* 20. 109–126.

Balogh, Kata & Corinna Langer. 2021. Additive particles, prosodic structure and focus sensitivity in Hungarian. *Linguistics* 60(1). 277–314.

Beaver, David & Jason Stanley. 2023. *The politics of language.* Princeton: Princeton University Press.

Beaver, David & Henk Zeevat. 2007. Accommodation. In Gillian Ramchand & Charles Reiss (eds.), *The Oxford Handbook of Linguistic Interfaces*, Oxford: Oxford University Press.

Beaver, David I. & Brady Z. Clark. 2008. *Sense and sensitivity: How focus determines meaning.* Malden, MA: Blackwell.

Beltrama, Andrea. 2018a. Precision and speaker qualities. The social meaning of pragmatic detail. *Linguistics Vanguard* 4(1).

Beltrama, Andrea. 2018b. *Totally* between subjectivity and discourse: Exploring the pragmatic side of intensification. *Journal of Semantics* 35(2). 219–261.

Beltrama, Andrea & Florian Schwarz. 2022. Social identity, precision, and charity: when less precise speakers are held to stricter standards. *Semantics and Linguistic Theory (SALT)* 32. 575–598.

Beltrama, Andrea & Florian Schwarz. 2024a. (im)precise personae: The effect of socio-indexical information on semantic interpretation. *Language in Society* 1–28.

Beltrama, Andrea & Florian Schwarz. 2024b. Social stereotypes affect imprecision resolution across different tasks. *Semantics and Pragmatics* 17(10). 1–34.

Beltrama, Andrea, Stephanie Solt & Heather Burnett. 2023. Context, precision, and social perception: A sociopragmatic study. *Language in Society* 52. 805–835.

Beltrama, Andrea & Laura Staum Casasanto. 2017. Totally tall sounds totally younger: Intensification at the socio-semantics interface. *Journal of Sociolinguistics* 21(2). 154–182.

Bošković, Željko. 2001. On the interpretation of multiple questions. *Linguistic Variation Yearbook* 1(1). 1–15.

Brown, Penelope & Stephen C. Levinson. 1987. *Politeness: Some Universals in Language Usage.* Cambridge, UK: Cambridge University Press.

Bucholtz, Mary & Kira Hall. 2005. Identity and interaction: A sociocultural approach. *Discourse Studies* 7. 585–614.

Büring, Daniel. 2003. On d-trees, beans, and b-accents. *Linguistics and Philosophy* 26. 511–545.

Burnett, Heather. 2019. Signalling games, sociolinguistic variation and the construction of style. *Linguistics and Philosophy* 42. 419–450.

Burnett, Heather. 2023. *Meaning, Identity, and Interaction: Sociolinguistic Variation and Change in Game-Theoretic Pragmatics*. Cambridge, UK: Cambridge University Press.

Butschety, Madeleine. 2023. *Inclusory constructions*. Graz, Austria: Karl-Franzens-Universität PhD dissertation.

Campbell-Kibler, Kathryn. 2007. Accent, (ING), and the social logic of listener perceptions. *American Speech* 82(1). 32–64.

Campbell-Kibler, Kathryn. 2008. I'll be the judge of that: Diversity in social perceptions of (ing). *Language in Society* 37. 637–659.

Campbell-Kibler, Kathryn. 2009. The nature of sociolinguistic perception. *Language Variation and Change* 21(1). 135–156.

Campbell-Kibler, Kathryn. 2011. Intersecting variables and perceived sexual orientation in men. *American Speech* 86(1). 52–68.

Chan, Marjorie K. M. 2022. *My Unfair Lady:* Gender, *sajiao*, and humour in a Hong Kong TV series. In Jessica Milner Davis (ed.), *Humour in Asian Cultures: Tradition and Context*, 238–267. London: Routledge.

Chierchia, Gennaro, Danny Fox & Benjamin Spector. 2012. Scalar implicature as a grammatical phenomenon. In Claudia Maienborn, Klaus von Heusinger & Paul Portner (eds.), *Semantics: An International Handbook of Natural Language Meaning, Vol. 3*, 2297–2332. De Gruyter.

Christensen, Rune H. B. 2023. *ordinal—regression models for ordinal data*. https://CRAN.R-project.org/package=ordinal. R package version 2023.12-4.1.

Ciardelli, Ivano, Jeroen Groenendijk & Floris Roelofsen. 2019. *Inquisitive Semantics*. Oxford: Oxford University Press.

Ciardelli, Ivano, Floris Roelofsen & Nadine Theiler. 2017. Composing alternatives. *Linguis-*

tics and Philosophy 40. 1–36.

Cohn-Gordon, Reuben & Ciyang Qing. 2019. Modeling "non-literal" social meaning. *Sinn und Bedeutung* 23. 301–309.

Coppock, Elizabeth & David Beaver. 2011. Exclusive Updates! Brought to you by your local QUD. *Amsterdam Colloquium* 271–280.

Davies, Mark. 2008–. The Corpus of Contemporary American English (COCA): 560 million words, 1990-present.

Dayal, Veneeta. 1996. *Locality in Wh Quantification: Questions and Relative Clauses in Hindi.* Dordrecht: Kluwer.

Dayal, Veneeta. 2002. Single-Pair versus Multi-Pair Answers: *Wh*-in-Situ and Scope. *Linguistic Inquiry* 33(3). 512–520.

Degen, Judith. 2023. The Rational Speech Act framework. *Annual Review of Linguistics* 9. 519–540.

Degen, Judith, Michael Franke & Gerhard Jäger. 2013. Cost-based pragmatic inference about referential expressions. *Proceedings of the Annual Meeting of the Cognitive Science Society* 35. 376–381.

Degen, Judith & Michael K. Tanenhaus. 2015. Processing scalar implicature: A constraint-based approach. *Cognitive Science* 39(4). 667–710.

Dewey, John. 1946. Peirce's theory of linguistic signs, thought, and meaning. *Journal of Philosophy* 43(4). 85–95.

Duranti, Alessandro. 2015. *The Anthropology of Intentions.* Cambridge, UK: Cambridge University Press.

Eckardt, Regine & Manuela Fränkel. 2012. Particles, *Maximize Presupposition*, and discourse management. *Lingua* 122. 1801–1818.

Eckert, Penelope. 2000. *Language Variation as Social Practice: The Linguistic Construction of Identity in Belten High.* Oxford, UK: Blackwell.

Eckert, Penelope. 2008. Variation and the indexical field. *Journal of Sociolinguistics* 12(4). 453–476.

Eckert, Penelope. 2011. *The future of variation studies.* https://web.stanford.edu/~eckert/ PDF/FutureOFVariation.pdf. Plenary talk given at New Ways of Analyzing Variation

(NWAV) 40, Georgetown University.

Eckert, Penelope. 2012. Three waves of variation study: The emergence of meaning in the study of sociolinguistic variation. *Annual Review of Anthropology* 41. 87–100.

Eckert, Penelope. 2019. The limits of meaning: Social indexicality, variation, and the cline of interiority. *Language* 95(4). 751–776.

Ervin-Tripp, Susan. 1976. Is Sybil there? The structure of some American English directives. *Language in Society* 5(1).

Farkas, Donka F. & Kim B. Bruce. 2010. On reacting to assertions and polar questions. *Journal of Semantics* 27. 81–118.

Farkas, Donka F. & Floris Roelofsen. 2017. Division of labor in the interpretation of declaratives and interrogatives. *Journal of Semantics* 34(2). 237–289.

Fleming, Luke & James Slotta. 2018. The pragmatics of kin address: A sociolinguistic universal and its semantic affordances. *Journal of Sociolinguistics* 22(4). 375–405.

Frank, Michael C. & Noah D. Goodman. 2012. Predicting pragmatic reasoning in language games. *Science* 336. 998.

Franke, Michael & Gerhard Jäger. 2016. Probabilistic pragmatics, or why bayes' rule is probably important for pragmatics. *Zeitschrift für Sprachwissenschaft* 35(1). 3–44.

Gajewski, Jon R. 2011. Licensing strong npis. *Natural Language Semantics* 19. 109–148.

Gast, Volker. 2006. The distribution of *also* and *too*: A preliminary corpus study. *Zeitschrift für Anglistik und Amerikanistik* 54(2). 163–176.

Gast, Volker & Johan van der Auwera. 2011. Scalar additive operators in the languages of Europe. *Language* 87(1). 2–54.

Geurts, Bart & Rob van der Sandt. 2004. Interpreting focus. *Theoretical Linguistics* 30. 1–44.

Giannakidou, Anastasia. 2007. The landscape of EVEN. *Natural Language and Linguistic Theory* 25. 39–81.

Giannakidou, Anastasia. 2011. Positive polarity items and negative polarity items: Variation, licensing, and compositionality. In Claudia Maienborn, Klaus von Heusinger & Paul Portner (eds.), *Semantics: An International Handbook of Natural Language Meaning*, 1660–1712. Berlin: Mouton de Gruyter.

Gibson, James J. 1979. *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.

Ginzburg, Jonathan. 1996. Dynamics and the semantics of dialogue. In Jerry Seligmann & Dag Westerståhl (eds.), *Logic, language, and computation*, vol. 1, 221–237. Stanford, CA: CSLI Publications.

Ginzburg, Jonathan. 2012. *The interactive stance: Meaning for conversation*. Oxford, UK: Clarendon Press.

Godden, David & Frank Zenker. 2018. A probabilistic analysis of argument cogency. *Synthese* 195. 1715–1740.

Goodhue, Daniel. 2021. Isn't there more than one way to bias a polar question? *Natural Language Semantics* 30(4). 379–413.

Goodhue, Daniel. 2022. Everything that rises must converge: Toward a unified account of inquisitive and assertive rising declaratives. *Biased Questions: Experimental Results and Theoretical Modeling* forthcoming. https://lingbuzz.net/lingbuzz/006493.

Goodman, Noah D. & Michael C. Frank. 2016. Pragmatic language interpretation as probabilistic inference. *Trends in Cognitive Science* 20(11). 818–29.

Goodman, Noah D. & Andreas Stuhlmüller. 2013. Knowledge and implicature: Modeling language understanding as social cognition. *Topics in Cognitive Science* 5(1). 173–84.

Graeber, David. 2014. What's the point if we can't have fun? *The Baffler* 24. 50–58.

Green, Georgia M. 1968. On *too* and *either*, and not just on *too* and *either*. *Chicago Linguistic Society (CLS)* 4. 22–39.

Greenberg, Yael. 2016. A novel problem for the likelihood-based semantics of *even*. *Semantics and Pragmatics* 9(2). 1–28.

Greenberg, Yael. 2017. A revised, gradability-based semantics for *even*. *Natural Language Semantics* 26. 51–83.

Grice, Herbert Paul. 1957. Meaning. *The Philosophical Review* 66(3). 377–388.

Grice, Herbert Paul. 1975. Logic and conversation. In Peter Cole & Jerry L. Morgan (eds.), *Syntax and Semantics*, vol. 3: Speech Acts, 59–82. New York: Academic Press.

Grice, Herbert Paul. 1978. Further notes on logic and conversation. In Peter Cole (ed.), *Syntax and Semantics*, vol. 9: Pragmatics, 113–127. Brill.

Grubic, Mira. 2018. Two strategies of reopening quds—evidence from german *auch & noch*. *Sinn und Bedeutung* 21. 517–534.

Grubic, Mira. 2019. Additives and accommodation. In Klaus von Heusinger & Ken Turner (eds.), *Secondary content: The semantics and pragmatics of side issues* (Current Research in the Semantics/Pragmatics Interface 37), 168–199. Leiden: Brill.

Guerzoni, Elena. 2004. *Even*-NPIs in yes/no questions. *Natural Language Semantics* 12. 319–343.

Gunlogson, Christine. 2008. A question of commitment. *Belgian Journal of Linguistics* 22. 101–136.

Gutzmann, Daniel. 2014. Semantics vs. pragmatics. In Lisa Matthewson, Cécile Meier, Hotze Rullmann & Zimmermann Ede (eds.), *The semantics companion*, Wiley.

Hamblin, Charles L. 1971. Mathematical models of dialogue. *Theoria* 37. 130–155.

Hamblin, Charles L. 1973. Questions in Montague English. *Foundations of Language* 10(1). 41–53.

Han, Chung-hye. 1998. *The structure and interpretation of imperatives: Mood and force in universal grammar*. Philadelphia: University of Pennsylvania PhD dissertation.

Hebdige, Dick. 1984. *Subculture: The Meaning of Style*. New York: Methuen.

Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*. Amherst: University of Massachusetts, Amherst PhD dissertation.

Heim, Irene. 1991. Artikel und Definitheit. In Arnim von Stechow & Dieter Wunderlich (eds.), *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, 487–535. Berlin: De Gruyter.

Heim, Irene. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9. 183–221.

Henderson, Robert & Elin McCready. 2020. Social meaning in repeated interactions. *Probability and Meaning Conference 2020* 69–72.

Hintikka, Jaakko. 1976. *The Semantics of Questions and the Questions of Semantics: Case Studies in the Interrelations of Logic, Semantics, and Syntax* (Acta Philosophica Fennica 28.4). Amsterdam: North Holland.

Hoeksema, Jack. 2012. On the natural history of negative polarity items. *Linguistic Analysis*

38. 3–33.

Hofmann, Lisa. 2022. *Anaphora and Negation*. Santa Cruz, CA: UC-Santa Cruz PhD dissertation.

Hofmann, Lisa. 2023. Negativity without negation. *Sinn und Bedeutung 27* 309–327.

Horn, Lawrence. 1969. A presuppositional analysis of *only* and *even*. *Chicago Linguistic Society (CLS)* 5. 97–108.

Irvine, Judith T. & Susan Gal. 2000. Language ideology and linguistic differentiation. In Paul V. Kroskrity (ed.), *Regimes of Language: Ideologies, Polities, and Identities*, 35–84. Santa Fe: School of American Research Press.

Irwin, Patricia. 2014. So TOTALLY speaker-oriented: An analysis of "Drama SO". In Raffaella Zanuttini & Laurence R. Horn (eds.), *Microsyntactic variation in north american english*, 29–70. Oxford, UK: Oxford University Press.

Jakobson, Roman. 1990. Shifters and verbal categories. In Linda R. Waugh & Monique Monville-Burston (eds.), *On Language*, 386–392. Cambridge, MA: Harvard University Press. Originally published in 1957.

Jasinkaja, Katja & Henk Zeevat. 2009. Explaining conjunction systems: Russian, English, German. *Sinn und Bedeutung* 13.

Jeong, Sunwoo. 2018. Intonation and sentence type conventions, two types of rising declaratives. *Journal of Semantics* 35. 305–356.

Johnstone, Barbara, Jennifer Andrus & Andrew E Danielson. 2006. Mobility, indexicality, and the enregisterment of "pittsburghese". *Journal of English Linguistics* 34(2). 77–104.

Kamp, Hans & Antje Rossdeutscher. 1994. Drs-construction and lexically-driven inference. *Theoretical Linguistics* 20(2/3). 166–235.

Kaplan, David. 1989. Demonstratives: An essay on the semantics, logic, metaphysics, and epistemology of demonstratives and other indexicals. In Joseph Almog, John Perry & Howard Wettstein (eds.), *Themes from Kaplan*, New York: Oxford University Press. Based on a series of lectures given at the University of California, Irvine in 1971.

Karttunen, Frances & Lauri Karttunen. 1977. *Even* questions. *North East Linguistic Society (NELS)* 7. 115–34.

Karttunen, Lauri. 1974. Presupposition and linguistic context. *Theoretical Linguistics* 1.

181–194.

Kay, Paul. 1990. Even. *Linguistics and Philosophy* 13(1). 59–111.

Keane, Webb. 2018. On semiotic ideology. *Signs and Society* 6(1).

Kiesling, Scott. 1998. Men's identities and sociolinguistic variation: The case of fraternity men. *Journal of Sociolinguistics* 2(1). 69–99.

Kiesling, Scott. 2009. Style as stance: Stance as the explanation for patterns of sociolinguistic variation. In Alexandra Jaffe (ed.), *Stance: Sociolinguistic Perspectives*, 171–194. Oxford, UK: Oxford University Press.

King, Sharese. 2014. *Exploring social and linguistic diversity across African Americans from Rochester, New York.* Stanford, CA: Stanford University PhD dissertation.

King, Sharese. 2021. Rethinking race and place: The role of persona in sound change reversal. *Journal of Sociolinguistics* 25. 159–178.

Kobuchi-Philip, Mana. 2009. Japanese 'Mo': Universal, additive, and NPI. *Journal of Cognitive Science* 10. 172–194.

Kockelman, Paul. 2005. The semiotic stance. *Semiotica* 157(1). 233–304.

Kockelman, Paul. 2006. Residence in the world: Affordances, instruments, actions, roles, and identities. *Semiotica* 2006(162). 19–71.

Kotek, Hadas. 2016. On the semantics of wh-questions. *Proceedings of Sinn und Bedeutung* 20. 430–447.

Krifka, Manfred. 1998. Additive particles under stress. *Semantics and Linguistic Theory (SALT)* 8. 111–128.

Kripke, Saul. 1980. *Naming and Necessity.* Cambridge, MA: Harvard University Press.

Kripke, Saul A. 2009. Presupposition and anaphora: Remarks on the formulation of the projection problem. *Linguistic Inquiry* 40(3). 367–386. Transcript of a talk delivered at the conference "Linguistic and Philosophical Approaches to the Study of Anaphora", Princeton University, 1990.

van Kuppevelt, Jan. 1996. Inferring from topics: Scalar implicatures as topic-dependent inferences. *Linguistics and Philosophy* 19(4). 393–443.

Labov, William. 1966. *The Social Stratification of English in New York City.* Washington, DC: Center for Applied Linguistics.

Labov, William. 1978. Where does the sociolinguistic variable stop? A response to Beatriz Lavandera. *Working Papers in Sociolinguistics* 44.

Labov, William, Sharon Ash, Maya Ravindranath, Tracey Weldon, Maciej Baranowski & Naomi Nagy. 2011. Properties of the sociolinguistic monitor. *Journal of Sociolinguistics* 15(4). 431–463.

Lakoff, Robin. 1974. Remarks on 'this' and 'that'. *Chicago Linguistic Society (CLS)* 10. 345–356.

Lambert, W. E., R. C. Hodgson, R. C. Gardner & S. Fillenbaum. 1960. Evaluational reactions to spoken languages. *Journal of Abnormal and Social Psychology* 60(1). 44–51.

Lasersohn, Peter. 1999. Pragmatic halos. *Language* 75(3). 522–551.

Lauer, Sven. 2013. *Towards a dynamic pragmatics*. Palo Alto: Stanford University PhD thesis.

Lenth, Russell V. 2025. *emmeans: Estimated marginal means, aka least-squares means*. https://rvlenth.github.io/emmeans/. R package version 1.10.7-100002.

Levinson, Dmitry. 2008. *Licensing of negative polarity particles yet, anymore, neither, and either: Combining downward monotonicity and assertivity*. Palo Alto, CA: Stanford University PhD thesis.

Levon, Erez. 2014. Categories, stereotypes, and the linguistic perception of sexuality. *Language in Society* 43(5). 539–566.

Lewis, David. 1969. *Convention: A Philosophical Study*. Blackwell.

Lewis, David. 1979. Scorekeeping in a language game. *Journal of Philosophical Logic* 8. 339–359.

Liberman, Mark. 2010. Sarah palin's distal demonstratives http://languagelog.ldc.upenn.edu/nll/?p=2240. Accessed May 1, 2025.

Mahler, Taylor. 2022. *Social identity information in projection inferences: a case study in social and semantic-pragmatic meaning*. Columbus, OH: Ohio State University PhD dissertation.

Malamud, Sophia A. & Tamina Stephenson. 2015. Three ways to avoid commitments: Declarative force modifiers in the conversational scoreboard. *Journal of Semantics* 32. 275–311.

McNally, Louise. 2013. Semantics and pragmatics. *WIREs Cognitive Science* 4. 285–297.

Mendoza-Denton, Norma. 2008. *Homegirls: Language and Cultural Practice Among Latina Youth Gangs.* Malden, MA: Blackwell.

Merin, Arthur. 1999. Information, relevance, and social decisionmaking: Some principles and results of decision-theoretic semantics. In Maarten de Rijke, Lawrence S. Moss & Jonathan Ginzburg (eds.), *Logic, Language, and Computation*, vol. 2, 179–221. Palo Alto: CSLI.

Mohammadi, Maryam & Maribel Romero. 2024. Polar particle in Farsi: Anaphora in the scoreboard model of discourse. *Sinn und Bedeutung* 28. 610–629.

Moore, Emma. 2004. Sociolinguistic style: A multidimensional resource for shared identity creation. *Canadian Journal of Linguistics* 49(3–4). 375–396.

Morris, Charles. 1938. *Foundation of a Theory of Signs.* Chicago: University of Chicago Press.

Morzycki, Marcin. 2012. Adjectival extremeness: degree modification and contextually restricted scales. *Natural Language and Linguistic Theory* 30. 567–609.

Ochs, Elinor. 1992. Indexing gender. In Alessandro Duranti & Charles Goodwin (eds.), *Rethinking Context: Language as an Interactive Phenomenon*, Cambridge, UK: Cambridge University Press.

Ochs Keenan, Elinor. 1976. The universality of conversational postulates. *Language in Society* 5(1). 67–80.

Parmentier, Richard J. 1994. *Signs in Society: Studies in Semiotic Anthropology.* Bloomington, IN: Indiana University Press.

Peirce, Charles Sanders. 1998. *The Essential Peirce, Vol. 2.* Bloomington: Indiana University Press.

Pharao, Nicolai, Marie Maegaard, Janus Spindler Møller & Tore Kristiansen. 2014. Indexical meanings of [s+] among copenhagen youth: Social perception of a phonetic variant in different prosodic contexts. *Language in Society* 43(1). 1–31.

Pistoia-Reda, Salvatore & Louise McNally. 2022. Rhetorically-based scalar-additivity: The view from Italian *addirittura*. *Semantics and Linguistic Theory (SALT)* 32. 463–480.

Podesva, Robert J. 2007. Phonation type as a stylistic variable: The use of falsetto in constructing a persona. *Journal of Sociolinguistics* 11(4). 478–504.

Pope, Emily. 1976. *Questions and Answers in English*. The Hague: Mouton.

Potts, Christopher. 2007. The expressive dimension. *Theoretical Linguistics* 33(2). 165–198.

Qing, Ciyang & Reuben Cohn-Gordon. 2019. Use-conditional meaning in Rational Speech Act models. *Sinn und Bedeutung* 23. 253–265.

Qiu, Zitong. 2013. Cuteness as a subtle strategy: Urban female youth and the online *feizhuliu* culture in contemporary china. *Cultural Studies* 27(2). 225–241.

Ratcliffe, Susan (Ed.). 2017. Paul Valéry, 1871–1945: French poet, critic, and man of letters. In *Oxford essential quotations, 5th edn.*, Oxford, UK: Oxford University Press.

Reese, Brian & Nicholas Asher. 2007. Prosody and the interpretation of tag questions. *Sinn und Bedeutung* 11. 448–462.

Revelle, William. 2011. An overview of the psych package.

Revelle, William. 2024. *psych: Procedures for psychological, psychometric, and personality research.* https://CRAN.R-project.org/package=psych. R package version 2.4.12.

Roberts, Craige. 1996. Information structure in discourse: Toward an integrated formal theory of pragmatics. *OSU Working Papers in Linguistics* 49. 91–136.

Roberts, Craige. 2012. Information structure in discourse: Towards an integrated formal theory of pragmatics. *Semantics and Pragmatics* 5(6). 1–69.

Roberts, Craige. 2017. The architecture of interpretation: Dynamic pragmatics and pragmatic competence. *Analytic Philosophy* 58(4). 418–439.

Roelofsen, Floris & Donka F. Farkas. 2015. Polarity particle responses as a window onto the interpretation of questions and assertions. *Language* 91(2). 359–414.

Romero, Maribel. 2020. Form and function of negative, tag, and rhetorical questions. In Viviane Déprez & M. Teresa Espinal (eds.), *The Oxford Handbook of Negation*, 235–254. Oxford, UK: Oxford University Press.

Romero, Maribel & Chung-Hye Han. 2004. On negative yes/no questions. *Linguistics and Philosophy* 27. 609–658.

van Rooij, Robert. 2004. Cooperative versus argumentative communication. *Philosophia Scientia* 2. 195–209.

Rooth, Mats. 1985. *Association with focus*. Amherst, MA: University of Massachusetts at Amherst PhD thesis.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1. 75–116.

Rosaldo, Michelle Z. 1982. The things we do with words: Ilongot speech acts and speech act theory in philosophy. *Language in Society* 11. 203–237.

Rudin, Deniz. 2018. *Rising above commitment.* Santa Cruz, CA: University of California Santa Cruz PhD dissertation.

Rudin, Deniz. 2022. Intonational commitments. *Journal of Semantics* 39. 339–383.

Rullmann, Hotze. 2003. Additive particles and polarity. *Journal of Semantics* 20(4). 329–401.

Ruys, E.G. 2015. On the anaphoricity of *too. Linguistic Inquiry* 46(2). 343–361.

Sadock, Jerrold M. & Arnold M. Zwicky. 1985. Speech act distinctions in syntax. In Timothy Shopen (ed.), *Clause Structure*, vol. 1 Language Typology and Syntactic Description, 155–196. Cambridge, UK: Cambridge University Press.

Sæbø, Kjell Johan. 2004. Conversational contrast and conventional parallel: Topic implicatures and additive presuppositions. *Journal of Semantics* 21. 199–217.

Sailor, Craig. 2014. *The variables of VP ellipsis.* Los Angeles: University of California Los Angeles PhD dissertation.

Saussure, Ferdinand de. 1983. *Course in General Linguistics.* La Salle, IL: Open Court. Originally published in 1916 in French.

Schmitz, Tijn, Lotte Hogeweg & Helen de Hoop. 2018. The use of the dutch additive particle *ook* 'too' to avoid contrast. *Tijdschrift voor Nederlandse Taal- en Letterkunde* 134(3). 197–219.

Schwenter, Scott & Richard Waltereit. 2010. Presupposition accommodation and language change. In Kristin Davidse, Lieven Vandelanotte & Hubert Cuyckens (eds.), *Subjectification, Intersubjectification, and Grammaticalization* (Topics in English Linguistics 66), Berlin: De Gruyter Mouton.

Sidnell, Jack & N.J. Enfield. 2012. Language diversity and social action: A third locus of linguistic relativity. *Current Anthropology* 53. 302–333.

Silverstein, Michael. 1976. Shifters, linguistic categories, and cultural description. In Henry A. Selby & Keith H. Basso (eds.), *Meaning in Anthropology*, 11–55. University of New Mexico Press.

Silverstein, Michael. 1985. Language and the culture of gender: At the intersection of struc-

ture, usage, and ideology. In Elizabeth Mertz & Richard J. Parmentier (eds.), *Semiotic Mediation: Sociocultural and Psychological Perspectives*, 219–259. Academic Press.

Silverstein, Michael. 1993. Metapragmatic discourse and metapragmatic function. In John A. Lucy (ed.), *Reflexive Language: Reported Speech and Metapragmatics*, 33–58. Cambridge, UK: Cambridge University Press.

Silverstein, Michael. 1998. The uses and utility of ideology: A commentary. In Bambi B. Schieffelin, Kathryn A. Woolard & Paul V. Kroskrity (eds.), *Language Ideologies: Practice and Theory*, 123–143. New York: Oxford University Press. Revised version of an essay originally published in *Pragmatics*, Vol. 2, No. 3 (1992).

Silverstein, Michael. 2001. The limits of awareness. In Alessandro Duranti (ed.), *Linguistic Anthropology: A Reader*, 382–401. Malden: Blackwell.

Silverstein, Michael. 2003. Indexical order and the dialectics of sociolinguistic life. *Language & Communication* 23(3-4). 193–229.

Silverstein, Michael. 2010. "direct" and "indirect" communicative acts in semiotic perspective. *Journal of Pragmatics* 42. 337–353.

Silverstein, Michael. 2023. *Language in Culture*. Cambridge, UK: Cambridge University Press.

Smith, E. Allyn, Kathleen Currie Hall & Benjamin Munson. 2010. Bringing semantics to sociophonetics: Social variables and secondary entailments. *Laboratory Phonology* 1. 121–155.

Solt, Stephanie, Roland Mühlenbernd & Mariya Burbelko. 2025. Social meaning and pragmatic reasoning: The case of (im)precision. *ELM* 3. 371–382.

Stalnaker, Robert. 1998. On the Representation of Context. *Journal of Logic, Language and Information* 7. 3–19.

Stalnaker, Robert C. 1978. Assertion. In Peter Cole (ed.), *Syntax and semantics*, vol. 9, New York: Academic Press.

Stjernfelt, Frederik. 2015. Dicisigns: Peirce's semiotic doctrine of propositions. *Synthese* 192(4). 1019–1054.

Surányi, Balázs. 2007. Focus structure and the interpretation of multiple questions. In Kerstin Schwabe & Susanne Winkler (eds.), *On Information Structure, Meaning, and*

Form: Generalizations across Languages, 228–253. Amsterdam: John Benjamins.

Szabó, Zoltán Gendler & Richmond H. Thomason. 2018. *Philosophy of Language*. Cambridge, UK: Cambridge University Press.

Theiler, Nadine. 2019. When additive particles can associate with wh-phrases. *Sinn und Bedeutung* 23(2). 345–362.

Thomas, William C. 2021. Toward a unified semantics for english *either*. *Semantics and Linguistic Theory (SALT)* 31. 446–465.

Thomas, William C. 2023. English does too have a [REVERSE, +] polarity particle! *Sinn und Bedeutung 27* 641–654.

Tonhauser, Judith, David Beaver, Craige Roberts & Mandy Simons. 2013. Toward a taxonomy of projective content. *Language* 89. 66–109.

Toosarvandani, Maziar. 2014. Contrast and the structure of discourse. *Semantics and Pragmatics* 7. 1–57.

Umbach, Carla. 2010. Strategies of additivity: German additive *noch* compared to *auch*. *Lingua* 122(15). 1843–1863.

Winterstein, Grégoire. 2011. The meaning of the additive *too*: Presupposition and discourse similarity. *International Tbilisi Symposium on Logic, Language, and Computation (TbiLLC) 2009* 322–341.

Winterstein, Grégoire, Regine Lai, Daniel Tsz-hin Lee & Zoe Pei-sui Luk. 2018. From additivity to mirativity: The Cantonese sentence final particle *tim1*. *Glossa* 3(1:88). 1–38.

Winterstein, Gregoire & Henk Zeevat. 2012. Empirical constraints on accounts of *too*. *Lingua* 122. 1787–1800.

Yang, Seojin. 2023. *Language, gender, and identity: The case of* sajiao *communication style*. Columbus, OH: Ohio State University PhD dissertation.

Yang, Zhaole. 2020. *Yě, yě, yě: On the syntax and semantics of Mandarin yě*. Leiden: Universiteit Leiden PhD dissertation.

Yueh, Hsin-I Sydney. 2013. Body performance in gendered language: Deconstructing the mandarin term *sajiao* in the cultural context of taiwan. *Ricerche di Pedagogia e Didattica—Journal of Theories and Research in Education* 8(1).

Zeevat, Henk. 2002. Explaining presupposition triggers. In Kees van Deemter & Rodger Kib-

ble (eds.), *Information Sharing: Reference and Presupposition in Language Generation and Interpretation*, 61–87. CSLI.

Zeevat, Henk. 2012. Objection marking and additivity. *Lingua* 122(15). 1886–1898.

Zeevat, Henk & Katja Jasinskaja. 2007. *And* as an additive particle. In Mixel Aurnague, Kepa Korta & Jesus M. Larrazabal (eds.), *Language, Representation, and Reasoning: Memorial Volume to Isabel Gómez Txurruka*, Universidad del País Vasco.

Zehr, Jeremy & Florian Schwarz. 2018. Penncontroller for internet based experiments (ibex).

Zhang, Qing. 2005. A Chinese yuppie in Beijing: Phonological variation and the construction of a new professional identity. *Language in Society* 34(3). 431–466.

Zimman, Lal. 2013. Hegemonic masculinity and the variability of gay-sounding speech: The perceived sexuality of transgender men. *Journal of Language and Sexuality* 2. 1–39.

Zimmermann, Malte. 2014. *Was glaubt EDE, wer der Mörder ist?* In Daniel Gutzmann, Jan Köping & Cécile Meier (eds.), *Approaches to Meaning: Composition, Values, and Interpretation*, 306–337. Leiden: Brill.