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**ISSUES AND ALTERNATIVES**

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in

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by

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# Gloss Abbreviations

A	Set A agreement marker (ergative/nominative)
B	Set B agreement marker (absolutive/accusative)
CL	Classifier
DEF	Definite article
IMP	Imperfective aspect
NEG	Negation
PFV	Perfective aspect
PL	Plural
PROG	Progressive aspect
REL	Relational noun suffix
SUBJ	Subjunctive
TERM	Terminative aspect
TOP	Topic

I use a subscript  $_F$  as a notational convention to indicate elements which are focused regardless of the how this focus is manifested and SMALL CAPS to indicate intonational focus.

## Abstract

Issues and Alternatives

by

Scott AnderBois

The central topic this dissertation is the semantic relationship between disjunctions, indefinites, and other instances of existential quantification on the one hand and questions on the other. I argue that the former have more in common with the latter than is generally acknowledged and, in particular, that their compositional semantics includes not only truth-conditional information, but also an issue-raising or *inquisitive* capacity. For example, a simple assertion like “Someone left.” not only proposes to rule out the possibility that no one left, it also presents the issue of ‘Who left?’ as a possible direction for future discussion.

This dissertation presents several empirical arguments for this inquisitive capacity and for particular interactions with other elements in the sentence. The most direct argument comes from novel fieldwork on wh- and alternative questions in Yucatec Maya (an indigenous language of Mexico), which consist of focused disjunctions and focused indefinite wh-words respectively. I argue that both patterns can be accounted for under a semantics where disjunctions and indefinite wh-words — across all their uses — make a contribution that is both inquisitive and potentially informative. The (contextually restricted) presupposition of focus is responsible for isolating this inquisitive capacity in questions, thus distinguishing them from assertions.

This Yucatec Maya-based semantics for disjunctions and indefinites sheds light on several puzzles regarding these elements more generally, and in particular, in English. The first of these is the ellipsis process known as Sluicing, which I analyze as the anaphoric retrieval of an issue introduced by prior inquisitive elements. Second, I provide an analysis of subtle differences between positive, negative, and alternative polar questions with *or not*, which makes use of a more structured ‘two-tiered’ semantics for issues. Finally, I provide a semantic/pragmatic account of polar questions with preposed negation in which (double) negation plays the pivotal semantic role, suppressing

inquisitive content within the question itself, thereby providing added emphasis on the truth-conditional information of the proposition itself (i.e. Verum Focus).



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# Chapter 1

## Introduction

The canonical usage of questions is to introduce a set of alternatives (i.e. its possible answers), proposing that one's interlocutors address the issue of which alternative or alternatives in fact hold. The presence of this issue-raising capacity (or inquisitiveness) in the semantics of questions seems inescapable. In this dissertation, I argue that inquisitiveness is also part of the semantics of (many) at-issue assertions in natural language and that its presence or absence has observable empirical consequences. More specifically, I argue that inquisitiveness in both questions and assertions is contributed by disjunctions, indefinites (including *wh*-words), and certain instances of covert existential quantification (e.g. over an event or state argument). In the course of analyzing the empirical effects of inquisitiveness itself, the dissertation also proposes particular compositional interactions between inquisitive content and other sentential operators.

In contrast to the theory developed here, previous literature has generally taken the issue-raising capacity of questions to be more or less unique to questions, and accounted for it using question-specific semantic tools (e.g. assigning questions and assertions different semantic types). The conclusion that the core meaning of questions arises from question-specific means has been reinforced by the fact that in a great many languages (particularly Indo-European ones), questions do make crucial use of words and constructions which are question-specific, i.e. *interrogative* morphosyntax. Since this question-specific meaning can be attributed to question-specific forms, this approach has seemed a natural one and one which allows for the Fregean principle of Compositionality to be obeyed in those languages.

At the same time, however, there are also a great many languages in which questions make crucial use of three elements which also occur in assertions: disjunctions, indefinite *wh*-words, and focus constructions of various sorts. Moreover, many question-specific pieces of morphosyntax show a clear diachronic relationship to these three elements. For example, polar question markers are often historically related to disjunctive coordinators. In the Chapter 2 of this dissertation, I examine polar, alternative, and *wh*-questions in a language in which they consist more or less exclusively of these elements<sup>1</sup>: Yucatec Maya. For example, *wh*-questions such as (1) consist of an indefinite *wh*-word in a preverbal focus position.

- (1) [máax]<sub>F</sub>          uk'                                  le    sa'-o'  
       someone/who drink.AGENT.FOCUS the atole-DISTAL  
       'Who drank the atole (a traditional corn beverage)?'

In order to provide a compositional semantics for *wh*-questions, then, I develop a semantics where indefinite *wh*-words make the same compositional contribution in questions as in assertions. In both cases, the indefinite *wh*-word introduces a set of alternatives meeting certain restrictions and makes two contributions: **(i)** proposes the information that this set is non-empty, and **(ii)** raises the issue of which alternative(s) in the set in fact hold. Questions are distinguished by the fact that (ii) is isolated because questions do not make an informative contribution (compositionally, I will argue that this can be attributed to the presuppositional semantics of the focus construction involved). Assertions with indefinites, on the other hand, contribute not only (i), but also (ii). That is, assertions not only provide truth-conditional information — ideally to address previous questions or issues under discussion — they also help chart the future course of the discourse by pointing out particular issues as potential topics for discussion.

By starting from the perspective of Yucatec Maya, we arrive at a potentially surprising semantics (from an English perspective) where the compositional contribution of indefinites and disjunctions is an alternative-evoking one. In this sense, the account is very much parallel to Kratzer & Shimoyama (2002), which argues for an alternative

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<sup>1</sup>This is not quite true for polar questions, as discussed in §2.4.

semantics for indefinites, in the style of Hamblin (1973)’s semantics for wh-questions.<sup>2</sup> Both accounts examine indefinites/wh-words from the perspective of a language where they have clearly related forms (unlike English), and both argue for a semantics where wh-words have an alternative-evoking core.

While the two theories share this alternative-evoking core, they differ significantly in the conception of alternatives and, correspondingly, in their empirical consequences. In Hamblin semantics, alternatives are simply an element of subsentential composition, with top-level denotations being the same as they are classically unless some higher element intervenes. In contrast, this dissertation argues that the alternatives involved in the composition of indefinites and disjunctions affect the top-level meaning by proposing the issue of which alternative(s) hold as a potential topic for future discussion.<sup>3</sup>

The result is that even a simple sentence with an indefinite such as ‘Someone left.’ is assigned a richer semantics than classical first order logic – or Hamblin semantics approaches – would dictate. The subsequent chapters in the dissertation examine several empirical consequences of this inquisitive potential and its interactions with other elements with which it is combined, such as negation, apposition, and the (disjunctive) polar question operator in English. In Chapter 3, I argue that one direct empirical reflex of the issue-raising capacity of indefinites and disjunctions across languages is their ability to license the ellipsis process Ross (1969) dubbed *Sluicing*, as in (2), whereby the crossed out material is unpronounced yet nonetheless understood.

(2) John talked to someone, but I don’t know who ~~John talked to~~.

I argue that sluicing is best analyzed as the anaphoric retrieval of an issue introduced by a previous inquisitive element (the indefinite *someone* in (2)). More specifically, the ellipsis in the question in (2) is possible if and only if the issue it proposes is identical to a salient one which has been raised in previous discourse. That is, sluicing is sensitive not only to the truth-conditional information of the linguistic

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<sup>2</sup>More recent work by Simons (2005), Alonso-Ovalle (2006), and others has developed a similar semantics for disjunction.

<sup>3</sup>The intuition that disjunctions and indefinites raise issues is present in various forms in other recent work in inquisitive semantics (e.g. Groenendijk (2007), Mascarenhas (2009), Groenendijk & Roelofsen (2009), and Ciardelli (2009)).

antecedent (as Merchant (2001)’s semantic account of sluicing), but also to the issues it raises.

Since the elided material in sluicing is always a question, this predicts that the antecedent material must be inquisitive. This includes not only indefinites, as in (2), but also disjunctions, a fact which has proven problematic for many accounts since first observed by Chung et al. (1995). On the other hand, by referencing inquisitive content, the account successfully rules out doubly negated indefinites as possible antecedents, despite the truth-conditional vacuity of double negation. Similarly, the account readily captures a complex set of interactions between sluicing<sup>4</sup> and apposition which have been, to my knowledge, unnoticed in prior literature. This part of the chapter expands on the account presented in AnderBois (2011), though the core ideas remain the same.

The second half of the chapter addresses the subtype of sluicing known as ‘sprouting’, where there is no overt indefinite or disjunction in the antecedent material, as in (3-4). I argue that such cases can be understood by extending inquisitive quantification beyond overt indefinites/disjunctions to at least certain instances of covert existential quantification, together with Chung (2006)’s lexical identity requirement. In cases like (3), the covert existential quantification is that contributed by the implicit theme argument of the antecedent clause ‘José ate’. In cases like (4), I argue that it is the existentially quantified neo-Davidsonian event argument, with the ellipsis material being felicitous via an accommodation process I dub ‘issue-bridging’ (by analogy with bridging definite descriptions like ‘the driver’ in ‘A bus went by. The driver waved at me.’).

(3) José ate, but I don’t know what José ate.

(4) Bill came to the party, but I don’t know with who ~~Bill came to the party~~.

Chapters 4 and 5 present a detailed examination of polar questions in English, focusing on the four varieties of polar questions in (5).<sup>5</sup> Each of the four varieties seems to be, in some sense, a different way of asking about the same main issue. At the same time, however, each variety conveys subtly different inferences about the questioner’s

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<sup>4</sup>Parallel facts are discussed and analyzed for Verb Phrase Ellipsis in §3.2.3.

<sup>5</sup>The typology of negative polar questions is itself a problematic issue. See §4.1 for discussion and justification of the high/low distinction.



expectations and beliefs. I develop an account where these inferences are derived from pragmatic reasoning based upon a subtly different semantics for the four types. In particular, I argue that the four questions differ in the issues contributed by inquisitive elements inside the question radical, e.g. the indefinite *a student* in the examples in (5).

- |     |   |                        |
|-----|---|------------------------|
| (5) | a. Is Isabel talking to a student?        | POSITIVE (POSQ)        |
|     | b. Is Isabel talking to a student or not? | ALTERNATIVE (ALTQ)     |
|     | c. Is Isabel not talking to a student?    | LOW NEGATION (LONEGQ)  |
|     | d. Isn't Isabel talking to a student?     | HIGH NEGATION (HINEGQ) |

Distinguishing between these questions, I argue, requires a more richly structured view of inquisitive content than is possible under the semantics developed in Chapters 2-3. In Chapter 4, I develop a theory of this sort using a semantics which distinguishes two meaning components, or *tiers*: the *main* ‘yes’/‘no’ issue and a secondary set of alternatives given special prominence, which I term the *projected* issue. This ‘Two-tiered Inquisitive Semantics (TIS)’ allows the inquisitive impact of the indefinite *a student* in (5a) to be retained, but nonetheless assigned a secondary status relative to the main issue.<sup>6</sup>

In Chapter 4, I show that this system allows for an account of (5a-5c) where each question raises the same main yes/no issue. At the same time, the distribution of negation in each variety manipulates the inquisitive content inside the question itself in compositionally predictable ways, resulting in distinct projected issues for the different varieties. For example, the main issue of the POSQ in (5a) consists of a set of two alternatives, as classical Hamblin approach would dictate: { that Isabel is talking to some student or other, that Isabel is not talking to any student }. The secondary issue contributed by (5a) arises compositionally from the indefinite *a student* and consists of a set of alternatives of the form ‘Isabel is talking to *x*’, where *x* is a student. The questions in (5b-5c) contribute the same main issue but differ in their projected issues. For example, the LONEGQ in (5c) projects a set of negated alternatives of the form ‘Isabel isn’t talking to *x*’. The various inferences conveyed by these questions (e.g. the negative bias of the LONEGQ) are argued to arise pragmatically on this basis.

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<sup>6</sup>This is in contrast to the ‘Single-tiered Inquisitive Semantics (SIS)’ of Chapters 2 and 3, in which the inquisitive content of the indefinite is necessarily eliminated.

Whereas (5a-5c) are distinguished by how they compositionally manipulate the projected issue, Chapter 5 argues that HiNEGQs like (5d) are distinguished by their failure to project an issue at all. That is, a HiNEGQ goes out of the way to limit the immediate discourse future to the main issue, in essence conveying that the speaker just wants an answer as to the truth of the main issue. While the idea that HiNEGQs are distinguished by a special emphasis on truth value — i.e. *Verum Focus* — has been proposed previously by Romero & Han (2004), TIS provides a new theory of the content and composition of verum focus, and its relationship to the inferences conveyed by HiNEGQs.

Rather than verum focus adding an additional piece of semantic meaning (truth-conditional or otherwise), verum focus consists of the *elimination* of the alternative-rich structure which assertions ordinarily possess. In terms of compositionality, this allows for an account where negation itself contributes verum focus, rather than a covert VERUM operator.<sup>7</sup> Empirically, this is an important result because, as Romero & Han (2004) show, the connection between (preposed) negation and verum focus is quite persistent. Yucatec Maya underscores this point nicely since there is only one variety of negative polar question (since negation already occurs high in the clause), as seen in (6), and verum focus and concomitant pragmatic properties that also hold of English HiNEGQs are consistently present.

- (6) ma'-wáa t-a beetik ch'uujuk waaj?  
 NEG-wáa PFV-A2 make sweet bread  
 'Didn't you make a cake?'

## Yucatec Maya

The theory at the core of this dissertation is one which arises from the detailed examination of the compositional connections between disjunction, indefinites,

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<sup>7</sup>One consequence of this is that the oft-discussed 'inner'/'outer' distinction cannot be captured as a scope ambiguity inherent to HiNEGQs (an approach suggested by Ladd (1981), and later made explicit by Romero & Han (2004)). Rather than being a shortcoming, however, I argue in §5.1.3 that this is in fact a virtue, by showing 'inner' HiNEGQs arise *only* in the presence of an NPI. That is, I argue empirically that HiNEGQs without polarity items lack any such ambiguity, thereby eliminating the motivation for positing a scopal ambiguity in their logical forms.

and questions in Yucatec Maya (YM). As such, I will provide here some brief background on the language, its speakers, its history, and the fieldwork through which the data described in this dissertation were obtained.

## Demographics and social setting

Yucatec Maya is one of approximately 30 Mayan languages spoken presently in Mesoamerica, principally in Mexico and Guatemala. More specifically, Yucatec Maya is spoken primarily in the Yucatán Peninsula in the states of Yucatán, Quintana Roo, and Campeche. It is also spoken by sizable immigrant communities in the United States, the largest of which is in San Francisco and the greater Bay Area.

While the language studied in this dissertation is known to linguists as Yucatec Maya (or Yukatek Maya), speakers often refer to the language simply as *Maaya* or *Maaya T'aan* ‘Maya speech’. I follow the standard practice among linguists of adding the Yucatec/Yukatek modifier to distinguish the language from other languages in the Mayan family. The choice between the two spellings is a matter of some unclarity, as both are commonly used by linguists presently, with the ‘Yucatec’ spelling seemingly more prevalent. On the one hand, the phoneme /k/ is represented with orthographic ‘k’ in the official standard alphabet, adopted in 1984.<sup>8</sup> On the other hand, many proper names, place names, business names, and other culturally important words are often written using various pre-1984 spelling conventions, almost all of which use the graph ‘c’ to represent the phoneme /k/. In this dissertation, I use the name ‘Yucatec Maya’, as this was preferred by most of the speakers with whom I consulted.<sup>9</sup>

In terms of the number of speakers, Yucatec Maya is one of the most robust of the Mayan languages, spoken by 759,000 people in Mexico as of 2005 (as reported in the *Perfil sociodemográfico de la población que habla lengua indígena*, INEGI (2009)). Roughly 70% of these speakers are in the state of Yucatán with most others being split between Quintana Roo (around 20%) and Campeche (around 10%). In addition, the *Asociación Mayab* (a San Francisco-based community organization) estimates on its website (<http://www.asociacionmayab.org/>) that there are 21,000 immigrants in the

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<sup>8</sup>The orthography of Yucatec Maya, including the adoption of the official alphabet, is described in great detail by Brody (2004) (who also uses the variant with ‘c’).

<sup>9</sup>Thanks especially to María Luisa Góngora for discussion of these issues.

Bay Area with Yucatec Maya as their native language. There are other YM-speaking immigrant communities elsewhere, though I have seen no estimates of the number of speakers in these communities.

While the number of speakers of the language remains relatively high, there is nonetheless reason for concern about the language's long-term health. First, an exceptionally high percentage of speakers of YM also speak Spanish (94.7% overall, 98.5% of 15-29 year olds). There is also a stark gender asymmetry across age groups in the census data, with women representing approximately 2/3 of the monolingual speakers. While bilingualism is not necessarily a sign of language shift, there is economic pressure to speak Spanish (and English). Second, while children are still learning the language, they are doing so with less regularity. All this is to say that while Yucatec Maya will certainly still be spoken to some extent in 2100, and is therefore not endangered according to some metrics, its long-term health beyond that is less than certain.

## My fieldwork

Unless otherwise cited, the data in this dissertation come from primary fieldwork I conducted in two one-month trips to the Yucatán peninsula (during the summers of 2009 and 2010) and in elicitation sessions with two native speaker consultants in San Francisco during the period from 2008-2010<sup>10</sup>. During the first trip to the Yucatán, I conducted fieldwork with native speaker consultants in Oxkutzcab, a town of approximately 25,000 people in the central western part of the state of Yucatán. During the second trip, I returned to Oxkutzcab and also conducted elicitation sessions with native speaker students in the *licenciatura en lingüística y cultura maya* at the Universidad de Oriente in Valladolid, Yucatán (though the students were from all around the peninsula). The data reported in Chapter 2 are from the first trip and the two speakers in SF; the data in chapter 5 were collected during the second trip. All consultants were paid for their participation.

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<sup>10</sup>Of these speakers, one was from a town near Xocen, the other from Mérida.

## Linguistic background

Recent years have seen a flurry of research on Yucatec Maya, including several books and dissertations. Several of these provide overviews of various aspects of the language, including its morphosyntactic properties. As such, I refer the reader to these works for background, and will instead simply discuss particular aspects of the morphosyntax/semantics of Yucatec Maya as they become relevant.

For an overview of the morphosyntactic structures of YM, particularly at the clausal level, the place to start is Ch. 4 of Bohnemeyer (2002). Among earlier works, Blair & Vermont-Salas (1965) also provides a clear and comprehensive picture of the morphosyntax of YM. Other book-length recent works focusing on particular topics in YM morphosyntax include: Lehmann (1998) (nominal syntax and possession in particular), Bohnemeyer (2002) (Aspect/Modal marking and other forms of temporal reference), Lois & Vapnarsky (2003) (morphology), Briceño Chel (2006) (verbal morphosyntax), Verhoeven (2007) (experiential constructions), and Norcliffe (2009a) (relative clauses and related constructions). For a comprehensive phonological sketch of the language, see Frazier (2009).

## Chapter 2

# Questions in Yucatec Maya

The semantic contribution which a question makes to a discourse is plainly different from the contribution which an assertion makes. Whereas an assertion presents some piece of truth-conditional information, a question presents a non-singleton set of alternatives (roughly its answers) and directs the addressee to select one (or more) of these. In many languages, this difference in meaning is reflected directly in the morphosyntactic form that questions take. That is, questions often make use of morphosyntax which is unique to questions, i.e. *interrogative*. The fact that certain sentences of a given language are questions, then, can often be straightforwardly attributed to the presence of interrogative morphosyntax in those sentences.

While interrogative morphosyntax is quite common, there are also several elements across languages which are central to question formation, but whose use is not limited to questions: wh-words with indefinite semantics, disjunction, and focus. For example, wh-questions in many languages are formed from wh-words which function as indefinites elsewhere in the language. Even in cases where question forms are not synchronically the same as these constructions, there is often a clear historical connection. For example, polar question particles often bear a clear diachronic connection to disjunctive coordinators.

In this chapter, we provide an account of wh- and alternative questions in Yucatec Maya (an indigenous language of Mexico), which do not make use of any obvious interrogative-specific morphosyntax. Rather, these questions consist of an indefinite wh-word or disjunction respectively in a focus construction. The challenge we face

then is how to compositionally derive a question denotation (i.e. an appropriate set of alternatives) from these two parts, neither of which individually produces a question meaning.

The account we propose builds on work in inquisitive semantics (most directly, Groenendijk & Roelofsen (2009)) which treats indefinites and disjunctions as evoking sets of alternatives and *latently* raising the issue of which of these alternatives holds. That is, the alternative-evoking core of a question is part of the semantics of these elements in general. In the absence of focus, however, sentences with indefinites and disjunctions not only raise the issue of which alternative holds, they also contribute the truth-conditional information that it's not the case that none of these alternatives holds. The fact that they are (potentially) truth-conditionally informative crucially distinguishes them from questions, which are not informative in this way. Compositionally, a question in our account consists of a set of alternatives produced by an indefinite or disjunction in a syntactic environment which renders these alternatives *uninformative* in a particular sense. Specifically, we argue that focus produces this un informativity by presupposing the informative component of the indefinite/disjunction. Since the indefinite/disjunction's truth-conditional information is already taken to hold, the alternative set and the issue of which alternative holds remain as the sentence's sole at-issue contributions.

In this chapter, we motivate this view of questions as semantically emergent through the detailed investigation of a variety of questions in Yucatec Maya (YM), which involve little to no interrogative morphosyntax. For example, a wh-question in YM consists of two parts: (i) a wh-word which functions as an indefinite in other environments and (ii) a syntactic movement process whose semantic contribution outside of questions is that of a focus (or perhaps cleft) construction. We see this illustrated in (7) where *máax* 'someone/who' is the wh-word and the focus construction is detectable based upon the fronted position of *máax* as well as the appearance of the verb in the so-called 'Agent Focus' (AF) form.

- (7) [máax]<sub>F</sub>            uk'                                    le    sa'-o'  
       someone/who drink.AGENT.FOCUS the atole-DISTAL  
       'Who drank the atole (a traditional corn beverage)?'

Such questions involve two elements — an indefinite wh-word and focus — which occur elsewhere in the language. We derive the fact that it functions as a question based solely on these two elements, without recourse to covert interrogative elements. The indefinite wh-word introduces a set of alternatives, and the focus construction’s presupposition obviates the informative potential which indefinites otherwise have. More striking is the case of alternative questions which consist of a disjunction in the focus/cleft construction as in (8).

**Scenario:** There are two trees in the yard: a mango tree and a papaya tree.

- (8) [le kuul maangooj wáa le kuul puut]<sub>F</sub> t-u ch’ak-aj Juan  
 DEF plant mango OR DEF plant papaya PFV-A.3 chop-STATUS Juan  
 ‘Was it the mango tree or the papaya tree that Juan chopped?’

Unlike in the case of wh-questions, however, a focused disjunction like (8) is able to function either as a question, as in (8), or as a disjunctive assertion, as in (9). The sentence is identical in the two examples<sup>1</sup>, the only difference being the discourse context.

**Scenario:** There are three trees in the yard: a mango tree, a papaya tree, and an orange tree.

- (9) [le kuul maangooj wáa le kuul puut]<sub>F</sub> t-u ch’ak-aj Juan  
 DEF plant mango OR DEF plant papaya PFV-A.3 chop-STATUS Juan  
 ‘It was the mango tree or the papaya tree that Juan chopped.’ (not the orange tree)

In our account, the polyfunctionality of the focused disjunction in (8)/(9) is captured not as an instance of ambiguity or polysemy, but rather as the result of predictable interactions between a single denotation and different contextual restrictions of the existential presupposition introduced by focus. In (8), since the proposed set of alternatives *exhausts* those which are present in the discourse context (as encoded by

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<sup>1</sup>This includes the sentence’s intonation as well. That intonation does not clearly distinguish the uses in (8) and (9) is not surprising given that focus more generally in Yucatec Maya has been shown to lack any particular intonational marking (Avelino (2008), Gussenhoven & Teeuw (2007), Kuegler et al. (2007) *inter alia*). Instead, intonational prominence in Yucatec Maya is given to topic phrases.



Finally, the approach to alternative questions can also be readily extended to polar questions in YM by analyzing the latter as a species of alternative questions where only one disjunct is syntactically present. This, combined with a particular semantics for the unrealized disjunct allows us to account for polar questions with a focused element as in (10). For polar questions, however, there is another potential path to uninformativity: creating a disjunction of the  $p \vee \neg p$  as in (11).

- (11) táan-*wáaj* u yuk'-ik le sa'-o' Juan  
 PROG-OR A.3 drink-STATUS DEF atole-DISTAL Juan  
 'Is Juan drinking the atole?'

## 2.1 Inquisitive Semantics for Disjunction and Indefinites

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Japanese, it is argued to be applicable more generally. Extending it to indefinites in other languages, then, is justified empirically by appeal to phenomena where alternatives exhibit exceptional interactions with other elements elsewhere in the sentence such as free choice effects, exceptional wide scope, and quantificational variability effects.<sup>2</sup>

Parallel arguments have been made regarding disjunction by Aloni (2003), Simons (2005), Alonso-Ovalle (2006), and others. These authors argue that treating disjunction as a set-collector rather than as the classical propositional logic operator,  $\vee$ , allows for appealing accounts of various phenomena such as the problem of free choice permission, quantificational variability, disjunctive counterfactual antecedents, and other effects similar to those found with indefinites. Furthermore, work by Rooth & Partee (1982), Schlenker (2006), and others has shown that these parallels extend to exceptional wide scope as well.

Empirically, these works demonstrate that the alternatives introduced by indefinites and disjunctions exhibit a wide array of non-local interactions which are unexpected under a semantics using only classical predicate logic. Theoretically, they make the persuasive case that these problems can be solved by treating disjunctions and indefinites as set-collectors, with their existential quantificational force being located elsewhere. While the empirical basis for this claim is quite strong for indefinites and disjunctions, the logical language of the Kratzer & Shimoyama (2002) account can also be applied to universal quantification, differing only in how many alternatives are required to hold (the same is true of Alonso-Ovalle (2006)’s account of disjunction *mutatis mutandis*). The nature of alternatives in this system does not preclude the closure operator from being universal rather than existential.

Kratzer & Shimoyama (2002) in fact propose a universal closure operator of exactly this sort for Japanese *-mo*. Outside of Japanese, however, there is little empirical support for such an account of universal quantification. Universal quantifiers do not exhibit quantificational variability, exceptional scope, or other analogous effects.

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<sup>2</sup>While they do not have to invoke alternatives in their composition, dynamic semantic approaches also allow for somewhat analogous non-local interactions by imposing various sorts of constraints on the variable introduced by non-quantificational determiners. The Kamp/Heim analysis of the definite/indefinite distinction is one such example, and various other such constraints for other kinds of indefinites are discussed by Farkas (2002) for different varieties of indefinites.

Even within Japanese, it has been argued by Yamashina & Tancredi (2005) that the purported universal operator (*-mo*) isn't really a universal quantifier at all, but a plural operator of a certain kind. Note also that conjunction similarly lacks behavior parallel to disjunction which would motivate an alternative treatment cross-linguistically. The fact that Hamblin semantics allows for an alternative semantics for conjunction and universal quantification reflects the fact that alternatives in this system are a compositional tool, rather than part of the top-level meaning of sentences, i.e. their Context Change Potential (CCP).

In what follows, we will see that Inquisitive Semantics (Groenendijk (2007), Mascarenhas (2009), Groenendijk & Roelofsen (2009), and Ciardelli (2009) *inter alia*) retains the insight that disjunction (and, by extension, indefinites) introduce alternatives, but treats these alternatives themselves as part of the CCP of assertions. That is, a disjunction or indefinite not only introduces a set of alternatives, but also *raises the issue* of which alternative(s) holds. In Hamblin semantics, an simple assertion containing a wide-scope disjunction happens to have arisen from a compositional process which involves alternatives, but makes the same contribution as a classical disjunction. In inquisitive semantics, such an assertion acts as a multi-alternative proposal to update the common ground, more like what a question does. It is exactly this deep parallel between questions and disjunctions/indefinites which we use in what follows to understand their compositional connection in YM.

Thus far, we have provided a largely conceptual motivation for the shift to inquisitive semantics. Before continuing, we would like to mention some data which have been suggested as support for this view in previous literature. Groenendijk (2007) mentions briefly that disjunctive assertions like (12a) readily allow for elliptical 'secondary responses' like those in (12b). Indefinites like 'someone' allow for similar responses as in (13). In both cases, we can think of the elliptical contributions in (b) as responding to the latent issue introduced by the disjunction/indefinite in (a). Since they are, of course, assertions, the (a) examples do not require such responses (in contrast to questions). However, the use of the overt indefinite or disjunction in (12-13) raises the issue of who murdered Joe latently, which facilitates the elliptical (b) responses.

- (12) a. Bill or Fred murdered Joe.
- b. It was Fred // Yeah, Fred // Fred // Probably Fred
- (13) a. Someone murdered Joe.
- b. It was Fred // Yeah, Fred // Fred // Probably Fred

In contrast, the truth-conditionally equivalent (14) does not readily allow such a response. Less elliptical paraphrases are possible in all of these cases, but are more or less required in (14). Finally, syntactically parallel quantifiers like *every* and *most* similarly do not pattern with disjunctions and indefinites in this way, as seen in (15-16). It is possible that such responses are felicitous given sufficient discourse, but their felicity depends on this context in a way (12-13) do not seem to.

- (14) a. It's not the case that no one murdered Joe.
- b. #It was Fred // #Yeah, Fred // #Fred // #Probably Fred
- (15) a. Everyone talked to John.
- b. #It was Fred, Bill, and Jane // #Yeah, Fred, Bill, and Jane // #Fred, Bill, and Jane
- (16) a. Most students talked to John.
- b. #It was Fred, Bill, and Jane // #Yeah, Fred, Bill, and Jane // #Fred, Bill, and Jane

A full account of the licensing of such secondary responses is beyond the scope of the present work and may well prove far more complicated than this limited data set would suggest. We mention them not as an empirical diagnostic, but merely to sharpen the intuition that disjunctions and indefinites in assertions have a latent issue-raising capacity. That is, assertions containing widest-scope disjunctions and indefinites not only introduce a set of alternatives and assert its non-emptiness, they make salient the issue of which one(s) hold.

### 2.1.1 Atomic formulas and other non-inquisitive connectives

The key technical shift to capture these intuitions is to have a sentence denote a set of *sets* of possible worlds rather than a set of possible worlds (in more intuitive terms, a sentence denotes a set of *alternatives*). In this way, we capture the alternative-evoking nature of disjunction and indefinites within the interpretation of the metalanguage, rather than the translation into the object language as in Kratzer & Shimoyama (2002).<sup>3</sup> As noted in the introduction, then, we make no type-theoretic distinction between questions and assertions; each will denote a set of classical propositions. As we discuss in detail in §2.1.5, this formal step is a natural one given a conception of assertion (Stalnaker (1978), Gunlogson (2001), Farkas (2003), and Farkas & Bruce (2010)) as a *proposal* to update the common ground rather than an actual update. For many sentences, this set will be the singleton set containing one alternative: the classical denotation. We term such sentences (or rather the formulas used to translate them) *classical*, following Groenendijk & Roelofsen (2009).

The remainder of this section presents the rules of semantic interpretation for formulas consisting of atomic formulas, conjunction, negation, and universal quantification. While formulas containing these elements will not necessarily be classical, formulas consisting solely of these elements will be. That is, since these semantic rules do not themselves introduce alternatives, we do not yet see the effect of inquisitiveness at this stage. The semantic rules we present differ from those of Groenendijk & Roelofsen (2009) in two ways. First, while inquisitive semantics is fundamentally concerned with intensions, the semantics we provide are, in a technical sense, extensional. This has the benefit of making explicit the procedure for determining the extension of a given

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<sup>3</sup>Locating alternatives in the metalanguage semantics also has the potential to avoid the technical problem Shan (2004) describes for Kratzer and Shimoyama-style Hamblin semantics. Shan argues that Hamblin semantics overloads free variables by using them for both binding and scope-taking. Empirically, this is problematic for sentences like ‘Who saw nobody’ on the assumption that this involves two free variables: one for the Hamblin alternatives introduced by *who* and one for *nobody* which is bound in quantifier raising. The present approach avoids this pitfall because, as in classical logics, indefinites are translated with a variable locally bound by the existential rather than a free variable. There are, of course, other ways of solving this technical problem (see Shan (2004), Eckhardt (2007) *inter alia*), but it is solved naturally in this framework.

formula in a given possible world, a procedure left implicit in Groenendijk & Roelofsen (2009). The more significant change is that we extend the logic from a propositional one to a first-order predicate calculus.

The motivation for this is, of course, to be able to capture the semantics of quantifiers, in particular the existential quantifier. The natural approach in extending inquisitive semantics to quantifiers is to take the universal quantifier to be a conjunction of unspecified length and the indefinite/existential to be a disjunction of unspecified length. As Groenendijk & Roelofsen (2009) show in detail for disjunction and conjunction, the result of this extension is that existential quantification, but not universal quantification, will introduce alternatives and raise the issue of which alternative holds. The extension we propose is parallel to that proposed by Balogh (2009) for a pair-based (as opposed to set-based) inquisitive semantics. For the sake of simplicity, we assume finite models throughout, avoiding the complications tackled by Ciardelli (2009) for models with infinite domains. Nothing crucial hinges on this decision since Ciardelli’s logic derives the same results for models which are finite.

Atomic formulas (simple version):

$$\mathbf{S1}: \llbracket \mathbf{R}^n(\gamma_1, \dots, \gamma_n) \rrbracket^{\mathcal{M}, g, w} = \{ \{ w' : \langle \llbracket \gamma_1 \rrbracket^{\mathcal{M}, g, w'}, \dots, \llbracket \gamma_n \rrbracket^{\mathcal{M}, g, w'} \rangle \in \llbracket \mathbf{R}^n \rrbracket^{\mathcal{M}, g, w'} \} \}$$

The simple version of the formulation directly returns the set containing the classical denotation. This is exactly the desired result for expressions which are classical. The simple version, however, would not allow us to formulate definitions for other expressions in a parallel fashion. While this is of no empirical consequence for atomic formulas, it will be useful to have uniform definitions across both classical and non-classical expressions (disjunctions and indefinites). Moreover, the simpler formulation would yield different results in the case of universal quantification and conjunction even though these operators do not themselves introduce alternatives. As such, we instead use the more complex but equivalent definition in **S1**.

Atomic formulas (final version):

$$\mathbf{S1:} \llbracket \mathbf{R}^n(\gamma_1, \dots, \gamma_n) \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{for all } w' \in \alpha : \langle \llbracket \gamma_1 \rrbracket^{\mathcal{M},g,w'}, \dots, \llbracket \gamma_n \rrbracket^{\mathcal{M},g,w'} \rangle \in \llbracket \mathbf{R}^n \rrbracket^{\mathcal{M},g,w'}\}$$

The right side of **S1** returns all of the sets of worlds that are such that the classical denotation holds in each world in the set. The material in brackets alone, however, would allow for non-singleton denotations such as  $\{\{w_1, w_2\}, \{w_1\}\}$  where one would-be alternative is properly contained within another. In order to get a set of true *alternatives*, then, we need to take one more step: to eliminate any sets of worlds which are properly contained within another. Following Groenendijk & Roelofsen (2009), we accomplish this by adding the alternative closure operator in (17) outside the brackets as above. Indeed, this alternative closure is needed in all semantic rules which potentially produce non-singleton sets of alternatives (i.e. everything other than atomic formulas and negation). See Ciardelli et al. (2009) for discussion and applications of a version of the logic without ALT.

$$(17) \quad \text{ALT}\mathcal{P} = \{\alpha \in \mathcal{P} \mid \text{for no } \beta \in \mathcal{P} : \alpha \subset \beta\}$$

Like the rule for atomic formulas, the semantic rules for negation, conjunction, and the universal quantifier will similarly not introduce alternatives into the composition. It should be noted that negation in this system can no longer be straightforwardly defined as complementation over the space of possible worlds. Instead, negation requires us to quantify over the alternatives in the negated expression. When the expression being negated is classical, this amounts to set complementation. Something more interesting happens when we negate non-singleton denoting expressions, as examined in §2.1.4.

Negation:

$$\mathbf{S2:} \llbracket \neg\varphi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{for all } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\}$$

When  $\varphi$  and  $\psi$  are classical, conjunction simply returns the singleton set containing the classical denotation as in **S3**. In cases where one or both of the conjuncts itself denotes multiple alternatives, the situation is more complicated. Since these com-

plications are irrelevant for present purposes, we refer the reader to Groenendijk & Roelofsen (2009) (see especially pp. 7-9). Since we will be dealing with indefinites shortly, we will need to extend Groenendijk & Roelofsen (2009)’s propositional logic to a predicate logic. With regards to the universal quantifier, we accomplish this through the rule in **S4**. **S4** treats the universal quantifier as a conjunction of *unspecified* length. Whereas conjunction specifies an exact number of conjuncts, the number of ‘conjuncts’ in a universal quantifier is limited only by contextual domain restriction (and, in a technical sense, by the number of individuals in the domain of the model). Nothing about the linguistic form of universal quantification, however, indicates the number of individuals in the domain of quantification.

Conjunction:

**S3:**  $\llbracket \varphi \wedge \psi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{there is some } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \subseteq \beta \text{ and there is some } \gamma \in \llbracket \psi \rrbracket^{\mathcal{M},g,w} : \alpha \subseteq \gamma\}$

Universal Quantifier:

**S4:**  $\llbracket \forall u \varphi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{for all } d \in \mathcal{D}_e: \text{there is some } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g[u/d],w} : \alpha \subseteq \beta\}$

### 2.1.2 Disjunction

Unlike the above expressions, a disjunction introduces a non-singleton alternative set, raising the issue of which one holds. Recalling that our broader goal is to provide a compositional semantics for *focused disjunctions* in Yucatec Maya, the goal for this section is to provide a semantics for non-focused disjunctions. An example like (18), with a disjunction in the canonical subject position is, like its English translation, unambiguously interpreted as an assertion.

- (18) t-u          yuk'-aj          le   sa'-o'          Juan wáa Daniel  
 PFV-A.3 drink-STATUS the atole-DISTAL Juan OR Daniel  
 ‘Juan or Daniel drank the atole.’

Intuitively, our semantics should deliver two alternatives in this case, one per disjunct. The denotation for (18) that we are trying to derive, then, is a set containing two alternatives: {juan drank the atole, daniel drank the atole}. This is exactly what



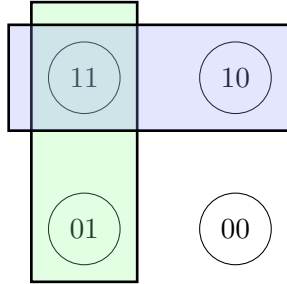
the semantic rule in **S5** provides<sup>4</sup>. In the most basic case where both  $\varphi$  and  $\psi$  are classical, this definition gives us two sets of worlds, one where  $\varphi$  holds and one where  $\psi$  holds. If one or both of the two disjuncts is itself inquisitive, it will return more than two alternatives. As in the above definition, ALT ensures that our alternatives will be true alternatives, precluding alternatives which contain other alternatives.

Disjunction:

$$\mathbf{S5:} \llbracket \varphi \vee \psi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq \mathbf{W} \mid \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \subseteq \beta \text{ or } \exists \gamma \in \llbracket \psi \rrbracket^{\mathcal{M},g,w} : \alpha \subseteq \gamma\}$$

As noted above, the locus of alternatives in this framework is the semantics of the metalanguage rather than the translation into it. Given this, simply associating a formula with a sentence of natural language will not clearly illustrate the inquisitive alternatives. Instead, we can represent the interpretations of sentences pictorially as in (19) where circles represent possible worlds in the model, the numbers within circles are the truth values of two atomic propositions ( $\varphi$  and  $\psi$ ) in that world, and boxes represent distinct alternatives. In cases where the disjuncts are themselves inquisitive rather than atomic, disjunction will collect all of the alternatives in each disjunct. For example  $\llbracket (\psi \vee \varphi) \vee \zeta \rrbracket$  will denote a set of three alternatives, rather than collapsing  $\psi$  and  $\varphi$  into a single alternative.

$$(19) \quad \llbracket \varphi \vee \psi \rrbracket^{\mathcal{M},g,w} =$$




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<sup>4</sup>While we cannot define conjunction in a parallel fashion, as Groenendijk & Roelofsen (2009) point out, we could alternatively define disjunction in terms of set union as in (1).

$$(1) \quad \llbracket \varphi \vee \psi \rrbracket^{\mathcal{M},g,w} = \llbracket \varphi \rrbracket^{\mathcal{M},g,w} \cup \llbracket \psi \rrbracket^{\mathcal{M},g,w}$$

Whereas atomic formulas only contribute truth-conditional information, the semantic contribution of a disjunction can be thought of in terms of two components: an *inquisitive* component and a (truth-conditionally) *informative* component. A disjunction  $\varphi \vee \psi$ , then, is a *hybrid* expression since it contributes to discourse in both ways. Following Groenendijk & Roelofsen (2009) and other work in inquisitive semantics, we call a formula *inquisitive* if and only if its interpretation consists of more than one alternative. Disjunctions, like questions, have such denotations and are therefore considered inquisitive in this sense.

Informativity is defined in terms of whether or not a given formula *eliminates* worlds from the common ground, as in Groenendijk & Roelofsen (2009)’s definition in (20). Crucial here is that the intended notion of informativity is one of *potential* informativity, not actual informativity in a given discourse. A given utterance of a sentence with a disjunction may fail to actually inform a given conversational participant on a particular occasion, but the sentence’s denotation itself may nonetheless be (potentially) informative in the intended sense. That is, the sentence *presents itself* as providing truth-conditional information, even if it happens not to do so in context.

(20) **Informativity (absolute):** A formula  $\varphi$  is *informative* iff :

- (i)  $\bigcup \llbracket \varphi \rrbracket \subset W$  and
- (ii)  $\bigcup \llbracket \varphi \rrbracket \neq \emptyset$

Groenendijk & Roelofsen (2009)’s definition holds that a formula is informative if it picks out a proper subset of the entire logical space. That is, their definition captures a notion of *absolute* informativity. Once we begin to consider presuppositions, however, it is at least as natural to think of informativity not in an absolute sense, but *relative* to the presuppositions linguistically expressed by a sentence. We formulate this notion of relativized informativity as in (21). In words, the definition states that a formula  $\varphi$  is informative relative to a presupposition  $\psi$  if and only if accepting  $\varphi$  will eliminate worlds not from  $W$  — as was the case for absolute informativity — but rather from  $W$  as updated with  $\psi$ .

- (21) **Informativity (relative):** A formula  $\varphi$  is *informative* relative to a semantic presupposition  $\psi$  *iff* :
- (i)  $\bigcup \llbracket \varphi \rrbracket \subset (W \cap \bigcup \llbracket \psi \rrbracket)$  and
  - (ii)  $\bigcup \llbracket \varphi \rrbracket \neq \emptyset$

In conceiving of the meaning of a sentence as its context change potential, it makes sense to think of whether or not a sentence is informative in terms of whether the context *change* it proposes is potentially informative. Crucially, here, we conceive of informativity as being relative to the linguistically expressed presuppositions (i.e. *semantic* presuppositions). What matters for these purposes is the informational exchange *potential* of the sentence itself, not the information it happens to provide when applied to any given context.

Since inquisitiveness and informativity are orthogonal to one another, Groenendijk & Roelofsen (2009) define labels for the four logically possible categories of formulas, as in (22). While the names ‘Question’ and ‘Assertion’ are clearly intended to evoke certain speech acts, for Groenendijk & Roelofsen (2009), they are simply labels for classes of formulas having particular formal properties.

- (22) **Groenendijk & Roelofsen (2009)’s 4 categories:**

	Inquisitive	Uninquisitive
Informative	Hybrid	Assertion
Uninformative	Question	Insignificant

In what follows, we will argue that the *speech acts* of Question and Assertion can be *semantically* defined on this basis, as in (23), with one important addendum to be discussed in §2.4.4. This definition, which we term the ‘Inquisitive Principle’, does not define what it means to function as a question or as an assertion, but simply which sentences will fall into which category.

This principle, then, does work that is done *syntactically* in classical question semantics (as well as Kratzer & Shimoyama (2002)) by assigning the two different types: *st* for assertions and either *stt* (Hamblin) or *sst* (Groenendijk & Stokhof) for questions.

(23) **Inquisitive Principle (provisional):**

	Inquisitive	Uninquisitive
Informative	Assertion	Assertion
Uninformative	Question	Assertion

It seems obvious that a sentence which provides truth-conditional information, but raises no issues, should function as an assertion, as Groenendijk & Roelofsen (2009)’s labeling indicates. Similarly, a sentence that introduces alternatives, but provides no truth-conditional information, should clearly function as a question. The only part of this chart which could conceivably be otherwise, it seems, are the cells representing sentences which are both inquisitive and informative (hybrid) or both uninquisitive and uninformative (insignificant). In terms of natural language, the facts are quite clear: a sentence with a widest scope disjunction or a non-disjunctive tautology both function in discourse like assertions.<sup>5</sup> In more theoretical terms, this makes sense since the primary purpose of conversation is the exchange of *information*. A question is a useful and necessary part of this exchange, but only because it directs one’s interlocutors to disclose particular pieces of truth-conditional information.

### 2.1.3 Indefinites

Like disjunctions, indefinites are hybrid expressions which are both inquisitive and informative. They raise the issue of which  $x$  satisfy  $\varphi$  and propose to eliminate worlds from the common ground where there is no  $x$  satisfying  $\varphi$ .

Indefinite:

$$\mathbf{S6:} \llbracket \exists u \varphi \rrbracket^{\mathcal{M}, g, w} = \text{ALT} \{ \alpha \subseteq W \mid \text{there is some } d \in \mathcal{D}_e \text{ s.t. } \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M}, g[u/d], w} : \alpha \subseteq \beta \}$$

As with disjunctions, sentences with widest scope indefinites are interpreted as assertions according to the principle in (23). A sentence with an indefinite, like (24), introduces one alternative per  $d$  in  $\mathcal{D}_e$  (modulo contextual restriction). Like we saw

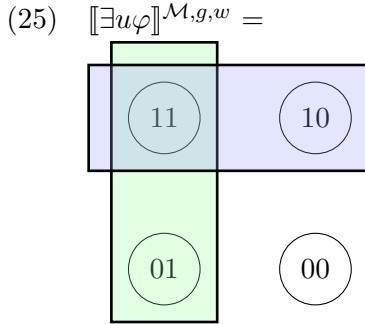
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<sup>5</sup>Disjunctive tautologies also function as assertions, contrary to the definition in (23). See §2.4.4 for a refined version of the Inquisitive Principle which addresses these.

with the semantic rule for the universal quantifier vis à vis conjunction, the rule for the existential treats it as a disjunction of an unspecified number of disjuncts. Whereas a disjunction is linguistically restricted to a specific number of alternatives, an indefinite introduces an alternative set whose cardinality is limited only by contextual restriction and the number of individuals in the model.

- (24) yan máax t-u yuk'-aj le sa'-o'  
exists someone/who PFV-A.3 drink-STATUS the atole-DISTAL  
‘Someone drank the atole’

Assuming a model with only two individuals, Juan and Daniel, the indefinite will have the same denotation as the disjunction in (25).



This semantics treats a sentence with a widest scope indefinite as a proposal to update the common ground with a non-singleton set of alternatives. As a result such a sentence proposes a change to the common ground along two different dimensions: truth conditional information and issues. In the spirit of dynamic semantics, then, the semantic content of a sentence is modeled not only in terms of its truth conditions but as its context change potential (CCP), i.e. a function from input contexts to output contexts. Whereas CCP in dynamic semantics consists of truth conditional information and discourse referents, for us, a sentence’s CCP consists of truth conditions and issues (what Groenendijk & Roelofsen (2009) dub the sentence’s ‘information exchange potential’).

Since our semantics is not limited to truth conditions, we need a definition of truth, as in dynamic semantics. Specifically, a set of alternatives will be true if and only if there is some alternative which holds in the world of evaluation, as in

(26). Equivalently, we could say that a formula is true iff the union of its alternatives contains the world of evaluation. Our definition for truth, then, does roughly the work that clause-level existential closure does in Kratzer & Shimoyama (2002), but locates the existential force in the interpretive system, rather than in the logical form itself.

- (26) **Definition of truth:**  $\varphi$  is true relative to a world  $w$  and a model  $\mathcal{M}$  and an assignment  $g$  iff  $\exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w}: w \in \beta$

#### 2.1.4 Non-inquisitive Closure

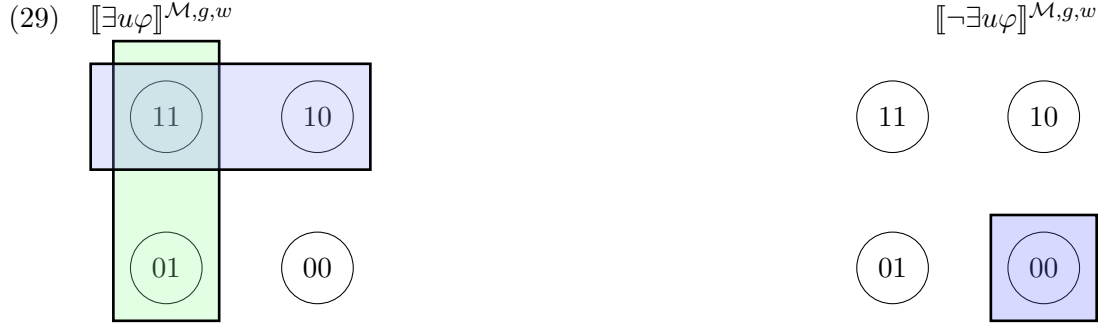
We have seen that disjunctions and indefinites both have the capacity to introduce new alternatives in a discourse, raising the issue of which holds. It's not the case, however, that all sentences containing one of these elements are inquisitive. For instance, an indefinite within the semantic scope of negation no longer intuitively raises an issue, even latently. Again, this intuition can be strengthened by the fact that secondary answers, as in (27), are infelicitous on the narrow scope reading of the indefinite (indeed, we would take such responses to disambiguate in favor of the wide-scope reading).

- (27) a. It is not the case that a student met Fred.  
 b. #It was Bill // #Yeah, Bill // #Bill // #Probably Bill

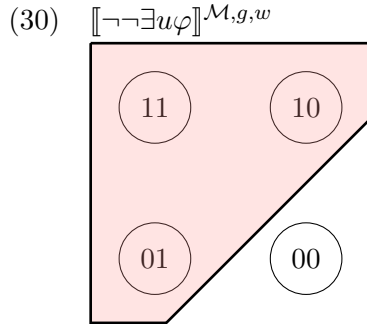
The fact that it is only *widest scope* indefinites which raise issues follows formally from the semantic rule for negation, repeated in (28).

$$(28) \quad \llbracket \neg \varphi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{for all } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w}: \alpha \cap \beta = \emptyset\}$$

This definition ensures that no matter how many alternatives are in  $\llbracket \varphi \rrbracket$ ,  $\llbracket \neg \varphi \rrbracket$  will only contain one alternative (recalling again that alternative closure gives us the *maximal* set of worlds where no alternative in  $\llbracket \varphi \rrbracket$  holds). We saw this above for the negation of an atomic formula, but it similarly holds for the negation of a disjunction or indefinite, (29).



Since negation always returns only a single alternative, double negation is no longer vacuous.  $\llbracket \neg\neg\varphi \rrbracket$  has the same informative component as  $\llbracket \varphi \rrbracket$ , but eliminates the inquisitive component as seen in (30). Double negation necessarily preserves truth-conditional meaning, but not the overall context change potential of a sentence. This is parallel to the effect of double negation in most dynamic logics (e.g. Brasoveanu (2007)’s ‘anaphoric closure’) which preserves truth conditions, but eliminates discourse referents introduced within the formula to which it applies.<sup>6</sup> Since these properties of double negation will be useful to us in subsequent sections, we can define, following Groenendijk & Roelofsen (2009), a non-inquisitive closure operator  $!$  as in (31). While non-inquisitive closure can be defined in terms of double negation, it can also be defined more directly as in the rightmost formula in (31).



Non-inquisitive closure (!):

$$(31) \quad \llbracket !\varphi \rrbracket := \llbracket \neg\neg\varphi \rrbracket = \{ \cup \llbracket \varphi \rrbracket \}$$

---

<sup>6</sup>While this property holds of most dynamic logics, it makes the wrong prediction with respect to anaphora to doubly negated indefinites. See Krahmer & Muskens (1995) for discussion of the data and a potential solution.

As the name describes, non-inquisitive closure of a formula  $\varphi$  returns a singleton set with a single alternative comprised of all of the worlds contained in any of the alternatives in  $\varphi$  and no others. For any  $\varphi$ , then,  $!\varphi$  has the same informative component as  $\varphi$  but with the inquisitive component eliminated. The inquisitive closure operator, then, allows us to capture formally the asymmetry noted above in (13-14) between a sentence with an overt indefinite in (32) and a truth-conditionally equivalent one with double negation, as in (33).

- (32) a. Someone murdered Joe.  
 b. It was Fred // Yeah, Fred // Fred // Probably Fred  
 c. Someone murdered Joe  $\rightsquigarrow \exists x.murder'(x, j)$
- (33) a. It's not the case that no one murdered Joe.  
 b. #It was Fred // #Yeah, Fred // #Fred // #Probably Fred  
 c. It's not the case that no one murdered Joe  $\rightsquigarrow !\exists x.murder'(x, j)$

### 2.1.5 Assertion and the common ground

Concomitant with this shift in the semantics of indefinites and disjunctions is a shift in our notion of common ground. Just as our denotations comprise both issues and information, so too will our common ground. As noted above, this shift is parallel to the move in dynamic semantics to retain in the discourse context any anaphoric information from previous sentences.

While it does not necessarily *follow* from the formal tools sketched thus far, the current semantic framework is a natural fit with a theory of assertion as a *proposal* to update the common ground rather than an actual update (Stalnaker (1978), Gunlogson (2001), and Farkas & Bruce (2010) *inter alia*). Empirically, Farkas & Bruce (2010) motivate such a theory with the fact that at-issue assertions, like questions (and unlike presuppositions and appositives) allow for the addressee to respond using particle answers like *yes*, *yeah*, and *no*, as in (34). Questions and at-issue assertions differ with respect to whether or not such a response is necessary, but both permit such responses.

- (34) a. Anne: Sam is home.  
 b. Ben: Yes // Yeah, he's home // No, he isn't home



For Farkas & Bruce (2010), questions and assertions differ at least in that the former are proposals which necessarily contain multiple alternatives while the latter necessarily denote proposals of a single alternative. At the same time, however, the empirical observation in (34) demonstrates one way in which questions and assertions are more similar than has been previously assumed by many researchers. Both are proposals to update the common ground, subject to the addressee’s response. Inquisitive semantics capitalizes on this conception of assertion, modeling both questions and assertions as sets of sets of possible worlds (i.e. of type *stt*). Building on Farkas & Bruce (2010), we hold that not only questions, but also assertions with widest scope disjunctions or indefinites put forth a non-singleton set of alternative ways to update the common ground. Empirically, we have already seen that the availability of secondary answers in (12) and (13) supports such a view.

Whether a given denotation will behave as a question or an assertion, then, is no longer predictable based solely on the number of alternatives in the proposed update. Instead, the difference between an assertion and a question in our account hinges on whether or not a response is required to eliminate worlds from the context set. In a question, the proposed update *exhausts* the space of possible worlds, meaning the update will only *eliminate* worlds from the context set if the addressee provides some sort of *answer* to the question (roughly speaking, identifies a proper subset of the set of alternatives as live options). In contrast, an assertion containing an indefinite,  $\exists x.\varphi(x)$  proposes to update the common ground with an alternative of the form  $\varphi(x)$ . Here, accepting the entire set of alternatives is itself *informative*, since doing so eliminates the worlds where there is no such  $x$ . An assertion with no inquisitive elements, then, is a special case where the proposed update contains a single set of possible worlds, and accepting the proposal would eliminate worlds where this alternative does not hold.

## 2.2 Focused Disjunctions in Yucatec Maya

In §2.1, we developed a theory of the semantics of inquisitive elements (indefinites/ disjunctions) where, in addition to their classical contribution, they introduce a set of alternatives and latently raise the issue of which alternative(s) in this set hold. The semantics of disjunctions and indefinites, then, contains a certain inquisitiveness

at its core. The rest of the paper sets out to tackle the empirical challenges raised in the introduction by questions in Yucatec Maya, which involve little to no question-specific morphosyntax. The analysis we develop derives the questioning nature of these sentences from interactions between this inquisitive semantics for indefinites and disjunctions and the independently observable semantics of focus.

The approach we take holds that questions consist of two main components: (i) a disjunction/indefinite which contributes both *informative* and *inquisitive* components and (ii) a focus construction which obviates the informative component by presupposing it to already hold. The account, then, will make crucial use of a revised *relative* definition of informativity spelled out in §2.1. In particular, we claim that the informativity to which the inquisitive principle refers is computed relative to an existential presupposition we attribute to the focus/cleft construction. Crucially, this existential presupposition is subject to contextual restriction, allowing the context to play a limited role in determining whether certain sentences function as questions or assertions.

For wh-questions, to be discussed in §2.3, this allows us to explain how questions are constructed compositionally without positing covert morphology. Given the parallels explored above between indefinites and disjunctions, we can also make sense of why focused disjunctions in Yucatec Maya can be interpreted as questions. At the same time, however, the differences between indefinites and disjunctions allow us to predict that, unlike focused indefinites, focused disjunctions can also function as assertions depending on the contextual restriction of the sentence’s presupposition. The remainder of §2.2 explores these interactions in detail. §2.4 extends the account to positive polar questions in YM, analyzing them essentially as covert alternative questions.

### 2.2.1 Questions, assertions and focused disjunctions

As we saw in (8-9), repeated in (35-36), a single Yucatec Maya sentence with a focused disjunction can function either as a question or as an assertion depending on the context. It should be noted that this construction appears to be the only way to form an alternative question in YM<sup>7</sup>; there is no alternative question construction apart

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<sup>7</sup>One further way in which focused disjunctions in YM appear similar to English alternative questions is that they convey the inference that at most one of the alternatives holds. The source and nature of this inference in English is an active area of research, and the situation in YM is no clearer. The

from focused disjunctions.

**Scenario:** There are two trees in the yard: a mango tree and a papaya tree.

- (35) [le kuul maangooj *wáa* le kuul puut]<sub>F</sub> t-u ch'akaj Juan  
 DEF plant mango OR DEF plant papaya PFV-A.3 cut-STATUS Juan  
 'Was it the mango tree or the papaya tree that Juan chopped?'

**Scenario:** There are three trees in the yard: a mango tree, a papaya tree, and an orange tree.

- (36) [le kuul maangooj *wáa* le kuul puut]<sub>F</sub> t-u ch'ak-aj Juan  
 DEF plant mango OR DEF plant papaya PFV-A.3 chop-STATUS Juan  
 'It was the mango tree or the papaya tree that Juan chopped.' (not the orange tree)

While this limited context sensitivity holds of disjunctions in the focus/cleft position, it is important to note that this does not hold of disjunctions in general in the language. Disjunctions which are not in the focus/cleft position function only as disjunctive assertions, just like their English translations. For example, a disjunction in argument position, as in (37), can only be interpreted as an assertion regardless of context.

- (37) t-u yuk'aj le sa'o' Juan wáa Daniel  
 PFV-A.3 drink DEF atole-DISTAL Juan OR Daniel  
 'Juan or Daniel drank the atole.'

Since this is so, we have no apparent reason to expect that the behavior of focus/clefted disjunctions in YM is due to a peculiarity of disjunction in the language more generally. Rather, all available evidence suggests that disjunction behaves the same in essential respects as in English, Spanish, and other well-studied languages. The possibility of interpretation as a question, then, arises as a result of the interaction of this semantics with that of the focus/cleft construction. We see this illustrated below in (38-39) with a focus/clefted version of (37).

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semantics we develop does not capture this inference. See Groenendijk & Roelofsen (2009) for discussion of this inference and a pragmatic account deriving from a semantics similar to the current account.



### 2.2.2 Focus/cleft position in Yucatec Maya

The term ‘focus’ in the semantic literature has been used to refer to a host of constructions across languages with arguably different semantics (see Kiss (1998) for discussion of differing notions of focus). This section aims only to characterize the aspect of the Yucatec Maya focus/cleft construction which we claim is relevant for questions: its existential presupposition. We remain agnostic on the issue of what other semantic contributions the focus/cleft may have (e.g. Roothian alternatives). Compare the sentence in (40), which has an ordinary, non-inquisitive element in the focus position, with its unfocused counterpart in (41).

- (40) [Juan]<sub>F</sub> uk' le sa'-o'  
 Juan drink.AGENT.FOCUS the atole-DISTAL  
 'It was Juan who drank the atole.'
- (41) Juan-e' t-u yuk'-aj le sa'-o'  
 Juan-TOP PFV-A3 drink-STATUS DEF atole-DISTAL  
 'Juan drank the atole.'

Morphosyntactically, there are several differences between (40) and (41) which indicate the presence of focus in (40) but not in (41). First, the focused element (the agent *Juan*) surfaces in preverbal position with no topic marking. Second, since the focused element is the agent, the verbal complex appears in the so-called ‘Agent-Focus (AF)’ form. As in other Mayan languages, ‘Agent Focus’ is the name given to a special construction which arises in questions/focus and in relative clauses when the ergative argument is focused/relativized. Unlike in other Mayan languages, in Yucatec Maya this construction is not expressed by an Agent Focus morpheme, but rather by (i) the omission of the otherwise obligatory aspectual marker and the set A (nominative/ergative) agreement marker and (ii) the appearance of the verb itself without the so-called ‘status’ suffix, *-aj*.

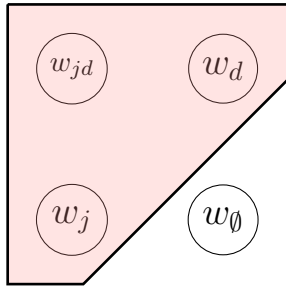
One complication worth noting is that Agent Focus in YM is subject to gradient realization based upon many different factors (see Norcliffe (2009b) for a detailed investigation and Gutiérrez-Bravo & Monforte (2009) for a different perspective). While it is essentially obligatory in basic question/focus examples like (40), it is far from obligatory in relative clause examples. Additionally, Norcliffe (2009b) argues that the presence of

Agent Focus becomes less preferred in certain types of more complicated examples even in the question/focus construction. All this is to say that while the presence of AF diagnoses focus, its absence does not necessarily indicate the lack of focus.

Semantically, (40) differs from (41) at least in that it bears an existential presupposition. Crucially, we analyze this existential presupposition as a classical existential quantifier rather than an inquisitive one. That is, the focus/cleft construction in (40) presupposes the truth-conditional *information* that there is some individual who drank the atole, but not that this individual's identity is previously at-issue in the discourse. While it does not presuppose this, it is certainly consistent with such a scenario and, indeed, this is a common use of the focus/cleft position (much like intonationally marked focus in English). However, the focus/cleft construction is also possible in uses without this issue under discussion in any obvious way such as corrections, contrast, and association with presumably focus-sensitive operators like *cheen* 'only'. Broadly speaking, the focus/cleft construction has the same range of uses as intonational focus in English, not *it*-clefts.

Given this, we can formalize the presupposition of (40) as in (42) where  $!$  is the non-inquisitive closure operator defined in §2.1.4. For ease of exposition, we assume a model with only four worlds ( $w_{jd}$ ,  $w_j$ ,  $w_d$ ,  $w_\emptyset$ ) differing only in the truth values of the two propositions corresponding to 'Juan drank the atole' and 'Daniel drank the atole'. We indicate this with subscripts on worlds indicating the exhaustive list of who drank the atole in that world.

(42) Presupposition of the Focus/Cleft for (40):  $!\exists x:\text{drink-atole}'(x)$

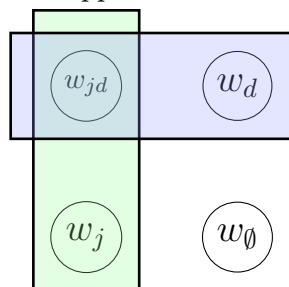


We have claimed that the existential presupposition for the Yucatec Maya focus/cleft should be captured in the logic with a classical existential quantifier, rather than an inquisitive one. Having introduced inquisitiveness into our logical language, how-

ever, there is no principled reason why a language should not have a presupposition which is itself inquisitive. Indeed, the English *it*-cleft seems to be such a construction. A sentence like (43) is felicitous only in contexts where the issue of who drank the atole had been active in the discourse (or the speaker wishes this to be accommodated), as encoded in the presupposition in (44).

(43) It was John who drank the atole.

(44) Presupposition of the *it*-cleft for (43):  $\exists x:\text{drink-atole}'(x)$



This idea is closely related to Kripke (2009)’s idea that *it*-clefts presuppose something like a question under discussion in the prior linguistic context. In the approach currently being sketched, the presupposition is not a question per se, but is nonetheless inquisitive. This also puts some teeth on intuitions expressed by Geurts & van der Sandt (2004) and others that the presupposition of the English *it*-cleft is somehow ‘more robust’ or ‘more anaphoric’ than the presupposition of other focus constructions. Its presupposition is more robust than that of the Yucatec Maya focus/cleft in that the latter has a presupposition which consists solely of truth-conditional information, rather than the hybrid one we ascribe to the *it*-cleft. As we will see in §2.2.5, this difference in the presuppositional semantics helps explain why a disjunction in the pivot of an English *it*-cleft cannot function as a question regardless of context.<sup>8</sup>

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<sup>8</sup>For some types of *it*-clefts, the picture may be more complicated. For example, in what den Dikken (2009) terms CONTINUOUS-TOPIC *it*-CLEFTS like (1), the presupposed question is something like ‘Why do you know Brian’s book?’ not ‘What got you interested in clefts?’. Here too, though, the presupposition of the *it*-cleft nonetheless appears to be an inquisitive one distinct from the purely informational one we attribute to the YM focus/cleft construction.

- (1) a. Do you know Brian’s book?  
b. Yes, in fact, it was Brian’s book that got me interested in clefts.

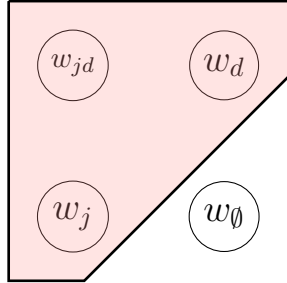




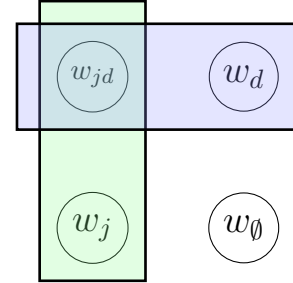
(45) (left) contains a single alternative comprised only of worlds where Juan or Daniel drank the atole. The at-issue content (right) introduces multiple alternatives but does not propose to eliminate worlds present in the presupposed input. The proposed update to the common ground, then, is not informative relative to the presupposed input state. The only at-issue contribution of the sentence is the inquisitive one the disjunction makes. Since the proposal is uninformative and inquisitive, it is predicted correctly to function only as a question in this context according to the ‘inquisitive principle’ in (23).

(46) Presupposition (left) and at-issue (right) semantics for (45):

Presupposition:  $\llbracket !\exists x:\text{drink}'(x) \rrbracket$



At-issue:  $\llbracket \text{drink}'(\text{juan}) \vee \text{drink}'(\text{daniel}) \rrbracket$



Since the input state indicated in the (contextually restricted) existential presupposition consists solely of worlds where at least one of Juan and Daniel drank the atole, the focused disjunction in (45) is predicted to uniformly function as a question in this context. The question interpretation emerges from the combination of two independently motivated semantic parts: (i) the inquisitive semantics account of disjunction and (ii) the non-inquisitive existential presupposition of the YM focus cleft.

#### 2.2.4 Usage as an Assertion

The account of questioning uses of focused disjunctions relied crucially upon the relationship between the worlds contained in the alternatives of the disjunction and those which were present in the contextually restricted existential presupposition of the focus/cleft. This limited context-dependence predicts that the same sentence will not necessarily function as a question in all contexts. We saw this demonstrated above in (39), repeated as (47).

(47) [Juan wáa Daniel]<sub>F</sub> uk' le sa'-o'  
 Juan OR Daniel drink.AGENT.FOCUS DEF atole-DISTAL  
 'It was Juan or Daniel who drank the atole.'

To capture this formally, assume a model where, in addition to the four worlds above, there is another world,  $w_m$ , where Juan and Daniel did not drink the atole, but Maribel did.<sup>9</sup> As seen in (48), the at-issue component of the assertion reading is the same as the question reading in (47). The only difference is the contextual restriction of the existential presupposition.

Presupposition:  $\llbracket !\exists x:\text{drink}'(x) \rrbracket$

At-issue:  $\llbracket \text{drink}'(\text{juan}) \vee \text{drink}'(\text{daniel}) \rrbracket$

38

While the at-issue proposal remains the same in this scenario, (39) is *informative* in this scenario because it proposes to eliminate  $w_m$  from the presupposed input state. According to the interpretive principle in (23), then, (39) is correctly predicted to be interpreted as an *assertion* in this context because it is both inquisitive and informative relative to the presupposed input state (like an ordinary disjunction). It should be noted that like an ordinary disjunctive assertion, the focused disjunction in this context still *allows* the addressee to respond by selecting one of the two alternatives (Juan or Daniel). As with ordinary disjunctions in Yucatec Maya and in English, however, the utterance produces no obligation to provide such a response.

Stepping back a bit, we see that focused disjunctions in YM at first blush appear to be *ambiguous* between two readings: a question reading and an assertion reading. In our account, however, the multifunctionality of focused disjunctions is not an instance of ambiguity at all. Rather, it results from the interaction of a hybrid semantics for disjunction and an informative presupposition contributed by the focus/cleft construction. The variation between the two scenarios arises because of ordinary contextual restriction of this existential presupposition and an independently necessary principle defining illocutionary questions and assertions.

It is worth contrasting this result with what happens in the case of an ordinary, non-focused disjunction, as in (49).

- (49) t-u          yuk'-aj          le   sa'-o'          Juan wáa Daniel  
 PFV-A.3 drink-STATUS the atole-DISTAL Juan OR Daniel  
 'Juan or Daniel drank the atole.'

Here, the proposed output state is the same as in the corresponding focused disjunctions, consisting of two alternative propositions: that Daniel drank the atole and that Juan drank the atole. Without the focus/cleft construction, the sentence imposes no semantic presuppositions on the prior context. The disjunction's contribution is therefore potentially informative and predicted correctly to function as a (hybrid) assertion regardless of context. Even though this update may happen to be uninformative to a given discourse participant, the sentence's semantics itself does not ensure that this will be so.

## 2.2.5 Beyond Yucatec Maya

The analysis we have provided derives the potentially surprising interaction between discourse context and the interpretation of focused disjunctions in Yucatec Maya from quite general semantic principles. As such, it is worth stepping back to consider why the pattern we have seen here is not attested in all languages, in particular, in English. The sentences we have considered in YM are composed of two components: (i) disjunction and (ii) the focus/cleft construction. One might well wonder, then, why a sentence like (50) plainly does not function as a question in the scenario where it is uninformative, but rather is infelicitous.

**Scenario A:** Addressee and speaker both agree that one of the speaker’s two brothers (Juan and Daniel) drank the soda that had been on the table.

(50) #It was Juan or Daniel who drank the soda.

There are (at least) three reasons in principle we might consider for why we might not find this pattern in English. First, the combination of focus/cleft construction and disjunction might not be possible for independent reasons. Second, the semantics of disjunction might be different in English than YM. Third, the semantics of the focus/cleft construction in question might be different.

The first reason clearly cannot be the explanation for the observation that (50) is not a question, since a disjunction clearly is possible in the pivot of an *it*-cleft. The second explanation also seems unlikely. The inquisitive semantics we motivated for disjunction in YM was originally proposed to capture facts about English, and there is no evidence outside of the focus/cleft construction that disjunction in YM behaves any differently.

We do, however, have independent reason to think that the presupposition of the *it*-cleft is quite different than that of the YM focus/cleft, as argued in §2.2.2. Central to the questioning use of the focused disjunction in YM was the fact that the presupposition of the focus/cleft was solely informational, not inquisitive. The disjunction in this scenario is felicitous because the *inquisitive* component of its at-issue contribution moves the discourse forward. Since the *it*-cleft makes an inquisitive

presupposition, the at-issue contribution of the disjunction will be the same as the presupposition, as in (51). Intuitively, the at-issue contribution of (50) is not informative in this scenario, but it is also *not inquisitive* relative to its presupposition.

(51) Presupposition (left) and at-issue (right) semantics for (50)

Presupposition:  $\llbracket \exists x:\text{drink}'(x) \rrbracket$

At-issue:  $\llbracket \text{drink}'(\text{juan}) \vee \text{drink}'(\text{daniel}) \rrbracket$



The other obvious candidate for an English sentence which would combine disjunction and a focus/cleft construction would be an intonationally focused disjunction as schematized in (52). While we can annotate such a sentence using a subscript  $_F$ , it is not clear whether there is an actual way to pronounce the string in (52) with the focus indicated. We can clearly focus either disjunct, the disjunctive coordinator itself, or various combinations of these. However, it is not clear *prima facie* if any of these options actually realizes the schematization in (52). If this is right, then, this would be an instance of the first of the three possible explanations we gave above — the combination of disjunction and intonational focus is not possible for independent reasons.

(52)  $[\text{Juan or Daniel}]_F$  drank the soda.

Alternatively, if there does turn out to be a particular intonational pattern which can realize the schematization in (52), there is another way in which intonational focus in English has been argued to differ from our characterization of the YM focus/cleft: it might lack a *semantic* presupposition altogether. The issue of whether or not English intonational focus contributes an existential presupposition is a matter of recent debate, and we do not intend to settle the matter here. However, one view proposed recently by Abusch (2010) is that the literal semantic contribution of intonational focus in English is a set of Roothian focus alternatives, with the existential inference

arising pragmatically. Under such a view, a focused disjunction in English would be predicted to behave just like an unfocused one with respect to the Inquisitive Principle since it lacks a true semantic presupposition.

## 2.3 Wh-Questions

Thus far, we have developed an account of the alternation focused disjunctions exhibit between functioning as a question and as an assertion. In our account, this alternation comes about through the relationship between the disjunction and the contextually restricted existential presupposition. Specifically, the alternation arose because disjunction introduces an alternative set of a *specified* number of alternatives. Because the number of alternatives specified in this set may or may not be a proper subset of those expressed by the existential presupposition, the focused disjunction may function as an assertion or a question. In this section, we extend the account to focused indefinite wh-words, which function as questions regardless of the discourse context, as seen in (53-54).

- (53) [máax]<sub>F</sub>            il-ech  
       someone/who see.AGENT.FOCUS-B.2  
       ‘Who saw you?’
- (54) [ba’ax]<sub>F</sub>            t-u            yuk’-aj  
       something/what PFV-A.3 drink-STATUS  
       ‘What did he/she drink?’

In the rest of this section, we develop an account of ordinary wh-questions like (53-54) which derives their interpretation as questions from the interaction of the semantics for indefinites posited in §2.1 and the existential presupposition of the focus/cleft. In addition to explaining why such sentences function as questions, the account must also explain why such sentences, unlike those with focused disjunctions, cannot function as assertions regardless of the discourse context. As we will see, this lack of context sensitivity follows naturally from the fact that indefinites are treated as disjunctions with the number of ‘disjuncts’ not specified linguistically, but rather contextually. Or rather, that the number of disjuncts in a disjunction is part of the at-issue, novel content,

whereas in wh-questions it can only be expressed presuppositionally (e.g. in a D-linked wh-question such as ‘Which of the three flavors do you like best?’).

### 2.3.1 The components of wh-questions

Before presenting the formal account deriving the interpretation of focused indefinites as wh-questions, a few words are in order as to why it makes sense to treat wh-words as indefinites both in YM and more generally. There are two main types of evidence — typological and formal semantic.

Typologically, research by Haspelmath (1997) and Bhat (2000) has shown that across languages, wh-words frequently also serve as indefinites, sometimes with additional morphology. This also holds in YM: wh-words occur as ordinary indefinites<sup>10</sup>, non-specific or dependent indefinites, and free choice indefinites in (55-57), respectively. It should be noted, however, that additional morphology (*wáa* or *je’en*) or a modifying relative clause is required in such cases in YM. While this is not possible in YM, such a situation is amply attested in other languages displaying the interrogative-indefinite affinity (see Ch. 3 of Haspelmath (1997), and references therein for examples).

- (55) yan máax t-u yuk’-aj le sa’-o’  
exists someone/who PFV-A.3 drink-STATUS DEF atole-DISTAL  
‘Someone drank the atole’ (alt. ‘There is someone who drank the atole.’)
- (56) tak in jantik wáa ba’ax  
want A.1 eat OR something/what  
‘I want to eat something or other’
- (57) je’en máax-ak j-u beeytal u bin ich kool meyaj-e’  
any someone/who-SUBJ surely-A.3 can A.3 go into milpa work-TOP  
‘Anybody can go work in the milpa.’ Tonhauser (2003), 7a

In addition to the tight morphological connection between wh-words and indefinites across languages, various formal semantic accounts of questions have treated

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<sup>10</sup>The syntactic structure of (55) is not entirely clear. The wh-word, *máax* precedes the verbal complex, contrary to ordinary word order in the language. The most straightforward way to account for this is to assume that this is a relative clause construction, i.e. that this is a free relative, rather than an indefinite. I leave investigation to future work since the very existence of relative pronouns in YM (as distinct from head nouns) has been a matter of controversy, since the two cannot co-occur (Gutiérrez-Bravo & Monforte (2009)).

wh-words as indefinites. Karttunen (1977), of course, does this quite directly. While Hamblin (1973) does not treat wh-words as indefinites, Kratzer & Shimoyama (2002)’s Hamblin semantics for indefinites has shown a tight connection between indefinites and wh-questions in the Hamblin approach.<sup>11</sup> While Groenendijk & Stokhof (1984) do not draw a close parallel to indefinites, other dynamic accounts of questions have. For example, van Rooÿ (1998) shows that the anaphoric properties of wh-words are quite parallel to those of indefinites. More recently, Haida (2008) has exploited this parallel in a fundamental way within a Groenendijk & Stokhof (1984)-based dynamic semantic framework.

For us, however, indefinites and wh-words are alike not only in their use of alternatives and anaphoric properties, but also in their issue-raising capacity. We saw this quite directly reflected above in the possible responses to assertions with widest-scope indefinites. In our account, wh-words are not only *like* indefinites, they *are* indefinites. The inquisitive nature of wh-questions does not distinguish them from assertions with indefinites; it unifies them. What distinguishes the two is that wh-questions isolate this aspect of the indefinite whereas assertions with indefinites do not.

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<sup>11</sup>As an anonymous NLS reviewer points out, Kratzer & Shimoyama (2002) also extend their account to apparent cases of universal quantification, as in their (1). They analyze the wh-word *dono* ‘which’ as introducing a non-singleton set of alternatives into the composition, with *-mo* quantifying universally over this set (though see Yamashina & Tancredi (2005) for arguments that *-mo* is not in fact a true universal quantifier). Their analysis relies crucially on the idea that the quantificational force in sentences with indeterminate pronouns in Japanese is non-local.

- (1) [[Dono hon-o yonda] kodomo] -mo yoku nemutta  
 which book-ACC read child -MO well slept  
 ‘For every book  $x$ , the child who read  $x$  slept well.’

While we follow previous work in inquisitive semantics in using the symbol ‘ $\exists$ ’ in our metalanguage translations, existential force is non-local in inquisitive semantics as well. The difference is that whereas the Hamblin approach builds existential quantification into the logical form as  $\exists$ -closure, we build it into the truth definition itself, parallel to dynamic semantics. The semantics we attribute to wh-words in Yucatec Maya is, therefore, quite similar to that which Kratzer & Shimoyama (2002) propose for Japanese. See Haida (2008) for further discussion of the relationship between indeterminate pronouns in Kratzer & Shimoyama (2002) and indefinites in more dynamically-oriented accounts.



### 2.3.2 Wh-questions as focused indefinites

In the theory developed in §2.1, an indefinite, like a disjunction, contributes truth-conditional information and latently raises an issue. Just as in the case of focused disjunctions, the focus/cleft construction presupposes the truth-conditional portion of the indefinite, leaving the inquisitive component as the sentence’s sole proposed at-issue contribution. Recall the semantic rule for interpreting existential quantification that we proposed in §2.1, repeated in (58):

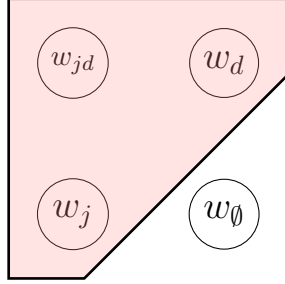
$$(58) \quad \llbracket \exists u \varphi \rrbracket^{\mathcal{M}, g, w} = \text{ALT} \{ \alpha \subseteq W \mid \text{there is some } d \in \mathcal{D}_e \text{ s.t. } \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M}, g[u/d], w} : \alpha \subseteq \beta \}$$

Just as our interpretive rule for disjunction returned the set containing the maximal sets of worlds satisfying either the left disjunct or the right one, the rule for the existential quantifier in (58) returns the set containing the maximal sets of worlds satisfying one of the propositions of the form  $\varphi(x)$ . The only difference here is that the alternatives come not from being overtly specified in the logical form, but from the assignment function the formula is interpreted relative to.

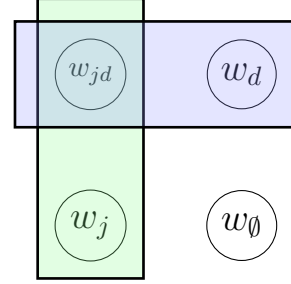
Consider a wh-question, as in (59), consisting of a sentence with focused indefinite wh-word. If we assume, as above, a model  $\mathcal{M}_A$  with only two individuals in it, *juan* and *daniel*, the at-issue denotation for the focused indefinite will be as shown in the right diagram — the same as for a disjunction with two disjuncts. The existential presupposition also remains constant (left) obviating the informative potential for the proposed at-issue update just as in the case of the focused disjunction. According to the Inquisitive Principle, then, the update in (60) will function as a question, since it is both *inquisitive* and *uninformative*.

- (59) [máax]<sub>F</sub> uk' le sa'-o'  
 someone/who drink.AGENT.FOCUS the atole-DISTAL  
 'Who drank the atole?'

(60) Presupposition of (59) in  $\mathcal{M}_A$

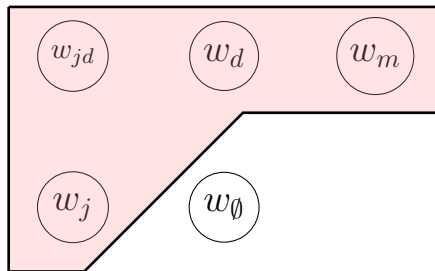


At-issue component of (59) in  $\mathcal{M}_A$ :

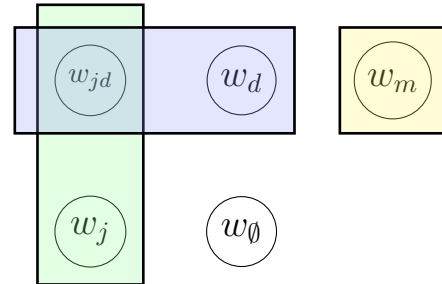


Since the contextual restriction limits the existential presupposition of the focus/cleft to two individuals, the indefinite in the focus/cleft functions as a question just as the disjunction *juan wáa daniel* 'Juan or Daniel' did in (38). Unlike in the case of focused disjunctions, however, a sentence like (59) with a focused indefinite can only function as a question. To see why, let's consider the same example interpreted in a context (scenario B from above) with three individuals (Juan, Daniel, and Maribel) as in (61). Here, the contextual restriction of the presupposition (left) limits the input to worlds where one of the three relevant individuals drank the atole. The at-issue contribution of the indefinite puts forth a set of alternatives (right) parallel to what we have seen above. In contrast to disjunctions, however, the number of alternatives in the proposal is not linguistically specified, but is determined by the contextual domain restriction of the quantifier. The result is an at-issue contribution consisting of three alternatives: Juan, Daniel, and Maribel.

(61) Presupposition of (59) in  $\mathcal{M}_B$ :



At-issue component of (59) in  $\mathcal{M}_B$ :



Whereas the focus/clefted two-disjunct disjunction, (39), is informative in this context and therefore interpreted as an assertion, the focus/clefted indefinite is still uninformative relative to the presupposition and therefore interpreted as a question. In the case of the disjunction, informativity was possible in such a context because the set of alternatives in the disjunction was *specified* in logical form to be a proper subset of those in the contextually restricted presupposition. The cardinality of the alternative set of the indefinite, however, is not specified in the logical form of the sentence itself, arising instead from the same contextual domain restriction as the presupposition. In extending Groenendijk & Roelofsen (2009)’s inquisitive semantics to the first order case, we characterized existential quantification as a ‘disjunction of unspecified cardinality’. It is precisely this difference between the ‘specified’ alternative set of disjunction and the ‘unspecified’ alternatives of the existential which produces the asymmetry between focus/clefted disjunctions and focus/clefted indefinites which we have seen.

### 2.3.3 Comparison with other approaches

Before moving on to polar questions in YM, it is worth comparing the account to previous approaches to understanding the relationship between focus, indefiniteness, and wh-questions. Most previous work on the role of focus in wh-questions both cross-linguistically (e.g. Beck (2006), Cable (2007)) and in YM (Tonhauser (2003)) takes *focus* to be the source of alternatives in wh-questions, rather than *indefinites*, as we have done. There are three central reasons, we believe, to prefer an account locating the issue-evoking character of questions in inquisitive elements rather than focus.<sup>12</sup>

First, a focus alternative-based account obscures the deep and pervasive connection between interrogatives and indefinites across languages, what has come to be known as the *interrogative-indefinite affinity*. In Beck (2006)’s account, for example, wh-words are lexically specified as having a focus semantic value (a set of alternatives), but lacking an ordinary semantic value. Indefinites clearly do possess a ordinary semantic value, and it is hard to see how the two can be related to one another. The focus semantic value Beck and others propose for wh-words is the same as the ordinary

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<sup>12</sup>It should be noted that the present account does not address *intervention effects*, the primary empirical focus of Beck (2006).

semantic value the present account posits for indefinites. However, this parallel exists precisely because we have proposed that indefinites evoke alternatives.

Second, setting aside questions for a moment, the conception of Roothian focus alternatives is quite different than that of inquisitive alternatives. Theories of focus differ in their conception of the precise relationship between focus and anaphoric processes more generally, but they all hold in some way or another that focus alternatives arise from *prior discourse context*. In contrast to the ‘backward-looking’ nature of focus alternatives, inquisitive alternatives — both in the present work and in other inquisitive semantic work — are explicitly conceived of in a ‘forward-looking’ way. Outside of questions, inquisitive semantics holds that indefinites and disjunctions make salient issues as potential *future* topics of discussion. The contribution of questions would seem to be intuitively forward-looking rather than backward-looking and therefore better captured using inquisitive alternatives.

Third, it is not clear if the focus alternatives-based approach can be extended to focused disjunctions in a principled way. Beck & Kim (2006) present an extension along these lines in their analysis of English alternative questions, under the assumption that they contain focused disjunctions.<sup>13</sup> However, in order to produce the desired alternative set for focused disjunctions, the account must stipulate that the focus semantic value of a disjunction [Juan or Daniel] is a set consisting of two alternatives, one for Juan and one for Daniel. As they rightly point out, however, this does not follow from the standard Roothian semantics. The standard Roothian algorithm for deriving focus semantic values would include alternatives not only for Frank and José, but also for all of the other individuals in the model. And indeed, this semantics seems to be borne out in (62-63), where the sentences clearly convey that alternatives other than the two disjuncts do not hold (as indicated in parentheses). Beck & Kim (2006)’s example in (64) suggests the same conclusion.

(62) It was coffee<sub>F</sub> or tea<sub>F</sub> that Frank brought. (i.e. Not something else)

(63) Frank only brought coffee<sub>F</sub> or tea<sub>F</sub>. (i.e. He didn’t bring anything else.)

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<sup>13</sup>This assumption itself has been disputed by Pruitt (2007) and other recent work, which argues that focus intonation is not a necessary or sufficient condition for English alternative questions. Instead, these authors argue that the final falling pitch on the last disjunct is crucial.

- (64) a. Who did Hans invite?  
 b. Hans invited Anna<sub>F</sub> or Sally<sub>F</sub>.

More closely related to the present account is Haida (2008), who argues that the indefinite semantics of *wh*-words is the source of alternatives in *wh*-questions. Rather than inquisitive semantics, Haida’s account exploits the formal properties of dynamic existential quantification. A full comparison and/or integration of dynamic and inquisitive semantics is beyond the scope of the present work, though the formal tools Haida uses have many parallels with those in the current account. Where the two accounts differ significantly is in what role focus plays in question formation and how the class of sentences which function as questions is to be defined.

For Haida (2008), the reason why focus is invoked in questions cross-linguistically is a syntactic one rather than a semantic one. In order to distinguish *wh*-questions from polar questions with indefinite *wh*-words, Haida argues that *wh*-words in *wh*-questions enter into an Agree relation with an interrogative complementizer,  $C^{[+Q]}$ . Haida describes the role of focus in *wh*-questions as follows: “the F[ocus]-feature is necessary for rendering a *wh*-word active for the Agree relation with  $C^{[+Q]}$ .” While Haida later argues that the F-feature does contribute an existential presupposition, the relationship between this focus semantics and the syntactic feature is not clear. Since focus semantics makes no essential contribution to question semantics for Haida (2008), nothing obvious would rule out languages where some different semantics is associated with this syntactic feature. Even if this possibility can be somehow ruled out, the connection between focus semantics and question interpretation under such an account is necessarily an indirect one.<sup>14</sup>

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<sup>14</sup>It is not clear how/whether Haida (2008)’s account could be extended to focused disjunctions. In part, this is because the dynamic logics which Haida constructs (like most dynamic logics) make use of a disjunction which is externally static, rather than being dynamic in a way parallel to indefinites. Even if we had a suitably dynamic semantics for disjunction, however, it is still not clear how we could make sense of the apparent ambiguity we see for focused disjunctions in Yucatec Maya.

## 2.4 Polar Questions in Yucatec Maya

Having examined the polyfunctionality of focused disjunctions in YM in §2.2, we turn now to a closely related construction: the polar question. In addition to the clear semantic parallel between polar questions and focused disjunctions, the two constructions in YM have much of their morphosyntax in common. The polar questions in both (65) and (66) make use of a word *wáa(j)* which is at least homophonous with the ordinary disjunctive coordinator.<sup>15</sup>

- (65) [Juan-*wáaj*]<sub>F</sub> uk' le sa'-o'  
 Juan-OR drink.AGENT.FOCUS the atole-DISTAL  
 'Was it Juan who drank the atole?'
- (66) táan-*wáaj* u yuk'-ik le sa'-o' Juan  
 PROG-OR A.3 drink-STATUS DEF atole-DISTAL Juan  
 'Is Juan drinking the atole?'

Furthermore, as we will argue in detail in §2.4.1, *wáa* in polar questions like (65) (but not (66)) occurs immediately following a focus/clefted syntactic constituent. To capture these syntactic and semantic parallels, §2.4.2 pursues an analysis of polar questions with a focused element, like (65), as versions of focused disjunctions with a single overt disjunct. In polar questions like (66) with no focused element, the position of the disjunctive coordinator, *wáa*, is determined prosodically rather than syntactically. In §2.4.3 we develop an account of such polar questions where the very nature of polarity ensures that such disjunctions will be *uninformative* with no role needed for the existential presupposition of the focus/cleft. In order to distinguish such polar questions from tautologous disjunctions which function as assertions, we revise the inquisitive principle in §2.4.4

### 2.4.1 Two classes of polar questions in Yucatec Maya

Superficially, the two polar questions in (65-66) appear quite similar to one another, with the disjunctive coordinator *wáa(j)* appearing in second position in both. While it is not clear from these examples whether the generalization should be syntactic

<sup>15</sup>The coda [h] in polar questions (orthographic ‘j’) is part of a regular process of phonological phrase-final [h]-epenthesis, see AnderBois (2009b) for details.

or prosodic, we might expect that a single generalization could capture the distribution of *wáa(j)* across both cases. As argued in AnderBois (to appear), however, we take the position of *wáa(j)* in polar questions to be syntactically determined in questions like (65) with a focus/clefted element, but prosodically determined in questions with no such element, as in (66).

In what follows, I will argue that this asymmetry arises because of a difference in *what* is disjoined in the two cases. On analogy with the alternative questions analyzed above, I take the disjunction in the case of (65) to be a focused DP, the only difference being the silence of the second disjunct.<sup>16</sup> In contrast, in examples like (66), I take the prosodically condition position of *wáa(j)* to reflect a syntax where it is the polarity itself which is disjoined. Since positive polarity is not overtly realized, *wáa(j)*'s position is prosodically determined in positive polar questions.

The clearest argument that the position of *wáa(j)* is prosodically determined in polar questions without focus comes from examples, such as (67), involving a free variation of the phonological form of certain aspect markers such as the terminative aspect marker, *ts'o'ok*. In (67), this morpheme appears in a full CVC form which meets minimal word requirements, and *wáa(j)* appears attached to it phonologically. In (68), we see the same morpheme appearing in a portmanteau of sorts, phonologically combined with the second person set A (Ergative/Nominative) agreement marker *a*. In this case, *wáa(j)* cannot surface attached to the aspect marker since it is prosodically light, and is instead positioned immediately following the main verb.

- (67) a. *ts'o'ok-wáaj a wa'alik ti leti'*  
           TERM-OR A.2 say to him  
           'Did you already tell him?'

- b. ? *ts'o'ok a wa'alik-wáaj ti leti'*

- (68) a. *ts'a wa'alik-wáaj ti leti'*  
           TERM.A.2 say-OR to him  
           'Did you already tell him?'

- b. \**ts'a-wáaj wa'alik ti leti'*

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<sup>16</sup>The presence of the final [h] (orthographic *j*) is independently expected given the existence of phonological phrase final [h]-insertion documented in AnderBois (2009b).

As there is no discernible semantic difference between (67) and (68), we conclude that the position of *wáa(j)* is prosodically conditioned. In contrast, polar questions with a focused element only allow *wáa(j)* to occur following the entire constituent, even if it is prosodically quite heavy, as in (69).<sup>17</sup>

- (69) a. [le ts'ooya'an sakpile'en maak-*wáaj*]<sub>F</sub> t-u yuk'-aj le  
           DEF thin pale man-OR PFV-A.3 drink-STATUS DEF  
           sa'-o'  
           atole-DISTAL  
           'Was it the thin, pale man who drank the atole?'  
       b. \*[le *wáaj* ts'ooya'an sakpile'en maak]<sub>F</sub> tu yuk'aj le sa'o'  
       c. \*[le ts'ooya'an *wáaj* sakpile'en maak]<sub>F</sub> tu yuk'aj le sa'o'  
       d. \*[le ts'ooya'an sakpile'en *wáaj* maak]<sub>F</sub> tu yuk'aj le sa'o'

This dual distribution of *wáa(j)* demonstrates that the distinction we have made between polar questions with and without focus is a *syntactically* relevant distinction. In the rest of this section, we will see that this distinction also produces subtle differences in the *semantics* of such questions both compositionally and in whether or not they bear an existential presupposition.

## 2.4.2 Polar Questions with Focus

Having established that polar questions with and without a focused element differ in their syntax, we now provide analyses of both types, starting with those with a focused element like (70). The approach we take is to treat such questions as versions of focused disjunctions consisting of a single overt disjunct (*juan* in (70)). While the disjunction only possesses one syntactic disjunct, we claim in what follows that, semantically, it in fact has two disjuncts. The 'empty' disjunct is interpreted roughly as 'anyone else' as schematized in (71). While we make use of the strikethrough notation schematically, we do not take the empty disjunct to literally be the result of ellipsis.

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<sup>17</sup>For reasons which are not altogether clear, this example was produced with the verb not in the Agent Focus, as one would expect. Speakers found the AF version to also be more or less acceptable, though somewhat dispreferred. See Norcliffe (2009b) for discussion of the gradient realization of Agent Focus in YM more generally.



(70) [Juan-wáa]<sub>F</sub> uk' le sa'-o'  
 Juan-OR drink.AGENT.FOCUS the atole-DISTAL  
 'Was it Juan who drank the atole?'

(71) [Juan wáa ~~ANYONE ELSE~~ ]<sub>F</sub> uk' le sa'-o'

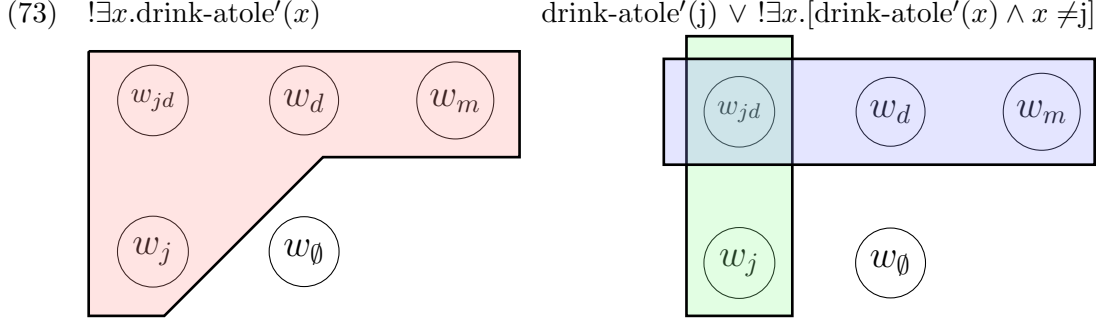
This interpretation for the empty disjunct is the result of grammaticalization of inferences that have been argued to hold (at least pragmatically) of ordinary disjunctions across languages (see, for example, Zimmermann (2000), Geurts (2005), and Simons (2000)). More specifically, we take the empty disjunct to be interpreted as the *exhaustive* set of *like elements* which is *mutually exclusive* from the overt disjunct. We see this semantics for *wáa* plus the empty disjunct formalized in (72). The denotation as given combines with an individual (Juan in (70)) and returns a disjunction with two alternatives: the left one where the overt disjunct satisfies the predicate and the right one where 'anyone else' satisfies the predicate. Given this 'default' interpretation for disjunctions containing an empty disjunct, the analysis developed in previous sections correctly predicts that such sentences, unlike focused disjunctions more generally, can only function as questions.

(72)  $\llbracket wáa \text{ ANYONE ELSE} \rrbracket = \lambda z_e. \lambda P_{\langle e, stt \rangle}. P(z) \vee !\exists x. [P(x) \wedge x \neq z]$

Recall that the questioning nature of wh- and alternative questions in previous sections was derived from the combination of a hybrid expression contributing inquisitiveness — a disjunction or an indefinite — rendered uninformative by the presuppositional semantics of the focus cleft. Since polar questions involve the disjunctive coordinator, *wáa(j)*, our account takes inquisitiveness in polar questions to be contributed by disjunction. In the case of polar questions with a focused element, the existential presupposition of focus will again obviate the informative potential of the disjunction.

The other path to informativity we saw for focused disjunctions (proposing to exclude Maribel in the above example) does not arise because of the *exhaustive* interpretation of the empty disjunct. Just as in the case of wh-questions, the at-issue content of such polar questions contains an existential quantifier (in the right disjunct of (72)) contextually restricted in the same way as the existential presupposition of the focus/cleft. Given the semantics we have attributed to the empty disjunct above, we predict correctly that single-disjunct focused disjunctions behave like focused indefinites

(and unlike focused disjunctions with both disjuncts overt). They can function only as questions according to the Inquisitive Principle, as in the semantics for (70) in (73) (the presupposed input state is in the left figure; the at-issue component in the right figure).



Whereas the analysis of alternative and wh-questions in YM did not posit any question-specific syntactic elements, the same cannot quite be said of polar questions with a focused element. The grammar of Yucatec Maya must contain the information that disjunctions with one disjunct are possible only in the focus/cleft position. Additionally, it must have grammaticized<sup>18</sup> the semantic rule for interpreting the ‘empty’ disjunct in (72).

What has grammaticized, however, is an interpretative procedure for single-disjunct disjunctions which consists of properties which hold of ordinary disjunctions, at least pragmatically. This makes sense of the cross-linguistically widespread connection

<sup>18</sup>Cross-linguistic support for this grammaticization can also be found in a parallel process that occurred historically with conjunction in Oceanic languages. Moyse-Faurie & Lynch (2004) document that in many Polynesian languages, a word historically related to the conjunctive coordinator can occur after a nominal with a meaning that can be described as ‘also’, ‘and others’, or ‘et cetera’. In many languages, the ordinary conjunctive coordinator for nominals and this post-nominal use are homophonous (e.g. Tokelauan, Samoan, West Uvean).

In languages where the forms differ, the difference is often limited to the vowel being longer in the post-nominal use. Moyse-Faurie & Lynch (2004), for example, reconstruct *\*ma* as the Proto Polynesian conjunctive and *\*mā* with a long vowel as the post-nominal (and phrase-final) marker meaning ‘and others’. The post-nominal use, then, plausibly resulted from the conjunctive coordinator being used in a phrase-final position and undergoing phrase-final lengthening (in languages where the vowel length differs, it is always in this direction). The existence of a parallel grammaticization process involving conjunction highlights the idea that the questioning nature of such polar questions *emerges* from properties of disjunction more generally.

between polar question particles and disjunctive coordinators (e.g. Bulgarian, Japanese, Korean, Latin, Polish, and Malayalam). While polar questions in YM therefore do involve a piece of question-specific semantics, that semantics does not directly encode the questioning nature of such sentences. Rather, the semantic contribution of *wáa* in polar questions includes the semantic contribution of *wáa* in ordinary disjunctions plus certain implicatures of ordinary disjunctions. From these properties alone, the present theory predicts that such disjunctions will necessarily be uninformative relative to the presupposed input state and therefore will function as questions regardless of the contextual restriction.

### 2.4.3 Polar Questions without Focus

We have analyzed polar questions with a focused element as single-disjunct disjunctions where the existential presupposition of the focus/cleft and the exhaustivity of the empty disjunct together remove both potential routes to informativity that disjunctions generally possess. We turn now to the second class of polar questions in YM, those like (74) which have no focus/clefted element. Recall from §2.4.1 that the position of *wáa(j)* in such questions is determined prosodically rather than directly by syntax.

- (74) *táan-wáaj* u yuk'-ik le sa'-o' Juan  
 PROG-OR A.3 drink-STATUS DEF atole-DISTAL Juan  
 'Is Juan drinking the atole?'

In these cases, we claim it is the polarity of the sentence itself which is being disjoined semantically. Since positive polarity is not overtly realized, as in (74), and *wáa(j)* itself fails to meet minimal prosodic word requirements, it instead attaches to the first prosodic word. This explains why the phonological host of *wáa(j)* in an example such as (74) (the progressive aspect marker, *táan*) does not seem to be focused or otherwise semantically prominent in the sentence. This view is supported by negative polar questions, as in (75), where the polarity of the sentence is realized overtly. In these cases, *wáa(j)* attaches to this overt polarity as seen in (75).

- (75) ma'-wáaj t-a beet-ik chuuhuk waaaj?  
 NEG-OR PFV-A.2 make-STATUS sweet bread  
 'Didn't you make a cake?'

While the basic question being asked remains the same, negative polar questions like (75), similar to their English translations, appear to convey a different sort of question than their positive counterparts. We focus on positive polar questions in this chapter, returning in Ch. 4-5 to analyze negative polar questions in both Yucatec Maya and English. In the case of polar questions with a focus-clefted element, we saw that the unpronounced disjunct is interpreted as the alternative comprised of the *exhaustive* set of *like elements* which are *disjoint* from the overt disjunct. Since what is disjoint in these cases is polarity, this means that the empty disjunct will be the negation of the overt polarity in the sentence. The whole disjunction for (74), for example, will have the semantics in (76).

- (76) {drink-atole'(juan), ¬drink-atole'(juan)}

More generally, disjunction of polarity will take the union of  $\llbracket \varphi \rrbracket$  and (the single alternative-denoting)  $\llbracket \neg \varphi \rrbracket$ . In the case of polar questions where the polarity itself is what is disjoint, the semantics produced is the same as that contributed by Groenendijk & Roelofsen (2009)'s non-informative closure operator. The empty disjunct in these cases denotes the set containing the (maximal) set of worlds which does not overlap with any of the alternatives in the overt, positive alternatives. Negation by its very nature (i.e. the law of the excluded middle) eliminates the informative potential of a disjunction, playing the role that focus did in polar questions with a focused element, wh-questions, and focused disjunctions. Since they are both inquisitive and uninformative (in both the relative sense and the absolute one), they are predicted to be unambiguously interpreted as questions according to the Inquisitive Principle.

#### 2.4.4 Refining the Inquisitive Principle

The account of polar questions without focus/clefted elements treated them as disjunctions of the form  $\{p, \neg p\}$  and argued that their functioning as questions follows from the fact that such a disjunction is uninformative due to the very nature of negation. While this seems sensible in theory, we know that ordinary disjunctions of this form are

possible, (77-79), and without special intonation, function as tautologous assertions, generally with some additional pragmatic effect (see Ward & Hirschberg (1991) for some discussion of these pragmatic effects).

(77) John came to the party last night or he didn't (come to the party).

(78) Bill is a linguist or he isn't.

(79) *Either a ham has a bone or it doesn't have a bone.* Where'd they get a name like 'semi-boneless' from? Ward & Hirschberg (1991)

The problem we face is not specific to the semantics we have given to YM questions, but is a quite general problem faced by any attempt to define illocutionary questions and assertions in terms of informativity and inquisitiveness. There are two ways this problem might be addressed without significantly altering the basic semantic framework. First, we might alter our semantics for polar questions and/or ordinary disjunctions. Second, we might revise the Inquisitive Principle so as to distinguish between polar questions and tautologous  $\{p, \neg p\}$  assertions.<sup>19</sup>

One option we might consider would be to extend the analysis from §2.4.2 by claiming that the YM polar questions with no focus/clefted element nonetheless do involve focus of some sort on polarity. There are two reasons to be skeptical of this line of reasoning. First, there does not seem to be any evidence that the form of such polar questions like (80) actually involves focus at all. They plainly don't involve the focus/cleft construction and they don't trigger any overt focus morpheme or obvious intonational contour. Moreover, the positive polarity in questions like (80) is not even present overtly, and therefore quite an unlikely candidate for focusing. Second, even if we assume that polarity is focused in such an example, the focus presupposition would

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<sup>19</sup>An anonymous NLS reviewer points out that a third option would be to make use of a semantics like Ciardelli et al. (2009), which provides a more complex view of alternatives by permitting not only maximal possibilities, but also non-maximal ones. Under this richer semantics, an ordinary disjunction ( $\varphi \vee \psi$ ) could be assigned a denotation with three possibilities: one for  $\varphi$ , one for  $\psi$ , and one for the union of the two, i.e.  $!(\varphi \vee \psi)$ . Defining questions and assertions with respect to *maximal* possibilities, then, would distinguish polar questions and uninformative disjunctive assertions. While nothing obvious rules out such an approach, it would require a significant revision of the basic framework, which the other two options avoid.

be quite odd. In (79), the presupposition would be that either the positive proposition holds or its negation does (i.e. the law of the excluded middle). Such a polar question, then, would have as a semantic presupposition something which would seem to be a logical truism.

- (80) táan-wáaj u yuk'-ik le sa'-o' Juan  
 PROG-OR A.3 drink-STATUS DEF atole-DISTAL Juan  
 'Is Juan drinking the atole?'

The second option, which we adopt presently, is to motivate a revision to the Inquisitive Principle which correctly distinguishes between polar questions and disjunctive tautological assertions. While the top-level semantics of the two are the same, the way in which this meaning is composed is quite different. In tautological disjunctions like (77-79), the two disjuncts are entire clauses (or elliptical versions thereof). In contrast, polar questions in YM like (80) appear to involve a disjunction of the polarity itself. Informally, we can draw from the pointwise compositional tools of Hamblin semantics and schematize this in (81). The polar question consists of a disjunction which introduces a set consisting of two alternatives (the identity function and negation) and applies this set to the propositional content of the question in a pointwise fashion.

$$(81) \quad \left\{ \begin{array}{l} \lambda P_{stt}.\neg P, \\ \lambda P_{stt}.P \end{array} \right\} (\varphi)$$

The fact that the polar question in (80) is uninformative, then, can be determined independent of the content of  $\varphi$ . In contrast, to determine the tautological nature of the disjunctions in (77-79), one must ensure that the lexical material in both disjuncts is the same. The special status of tautologies whose tautological nature can be determined from their logical items alone has been claimed for entirely different cases by Gajewski (2009) (and Gajewski (2002)).<sup>20</sup> He terms the former class of uninformative sentences 'L-trivial' and proposes that such sentences are not merely tautologies, but instead have a different status (which we return to shortly). While it is not entirely clear how the class of 'logical items' in a given language is to be defined in general, disjunction and negation would certainly seem to be among them under any reasonable

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<sup>20</sup>Specifically, Gajewski (2009) uses the principle to account for the definiteness effect in *there*-existentials, certain selection properties of exceptive *but*, and negative islands in comparatives.

way of doing so. Polar questions, then, are not simply uninformative, they are uninformative by virtue of being L-trivial. Given this, we can reformulate the Inquisitive Principle from (23) as in (82).

(82) **Inquisitive Principle (final):**

- a. A formula  $\varphi$  is a *question* iff (i)  $\varphi$  is inquisitive, and (ii)  $\varphi$  is uninformative by L-triviality.
- b. Otherwise,  $p$  is an *assertion*.

For Gajewski (2002)/Gajewski (2009) and other work relying on the notion of L-triviality (e.g. Menéndez-Benito (2005), Abrusán (2007)), L-trivial sentences are claimed to be not merely tautological, but *ungrammatical*. Crucially, however, all of the instances of the principle of L-triviality considered by these authors are of a particular speech act type: assertions. The sentences we are presently concerned with, however, are not ungrammatical, they simply cannot be used as assertions. Applying Gajewski's notion of L-triviality to our present case, then, we must tweak the principle as follows: sentences which are L-trivial are 'strongly unassertible', rather than ungrammatical.<sup>21</sup>

That the principle of L-triviality would require some tweaking along these lines seems inevitable when one considers speech acts other than assertions. Regardless of the specific analysis of questions one assumes, questions are often or always uninformative by L-triviality, yet obviously not ungrammatical. Moreover, this revision allows us to capture the otherwise puzzling observation that English examples like (83-84) are unable to serve as tautological assertions in the way that (77-78) could. Assuming a conservative syntax (i.e. one without any cataphoric ellipsis), this observation readily receives an explanation in terms of L-triviality. The disjoined polarity 'did or did not' ensures that regardless of the non-logical material in the sentence, the sentence is not potentially informative. With appropriate intonation, however, such examples can be readily used as questions of a special sort, and therefore cannot be considered truly

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<sup>21</sup>In coining the term 'strongly unassertible', we intend to distinguish the present notion from the notion of 'unassertibility' referred to, for example, in the literature on Moore's paradox sentences (e.g. 'It's raining and I don't believe it's raining.') where the term means something more like 'capable of being asserted, but not without violating certain conversational norms of assertion' (much like ordinary tautologies like 'It's raining and it's not raining.').

ungrammatical.<sup>22</sup>

(83) #?John did or did not come to the party last night.

(84) #?Bill is or isn't a linguist.

Summing up, by revising the inquisitive principle to be sensitive not just to unformativity, but unformativity via L-triviality, we draw a principled distinction between merely tautological disjunctive assertions like (77-79) and sentences like (80) and (83-84) which are strongly unassertible, yet grammatical as questions. Both kinds of sentences are uninformative in the absolute sense because of the law of the excluded middle. However, only the latter class can be identified as uninformative without looking at the lexical material of the individual disjuncts.

## 2.5 Conclusion

In this chapter, I have developed a compositional semantics for alternative, wh-, and polar questions in Yucatec Maya. Setting aside polar questions, the morphosyntax of questions in Yucatec Maya have no obvious question-specific elements, instead consisting of particular combinations of elements which occur in assertions as well. In particular, they are formed from a disjunction (alternative questions) or indefinite wh-word (wh-questions) occurring in a preverbal focus/cleft construction. Given the absence of question-specific elements, the central challenge for a compositional account of such questions is to understand the source of their alternative-evoking, inquisitive core.

I have argued that it is disjunctions and indefinite wh-words which provide the inquisitive core of question, rather than focus or a covert interrogative morpheme. By starting from the perspective of the compositional semantics of Yucatec Maya, I have argued for a theory which is potentially surprising from an English perspective: disjunctions and indefinites make a question-like inquisitive contribution even in assertions. It would not be inconceivable — nor would it be uninteresting — if this investigation

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<sup>22</sup>Curiously, the addition of *either* allows these sentences to be 'rescued' as tautological assertions, similar to (77-78), a matter which I leave to future investigation.



simply gave us evidence that disjunctions and indefinites in Yucatec Maya were fundamentally different than those in more well-studied languages like English. In the subsequent chapters of this dissertation, however, I argue that the lessons learned from Yucatec Maya offer deep insight into the nature of disjunctions and indefinites across languages and shed light on several long-puzzling topics in the semantics of English and beyond.

## Chapter 3

# Sluicing and Inquisitive Content

In Chapter 2, we argued that the alternative-evoking core of questions in Yucatec Maya comes from the inquisitive semantics contributed by indefinite *wh*-words and disjunctions across all their uses. Under this semantics, sentences with widest-scope disjunctions or indefinites have top-level meanings which are deeply similar to those of questions. While questions in English do not show the same tight morphosyntactic connections to indefinites and disjunctions, we argue in this chapter that this connection can be seen in another way: through the ellipsis process known since Ross (1969) as *Sluicing* and seen in (85). In both examples, the crossed out material is unpronounced, yet interpreted. Following common practice, we refer to the clause containing the unpronounced material as the Elided or E clause. Crucial to the felicity of the omission of the E clause material is the presence of a clause in prior discourse (the Antecedent or A clause) which is sufficiently similar to the E clause in certain ways.

- (85) a. [Francisco ran or took the bus]<sub>A</sub>, but I don't know [which ~~one he did~~]<sub>E</sub>.  
b. [Marta lent something to Joe]<sub>A</sub>, and I want to find out [what ~~she lent to Joe~~]<sub>E</sub>.

The grammaticality of the examples in (85) relies crucially on the presence of an inquisitive element in the A clause corresponding to the *wh*-word in the E clause, what Chung et al. (1995) term the ‘inner antecedent’. Following Chung et al. (1995)’s descriptive terminology, we will refer to this variety of sluicing where the A clause contains an *overt* inner antecedent as ‘merger’. In (85a), the inner antecedent is the clausal

disjunction; in (85b), it is the indefinite *something*. One of the central topics that an account of sluicing must address is what kind of similarity relation between the two clauses is needed to ensure that A clauses containing wide-scope disjunctions and indefinites are sufficiently similar to interrogative E clauses, while those with conjunctions, definite descriptions, and other quantifiers are not, as in (86).

- (86) a. \*Francisco ran and took the bus, but Mary doesn't know which.  
 b. \*Marta lent the book to Joe, and I want to find out what.  
 c. \*Marta lent every book to Joe, and I want to find out what.

Since Merchant (2001), it has been widely (though not universally) agreed that this condition must be at least partially semantic in nature. The main claim put forth in this chapter is that the semantic condition on sluicing must make reference to semantic representations which include not just truth-conditional information (as in Merchant (2001)), but also inquisitive content of the sort developed in the previous chapter. Under this approach, then, indefinites are licit inner antecedents for sluicing not due to any syntactic similarity with *wh*-words (or traces), but because the two have fundamentally related semantics, both in terms of their truth-conditions and their issue-raising capacity.

Beyond providing a deep understanding of the nature of inner antecedenthood, the account also straightforwardly captures two observations which have been problematic for previous accounts. First, the fact that disjunctions can serve as an inner antecedent for sluicing, as in (85a), follows naturally since they too make an inquisitive contribution to discourse. As noted by Chung et al. (1995), the fact that disjunctions can serve as inner antecedents is problematic for accounts which rely on syntactic isomorphy (especially for disjunctions of non-arguments). Second, doubly negated indefinites cannot serve as inner antecedents, as seen in (87). While such examples are trivial for a syntactic isomorphy approach, the truth-conditional vacuity of double-negation makes them problematic for accounts relying on truth-conditional semantic isomorphy alone.

- (87) a. \*[It's not the case that no one left]<sub>A</sub>, but I don't know [who left]<sub>E</sub>.  
 b. \*[It's not the case that John didn't meet with a student]<sub>A</sub>, but Fred still wonders [who ~~John met with~~]<sub>E</sub>

In addition to these two puzzles, we present novel facts regarding the surprising interactions between sluicing and appositive relative clauses: overt indefinites and disjunctions inside appositive relative clauses cannot serve as inner antecedents, as seen in (88). Here, the two clauses are alike both in syntactic form and in their truth-conditions, yet sluicing is not licensed.

- (88) #Joe, who once killed a man in cold blood, doesn't even remember who.

Finally, we show that the account can be extended to instances of sprouting under a 'hybrid' approach where sluicing is subject not only to a semantic condition, but also a minimal lexical condition (following Chung (2006)). 'Sprouting' is the term coined by Chung et al. (1995) to refer to instances of sluicing where there is no pronounced inner antecedent. Within sprouting, we distinguish two subtypes: *direct* sprouting such as (89), where there is an existentially interpreted implicit argument, and *indirect*, where there is no element directly corresponding to the wh-phrase, as in (90). The former case, we argue, can be readily assimilated to merger cases, given the independently needed semantics for implicit arguments. For the latter case, we develop an account where the A clause also contains an inquisitive element: the covert existential quantification of the neo-Davidsonian event/state argument. Sluices like (90) which pick out a particular neo-Davidsonian argument, then, are the result of a type of accommodation process, which we term 'issue-bridging' (by analogy with bridging uses of definite descriptions).

- (89) [John ate ---]<sub>A</sub>, but I don't know [what ~~John ate~~]<sub>E</sub>

- (90) [Mary came to the party]<sub>A</sub>, and I'm going to find out [who with]<sub>E</sub>

The chapter is organized as follows: §3.1 briefly reviews previous accounts, formulates a symmetric entailment condition on sluicing (building on Merchant (2001)), and shows how it captures the data in (85-87). §3.2 develops an independently motivated semantics for appositives and shows that it accounts not only for the infelicity of examples like (88), but also for related effects regarding Verb Phrase Ellipsis (VPE). §3.3 extends the account to cases of direct sprouting, arguing that these can be, in essence, assimilated to merger cases. §3.4 analyzes indirect sprouting in terms of issue-bridging, showing that independently motivated factors properly constrain this accommodation process. §3.5 concludes.

## 3.1 Questions and inquisitive entailment

In this section, we briefly review previous accounts of sluicing in order to properly situate the proposed account with respect to prior literature. Of particular interest is Merchant (2001), whose account is in many respects the most immediate predecessor to the current account. Having made clear these background assumptions, we then move to formulate the core semantic condition of the account: that the inquisitive semantic interpretations of the A and E clauses symmetrically entail one another.

### 3.1.1 Previous approaches to Sluicing

One of the central reasons why sluicing (and ellipsis more generally) has been a topic of such great interest to researchers is the apparent mismatch between what is pronounced and what is interpreted. There are two central questions about this mismatch which an account of sluicing must address: **(i)** How does this mismatch arise? and **(ii)** What condition(s) is this mismatch subject to? The arguments in this chapter are principally about the latter question, but a few brief words are in order about the former.

With respect to the first question, three kinds of approaches have been proposed in prior literature. The first approach claims that the perceived mismatch is not actually a mismatch after all (e.g. Ginzburg & Sag (2001), Culicover & Jackendoff (2005)). That is, the bare *wh*-word or phrase simply has an anaphoric interpretation, much like a pronoun. Just as we no longer think of pronouns as resulting from a pronominalization transformation replacing a fully fleshed out definite description, these authors argue that Sluicing should be seen as the base generation of an anaphor (albeit of a special type) with no covert structure present in the syntax at any level.

In the absence of evidence to the contrary, such an account would seem to be preferable to one which posits covert syntax since it relies only on independently motivated mechanisms of anaphora resolution. Much research in previous decades, however, has provided several persuasive kinds of counterevidence. As the issue is largely orthogonal to our present concerns, we refer the reader to Merchant (2001) for detailed arguments, as well as Chung (2006) and Chung et al. (2010) for more recent discussions of this issue.

The other two approaches both assume covert syntactic structure at some level of representation, differing crucially in what this level is and where this structure comes from. One view, originally proposed by Ross (1969), and espoused more recently by Merchant (2001), holds that the E clause has a full clausal structure constructed in the normal way. That is, the surface syntax of the E clause is essentially the same as that of its non-elliptical counterpart. While this structure is present in the surface structure, it is deleted at PF under the appropriate conditions. This approach has therefore come to be known as *PF-Deletion*. The other view, developed by Chung et al. (1995) (and more recently defended by Fortin (2007) and Chung et al. (2010)), holds that the surface syntax of the E clause matches what is pronounced, consisting of a wh-word (or phrase) and an empty TP. This empty TP is filled-in at logical form via the ‘re-use’ or ‘copying’ of a TP from prior discourse, and is therefore termed *LF-copying*.

The central argument we present in this chapter is that the retrieval conditions on Sluicing make crucial reference to inquisitive content in the A clause in the particular sense developed in Chapter 2. While we implement this idea in a way that makes use of covert structure, the main idea would seem to be equally implementable under a suitable structure-free approach.<sup>1</sup> For the sake of concreteness, I formulate the analysis under a PF-deletion theory of ellipsis. Though we will see a couple of potential stumbling blocks for such an approach, I believe it is likely also compatible with an LF-copying theory. The primary reason for this choice, however, is that it allows for a more direct comparison with the closest predecessor in other respects to the current account, namely Merchant (2001).

In this chapter, we focus on the isomorphy question: what conditions are imposed on the mismatch between what is pronounced and what is interpreted.<sup>2</sup> Since we couch our account in terms of PF-deletion, then, these are the conditions that this deletion process is subject to. The isomorphy conditions which are commonly posited

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<sup>1</sup>See §3.2.2 for further discussion of the relationship between Sluicing and other anaphoric processes such as pronominal reference.

<sup>2</sup>In addition to the conditions on sluicing itself, there are conditions on deaccenting which must be met by focus parallelism domains which are (possibly) larger than the A and E clauses themselves. See Rooth (1992) and Fiengo & May (1994) for discussion of this condition in general and Romero (1998) for detailed discussion of its implications for sluicing.

fall into two major categories: (a) conditions on the syntactic/morphological/lexical *form* of the A and E clauses and (b) conditions on their *meanings*.

For example, in Ross (1969)’s seminal work, he argues that sluicing is subject to a single isomorphy condition between the A and E clauses: syntactic identity. In contrast to Ross (1969), Merchant (2001) argues that sluicing is subject to only a semantic identity condition: that the focus closures of the A and E clauses symmetrically entail one another. Since Merchant (2001), the view that the isomorphy conditions on sluicing are at least partially semantic has come to be widely accepted. At the same time, however, there is mounting evidence that a purely semantic account might be too permissive, leading many recent authors (e.g. Chung (2006), van Craenenbroeck (2008), and Chung et al. (2010)) to conclude that the conditions must include both a semantic isomorphy condition *and* some sort of form-based condition. Under a ‘hybrid’ approach of this sort, the possibility arises that the form-based condition can be far less stringent than full-blown syntactic isomorphy. For example, Chung (2006) argues that sluicing is subject to both a semantic condition and a lexical condition (all unpronounced words must have a pronounced counterpart in the A clause). When we turn to consider sprouting in §3.3, we will adopt an approach of exactly this sort.

In order to capture the data from (85a), (87), and (88), we argue that we need a symmetric entailment condition which references a richer semantics than the purely truth-conditional semantics in Merchant (2001)’s account. Since the semantic isomorphy condition we propose builds on Merchant (2001)’s in its basic form, it is worth considering his condition in more detail before proceeding. Building on Schwarzschild (1999)’s account of deaccenting, Merchant argues that Sluicing is subject to the condition in (91). That is, the A clause must entail the focus-closure of the E clause and vice versa.<sup>3</sup>

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<sup>3</sup>There are two parts of this definition which will not concern us here. First, the existential type-shifting is included here to account for VP-ellipsis and other ellipsis where E and A are not full clauses and therefore do not denote propositions. Existentially closing the subject in VP-ellipsis makes their denotations propositional, allowing for entailment to be computed between the two VPs. This part of the definition plays no role in sluicing since IPs are already proposition-denoting. Second, the focus-closure part of the definition is needed to handle two kinds of sluices which we will not discuss here: ones where the *wh*-phrase contains *else*, as in (1), and so-called ‘contrast’ sluices like (2), both examples from Merchant (2001). For exposition’s sake, we ignore this in what follows, though something like it

- (91) **Merchant (2001)’s e-Givenness condition:** An IP  $\alpha$  can be deleted only if  $\alpha$  is e-GIVEN.
- (92) **e-Givenness** An expression E counts as e-GIVEN iff E has a salient antecedent A and, modulo existential type-shifting,
- a. A entails F-clo(E), and
  - b. E entails F-clo(A).

While Merchant’s condition is a semantic one, one key point to make about it is that the reason indefinites are good inner antecedents in this account is nonetheless syntactic. Consider an example like (85b), repeated below in (93). The condition in (91) holds that the crossed out material in the E clause can be elided only if it symmetrically entails the A clause. Merchant would (uncontroversially) assign the A-clause a denotation with existential truth-conditions. Where a decision has to be made is with respect to the trace of the wh-phrase. What semantics should the trace be given for the purposes of computing e-GIVENNESS? Merchant’s answer, not surprisingly, is to give the trace an existentially quantified interpretation, so that  $IP_E$  and  $IP_A$  have the same interpretation, and ellipsis is correctly predicted to be possible.

- (93) [ [Marta lent something to Joe] $_{IP}$  ] $_A$ ,  
and I want to find out [what $_i$  [ ~~she lent  $t_i$  to Joe~~] $_{IP}$  ] $_E$ .

While this correctly captures the fact that indefinites are licit inner antecedents, it doesn’t provide a deep semantic explanation for *why*. It is not the semantics of interrogative E clauses itself which makes them sufficiently similar to A clauses with indefinites. Rather, it is the existential closure built into the symmetric entailment condition coupled with the free variable contributed by the wh-trace. In the account to be developed below, the ability of indefinites to serve as inner antecedents arises because

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surely needed to account for examples of this sort.

- (1) Abby called  $BEN_F$  an idiot, but I don’t know who else.
- (2) She has five  $CATS_F$ , but I don’t know how many  $DOGS_F$ .



of the tight semantic connection between indefinites and *wh*-words themselves. The inner antecedenthood of indefinites is another manifestation of the interrogative-indefinite affinity discussed in Chapter 2.

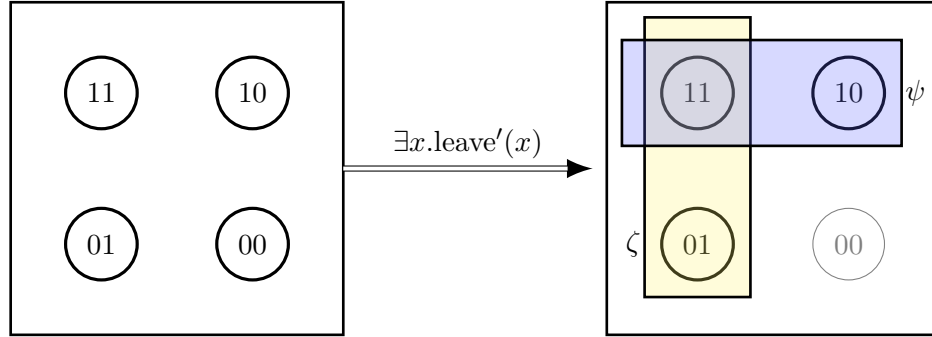
### 3.1.2 An inquisitive entailment condition on Sluicing

In Chapter 2, we saw that the composition of questions in Yucatec Maya led us to a semantics where sentences with wide-scope indefinites (and disjunctions) are given interpretations with an alternative structure similar to that of questions. In this section, we propose a symmetric entailment condition over these inquisitive semantic representations. Indefinites can serve as inner antecedents, then, because they make the same inquisitive contribution to discourse as questions do. In addition to providing an understanding of the nature of inner antecedenthood, this definition will also allow for an account of the three puzzling observations about merger with which we began this chapter: (i) that disjunctions can also serve as inner antecedents, (ii) that doubly negated indefinites cannot, and (iii) that even overt indefinites in appositive relative clauses cannot be inner antecedents.

In considering sluicing, it will be helpful to picture the single-tiered inquisitive semantics of the previous chapter in a more dynamic way. For example, the denotation for a sentence with an indefinite, such as (94), can be pictured as in (95) (for a toy model with two individuals). On the left hand side is the input state as encoded by the sentence’s semantic presuppositions. In the case of (94), there are no such presuppositions conveyed by the sentence itself. On the right hand side is the proposed output state which the update creates, if accepted by the addressee. Relative to the presupposed input state, the update is inquisitive since it contains multiple alternatives and informative since it proposes to eliminate the grayed out worlds from the live options ( $w_{00}$  in this example).

(94) Someone left.

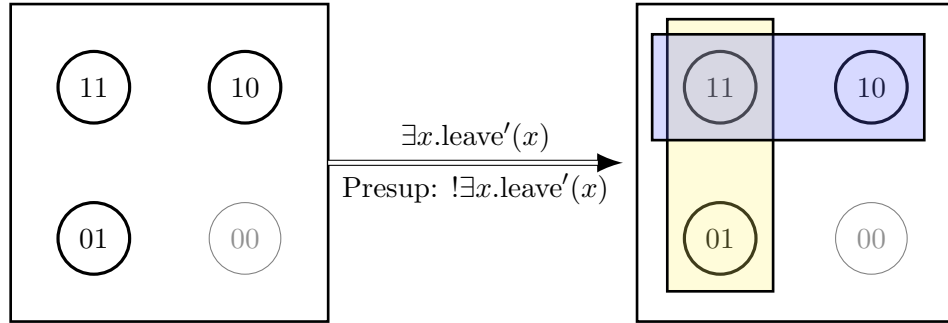
(95)



The question semantics we developed for Yucatec Maya assigns the corresponding question, (96), the denotation pictured in (97). In contrast to the indefinite in (95), the question's existential presupposition linguistically specifies an input state where  $w_{00}$  has already been eliminated. As we saw in Chapter 2, the result of this is that, relative to the presupposed input state, (96) is not potentially informative. The sentence therefore meets the definition we have termed the inquisitive principle, and therefore functions as a question.

(96) Who left?

(97)



While the two denotations differ in the presuppositions they impose on the input state, they propose the same output state (i.e. they have the same *at-issue* meaning). They not only contain the same truth-conditional *information*, but also make the same *inquisitive* contribution (i.e. raise the same *issues*). Sluicing, we claim, requires symmetric entailment over both kinds of semantic content, not just truth-conditions. That is, for an interrogative E clause to be elided, its proposed output must have identical truth conditions *and* inquisitive content as an A clause in prior discourse.

Formally, we achieve this by imposing a symmetric entailment condition (following Merchant (2001)), but defining entailment over our inquisitive semantic denotations, as in (98), from Groenendijk & Roelofsen (2009). A formula  $\varphi$  entails another formula  $\psi$  iff every alternative in  $\varphi$  is a subset of some alternative in  $\psi$ . For formulas which denote singleton sets (e.g. those which are free of disjunctions and indefinites), this definition reduces to the standard notion of entailment. For elements which are inquisitive, the definition mirrors Groenendijk & Stokhof (1984)’s entailment for questions, the difference being that the alternatives are allowed to overlap, therefore not necessarily forming a *partition*.

(98) **Entailment:**  $\varphi \models \psi$  iff  $\forall \alpha \in \llbracket \varphi \rrbracket$  is such that  $\exists \beta \in \llbracket \psi \rrbracket$  such that  $\alpha \subseteq \beta$

Crucially for our present purpose, this definition for entailment operates over only the proposed output states, ignoring the presupposed input. The result, then, is that we essentially compute entailment over the entire clause, including the wh-phrase, but ignoring the existential presupposition (which, for English, we can attribute to a covert interrogative complementizer  $C_{+Q}$ ). Given this definition for entailment, we can state the semantic condition on sluicing as in (99)<sup>4</sup>:

(99) **Symmetric Entailment Condition on Sluicing:** Given a structure  $\begin{array}{c} \text{CP}_E \\ \swarrow \quad \searrow \\ \text{C}_{+Q} \quad \text{IP}_E \end{array}$ ,

$\text{IP}_E$  can be elided only if there is some salient antecedent  $\text{CP}_A$  such that:

- a.  $\text{CP}_E \models \text{CP}_A$ , and
- b.  $\text{CP}_A \models \text{CP}_E$

In addition to defining entailment over richer semantic objects as discussed above, there are two further differences between this condition and Merchant (2001)’s from (91). First, this definition makes explicit that the prospective E clause is a question, something which Merchant (2001) states, but does not explicitly include in his definition. The more substantial difference (facilitated by the richer semantics we adopt)

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<sup>4</sup>As discussed above, this definition would have to be complicated with focus closure or something similar in order to account for contrast sluices and sluices with *else*. We ignore this complication in what follows, as it is orthogonal to our present concerns.

is that symmetric entailment can be defined over the entire clause *including* the wh-phrase. Since wh-words always make an inquisitive contribution, the symmetric entailment condition therefore dictates that the A clause must also have a denotation which is inquisitive. The empirical generalization which follows from (99), therefore, is stated in (100).

- (100) **Inner antecedent generalization:** An expression  $\alpha$  can serve as an inner antecedent for sluicing only if  $\alpha$  makes an inquisitive contribution.

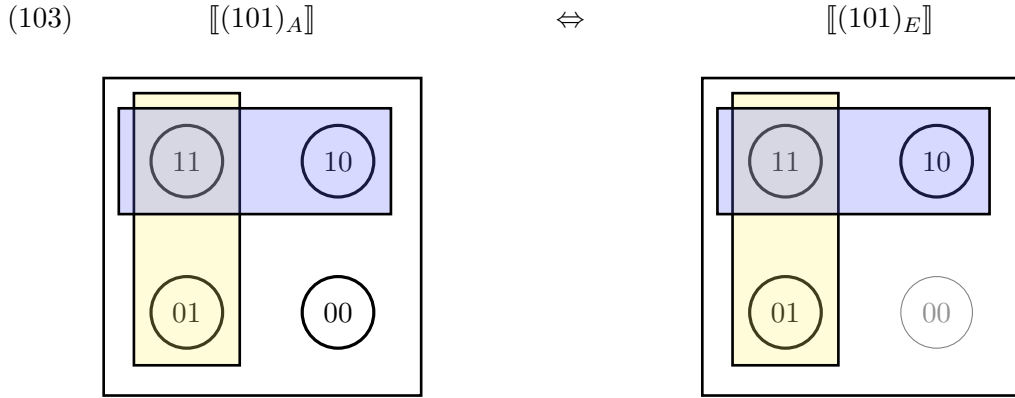
In contrast to this, Merchant (2001)’s entailment condition is computed over the  $IP_E$  to be elided, and therefore disregards the wh-phrase itself. What matters for Merchant (2001)’s account, then, is the relationship between the inner antecedent and the existentially-closed trace, rather than the inner antecedent and the wh-phrase itself. The wh-phrase and the trace of course, must also be related, since they form a single chain of ordinary A’-movement. Under the present approach, the intermediate step of existentially closing the trace becomes unnecessary; the wh-phrase itself already has suitably similar semantics to the inner antecedent, as we will see in detail shortly.

We can first consider the most straightforward case, an example where there is a widest-scope overt indefinite in the A clause serving as inner antecedent, as in (101). The A clause ‘Someone left’ will be assigned the metalanguage translation in (102a), whose inquisitive semantic interpretation is pictured in the left-hand side of (103). That is, the denotation of the A clause here consists of a set of alternative propositions of the form ‘ $x$  left’. The E clause will be assigned the metalanguage translation in (102b) whose output state is pictured in the right-hand side of (103). The interrogative E clause’s denotation, then, differs from that of the A clause only in the input condition it presupposes (indicated by the grayed out circle).

- (101) [Someone left]<sub>A</sub>, but I don’t know [who ~~left~~]<sub>E</sub>

- (102) a. (101)<sub>A</sub>  $\rightsquigarrow \exists x.\text{leave}'(x)$

- b. (101)<sub>E</sub>  $\rightsquigarrow \exists x.\text{leave}'(x)$  (Presupposes:  $!\exists x.\text{leave}'(x)$ )



Given these denotations, the symmetric entailment condition in (99) will be met and the sluice is predicted to be well-formed. Each alternative in  $CP_E$  is contained by one in  $CP_A$  (since they are the same alternatives), and the same holds in the opposite direction. The definition we have given for entailment ignores the presupposition of the E clause, which is precisely what distinguishes the two clauses. We also straightforwardly predict that proper names and strong quantifiers cannot similarly serve as inner antecedents, as in Chung et al. (1995)’s examples in (104). The prospective A clauses in these examples have denotations which are not inquisitive in the way that indefinites are.

- (104) a. ?\* I know that Meg’s attracted to Harry, but they don’t know who.  
 b. \*She said she had spoken to {everybody/most students}, but he wasn’t sure who.

The account can also handle what Chung et al. (1995) term ‘inheritance of content’, as in their (107) and Ross (1969)’s (105-106). The interesting thing about these examples is that the underlined material in the inner antecedent is inexplicably absent from the E clause. That is, the problems in the E clause in (106) can only be old problems, the individuals in the E clause of (107) can only be students, etc. The wh-phrase appears to include the descriptive content of the inner antecedent even when that content is not present in the E clause.

- (105) [ Ralph is going to invite someone from Kankakee to the party]<sub>A</sub>, but they don’t know [ who<sub>j</sub> he’s going to invite ~~t<sub>j</sub>~~ to the party ]<sub>E</sub>

- (106) [ He’s going to give us some old problems for the test ]<sub>A</sub>, but [ [which problems]<sub>i</sub> ~~he’s going to give us  $t_i$  for the test~~]<sub>E</sub> isn’t clear.
- (107) Joan said she talked to some students, but I don’t know [ who<sub>k</sub> ~~she talked to  $t_k$~~ ]<sub>E</sub>

On the face of it, such examples pose a serious problem for a theory of sluicing based on syntactic identity. In order for syntactic identity to be met, the underlined material would have to be present in the syntactic structure of the E clause as illustrated in (108). This assumption is problematic since there is no independently observable process which, for example, would delete the adjective *old* in (106) or else strand it in the ellipsis site. Under a strict syntactic isomorphy approach, such examples must be derived from a structure like (106) rather than one like (108).

- (108) [ He’s going to give us some old problems for the test ]<sub>A</sub>, but [ [which ~~old~~ problems]<sub>i</sub> ~~he’s going to give us  $t_i$  for the test~~]<sub>E</sub> isn’t clear.

In order to account for such examples, then, Chung et al. (1995) posit that LF-copying makes available a sluicing-specific process, which they term ‘Merger’, which combines semantically the conditions from the copied inner antecedent and the wh-phrase itself. The idea is that Merger coindexes the variable in the recycled inner antecedent as well as that of the wh-phrase in the E clause, resulting in both conditions restricting the wh-word’s domain. As Merchant (2001) points out, this means that their semantics can, in principle, interpret sentences like ‘Who<sup>*x*</sup> did you see someone<sup>*x*</sup>?’ in such a way that the descriptive content of *who* and *someone* is ‘merged’ together.<sup>5</sup>

There are, however, three problems for this account of the inheritance of content facts. First, as we will see in greater detail in §3.1.3, the class of inner antecedents also includes disjunctions, whose LF is not standardly taken to contain a free variable. Second, the ‘inheritance of content’ occurs only in one direction: from the inner antecedent to the wh-phrase. In contrast, nothing inherent to coindexing the two variables would seem to preclude examples like those in (109) where the wh-phrase contains

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<sup>5</sup>Merchant makes the stronger claim that Chung et al. (1995)’s account fails to provide a principled explanation for the ungrammaticality of the sentence ‘Who did you see someone?’. It is true that they do not rule out such a sentence on semantic grounds. However, there is ample reason to think that such examples might be ruled out by the syntax, as long as there is no overt counterpart to Merger.

conditions not present in the antecedent clause.<sup>6</sup> One could, of course, impose additional conditions on the operation, but if the operation of Merger is indeed particular to sluicing, such a move would seem to be more or less stipulative.

- (109) a. ??He’s going to give us some problems for the test, but which old problems isn’t clear.  
 b. ??John ate something, but I don’t know which sandwich.  
 c. ??John talked to a mean guy yesterday, but I don’t know which jerk.

Third, since merger is particular to sluicing, Chung et al. (1995) predict these effects to be limited to sluices, and in particular, to not arise with non-elliptical control sentences. Chung et al. (1995) offer as support the fact that (110) can be interpreted in a way such that *when* in the second clause need not be restricted to Sunday. There are reasons to doubt that this example is indicative of the general pattern here. First, it seems to rely crucially on the fact that *when* is, in some sense, “ambiguous” between two related meanings, one paraphraseable as ‘what time’ and the other ‘what day’. That is, the reading of (110) which appears to not inherit the restriction from the inner antecedent is equally possible if we omit the phrase *some time*. If we substitute the phrase *what time* in place of *when*, as in (111), the result is markedly worse.

- (110) They were going to meet some time on Sunday, but the faculty didn’t know when they were going to meet.  
 (111) ??They were going to meet some time on Sunday, but the faculty didn’t know what time they were going to meet.

To the extent that (111) is felicitous, it relies on contrastive focus on some element such as *the faculty* in order to achieve the intended interpretation. That is, the putative counterexamples are ones where, as Romero (1998) discusses at length for other examples, the prospective E clause does not meet the more general conditions on deaccenting. The ‘inheritance of content’ phenomenon does indeed occur with both sluices

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<sup>6</sup>It should be pointed out that non-elliptical versions of the examples in (109) are often quite degraded too. As best as I can tell, however, this does not affect the predictions that a Chung et al. (1995)-style Merger account makes. The grammatical examples they analyze as involving Merger (e.g. (107)) also involve structures which have no ungrammatical overt counterparts as discussed in Fn. 5.

and their non-elliptical counterparts, provided that the non-elliptical counterparts are deaccented, as seen in (112). We therefore conclude, following Romero (1998), that this body of facts is better attributed to more general pragmatic mechanisms, rather than something specific to the grammar of sluicing.

- (112) a. Ralph is going to invite someone from Kankakee to the party, but they don't know who he's going to invite.  
 b. He's going to give us some old problems for the test, but which problems he's going to give us isn't clear.  
 c. Joan said she talked to some students, but I don't know who she talked to.

More specifically, under a semantic approach like the present account (or Merchant (2001)), such examples can be treated as more or less ordinary instances of contextual domain restriction of the *wh*-phrase. The fact that *who* is restricted to students is because the only contextually salient group of individuals which meets the conditions for deaccenting are students. Given this contextual restriction, the A and E clauses in an example like (113) will symmetrically entail one another and the ellipsis is predicted to be licit according to the symmetric entailment condition in (99).

- (113) Joan said [ she talked to some students ]<sub>A</sub>, but I don't know  
 [ who ~~she talked to~~ ]<sub>E</sub>.

Before proceeding, it is worth reiterating that this line of analysis for these examples is only possible under semantic isomorphy approaches (or purely discourse/pragmatic approaches). They are incorrectly ruled out by approaches which rely directly on full-blown syntactic isomorphy since material which is overt in the A clause is present in the interpretation of the E clause only in the contextual domain restriction of the quantifier. Moreover, since the same inheritance of content facts occur in non-elliptical controls which are properly deaccented, 'inheritance of content' must be the result of more general pragmatic principles, rather than something sluicing-specific.



### 3.1.3 Disjunctions and the nature of inner antecedents

Thus far, the fact that indefinites are licit inner antecedents for sluicing is derived from a symmetric entailment condition on sluicing in combination with the semantics for indefinites and questions we developed in Chapter 2 in order to account for the interrogative-indefinite affinity in Yucatec Maya. Since questions are always inquisitive (indeed, this is their sole contribution), symmetric entailment dictates that the antecedent clause must not only have the same informational content, but must also be inquisitive. In this section, we show that the account straightforwardly extends to capture the fact, first observed by Chung et al. (1995), that another inquisitive element — disjunction — can also readily serve as an inner antecedent for sluicing. Some basic examples are in (114):

- (114) a. [(Either) Ryan or Dexter will play center field]<sub>A</sub>, but they haven't announced  
[which (one) ~~will play center field~~]<sub>E</sub>.  
b. [Carlos (either) likes tofu or chicken]<sub>A</sub>, and I'm going to find out [which  
(one) ~~he likes~~]<sub>E</sub>.  
c. [Troy gave the ball to (either) Todd or Ian]<sub>A</sub>, but I don't know [which (one)  
~~he gave the ball to~~]<sub>E</sub>.

In each of the examples in (114), we can readily replace the disjunction with a suitable indefinite and the resulting sentence is felicitous with roughly the same meaning. This parallelism is, in a sense, unsurprising, given the long noted semantic parallels between disjunctions and indefinites (e.g. Rooth & Partee (1982), Schlenker (2006)).<sup>7</sup> Indeed, Chung et al. (1995) suggest an approach in passing (pp. 268-9) which would treat such disjunctions as indefinites whose values are restricted to one of two individuals. It is not clear how literally this syntactic suggestion is intended, but regardless, it will struggle with examples like those in (115), where the disjunction is not of arguments, but of clauses or other constituents larger than DPs.

- (115) a. (Either) Freddie is baking a cake again or something is on fire, but I can't  
tell which (one).

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<sup>7</sup>The only thing distinguishing these examples is the obligatory presence of the D-linked wh-word, *which*, which we take to be independently motivated, as discussed by Dayal & Schwarzschild (2010).

- b. Russ is in the back or Ali is working alone, but I can't tell which (one).
- c. Estelle (either) walked in the park or took out the trash. If you wait, you'll find out which (one).

The examples in (115) demonstrate that the potential for disjunctions to serve as inner antecedents is not a peculiarity of argumental disjunctions, but is a fact about disjunctions in general. Chung et al. (1995)'s suggested tactic of assimilating disjunctions like (114) to indefinites does not seem readily generalizable to the data in (115).<sup>8</sup> On the face of it, clausal disjunctions are quite different than indefinites in terms of their syntax. In Chapter 2, however, we have already seen ample reason to think that there are deep semantic parallels, including their shared *inquisitiveness*.

Before going through an example in detail, we should mention one open question raised by the examples in (115): the internal syntax of the E clause. In argument disjunctions, it seems clear what the internal syntactic structure should be, by analogy with corresponding examples where an indefinite serves as inner antecedent. For (115), however, it is less clear what the internal structure of the E clause is. A number of different paraphrases would seem to yield (roughly) the appropriate meaning. For example, the E clause in (115a) could be *which (one) is happening*, *which (one) is true*, *which (one) it is*, among other possibilities. (115c) has an additional paraphrase which is of particular note: *which (one) she did*. While this paraphrase does not immediately suggest a solution, it suggests that the problem posed by (115) is closely related to another well-known phenomenon from the literature on VP-ellipsis: that of so-called *split antecedents* (Elbourne (2008), Fiengo & May (1994) among others), as in (116).

- (116) a. Bob wants to sail round the world and Alice wants to climb Kilimanjaro, but neither of them can, because money is too tight. (Webber (1978))
- b. Whenever Max uses the fax or Oscar uses the Xerox, I can't. (Fiengo & May (1994))

We leave this larger issue for future work, as the choice between the different possible E clauses is largely orthogonal to our present concerns. As long as the wh-phrase

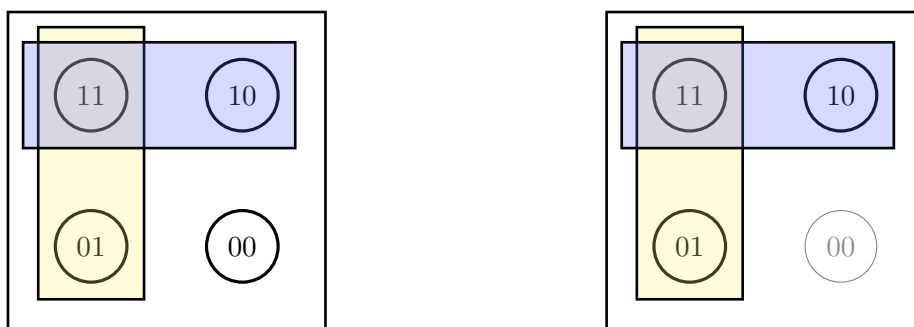
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<sup>8</sup>However, it is not impossible to imagine recasting Alonso-Ovalle (2006)'s semantics for disjunction in a way which would facilitate such an approach.

plus the elided material has the same semantics as the A clause, our account predicts ellipsis to be possible. The central difference between clausal disjunctive antecedents to sluicing and split antecedents for VPE — the fact that they arise with disjunctions rather than conjunctions — follows straightforwardly from our account since only disjunctions have denotations which are inquisitive.

This caveat aside, the account developed in the previous section in tandem with the Yucatec Maya-inspired semantics for disjunction from Chapter 2 correctly predicts the felicity of sluicing with a disjunctive inner antecedent, as seen in (117). The interpretation of the A clause puts forth a set of two alternatives, as pictured in the left-hand side of (117c). The E clause, right, is also inquisitive, due to the *wh*-word. The contextual restriction of *which* limits the alternative set of the E clause to the same two alternatives made salient by the disjunctive inner antecedent. Since the A clause and E clause denote the same set of alternatives, the symmetric entailment condition in (99) is met, and the sluice is predicted to be acceptable.

- (117) a. [(Either) John or Fred left]<sub>A</sub>. Tell me [which (one) left]<sub>E</sub>.  
 b. i. (117)<sub>A</sub>  $\rightsquigarrow$  leave'(j)  $\vee$  leave'(f)  
 ii. (117)<sub>E</sub>  $\rightsquigarrow$   $\exists x.x \in \{j,f\} \wedge \text{leave}'(x)$  (Presupposes:  $\exists x.x \in \{j,f\} \wedge \text{leave}'(x)$ )  
 c.  $\llbracket (117)_A \rrbracket \quad \Leftrightarrow \quad \llbracket (117)_E \rrbracket$



One thing which this example makes quite clear is that it is the interpretation of the two clauses, in (117c), which is crucial to the example's felicity. The metalanguage translations of the two clauses in (117b) are quite different, yet sluicing succeeds due to the semantic parallels between the interpretations of disjunctions and indefinites. The clausal disjunctions in (115) illustrate this mismatch even more starkly. While

this account is ultimately quite distinct from that suggested by Chung et al. (1995), there is nonetheless a shared intuition that the reason why disjunctions are licit inner antecedents stems from the parallelism between them and indefinites. Chung et al. (1995) suggest that this parallel might be cashed out syntactically, which is plausible for argument disjunctions, but less so for clausal disjunctions. By cashing out this parallel in the semantic interpretation itself, we capture the relevant data, but without positing an indefinite-like syntax for disjunctions.

### 3.1.4 Double negation

The symmetric entailment condition we have developed in this section holds that A clauses for Sluicing must have not only the same truth conditions as their corresponding E clauses, but also the same inquisitive potential. This richer semantic condition predicts that there should be A clauses which have existential truth conditions, yet fail to license sluicing. The first case of this sort which we examine is that of doubly negated indefinites, which do not license sluicing, as seen in (118).

- (118) a. \*[It's not the case that no one left]<sub>A</sub>, but I don't know [who left]<sub>E</sub>.  
 b. \*[It's not the case that John didn't meet with a student]<sub>A</sub>, but Fred still wonders [who ~~John met with~~]<sub>E</sub>.

While the A clauses in such sentences are clearly pragmatically marked, it seems equally clear that they have the same truth conditions as their negation-less counterparts. Furthermore, in examples where the indefinite is provided by an ordinary indefinite, rather than *no one* or *anyone*, the sentence has the same potential for licensing cross-sentential anaphora, as seen in Krahmer & Muskens (1995)'s example in (119).<sup>9</sup>

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<sup>9</sup>It is, of course, not impossible that the anaphora in such examples is somehow exceptional, not arising from ordinary means (e.g. via something pragmatic). It is not at all clear to me, however, that it is possible to formulate such an account in a way which correctly predicts the asymmetry between (119) and other pragmatically similar examples such as Partee's famous marble example, in (i), and examples of negated negative quantifiers like (ii).

- (i) I lost ten marbles and found only nine of them. # It is probably under the sofa.  
 (ii) It's not the case that no student came to office hours. #He just left early.

- (119) It is not true that John didn't bring an umbrella. It was purple, and it stood in the hallway.

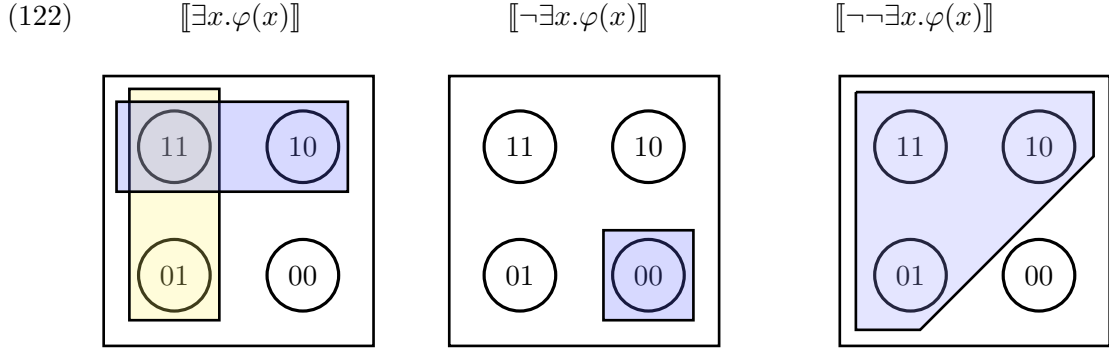
Given these facts, then, it seems that double negation must preserve truth-conditions, but nonetheless has a semantic effect, namely eliminating the fine-grained inquisitive structure that the indefinite ordinarily possesses. This result follows quite directly from the way we have defined negation in Chapter 2, repeated in (120). Negation closes off alternatives by quantifying over them universally.

$$(120) \quad \llbracket \neg\varphi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{every } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} \text{ is such that } \alpha \cap \beta = \emptyset\}$$

This definition is empirically supported by the fact that an indefinite within the scope of negation, as in Chung et al. (1995)'s (121), does not license sluicing. The continuation with sluicing is grammatical, but indicates that the indefinite in the A clause takes wide-scope over negation.

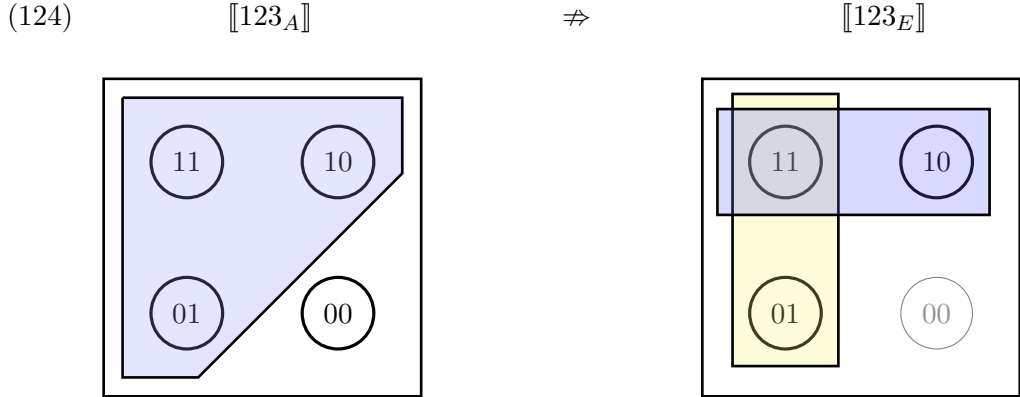
- (121) She didn't talk to one student; I wonder who.

It follows directly from this definition that *double* negation is no longer semantically vacuous. While it preserves truth conditions, it nonetheless has a semantic effect: eliminating the inquisitive component of the formula to which it applies. We can see this visually in (122). The first negation (middle) looks at all of the alternatives of the indefinite (left) and returns the maximal alternative which has no overlap with any of them. The second negation looks at this necessarily singleton set and returns the maximal set with no overlap with that single alternative. The resulting set contains a single alternative comprising all of the worlds which were members of some alternative or other in  $\llbracket \exists x.\varphi(x) \rrbracket$ . That is, double negation preserves the truth-conditions of the formulas to which it applies, but eliminates the potential for inquisitiveness.



Returning to our sluicing example, we now understand why indefinites under double negation cannot serve as inner antecedents, as in (123), repeated from above. The A clause receives the interpretation schematized in the left-hand picture below, while the question is still, of course, inquisitive and has the proposed output state seen in the right picture. Since we are operating under a PF-deletion theory of ellipsis, we only need to consider an E clause with no negation since the doubly-negated clause does not allow wh-extraction (the predictions of the LF-copying approach will be discussed shortly).

(123) \* $[\text{It's not the case that no one left}]_A$ , but I don't know  $[\text{who left}]_E$ .



Applying our symmetric entailment condition, then, we see that the E clause does indeed entail the A clause. Each alternative in the E clause finds some alternative (the single alternative) in the denotation of the A clause which is a superset of it. In the other direction, however, we find that the single alternative in the doubly negated A clause does not find any alternative in the E clause which contains it. Since symmetric entailment fails, we correctly predict that double negation should block sluicing.

The account, then, correctly predicts the unacceptability of such examples because of the semantic (but non-truth-conditional) effect of double negation. At this point, we can compare the present account with previous accounts, many of which struggle with such examples. While we have already seen several other problems for such accounts above (and Merchant (2001) points out several more), accounts based on full-blown syntactic isomorphy get these examples right since the A clause with its double negation quite obviously has a different internal structure than the corresponding question with no negation.

An account based on symmetric entailment over a solely truth-conditional semantics, such as Merchant (2001), incorrectly predicts sluicing to be possible in such cases. The A clause has the same informational content as the existentially closed E clause and should therefore license sluicing in exactly the same way as the corresponding example with no negation. The more general conditions on deaccenting discussed by Romero (1998) will similarly predict that double negation will have no effect. For deaccenting, this prediction seems to be borne out: it seems that the underlined material in (125) can be destressed felicitously, as predicted by either the Roothian approach or Schwarzschildian givenness.

- (125) It's not the case that Bill didn't donate a book to the library, but I don't know which book he donated.

Despite this, the corresponding sluice is ill-formed, which shows us a rift between deaccenting and sluicing (possibly ellipsis more generally, see §3.2.3). Deaccenting really is concerned with whether or not truth-conditional information is given, as both Rooth (1992) and Schwarzschild (1999) argue. Sluicing, on the other hand, is concerned primarily with *inquisitive* content, i.e. with retrieving an issue which the prior linguistic context has made salient. Ordinary indefinites are hybrid expressions, in that they make both an informational contribution and an inquisitive one. Double negation removes this latter contribution, and it is this richer notion of meaning to which sluicing is sensitive.

It is a bit more tricky to assess the predictions made by Chung et al. (1995) with regards to double negation. Their account relies on the copied IP containing a free variable which the question operator can bind, yielding the desired interpretation.

On the one hand, since Heim (1982)’s semantics for negation does not predict there to be a free variable, Chung et al. (1995)’s account would appear to correctly rule out examples like (123). On the other hand, however, Heim (1982)’s account itself is aimed at capturing the anaphoric potential of such expressions, and therefore makes the wrong prediction with regards to doubly negated indefinites (as do nearly all other dynamic accounts, see Krahmer & Muskens (1995) for discussion). The potential for sluicing in Chung et al. (1995)’s account is closely tied to the potential for cross-sentential anaphora, and double negation represents a case where the two diverge (in §3.2, we will see that appositives provide another such case).

Focusing on the ‘merger’ subtype of sluicing, this section has proposed that sluicing is subject to a semantic condition: that the inquisitive semantic denotations of the A and E clauses symmetrically entail one another. Since E clauses in sluicing are always matrix or embedded questions, it follows from this that the A clause must not only have the same truth-conditions (modulo the question’s existential presupposition), it must have the same issue-evoking capacity. The so-called ‘inner antecedent’ is the element which provides this in the cases we have considered in this section. The semantics we have argued for, then, derives several observations about the nature of inner antecedents including the felicity of disjunctions as inner antecedents and the infelicity of doubly-negated indefinites. Examples of this sort have proven problematic for prior syntactic and truth-conditional semantic accounts respectively. Moreover, we will see in the next section that this account can be minimally extended to capture a novel body of facts which will prove problematic to both syntactic and truth-conditional semantic accounts: the interaction between sluicing and appositives.

## 3.2 Ellipsis and Apposition

The semantics we have developed for ordinary assertions in Chapter 2 is more like that traditionally assumed for questions. So far in this chapter, we have claimed that it is this alternative-rich structure which allows sentences with indefinites and disjunctions to be sufficiently similar to questions to license sluicing. In this section, we examine an environment which, we claim, lacks this alternative-rich structure — appositive relative clauses — and show that a number of novel observations about sluicing, and



VP-ellipsis by extension, follow from this idea. Central among these observations is that even overt indefinites inside relative appositive clauses are not licit inner antecedents for sluicing, as in (126).

(126) \*Joe, who once killed a man in cold blood, doesn't even remember who.

The section proceeds as follows: §3.2.1 provides independent motivation for treating appositives as having a semantics which is more like that of classical assertions than questions, devoid of the rich structure we attribute to at-issue assertions; §3.2.2 demonstrates that this semantics correctly predicts the interactions between sluicing and apposition which we find; and §3.2.3 accounts for parallel effects in VP-ellipsis, arguing that sensitivity to inquisitive content is a property of ellipsis in general, not just of sluicing.

### 3.2.1 Appositives as classical updates

In recent literature, it has been widely agreed upon that the semantics of appositives is, in some way, different from that of at-issue assertions. That is, the semantics — broadly construed — of a sentence like (127a) is not reducible to that of (127b) plus some additional piece of semantics or pragmatics.

- (127) a. Mary, who is originally from Los Angeles, has a really good recipe for salsa.  
 b. Mary is from Los Angeles and she has a really good recipe for salsa.

Following Potts (2005), it has become common to think of the content of the appositive relative clause as being in some way *separate* from the rest of the sentence. While this result seems right at the level of propositional content, several recent works have shown that this separation does not extend to anaphora in general (Nouwen (2007), Amaral et al. (2007)) or to ellipsis more specifically (AnderBois et al. (2011)). For example, VP-ellipsis can operate more or less freely<sup>10</sup> across the at-issue/appositive boundary, as in (128). While ellipsis in general can freely cross the at-issue/appositive boundary, sluicing proves a surprising exception, as seen in (129).

(128) Mary, who doesn't help her sister, told Jane to ~~help her sister~~ instead.

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<sup>10</sup>The exceptions to this general pattern are discussed in §3.2.3.

(129) \*Joe, who once killed a man in cold blood, doesn't even remember who.

Since other anaphoric processes including VPE are possible, the infelicity of (129) cannot simply be attributed to the separation or extradimensionality of appositive content.<sup>11</sup> Rather, it must be that the semantic contribution of appositive content is itself different from that of at-issue content in a way which derives this difference. To see how, we must first flesh out the conception of ordinary at-issue assertions assumed in Chapter 2.

The conception of meaning put forth in Chapter 2 treats assertions as being more question-like than is traditionally assumed. One of the central motivations for this is the idea that assertions, like questions, are *proposals* to update the common ground (see Groenendijk & Roelofsen (2009) for further discussion of this motivation). This conception is developed most explicitly by Farkas & Bruce (2010) in their account of responses to questions and assertions. Empirically, they argue for this view of at-issue content based in part on the fact that across languages, assertions often *allow* for the responses that polar questions *expect*, as seen for English in (130).

- (130) a. Anne: Sam is home.  
b. Ben: Yes. // Yeah, he's home. // No, he isn't home.

Appositives, however, do not intuitively *propose* updates to the common ground, they *impose*<sup>12</sup> them. That is, while they also aim to enrich the common ground, they are not readily subject to the same 'discourse negotiation' tactics as at-issue assertions (see AnderBois et al. (2011) for a more detailed discussion). For example, the response particles *yeah* and *no* do not seem to target appositive content, leading to felicitous responses, as in (131a-131b).

- (131) A: Sonia, who is a terrible housemate, left the door unlocked last night.  
a. B: Yeah, but she is still a good housemate.  
b. B: No, but she *is* a terrible housemate.

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<sup>11</sup>The observation below that E clauses inside of appositives are possible, in (141), makes a similar point.

<sup>12</sup>Thanks to Floris Roelofsen for suggesting this term.

The observation that at-issue assertions, like questions, *propose* ways of updating the common ground fits naturally in inquisitive semantics, since both are modeled as being of the same semantic type, *stt*. To capture the observation that appositives *impose* rather *propose*, then, they ought to be of the same type as classical assertions — *st* — rather than questions. As we have seen in Chapter 2, however, being of type *stt* is also the exact feature of the logic that allows for *inquisitiveness*. This is because inquisitiveness is due to a formula denoting a set consisting of multiple alternative sets of possible worlds. Since appositives are not proposals, it follows then, that they cannot be inquisitive; the two properties are inextricably linked.

In terms of compositional semantics, one way to capture this behavior is by making appositive content subject to a COMMA operator, as in (132). This operator takes an inquisitive proposition  $\varphi$  (i.e. a set of alternative sets of possible worlds) and returns a simple set of worlds where some alternative or other in  $\llbracket \varphi \rrbracket$  holds.

$$(132) \quad \llbracket \text{COMMA}(\varphi) \rrbracket = \{w \mid \text{there is some } \alpha \in \llbracket \varphi \rrbracket \text{ s.t. } w \in \alpha \}$$

A full account of appositives is beyond the scope of the present work, as it requires a semantic account of *how* these two kinds of content update the common ground. While I do not pursue this presently, I believe the account which AnderBois et al. (2011) develop provides an update semantics for appositives which is compatible with the present view. What matters for our present purposes, however, is what structures these updates consist of; the operator in (132) accomplishes exactly this.

### 3.2.2 Sluicing and appositives

Returning to Sluicing, we see that unlike other ellipsis processes, it cannot freely cross the appositive/at-issue boundary. More specifically, Sluicing is ungrammatical whenever the would-be A clause occurs in an appositive relative clause, as in (133-135). As the (b) examples show, this restriction does not seem to be due to some independent source; it is the ellipsis itself which is ill-formed. Furthermore, since we have already seen in (128) that VPE can find its antecedent VP inside an appositive, this sluicing data cannot be due to discourse parallelism constraints on ellipsis of the sort discussed by Hardt & Romero (2004) and Frazier & Clifton (2006), which affect both VPE and Sluicing. Similarly, it cannot be due to more general conditions on

deaccenting discussed by Romero (1998) and others since VPE is generally taken to be subject to these conditions as well.

- (133) a. \*Joe, who once killed a man in cold blood, doesn't even remember who.  
       b. Joe, who once killed a man in cold blood, doesn't even remember who he killed.
- (134) a. \*The valiant knight, who defeated a masked enemy, still wonders who.  
       b. The valiant knight, who defeated a masked enemy, still wonders who he killed.
- (135) a. \*Amy, who coined a new word last night, forgot what/which.  
       b. Amy, who coined a new word last night, forgot what/which word she coined.

This contrast is further supported by naturally occurring examples like (136) (from the Davies (2008-)'s Corpus of Contemporary American English) which become infelicitous if we remove 'it was' from the attested example.

- (136) My sister did not kill herself, which means someone else must have done it, and I intend to discover who \*(it was).

We see the same contrast present in examples where the clause containing the indefinite is embedded within the appositive, as in (137). Such examples are important because the prospective A and E clauses in them are identical in every respect: lexically, syntactically, and truth-conditionally. They differ only in that the A clause occurs inside an appositive relative clause, yet sluicing is not possible.

- (137) Elizabeth, who thinks that Joe murdered a man in cold blood, wants to find out who \*(it was).

In §3.2.1, we motivated a semantics of appositives as purely informational updates imposed on the common ground. We achieved this in the logic by positing a semantics for comma intonation which collapses all the alternatives in the formula to which it applies into a single classical proposition (i.e. a set of worlds). Since the antecedent clause, as it has entered the common ground, doesn't possess inquisitive

alternatives, it cannot entail the inquisitive E clause.<sup>13</sup> Since symmetric entailment fails, sluicing is correctly predicted to be ungrammatical as demonstrated for (138) in (139-140).

(138) \*Joe [<sub>A</sub> who once killed a man in cold blood, ]<sub>A</sub>, doesn't even remember [<sub>E</sub> ~~who he killed in cold blood~~]<sub>E</sub>.

(139) a.  $\llbracket 138_A \rrbracket = \text{COMMA}(\exists x. \text{kill}'(\text{Joe}, x))$

b.  $\llbracket 138_E \rrbracket = \text{At-issue: } \exists x. \text{kill}'(\text{Joe}, x)$  Presupposes:  $!\exists x. \text{kill}'(\text{Joe}, x)$

(140)  $\text{COMMA}(\exists x. \text{kill}'(\text{Joe}, x)) \not\Rightarrow \exists x. \text{kill}'(\text{Joe}, x)$

One thing that these examples make clear is that the proposed semantic condition on sluicing is truly a condition on the anaphoric *retrieval* of the issue introduced by the inner antecedent. To determine whether the E clause can be elided, we must examine the representation of prior conversation and try to find a suitable antecedent which entails it symmetrically. In the case of appositives, the appositive provides a prior clause with the same lexical items, syntax, and truth-conditional semantics, yet sluicing is not possible since that clause has been subjected to the comma operator.

Since it is a condition on the anaphoric retrieval of the A clause, we predict the restriction on sluicing across the appositive/at-issue boundary to be an asymmetric one. Since issues *within* the scope of a COMMA operator do not exhibit any special behavior (e.g. there are embedded questions within appositives), we expect that sluicing with an at-issue A clause and an appositive E clause should be equally well-formed as when no appositive is involved. This is exactly what we find in examples like (141):

(141) [Someone left the door open]<sub>A</sub>. Jamie, who wants to find out who [<sub>E</sub> ~~left the door open~~]<sub>E</sub>, is interrogating the likely culprits.

Given this, it is perhaps tempting therefore to simply attribute these observations to a more general condition already present in Merchant (2001)'s semantic condition in (91): that the A clause be *salient* in prior discourse. That is, one might think

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<sup>13</sup>In a technical sense, entailment as defined in (98) is not even defined for appositives since they are of different types. We can fix this by defining entailment for elements of type *st* in terms of the entailment properties of the singleton sets containing them.

that being inside an appositive is simply a particular way that a clause can fail to be sufficiently *salient*. This, however, cannot be since Merchant (2001)’s condition is explicitly stated to hold of both sluicing and VPE, which we have seen can indeed find its antecedent material inside an appositive. Moreover, we will see in the next section that even though antecedents of VPE can occur inside appositives, the material retrieved cannot be inquisitive in these cases. That is, the inquisitive semantic condition we have proposed for sluicing can be shown to also hold of VPE.

### 3.2.3 VPE and appositives

In the preceding section, we saw that the independently motivated semantics for appositives correctly predicts the ungrammaticality of Sluicing from an antecedent A clause inside of an appositive relative clause. The account, however, made only indirect reference to Sluicing by referring directly to symmetric entailment over *inquisitive* content. Since the clause to be elided in Sluicing is necessarily interrogative, this means that Sluicing will always be ill-formed. It also, however, predicts that other ellipsis processes subject to the same constraint, such as VPE, cannot contain inquisitive content when their antecedents are inside of appositives. That is, we predict that the indefinite in a case of VPE like (142), unlike ordinary overt indefinites, ought to not be inquisitive.<sup>14</sup>

(142) Joe, who [murdered a man in cold blood]<sub>A</sub>, convinced Bill to [~~murder a man in cold blood~~]<sub>E</sub> too.

Since the antecedent VP is inside an appositive, we predict it should enter the conversation via a purely informational update, subject to the COMMA operator. At the ellipsis site, then, the conversational record should contain only a VP with the semantics in (143a), devoid of inquisitive alternatives (recall that ‘!’ is the non-inquisitive closure operator).

- (143) a.  $\llbracket 142_E \rrbracket = \lambda y. !\exists x. \text{murder}'(y, x)$   $\Leftarrow$  Predicted  
 b.  $\llbracket 142_E \rrbracket = \lambda y. \exists x. \text{murder}'(y, x)$

Looking at our intuitions alone, it is not clear whether the elided indefinite in (142) is inquisitive. Whereas the E clause in Sluicing is necessarily inquisitive, the elided

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<sup>14</sup>Thanks to Jeroen van Craenenbroeck for insightful discussion of the data and ideas in this subsection.

VP in VPE need not be. However, there are at least two pieces of evidence confirming the predicted semantics in (143a). First, we can force the elided VP to be inquisitive by having it occur in an E clause which is itself interrogative. As we see in (144-145), such examples are quite clearly ungrammatical.

- (144) \*Joe, who once killed a man in cold blood, doesn't even remember who he did.  
 (145) \*The valiant knight, who will defeat a masked enemy at sunrise, is trying to figure out who he will.

With these examples, one might object that sentences parallel to (144-145), but without an appositive, are also ungrammatical, as in (146). However, the generally accepted explanation (Takahashi & Fox (2005) *et seq.*) for the ungrammaticality of such examples is that Sluicing would have been possible instead, and a general principle — MaxElide — rules out VPE in (146) because more material could have been elided. In the cases with appositives in (144-145), however, MaxElide does not seem to be a possible explanation since Sluicing itself is ungrammatical.

- (146) \*Joe once killed a man in cold blood and he doesn't even remember who he did.

The second way to show that the elided VP in (142) is not inquisitive is by testing if the indefinite inside it can serve as an inner antecedent. Before we can see this, we first show in (147) that an indefinite inside an elided VP is, in principle, a possible inner antecedent for Sluicing. That is, (147) has a reading where Jane can't remember who *she* met with, i.e. where the A clause is 'Jane did ~~meet with a student yesterday~~'.

- (147) John met with a student yesterday. Jane<sub>i</sub> did too, but she can't remember who [~~she<sub>i</sub> met with yesterday~~].

In contrast, if the antecedent of the VPE is inside an appositive, the clause containing the elided VP can no longer serve as antecedent to Sluicing, as in (148).

- (148) \*John, who met with a student yesterday, convinced Jane to too, but she can't remember who [~~she met with yesterday~~].

The two observations we have made here confirm that VPE is subject to the same inquisitive entailment condition as sluicing. From this general condition, it follows

that sluicing from an appositive is never grammatical, since the E clause is necessarily a question and the A clause is necessarily non-inquisitive. Since the E clause in VPE need not be inquisitive, VPE from appositives is possible. Constructing examples where the VP is forced to be inquisitive, however, causes VPE to be as bad as the corresponding sluice.

Summing up, we see that the appositive data highlights the sense in which ellipsis is truly an *anaphoric process*. An account which simply compares the logical form of the antecedent to the elided clause, whether syntactically or semantically, would be unable to account for such facts. The content of the A clause itself is not what determines the ungrammaticality of these examples. Rather, it is the fact that their material entered the conversational record via an appositive (i.e. subject to the COMMA operator) which derives their ungrammaticality. Furthermore, these facts demonstrate an asymmetry between issues and pronominal anaphora in indefinites. Whereas indefinites inside appositives still serve as antecedents for subsequent anaphoric reference, they cannot serve as inner antecedents for sluicing. Given this, even an account referring to symmetric entailment over dynamic semantic representations will not be able to account for these facts.

### 3.3 Direct Sprouting

Thus far in this chapter, I have proposed that sluicing is subject to a symmetric entailment condition over inquisitive semantic representations. Since the elided clause in sluicing is always a question, this condition predicts that the antecedent clause in sluicing will always have an inquisitive interpretation. Thus far, we have considered the class of sluices where the inquisitiveness of the A clause is provided by an overt indefinite or disjunction, a type of sluicing which Chung et al. (1995) dub ‘merger’. In the remainder of this chapter, we turn to cases where there is no such inquisitive element overtly present (i.e. pronounced) in the A-clause, what Chung et al. (1995) term ‘sprouting.’<sup>15</sup>

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<sup>15</sup>For Chung et al. (1995), these two terms do double duty, referring not only to the two descriptive classes defined in the main text, but also to a particular analysis of these. For Chung et al. (1995), examples of sprouting arise from a specific LF-augmentation procedure of the same name. In general, my use of these two terms is intended as a descriptive one, not presupposing any particular analysis.



As seen in the examples in (149), the *wh*-phrases in sprouting can correspond to either an argument of the main predicate (149a-149b) or to an adjunct (149c-149d).

- (149) a. [Alexis was reading]<sub>A</sub>, but [what ~~Alexis was reading~~]<sub>E</sub> isn't clear.  
 b. [Craig is jealous]<sub>A</sub>, but I don't know [who of ~~Craig is jealous~~]<sub>E</sub>.  
 c. [Francisco finished the book]<sub>A</sub>, but I'm not sure [when ~~Francisco finished the book~~]<sub>E</sub>.  
 d. [Seth arrived]<sub>A</sub>, but I don't know [who with ~~Seth arrived~~]<sub>E</sub>.

At first blush, such examples appear to be counterexamples to the inquisitive entailment condition we have proposed. What we will argue in what follows is that such cases are not counterexamples at all, but rather are instances where the semantic representation of the A clause contains covert existential quantification of one sort or another. Just as we have claimed that overt existential quantification is often inquisitive (e.g. in ordinary indefinites), so too with these cases of covert existential quantification.

One of the challenges posed by sprouting is the fact that prepositional material such as *of* in (149b) cannot be elided (whether or not the language allows preposition-stranding in general). To account for this observation, we follow Chung (2006) in taking the semantic condition on sluicing to be supplemented by the lexical requirement in (150).<sup>16</sup> The condition in (150) ensures that no morpheme can be elided which was not present in the A clause. Since the requirement is stated in terms of the minimalist notion of the numeration, the *wh*-phrase's trace is not considered by the requirement. There are other ways of achieving this aim without referencing numerations, as for instance in Merchant (2007).<sup>17</sup>

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Indeed, I will argue below that some instances of sprouting are best analyzed in a way more akin to merger than is generally assumed.

<sup>16</sup>The moniker 'No New Morphemes' is due to Merchant (2007).

<sup>17</sup>Another interesting consequence of this formulation is that, in combination with a PF-deletion view of ellipsis, it straightforwardly accounts for examples like (147) where part of the antecedent material is itself elided (in this case, by VPE). While this result is straightforward under a PF-deletion view, it is not expected under an LF-copying view. Since the elided material is not present in the narrow syntax under this view, it will also not be present in the numeration and would therefore violate (150). While it is presumably possible to reformulate the lexical condition to address this issue, it again highlights the sense in which the LF-copying theory of ellipsis is a less natural fit for an account based on semantic

- (150) **No New Morphemes:** Every lexical item in the numeration of the sluice that ends up (only) in the elided IP must be identical to an item in the numeration of the antecedent CP.

Within this basic framework, the goal for the rest of the chapter is to argue that examples like those in (149) do meet the symmetric entailment condition from (99) with no sprouting-specific operation required. Central to the analysis is the idea that once we take seriously the claim that existentially interpreted implicit arguments are present in the semantics, many cases of sprouting follow quite naturally. For example, if we assign an example like (149a) a translation as in (151), we predict sluicing to be possible just as it is with an overt indefinite.

- (151) ‘Alexis was reading.’  $\rightsquigarrow \exists x.\text{read}'(A, x)$

For certain adjuncts, however, it is clearly untenable to claim that the interpretation of the A clause contains an existential quantifier *directly* corresponding to the wh-phrase of the E clause. For example, assigning the A clause in (149d) a translation such as (152) clearly produces truth-conditions which are too strong. That is,  $(149d)_A$  plainly does not entail that Seth had a companion. There is no implicit companion argument of any sort in the meaning of a sentence like ‘Seth arrived.’. The sentence’s meaning does not preclude this possibility, of course, but this has no bearing on the semantic representation of the sentence.

- (152) ‘Seth arrived.’  $\rightsquigarrow \exists x.\text{arrive-with}'(S, x)$

Instead, we will argue that the inquisitive element in  $(149d)_A$  is something more general: existential quantification of a neo-Davidsonian event argument. The felicity of examples like (149d) (and possibly (149c)) is the result of an accommodation procedure which we term ‘issue-bridging’. The idea is that the existence of the issue corresponding to a specific argument of the event introduced by the E clause can be accommodated based on the more general issue previously raised by the inquisitive existential quantification in the A clause. The proposed accommodation process is similar to what we find in bridging definite descriptions, where a discourse referent can

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isomorphy.

be accommodated by ‘bridging’ from one previously present in the discourse (e.g. ‘A bus went by and *the driver* waved.’).

Following this discussion, we can divide sprouting into two different subclasses, depending on whether there is an inner antecedent which corresponds *directly* with the wh-phrase. We term cases of sprouting where there is such an inner antecedent present semantically *direct* sprouting and cases with no such element *indirect* sprouting.<sup>18</sup>

(153) **Two kinds of sprouting:**

- a. **Direct:** The A clause contains a semantically represented inner antecedent equivalent to the wh-phrase.
- b. **Indirect:** The A clause does not contain a semantically represented inner antecedent equivalent to the wh-phrase.

The analysis we develop attributes the two types the properties spelled out in (154). We discuss direct sprouting in the remainder of the present subsection and indirect sprouting in §3.4.

(154) **Properties ascribed to direct/indirect sprouting:**

	<b>Direct</b>	<b>Indirect</b>
Paradigm Example	(149a)	(149d)
Inquisitive material in A clause	Implicit Argument	Event Quantification
Involves bridging?	No	Yes

### 3.3.1 The typology of implicit arguments

Among the phonologically null elements in natural language are those which have come to be collectively known as ‘implicit arguments’, as in (155) (as opposed to other null elements such as traces, PRO, and pro). While it is universally agreed upon that implicit arguments are understood at some level of interpretation, the details of how this happens is the subject of widespread disagreement.

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<sup>18</sup>While I will use the terms ‘direct’ and ‘indirect’ here to refer to instances of sprouting, the terms could equally be applied to all instances of sluicing, including merger cases. Since merger involves an overt indefinite or disjunction in the A clause, such cases will necessarily be classified as ‘direct’ sluicing. The direct/indirect distinction is therefore the semantic analog of Chung et al. (1995)’s syntactically/phonologically defined merger/sprouting distinction.

On the one extreme, Recanati (2007) argues that the implicit location in (155b) arises pragmatically, not being represented either semantically or syntactically. On the other extreme, Landau (2010) has recently argued that many sorts of implicit arguments are always present in the syntax, differing from their overt counterparts only in being featurally deficient and unpronounced. While they express uncertainty about exactly what this would mean, Bhatt & Pancheva (2006)’s survey article reaches a similar conclusion, claiming that (many) implicit arguments are ‘syntactically active but not syntactically projected’.<sup>19</sup> In between these extremes are accounts such as Condoravdi & Gawron (1996), which take implicit arguments to be present in the semantics, but make no commitments about their status in the syntax.

- |       |                             |                        |
|-------|-----------------------------|------------------------|
| (155) | a. Jacques finally noticed. | (implicit proposition) |
|       | b. It’s raining.            | (implicit location)    |
|       | c. Alexis was reading.      | (implicit theme)       |
|       | d. Bill was eating.         | (implicit theme)       |

In contrast to the lack of consensus in the literature on implicit arguments, the literature on sluicing has (often tacitly) taken the position that implicit arguments are absent from the syntax. For example, Merchant (2001) assigns (155c) the syntax in (156) without argument (though as far as I can tell, this syntax is in no way crucial to his account).<sup>20</sup> I take no particular position on the issues of whether and how such

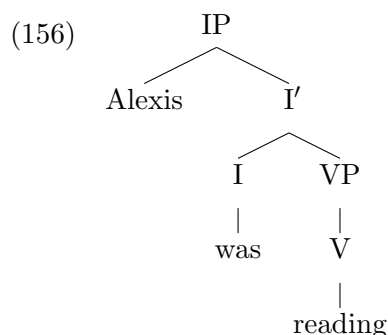
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<sup>19</sup>There is a wider range of other syntactic approaches than the present discussion would suggest (see Bhatt & Pancheva (2006) for a recent survey). The differences between them are not important for our purposes, however, since our account of sluicing relies mainly on semantic identity.

<sup>20</sup>Merchant (2007) considers the issue more directly, concluding that representing all implicit would-be inner antecedents in the syntax would likely lead to ‘madness’. Merchant illustrates this ‘madness’ with the would-be implicit helper in Chung (2006)’s example in (i). Just as we argued for (149d), however, this is a case where the truth-conditions of the A clause clearly preclude the possibility of an implicit argument of any sort, i.e. an instance of indirect sprouting. Since no implicit material is understood at any level, this example does not seem to tell us anything about the syntactic/semantic representation of implicit arguments.

- (i) They did it, but I don’t know with whose help.

arguments are represented in the syntax in what follows. However, it is worth stressing that accounts relying on syntactic isomorphism are committed to the controversial though not indefensible position that implicit arguments are absent from the syntax.<sup>21</sup>



Under the account of the present chapter, however, what matters is not whether implicit arguments are present in the syntax, but whether they are present in the semantics. Here, the literature is more or less in agreement that such implicit material must be present in the semantics. Even dissenters such as Recanati (2007) who attribute certain implicit arguments to pragmatics, claim that these pragmatic mechanisms somehow alter the literal truth-conditions (via a process he terms ‘free-enrichment’, see Martí (2005) for a critical discussion and counterproposal).

The main reason why the semantic representation of implicit arguments seems inescapable is the need to distinguish between the two different classes of implicit arguments first identified by Fillmore (1969) (see also Fillmore (1986)). The first class of implicit arguments are ones which necessarily receive an *anaphoric* interpretation, such as those in (155a-155b). In order to remain neutral about the proper analysis of them, I will refer to them as *notice*-type implicit arguments. The second class are *eat*-type implicit arguments like those in (155c-155d). These are generally taken to receive an existentially quantified interpretation, albeit one with particular restrictions discussed by Fillmore (1986), Allerton (1975), and many others (e.g. the implicit theme of *drink* must be alcohol, the implicit theme of *bake* can be bread or cake but not potatoes or bricks). In order to avoid representing implicit arguments semantically, then, one must

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<sup>21</sup>There are at least two other potential remedies for syntactic isomorphism accounts, neither of which seem overly promising. First, implicit arguments might be present in the syntax, but somehow ignored for computing syntactic isomorphism. Second, they might be present in the syntax but somehow sufficiently similar to the wh-trace of the E-clause for the isomorphism condition to succeed.

have an account which predicts the distribution of the two types of implicit arguments without simply stating it in their lexical entries. While some authors have previously expressed the intuition that this may indeed be possible, it seems quite difficult in the face of minimal pairs like Allerton (1975)’s pair in (157) from British English.

- |       |                       |                             |
|-------|-----------------------|-----------------------------|
| (157) | a. She’s telephoning. | Existential implicit object |
|       | b. She’s ringing up.  | Anaphoric implicit object   |

Returning to sluicing, we find that existential implicit objects can serve as inner antecedents for sluicing, as in (158), while anaphoric ones cannot, as in (159). Assuming that the existential quantification of (158)<sub>A</sub> is inquisitive, this result is as expected.

(158) Alexis was reading, but I don’t know what.

(159) #Alexis noticed, but I don’t know what.

Initially, it might seem that a purely syntactic account would struggle with this observation. The verb *notice* can take an internal argument, and if sprouting is an operation which augments LFs within the bounds of argument structure (e.g. as argued by Chung et al. (1995)), we might expect (159) to be felicitous. This concern, however, largely goes away once we observe that the non-elliptical control, (160), is also infelicitous, as Fillmore (1986) observes. Given this, syntactic accounts can presumably derive the infelicity of (159) from that of (160) or at least from the same mechanism.

(160) #Alexis noticed, but I don’t know what she noticed.

The asymmetry between existential and anaphoric implicit arguments can be further supported with examples from predicates with multiple implicit arguments, one anaphoric and one existential. For example, Allerton (1975) argues that *play* (in the musical sense) has two implicit arguments — a piece and an instrument — with the former being existential and the latter being anaphoric. We see this directly reflected in the asymmetric possibility for sluicing in (161). While it should be noted that the instrument sluice can be ameliorated to some extent by context, there is nonetheless an asymmetry between the two arguments in the expected direction.

(161) John is playing, but I don't know { what song / #?what instrument }.

While the asymmetry between (158) and (159) provides additional support for the well-known divide between anaphoric and existential implicit arguments, further examination of examples from the sluicing literature reveals the existence of a third type of implicit arguments, which we will term the *jealous-type*.<sup>22</sup> Intuitively, these implicit arguments seem to be ambiguous between an anaphoric interpretation and an existential one. Like *notice-type* implicit arguments *jealous-type* ones can easily receive an apparently anaphoric interpretation when the context provides a suitable antecedent, as in (162). In many cases, the apparently anaphoric interpretation is more or less the only one possible, or at least the most salient. For example, in (162a), it is difficult or impossible to interpret B's statement as meaning anything other than that she is jealous of Fred or of his having won the lottery.

- (162) a. A: Fred just won the lottery.  
           B: I am so jealous \_\_\_\_.
- b. A wolf might enter. I would be very afraid \_\_\_\_.
- c. That was quite a game! The Giants won \_\_\_!
- d. There is a small bull's-eye at the other end of the range. I've been firing \_\_\_ all day, but still haven't hit it.
- e. The Nobel prize is a really big deal. It's an honor just to be nominated \_\_\_\_.

This is in stark contrast to *eat-type* implicit arguments which, like overt indefinites, cannot be used to refer to discourse referents from previous discourse (see Martí (2005) for detailed discussion of this property with *eat*). That is, *eat-type* implicit arguments and overt indefinites are subject to a condition of *anti-familiarity* (or *novelty*) which *jealous-type* and *notice-type* implicit arguments clearly are not.

- (163) a. A: What happened to my sandwich?  
           B: #I ate.
- b. # That was an amazing book! I'm really glad I read!

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<sup>22</sup>Thanks to Rajesh Bhatt for enlightening discussion of these examples and their significance.

Given these data, we would expect that sluicing would not be possible with *jealous*-type implicit arguments. What we find, however, is that sluicing *is* possible in these cases, as in the examples in (164). Such cases, however, are the exception that proves the rule since the implicit material in these examples receives an existential interpretation.<sup>23</sup> For example, if we provide a context which makes salient an antecedent for the anaphoric interpretation, sluicing becomes quite degraded, as in (165), as does the non-elliptical control.

- (164) a. They're jealous, but it's unclear of who. Chung (2006)  
 b. He was very afraid, but he couldn't tell us of what. Chung (2006)  
 c. Fred definitely won, but I'm not sure which race.  
 d. They were firing, but at what was unclear. Chung et al. (2010)  
 e. John found out he has been nominated, but he still hasn't found out for which award.
- (165) # That was quite a game! The Giants won, but I don't know { what / which game }.

The empirical generalizations about the three types of implicit arguments are summarized in (166):

(166) **3 types of implicit arguments:**

	<i>notice</i>	<i>eat</i>	<i>jealous</i>
Anaphoric?	Yes	No	Yes
Existential?	No	Yes	Yes
Inner Antecedent for Sluicing?	No	Yes	Yes (existential only)

Given the dual life of *jealous*-type implicit arguments, it is perhaps tempting to simply treat them as being somehow ambiguous between an *eat*-type reading and a *notice*-type reading. While nothing obvious argues against such an account, a simpler explanation is possible: *jealous*-type implicit arguments always receive an existential interpretation, but lack the antifamiliarity condition associated with *eat*-type implicit arguments and overt indefinites in English. When a suitable entity is contextually

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<sup>23</sup>For reasons which aren't altogether clear, many of these examples are made better by the inclusion in the A clause of epistemic and other adverbs such as *definitely*, *really*, *certainly*, etc.



provided, the referent of the existential is naturally equated with that entity since antifamiliarity condition prevents this co-reference.<sup>24</sup>

While other facts about them may differ (e.g. scope), the distribution I have sketched here for *jealous*-type implicit arguments is quite similar to what Matthewson (1996)'s finds for overt determiners in Salishan languages. Like *jealous*-type arguments, certain determiners in Salishan languages are argued to assert existence, but are possible with either familiar or novel referents. For example, Matthewson provides the following pair of examples from Sechelt, a central Salishan language. Both examples use the same determiner, *lhe*, even though (167a) is the first mention of the snake-woman in the text, and (167b) occurs later in the text to refer to the same creature. As we have argued for *jealous*-type implicit arguments in English, Matthewson argues that *lhe* and analogous determiners in other Salishan languages have uniformly existential semantics, with no sensitivity to whether the discourse referent is novel or familiar (i.e. whether the usage is existential or anaphoric).

- (167) a. t'i súxwt-as **lhe** 7úlhka7 slhánay ...  
           fact saw-he **det** snake woman  
           'He saw a snake woman ...' (*existential*)
- b. t'i tl'um s-kwal-s **lhe** slhánay ...  
           fact then nom-speak-her **det** woman  
           'Then the woman said ...' (*anaphoric*)

The differences between *jealous*-type and *eat*-type implicit arguments raise many interesting questions which we must leave to future work. One of the most burning questions is what independent syntactic, semantic, pragmatic, and argument-structural factors correlate with this distinction. For example, many accounts of the antifamiliarity condition on indefinites (e.g. Heim (1991)) rely on the presence of a definite competitor together with a general pragmatic principle 'Maximize Presupposition'. While such an account would be desirable, it is not immediately clear whether it can be extended to *eat*-type implicit arguments, since they *do* seem to have an antifamiliarity requirement,

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<sup>24</sup>A possible alternative approach, mentioned briefly in §3.4, would be to take the apparent ambiguity of *jealous*-type implicit arguments as evidence that they are not semantic arguments at all, but are simply lexical entailments of the predicate in question. Sprouting with *jealous*-type implicit material would therefore be an instance of indirect sprouting rather than direct.

but do not have clear definite competitors in the way that overt indefinites do.

With respect to sluicing, however, the important point is that even though *jealous*-type implicit arguments receive apparently non-existential interpretations in examples like (162), they are nonetheless existential quantifiers (or at least can be).

### 3.3.2 Indefinite implicit arguments and intervention

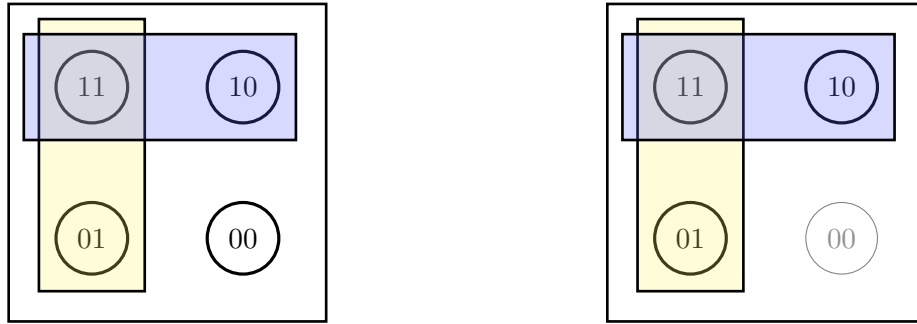
In the previous section, we have seen ample reason to believe that implicit arguments must be represented semantically and that despite apparent counterexamples, the relevant implicit arguments all have existential semantics. Given this, we readily understand why *eat*-type and *jealous*-type implicit arguments can serve as the inner antecedents for Sluicing. Since these implicit elements receive the same interpretation as their overt counterparts (modulo the possibly pragmatic novelty condition), sluicing is licensed for the same reason, as seen in (169) for the example in (168). Recall that the obligatory nature of the preposition *of* in (168) is attributed not to the semantics, but to Chung (2006)’s ‘No new morphemes’ constraint.

(168) [John is jealous]<sub>A</sub>, but it’s unclear [ of who ~~John is jealous~~]<sub>E</sub>.

(169) a. (168)<sub>A</sub>  $\rightsquigarrow \exists x.\text{jealous}'(\text{J}, x)$

b. (168)<sub>E</sub>  $\rightsquigarrow \exists x.\text{jealous}'(\text{J}, x)$  (Presupposes:  $\neg \exists x.\text{jealous}'(\text{J}, x)$ )

(170)  $\llbracket (168)_A \rrbracket \quad \Leftrightarrow \quad \llbracket (168)_E \rrbracket$



Another *eat*-type implicit argument which is handled straightforwardly under this approach is the implicit agent of English passives, as in (171). Unlike the corresponding inchoative in the would-be A clause of (172), the passive entails the existence of a causer/agent. As such, the A and E clauses receive translations as in (173) including

an (inquisitive) existential quantifier (see AnderBois (2011) for a different approach to these data which denies the inquisitiveness of the existential quantified agent). Given these translations, the symmetric entailment condition in (99) is met, and sluicing is predicted to be possible. The non-omissibility of the preposition *by* in (171) is attributed to the ‘No New Morphemes’ constraint, as confirmed by the contrast with the long passive in (174), since *by* is present in the A clause in this example as well.

(171) [The boat was sunk]<sub>A</sub>, but Fred wasn’t sure [who by ~~the boat was sunk~~]<sub>E</sub>.

(172) \*The boat sunk, but Fred wasn’t sure who by.

(173) a. (171)<sub>A</sub>  $\rightsquigarrow \exists x.\text{sink}'(x, \text{the boat})$

b. (171)<sub>E</sub>  $\rightsquigarrow \exists x.\text{sink}'(x, \text{the boat})$  (Presupposes:  $!\exists x.\text{sink}'(x, \text{the boat})$ )

(174) [The boat was sunk by someone]<sub>A</sub>, but Fred wasn’t sure [who ~~the boat was sunk by~~]<sub>E</sub>.

While the account we propose assimilates direct sprouting to merger cases, the account also readily provides an explanation for the central asymmetry between the two: sensitivity to islands (and other intervening operators). One of the properties of the merger subtype of sluicing that has attracted the most attention in previous literature (dating back to Ross (1969)) is its lack of sensitivity to syntactic islands. For example, sluicing is possible in an example like (175) even though the non-elliptical version of the E clause, (176), is not possible (see Merchant (2001) for examples from a variety of islands and detailed discussion).

(175) That Tom will win a (certain) race is likely, but it’s not clear which race.

(176) \*It’s not clear [which race]<sub>i</sub> that Tom will win *t<sub>i</sub>* is likely.

While this ‘island-amnestying’ effect holds in cases of merger, it has been observed by Chung et al. (1995) (who in turn attribute the observation to unpublished work by Chris Albert) that no such effect arises in corresponding examples of sprouting, as seen by the ungrammaticality of their example in (177).

(177) \*That Tom will win is likely, but it’s not clear which race.

For Chung et al. (1995) and many other authors, there is an analytical intuition that the source of the ungrammaticality of (177) is the same as that of (176). In particular, their idea is that relationship between the *wh*-phrase and the trace in sprouting is similar (or perhaps identical) to the *A'*-movement which takes place in overt *wh*-movement. In contrast, merger cases are argued to involve unselective binding rather than movement and therefore are expected to be island-insensitive. This approach, then, makes the prediction that sprouting should be subject to exactly the same constraints as overt *A'*-movement. While it is true that sprouting is subject to all of the constraints that overt *A'*-movement is, Romero (1998) and later Merchant (2001) show that it is in fact subject to a more stringent condition than *A'*-movement. Evidence for this comes from minimal pairs like those in (178-179) where there is some intervening element which blocks sprouting, as in the (a) examples, but allows overt *A'*-movement, as in the (b) examples.

- (178) a. \*Ramon is glad that Sally ate, but I don't remember which dish.  
           b. I don't remember which dish he is glad that Sally ate.           Romero (1998)
- (179) a. \*A nurse is rarely on duty — guess when!  
           b. When is a nurse rarely on duty?                               Merchant (2001)

Looking at the whole body of data from (175-179), Romero (1998) identifies the unifying pattern: sluicing is possible if and only if the existential in the *A* clause — whether overt or not — takes widest scope, as the *wh*-phrase does in the *E* clause. That is, the island-escaping example in (175) is possible only under a wide scope reading for the indefinite *a race*. She argues that the asymmetry between (175) and (177) can therefore be attributed to independently observed scopal properties of overt and implicit arguments (Merchant (2001) makes the same case). In particular, it has been independently observed that implicit existential arguments always take narrow scope relative to all other operators (e.g. Fodor & Fodor (1980), Lasnik (1997)). In contrast, overt indefinites have the property, first discussed by Farkas (1981), of being able to take wide-scope outside of syntactic islands, what has come to be known as 'exceptional wide scope'.

In terms of the present account, then, this means that A clauses containing overt indefinites will have a reading (the wide-scope reading) which will be assigned an inquisitive denotation, even when the indefinite occurs inside an island. Put simply, the fact that sluicing with overt indefinites as inner antecedents is island-insensitive is directly related to the exceptional wide scope of overt indefinites more generally.<sup>25</sup> Implicit existential arguments (both *jealous*-type and *eat*-type) do not exhibit exceptional wide scope (in fact, quite the opposite) and, correspondingly, sluicing with implicit inner antecedents is only possible when no such operator intervenes.

Since overt disjunctions show the same sort of exceptional wide scope (Schlenker (2006) and references therein), we predict straightforwardly that sluicing with an overt disjunction as inner antecedent should also be island-insensitive. We see this prediction borne out in (180), parallel to (175).

- (180) That Tom will win (either) the downhill or the slalom is likely, but it's not clear which.

In this section, we have seen that once we take the independently motivated position that implicit arguments should be represented in the semantics, many instances of sprouting (which we dub 'direct' sprouting) can be given essentially the same analysis as corresponding examples with overt indefinites. Moreover, this is so even in cases such as the implicit stimulus argument of *jealous* where the implicit argument appears to be anaphoric in many non-sluicing examples. Finally, we have seen, following Romero (1998) and Merchant (2001), that the more limited distribution of sluicing with implicit inner antecedents follows directly from their independently observed scopal properties.

### 3.4 Indirect Sprouting

In §3.3, we argued that A clauses with existentially interpreted implicit arguments — 'direct' sprouting — are possible inner antecedents for the same reason as their overt counterparts. While this strategy succeeds for implicit arguments, it does not straightforwardly succeed for 'indirect' sprouting such as that in (181), where there is no existential directly corresponding to the *wh*-phrase.

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<sup>25</sup>See Merchant (2001) for a detailed discussion of island effects and scope.

- (181) a. [Francisco finished the book]<sub>A</sub>, but I'm not sure [when ~~Francisco finished the book~~]<sub>E</sub>.  
 b. [I dropped my keys]<sub>A</sub>, and I need to figure out [where ~~I dropped my keys~~]<sub>E</sub>.  
 c. [Seth arrived]<sub>A</sub>, but I don't know [who with ~~Seth arrived~~]<sub>E</sub>.  
 d. [John baked a cake]<sub>A</sub>, but we're all wondering [with whose help ~~John baked a cake~~]<sub>E</sub>.  
 e. [Mary learned French]<sub>A</sub>, but I don't know [who for ~~she learned French~~]<sub>E</sub>.

Specifically, the issue is whether or not it is plausible for the semantics of the A clause to contain (inquisitive) existential quantification, as I have argued for implicit arguments. For adjuncts such as (181a) and possibly (181b), the answer would certainly seem to be yes. It necessarily follows from (181a)<sub>A</sub> that there is some time or other at which Francisco finished the book.<sup>26</sup> For examples like (181c-181e), however, it is clearly wrong to assume existential quantification of the would-be inner antecedent. Seth can arrive on his own, Mary can learn French without doing so for anyone's benefit, and, gender stereotypes aside, John can bake a cake on his own.

In these examples, then, there is no inquisitive element which directly corresponds to the wh-phrase either overtly, as in merger cases, or covertly, as we have argued for sprouting with implicit *arguments*. While it is true that no inquisitive element *directly* corresponds to the wh-phrase in these examples, in this section, we argue that the A clause in indirect sprouting nonetheless does contain an inquisitive element: the existential quantification of a neo-Davidsonian event argument. The sluices in (181), then, are the result of an accommodation process of sorts, which we term *issue-bridging*. The term is intended to highlight the analogy with bridging in the realm of definite descriptions, as exemplified by the definite *the driver* in (182).

- (182) A bus went by. The driver had on sunglasses.

Like any accommodation process, *issue-bridging* must be constrained in particular ways in order to correctly rule out the accommodation of the various illicit sluices

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<sup>26</sup>Even here, it has been argued by Recanati (2007) that such adjuncts are simply metaphysical entailments, and therefore potentially absent from the semantic representation in a certain sense. The issue is moot for present purposes, however, since the existential material in (181c-181e) is absent from the semantics in a more obvious way.

we have seen in previous sections. In §3.4.1, we spell out and motivate the extension of inquisitive existential quantification beyond the domain of individuals. In §3.4.2, we examine three ways in which the analysis from previous sections constrains *issue-bridging*. First, the ‘sprouted’ wh-phrases must be ‘licensed’ by the material in the A clause since the E clause is, by hypothesis, a fully articulated clause underlyingly. Second, the entire wh-phrase including prepositions must be present overtly due to the ‘No New Morphemes’ constraint. Third, just as bridging requires a prior discourse referent, issue-bridging still requires a prior issue, in the form of the *inquisitive* A clause. Collectively, these constraints ensure that issue-bridging: (i) only occurs with wh-phrases which do not have counterparts in the A clause (mostly adjuncts), and (ii) is subject to the same operator/island intervention effects as sprouting with implicit arguments.

### 3.4.1 Inquisitive existential quantification beyond individuals

In Chapter 2, we argued that the compositional semantics of indefinites not only includes the truth-conditional information that there is some entity satisfying a given predicate, but also raises the issue of which entity or entities do so. Therefore, a sentence containing a wide-scope indefinite (or disjunction) makes a hybrid contribution to discourse: it provides information (ideally) aimed at resolving old issues and simultaneously pushes the discourse forward by opening up new issues for elaboration. In this subsection, we extend this idea to other kinds of existential quantification, particularly that of an event/state argument, proposing that they too make a similar hybrid contribution.

Before tackling existential event quantification, recall how the interpretation of indefinites came about for a basic example like (183). First, we translated this formula into our metalanguage with the formula in (184). Second, the metalanguage interpretation of this formula consists of a set of alternative possibilities in (185).<sup>27</sup> In terms of information, the sentence is considered true iff there is at least one alternative in (185) which contains the world of evaluation. In addition to this truth-conditional information, (183) also introduces the issue of which alternative(s) in (185) hold as a

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<sup>27</sup>Recall from Chapter 2 that each alternative is in fact a set of possible worlds, with the text ‘John left’ in (185) being shorthand for the set of possible worlds  $w'$  which are such that ‘John left’ is true in  $w'$ .

potential future issue for discussion.

(183) Someone left.

(184)  $\exists x.\text{leave}'(x)$

(185)  $\left\{ \begin{array}{l} \text{John left} \\ \text{Maribel left} \\ \text{Alexis left} \\ \text{Ignacio left} \\ \dots \end{array} \right\}$

For events, we repeat the same procedure, differing only in the ontological domain we are operating over. Ignoring tense, a simple sentence like (186) is assigned a metalanguage translation as in (187). Interpreting the existential event quantification in the same way gives us the semantic interpretation in (188).

(186) John left.

(187)  $\exists e.\text{leave}'(e) \wedge \text{AGENT}(J, e)$

(188)  $\left\{ \begin{array}{l} e_1 \text{ is an event of John leaving} \\ e_2 \text{ is an event of John leaving} \\ e_3 \text{ is an event of John leaving} \\ e_4 \text{ is an event of John leaving} \\ \dots \end{array} \right\}$

In terms of information, the sentence is therefore true iff at least one of the alternative possibilities is true in the world of evaluation. If we add in a suitable semantics for tense, this gives us exactly the truth conditions we expect for the sentence. However, it also makes an inquisitive contribution, putting forth the issue of which events are in fact events that consist of John leaving.

On the face of it, this is a somewhat strange issue to imagine, perhaps because there is no overt corresponding question of the form ‘Which event(s) is one of John leaving?’ in the way that the issue raised by (183) can be straightforwardly paraphrased as ‘Who left?’. This strangeness, I believe, merely points to what we already knew: that while we take events to be, in some sense, objects in the real world, they are a quite different sort of object than individuals. It is not natural to individuate events in the



same way as we do physical entities such as people and things (much as it is not natural to do in the case of possible worlds). While it is not so natural to individuate events, it is quite natural to *sort* them along a given dimension. That is, while it is somewhat odd to imagine asking a question about ‘which event’, it is quite easy to imagine asking questions about ‘which kind of event’.

Issue bridging, then, involves making just such a leap: from the general issue of ‘which event’ introduced by the inquisitive existential quantification in the A clause to the adjunct wh-question which sorts the space of events along a particular argument of the event and asks the question ‘which kind of event?’. Consider, for example, a basic case of adjunct sprouting like (189).

(189) [John left]<sub>A</sub>, but I don’t know [when ~~John left~~]<sub>E</sub>.

Here, the A clause will have the semantic contribution sketched in (188), raising the issue of which event(s) in fact are events of John leaving. We can visualize this in terms of a table as in (190) where each row represents a different event and the columns describe properties of those events. For the purposes of illustration, we assume a model with only 8 events differing only in two parameters: time and place. The existential quantification of the (189)<sub>A</sub>-clause puts on the table the issue of which row(s) contain events of John leaving.

(190)

Event	Time	Place
e <sub>1</sub>	t <sub>1</sub>	p <sub>1</sub>
e <sub>2</sub>	t <sub>1</sub>	p <sub>2</sub>
e <sub>3</sub>	t <sub>2</sub>	p <sub>1</sub>
e <sub>4</sub>	t <sub>2</sub>	p <sub>2</sub>
e <sub>5</sub>	t <sub>3</sub>	p <sub>1</sub>
e <sub>6</sub>	t <sub>3</sub>	p <sub>2</sub>
e <sub>7</sub>	t <sub>4</sub>	p <sub>1</sub>
e <sub>8</sub>	t <sub>4</sub>	p <sub>2</sub>

The E clause in (189), on the other hand, presents a closely related issue, but one which is slightly more coarse-grained. Instead of asking the question of which row contains an event of John leaving, it sorts the space of events along a particular dimension (time) and asks which box contains one of John leaving (e.g. is there a t<sub>1</sub> event of John leaving, a t<sub>2</sub> event, etc). We can see this visually in terms of the bolded boxes in (191).

(191)

Event	Time	Place
e <sub>1</sub>	t <sub>1</sub>	p <sub>1</sub>
e <sub>2</sub>	t <sub>1</sub>	p <sub>2</sub>
e <sub>3</sub>	t <sub>2</sub>	p <sub>1</sub>
e <sub>4</sub>	t <sub>2</sub>	p <sub>2</sub>
e <sub>5</sub>	t <sub>3</sub>	p <sub>1</sub>
e <sub>6</sub>	t <sub>3</sub>	p <sub>2</sub>
e <sub>7</sub>	t <sub>4</sub>	p <sub>1</sub>
e <sub>8</sub>	t <sub>4</sub>	p <sub>2</sub>

Sluicing of this sort, then, consists of an A clause which presents a general issue (‘Which event?’), thereby encouraging further discussion of the details of the event described. The E clause presents a more specific issue partially addressing this larger issue and can therefore be accommodated as being sufficiently similar to the general issue. That is, indirect sprouting is expected to be licit to the extent that the world knowledge and context support the inference that different events in (190) differ along the specified dimension.

One reason that this issue-bridging is possible, then, is because of the peculiar linguistic status of events, in particular, the fact that there is no overt question directly corresponding to the issue introduced by existential event quantification (this fact itself is presumably rooted in deeper properties of events). Questions addressing a particular neo-Davidsonian event argument, then, are the closest which we can get and can therefore be considered as contributing issues which are sufficiently similar for sluicing to succeed, even if these issues themselves introduce presuppositions not present in the issue of the A clause, as in (181c-181e).

While the cases we have discussed so far involve elements which are overtly realized as adjuncts, there is no principled reason why it could not apply to arguments under the appropriate conditions. One place where this possibility arises is in the case of sprouting with *jealous*-type implicit arguments. As we saw above, such implicit arguments exhibit an apparent ambiguity between apparently anaphoric and existential uses. In §3.3, I proposed an analysis where these implicit arguments are unambiguously translated as existentials, but ones which lack the antifamiliarity condition generally associated with (English) indefinites.

There is an alternative approach worth considering, however, which would be

to argue that apparent implicit arguments of the *jealous*-type aren't really implicit arguments in the same way as *eat*-type and *notice*-type ones are. Rather, they could be thought of as something more like metaphysical entailments of the predicate. The lack of antifamiliarity could therefore be attributed in some way to the lack of semantic representation of the 'argument' in question. The predicate simply entails its existence but imposes no further requirements of (anti)familiarity of the sort seen in overt (in)definites as well as *eat*-type and *notice*-type implicit arguments.

Under this approach, then, sprouting with *jealous*-type implicit material would be an instance of indirect sprouting and would be predicted to be licensed as long as the events in question plausibly differ in the identity of the implicit argument. I leave the decision between the two approaches to future work since either approach correctly captures the sluicing facts.

### 3.4.2 Constraints on issue bridging

As with any accommodation process, we are immediately led to wonder what constraints issue-bridging is subject to. As Chung (2006) discusses, unconstrained accommodation runs the risk of being too permissive, allowing any arbitrary issue to be accommodated. Chung points out examples like (192) as being problematic for an account making use of free or unconstrained accommodation. The examples in (193-195) present further cases which would seem in principle to be problematic for free accommodation.

(192) #He finished the project, but we don't know whose help. Chung (2006)

(193) #The ship sunk. Guess who (by).

(194) #Tony sent Mo a picture that he painted, but it's not clear with what.  
Chung et al. (1995)

(195) #No nurse was on duty, but we don't know when. Merchant (2001)

The account developed in previous sections to account for sluicing with overt and implicit inner antecedents, however, naturally constrains issue-bridging in ways that rule out such examples. In particular, there are three independently motivated forces that serve to constrain issue-bridging:

(196) **3 constraints on issue-bridging:**

1. No New Morphemes
2. Overt E clause must be grammatical.
3. The A clause is inquisitive.

First, in order to account for the obligatory presence of prepositions introducing implicit arguments, we have, following Chung (2006), assumed that the elided material cannot contain any morphemes which are not previously present in the A clause. This correctly predicts that any prepositional material is obligatorily present in cases like (197-198), just as it was for semantically-represented implicit arguments.

- (197) a. #He finished the project, but we don't know whose help.  
b. He finished the project, but we don't know with whose help.
- (198) a. #John got to the party, but we don't know whose bike.  
b. John got to the party, but we don't know on whose bike.

Second, the account we have proposed is based on the PF-deletion of a fully articulated E clause. One consequence of this is that the fully formed E clause itself must be possible in the first place (island amelioration being the notable exception, as discussed in detail by Merchant (2001)). Given this, examples like (199) are expected to be ill-formed since the E clause is itself not possible. Not only must the E clause itself be well-formed, but the combination of the A clause and the fully formed E clause must be well-formed. This constraint rules out examples like (200) where the E clause is itself is well-formed, but is infelicitous following the A clause (for reasons which are not necessarily clear).

- (199) a. #She knew French, but I don't know for whom.  
b. #John was tall, but I don't know on what occasions.  
c. #They noticed the painting, but I don't know for how long.  
d. #The ship sunk. Guess who (by).
- (200) a. #John noticed, but I don't know what.  
b. #The cake was tasty, but I don't know for who.

Finally, the accommodation process we have proposed is a *bridging* process, not the direct accommodation of a question or issue under discussion. What we have argued is accommodated in sluicing with adjuncts is the similarity relation between the adjunct question and the issue introduced by the A clause. As such, the A clause still must be inquisitive in order for this to be possible. Like the existential quantification found in implicit arguments, existential quantification over events is also known to have narrow-scope relative to other operators (e.g. Landman (2000)) including negation. Given this, we predict that sprouting of this sort will pattern with sprouting with implicit arguments in being sensitive to strong islands, as in (201), as well other intervening operators such as negation, as in (202). This also correctly predicts the impossibility of adjunct sprouting in cases of double negation, as in (203).

(201) #Tony sent Mo a picture that he painted, but it's not clear with what.

Chung et al. (1995)

(202) #No nurse was on duty, but we don't know when. Merchant (2001)

(203) #It's not the case that John didn't leave. Guess when!

In this section, I have proposed an analysis of *indirect* sprouting, i.e. sprouting where there is no inner antecedent directly corresponding to the wh-phrase. In particular, the analysis holds that such cases involve anaphoric retrieval of an issue introduced by the inquisitive existential quantification of the event argument plus an accommodation process, issue bridging.

At this point, then, it is worth considering the relationship between issue-bridging and ordinary bridging and therefore the place of sluicing (and, by extension, VPE) within the typology of anaphoric processes more generally (e.g. pronouns and various sorts of presuppositions). While they do not consider ellipsis, one distinction which has been made by Beaver & Zeevat (2007) is between anaphoric processes which readily allow for accommodation (albeit with certain restrictions) and those which do not. Some examples of the first category, seen in (204), are the presuppositions of change of state verbs like *stop* and of factive verbs such as *realize*. The second category, according to Beaver & Zeevat (2007), includes pronouns, short definite descriptions, as well as certain lexical presuppositions such those contributed by *too* and *another*.

- (204) a. It will *stop* raining.  
       b. Mary *realizes* it is raining.
- (205) a. *He* is very cute.  
       b. *The* driver waved at me.  
       c. John is having dinner in New York *too*.  
       d. *Another* man came in.

This distinction, Beaver & Zeevat (2007) argue, can be boiled down to the precise nature of the material to be accommodated. Specifically, they claim that the anaphoric material sought in (204) is limited to propositions or facts about the world, while those in (205) are “intrinsically concerned with the discourse record itself”. While they leave many of the details for future work, they attribute the asymmetry in accommodation between the two cases to a general principle such as (206).

- (206) **The Discourse Record Principle:** Presuppositions about what is in the discourse record may not be accommodated.

Given this distinction, it seems clear that sluicing ought to belong to the second category; sluicing in general is clearly about the discourse record. Like pronouns and the presuppositions of *too* and *another*, sluicing requires a linguistic antecedent and does not allow for the relevant material to be accommodated if no such material is found, as in Hankamer & Sag (1976)’s example in (207). In essence, this claim is not particularly new, being more or less a restatement of Hankamer & Sag (1976)’s claim that sluicing is a type of ‘surface anaphora’.

- (207) **Scenario:** Hankamer produces a gun, points it offstage and fires, whereupon a scream is heard.  
       Sag: #Jesus, I wonder who.

The present account offers two insights with regarding the status of sluicing within this broader picture. First, the account gives us a clear indication of why sluicing must be intrinsically concerned with the discourse record. The material to be retrieved is not a mere proposition or fact, but rather is itself an intrinsically discourse-related entity,

an *issue* (much the same can be said for pronouns). Second, the account of sprouting in this section has provided an explanation of a class of apparent counterexamples: indirect sprouting. Consider again an instance of sprouting such as (197b), repeated in (208).

(208) He finished the project, but we don't know with whose help.

Since the issue in the E clause has no direct inner antecedent in the A clause, indirect sprouting appears to involve the accommodation of an issue with no antecedent in the prior discourse record. In this section, however, we have argued that such examples do indeed involve the retrieval of an issue from the previous discourse record: the issue introduced by existential event quantification. To arrive at the specific issue in the E clause requires some inference in the form of issue-bridging, but it also requires the existence of the issue in the previous discourse record from which to bridge. In this way, the account allows us to maintain the idea that sluicing is a type of surface anaphora, intrinsically concerned with the discourse record, yet still capture examples like (208). Indirect sprouting, therefore, is parallel to bridging definite descriptions like (209). The short definite *the driver* signals the retrieval of a referent from the discourse record. While the prior material does not contain such a discourse referent directly corresponding to the driver, it does contain one that is sufficiently similar to license the definite, namely the one introduced by the indefinite *a bus*.

(209) A bus went by. *The driver* waved.

### 3.5 Conclusion

In Chapter 2, we argued that providing a compositional account of alternative, polar wh-questions in Yucatec Maya motivated a theory where overt indefinites and disjunctions make an inquisitive contribution to discourse. In this chapter, we have seen that applying this theory to English sluicing yields a number of insights and captures several kinds of data which are problematic for previous accounts. Among these are the ability of disjunctions to serve as inner antecedents, the inability of doubly negated indefinites to do so, and the fact that even licit inner antecedents cannot occur inside of appositive relative clauses. The account, therefore analyzes sluicing in a way parallel

to the interrogative-indefinite affinity. Both are particular manifestations of the deep semantic connection between indefinites and disjunctions on the one hand, and *wh*- and alternative questions on the other.

In addition to providing an account of the semantic condition on sluicing, this chapter has made two main contributions to the study of inquisitive content more generally. First, the ability to serve as the inner antecedent for sluicing emerges as a *diagnostic* for inquisitive content. Since E clauses for sluicing are necessarily questions, the symmetric entailment condition we have proposed makes the prediction that the A clause will necessarily contain an inquisitive element. One particular case where this diagnostic has been of particular use in this chapter is in understanding the properties of a class of implicit arguments which we have dubbed *jealous*-type implicit arguments. While these elements often have apparently anaphoric usages, the possibility for sluicing indicates the presence of inquisitive content, existential quantification in particular.

Second, in extending the account to sprouting in §§3.3-3.4, we have seen empirical evidence that inquisitiveness in natural language is present not just in ordinary overt indefinites and disjunctions, but also in at least certain instances of covert existential quantification such as existentially interpreted implicit arguments and the covert existential quantification of the neo-Davidsonian event argument. Given the pervasiveness of such covert existential quantification, the issue-raising property we are examining is a quite general property of at-issue assertions. While this is for the most part true, the semantics we have developed predicts one notable class of exceptions: sentences where negation outscopes all inquisitive elements. As we will see in Chapters 4 and 5, this fact can be leveraged to help explain a number of asymmetries between corresponding negative and positive sentences, especially in the realm of polar questions.



## Chapter 4

# Weak Bias in Polar Questions

In the two preceding chapters, I have presented two empirical arguments that widest-scope disjunctions and indefinites make an inquisitive contribution as part of their semantics. The composition of *wh*-, alternative, and polar questions in Yucatec Maya provided initial motivation for this capacity, as well as for locating it in the compositional semantics itself. The analysis of Sluicing in Chapter 3 provided cross-linguistic support for this idea, but also provided us with evidence that certain logical operators (e.g. double negation, COMMA) eliminate this inquisitive contribution, despite preserving truth conditions. In this chapter, I turn to examine the compositional interaction between inquisitive alternatives and a different sort of higher operator: disjunction itself. As we have seen, disjunction introduces inquisitive content into composition, creating an alternative per disjunct. The question to be addressed here, however, is the status of inquisitive content *within* each disjunct of the polar question.

The semantics developed in Chapter 2 (henceforth ‘Single-tiered Inquisitive Semantics’ or SIS) allows for just two possibilities. First, it could pass up the tree any inquisitive content in the formula to which it applies, by existentially quantifying over the alternatives to which it applies ( $\vee$  and  $\exists$  does exactly this in SIS). Since disjunction itself introduces alternatives, this means that all of the alternatives from the two disjuncts are treated equally. Second, it could eliminate inquisitive content by universally quantifying over the alternatives in its scope ( $\neg$  is an example of this in SIS). This option would mean that only the highest inquisitive operator will affect the top-level context change potential of the formula. In this chapter, I will argue that

disjunction in fact does neither of these things. Rather, I will argue that disjunction preserves the inquisitive structure of its disjuncts, but assigns it a secondary status relative to the alternatives introduced by the disjunction itself.

To make this case empirically, my focus is on a particular class of sentences which instantiate this pattern: polar questions like (210). Intuitively, each of these questions serves as a request for the same main piece of information, that is, a request that the addressee resolve the same *yes/no*<sup>1</sup> issue. Given this observation alone, it would seem that the disjunction inherent in the polar question ought to eliminate inquisitive content in the formula to which it applies, leaving a classical Hamblin semantics. The same can be said of polar questions with preposed or high negation (e.g. ‘Isn’t John baking a cake?’), which are the subject of Ch. 5.

- |       |                                  |        |
|-------|----------------------------------|--------|
| (210) | a. Is John baking a cake?        | POSQ   |
|       | b. Is John not baking a cake?    | LoNEGQ |
|       | c. Is John baking a cake or not? | ALTQ   |

However, much previous literature has demonstrated that the questions in (210) have distinct felicity conditions and convey different inferences when they are used (e.g. Bolinger (1978), Büring & Gunlogson (2000), van Rooÿ & Šafářová (2003), Biezma (2009)). The only prior work to address all three kinds, van Rooÿ & Šafářová (2003), describes these inferences as follows: POSQs convey bias towards the positive answer; ALTQs convey the speaker’s neutrality; and LoNEGQs convey bias towards the negative answer.<sup>2</sup> That is, van Rooÿ & Šafářová (2003) characterize these three types of polar question as consistently displaying a pattern which we dub ‘bias to the overt’, stated in (211).

- (211) **Bias to the overt:** POSQs, ALTQs, and LoNEGQs always convey the speaker’s bias towards the alternative(s) which are overtly realized in the question’s form.

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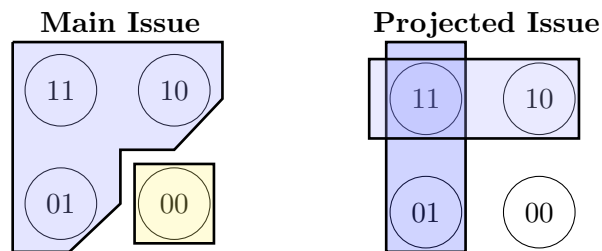
<sup>1</sup>Using the term ‘*yes/no*’ here is somewhat misleading since these particles in English are only clearly felicitous in response to (210a). See §4.2.4 for discussion of *yes* and *no*.

<sup>2</sup>It should be noted that van Rooÿ & Šafářová (2003)’s primary aim is to understand the nature of this bias itself, rather than it’s relationship to different types of polar questions (a matter which we return to in §4.2).

While this pattern is upheld for the most basic cases, we will show in §4.2 that there are several classes of examples in which the ‘bias to the overt’ pattern is broken. In particular, we find that POSQs and ALTQs have a broader distribution than (211) predicts, while LONEGQs have a more restricted distribution. In this chapter, we propose an account which captures the bias to the overt tendency and its regular exceptions while retaining the intuition that all three types of questions are, in some sense, ways of asking the same question. To accomplish this, we develop a compositional semantics which makes use of two meaning components or *tiers*: the *main* ‘yes’/‘no’ issue and a secondary set of alternatives, which we term the *projected* issue. The conception of the projected issue will be clarified as we proceed, but the core intuition is that it is a set of alternative propositions which is may be of use in the *immediate future of the discourse*.

Under this semantics, a POSQ such as (210a) will be assigned the two-tiered denotation pictured in (212). The main issue (left) puts forth a set of two alternatives (roughly, ‘yes’ and ‘no’), as in the classical Hamblin semantics. The projected issue (right) consists of a set of alternative propositions corresponding to inquisitive elements inside the question radical itself. In this example, these alternatives are contributed by the indefinite ‘a cake’ and correspond to different cakes (only two are shown to simplify the pictures). The proposed semantics, then, holds that the POSQ in (210a) raises the issue of whether John is baking some cake or other and makes salient those discourse futures where the various propositions of the form ‘John is baking  $x$ ’ will be relevant.

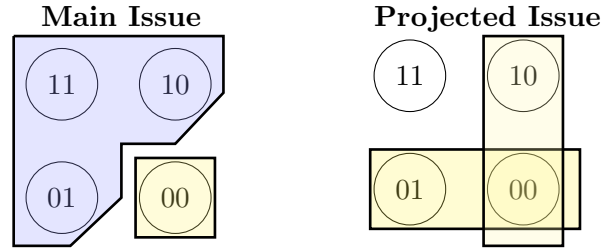
(212) Two-tiered interpretation of a POSQ:



In contrast to POSQs, then, LONEGQs present the same main issue, but will project a different set of alternatives, as pictured in (213). Whereas the projected issue of (210a) consists of positive alternatives of the form ‘John is baking  $x$ .’, the projected

issue of (210b) consists of (essentially pointwise) negative alternatives of the form ‘John is not baking  $x$ ’, making salient immediate discourse futures where the issue of which of these various alternative propositions holds is relevant.

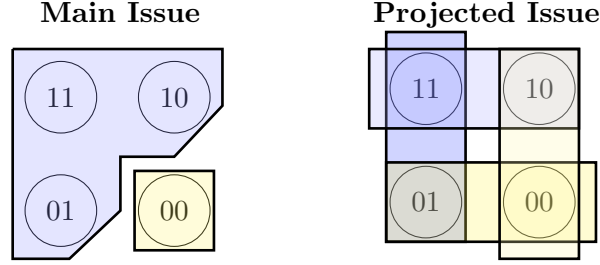
(213) Two-tiered interpretation of a LoNEGQ:



While both questions push the discourse forward by projecting a set of alternatives, there is an asymmetry between the two cases. In the positive case, the projected alternatives represent a further refinement of one resolution to the main issue. The projected issue, therefore, is a *sub-issue* of the main issue, being addressable only after a particular resolution of the main issue. In the negative case, the projected issue is logically prior to the main issue; the alternatives projected are *partial answers*.

Theoretically speaking, this asymmetry gives us a concrete way of thinking about the age-old idea, discussed at length by Horn (1989), that negative statements are somehow weaker or less informative than their positive counterparts (despite the apparent impossibility of this being truth-conditionally so). Negative polar questions (and statements) are not less informative, but their projected issues move the discourse forward less than their positive counterparts. Relative to the default projection of the PosQ, LoNEGQs provide a specific means of reducing the salience of the sub-issue of how the positive answer may hold. Finally, alternative questions like (210c) project both sets of alternatives: positive and negative, as seen in (214).

(214) Two-tiered interpretation of an ALTQ:



Given these representations, we capture both the similarities and differences between the types of questions in (210). That each requests the same piece of information is reflected by the fact that each question puts forth the same *main* issue. The differences between these varieties, then, have as their semantic basis the various kinds of *projected* issues which they make salient. Based on this semantics, I argue that the distinct inferences that characterize each type arise from pragmatic reasoning about why a (presumably) rational speaker would choose to project one given set of alternatives rather than another.

### Road Map:

The road map for the rest of this chapter is as follows: §4.1 addresses the question of how many varieties of polar question are to be distinguished; §4.2 describes the properties of positive, low negative, and alternative polar questions; §4.3 discusses the predictions made by previous question semantics; §4.4 motivates a two-tiered semantics for all three types of polar questions and derives the different inferences/felicity conditions of each variety pragmatically; §4.5 provides a compositional system producing the desired semantics; and §4.6 concludes.

## 4.1 How many types of polar questions are there?

Before proceeding, it is worth clarifying several terminological points, as the literature on negative polar questions in particular has been rife with inconsistency and (often unstated) disagreement on the basic issue of how many different types of polar questions are to be distinguished. In this chapter, I will distinguish four varieties of

polar questions, as in (215).

The four varieties in English are defined in terms of their form and, in particular, the presence and location of negation. POSQs contain no negation, at least in the highest clause (i.e. ‘Does John think that Bill didn’t like Mary?’ is still a POSQ). LONEGQs contain sentential negation occurring in its canonical position following the subject. ALTQs contain negation occurring in the right disjunct of a matrix disjunction (i.e. ‘or not’). HiNEGQs contain sentential negation occurring in a fronted position (we remain agnostic as to the syntactic details of what this position is) preceding the subject.

- |       |    |                               |        |
|-------|----|-------------------------------|--------|
| (215) | a. | Is John baking a cake?        | POSQ   |
|       | b. | Is John not baking a cake?    | LONEGQ |
|       | c. | Is John baking a cake or not? | ALTQ   |
|       | d. | Isn’t John baking a cake?     | HiNEGQ |

One notable distinction which the reader will notice is missing thus far is the distinction introduced by Ladd (1981) between ‘inner’ and ‘outer’ negation polar questions. These terms have been applied in a fairly non-uniform fashion in subsequent literature with little discussion of the differing definitions being employed. While Ladd does not explicitly define the boundaries of the two varieties, his original distinction is between two kinds of HiNEGQs, those like (216) where the speaker intuitively seeks to ‘double-check’ the positive proposition ‘Jane is coming’ and those like (217) where the speaker seeks to verify the negative proposition ‘Jane is not coming’. The difference between these two ‘readings’<sup>3</sup> is, by Ladd’s admission, somewhat slippery, though the presence of positive and negative polarity items (e.g. *too* and *either*) is claimed as a more certain diagnostic.

(216) Isn’t Jane coming (too)?

(217) Isn’t Jane coming either?

The main point of confusion arises when we consider polar questions with negation in its canonical, non-preposed position, i.e. LONEGQs in the present termi-

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<sup>3</sup>While we will refer to the two interpretations as ‘readings’ for the time being, we will ultimately argue in what follows that these are not in fact distinct syntactic/semantic readings.

nology. Ladd (1981) does not actually say whether or not ‘inner’ or ‘outer’ also apply to LONEGQs. On the one hand, his analytical intuition is that this difference is due to ‘inner’ negation being somehow part of the proposition in question (i.e. the question radical). Following this intuition, one might think that LONEGQs would always be cases of ‘inner’ negation since negation is not high enough syntactically to ever be interpreted ‘outside the question’. On the other hand, he illustrates both ‘outer’ and ‘inner’ questions using only examples with high/preposed negation.

In the wake of this unclarity, many subsequent authors have taken the term ‘inner’ to refer not only to certain readings of HiNEGQs, but also to some or all instances of LONEGQs. This application of the term is presumably undertaken on the assumption that ‘inner’ HiNEGQs have the same semantics/pragmatics as LONEGQs despite their different syntax. This reduction, however, is problematic for several reasons. First, as Romero & Han (2004)’s example in (255) demonstrates, certain contexts admit one, but not the other (at least in the absence of special intonation of some sort).

(218) **Scenario:** The speaker is organizing a party and she is in charge of supplying all the non-alcoholic beverages for teetotalers. The speaker is going through a list of people that are invited. She has no previous belief or expectation about their drinking habits. A says “Jane and Mary do not drink.”

a. S: OK. What about John? Does he not drink (either)?

b. #S: OK. What about John? Doesn’t he drink (either)?

Second, as we will argue in detail in §5.1.3, HiNEGQs only convey a negative bias (of some sort) in the presence of an NPI or other scale-manipulating operator such as *even*. In contrast, LONEGQs consistently exhibit a negative speaker bias whether or not they contain an NPI.<sup>4</sup> The differences between the ‘inner’ HiNEGQs and LONEGQs will be discussed in further detail in §4.2.3, but we take Romero & Han (2004)’s example to have shown that the two cannot be straightforwardly treated as a single class.

In addition to this usage, there seems to be a third application of the ‘inner’/‘outer’ terminology in which the terms are synonymous with our usage of ‘high’ and ‘low’, being defined by the syntactic position of negation, and possibly correlating

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<sup>4</sup>We will additionally see that the two negative biases are of a different sort, though this is an admittedly subtle matter.

with some sort of semantic distinction (though this is not always clear). Given this confusion, I will try to refrain from using the ‘inner’/‘outer’ terminology wherever possible, describing the readings in prose where possible and otherwise using the descriptive terms in (215). When the terms ‘inner’ and ‘outer’ are used, they will be used in combination with the term HiNEGQ and are intended to be used in Ladd (1981)’s sense. It should be noted, though, that the account I develop differs significantly from his in its characterization of the grammatical status of the distinction and its relationship to NPIs.

Before proceeding, there is one final complication worth mentioning, first noted by Romero & Han (2004). The complication is that the distinction between high and low negation which we find in modern English is a relatively recent innovation. For example, Romero & Han (2004) note that (219a) can be used as an archaic version of (219b), an observation they support with historical corpus data. The same point is made by the example in (220) from the movie *Gladiator*, which is constructed by the writers as an archaic (or perhaps more stilted) way for the protagonist to achieve the effects typically associated with HiNEGQs. The fact that modern movie-goers can readily understand the intended meaning is, of course, interesting. However, it seems quite clear that this effect is achieved in no small part because the movie takes place in a previous era, helping viewers to identify the sentence as belonging to an earlier version of English. Given this clear perception that such usages are archaic or characteristic of a certain sort of formal oratory, we will set aside such “Gladiator-LoNEGQs” in what follows.

- (219) a. Should she not have talked to him already?  
       b. Shouldn’t she have talked to him already?
- (220) SCENARIO: The gladiator protagonist, Maximus, effortlessly kills yet another competitor. The crowd reacts with stunned silence at Maximus’ ruthless efficiency, rather than applause.
- a. Maximus: Are you not entertained? Are you not entertained? Is this not why you are here?



## 4.2 Beyond ‘bias to the overt’

As noted in the introduction to this chapter, POSQs, LoNEGQs, and ALTQs often (though not always) exhibit a pattern which we termed ‘bias to the overt’. That is, in addition to putting forward a request for information, these three types of polar question also often give rise to the inference that the speaker is biased — in some way — towards the alternative which is overtly realized in the question’s form. A POSQ potentially expresses bias towards the positive or ‘yes’ answer, while the corresponding LoNEGQ indicates bias towards the negative answer. An ALTQ overtly realizes both alternatives and therefore conveys that the speaker is equally disposed to the two answers, i.e. neutral. In this section, I present data on all three varieties of English polar questions, demonstrating both the overarching ‘bias to the overt’ pattern, and crucially, the places where it breaks down.

An important question which will arise several is the question of what the exact factors determining this bias are. In most examples, the bias conveyed by these questions is most readily taken to be epistemic or doxastic. The contexts where a LoNEGQ like (221) is felicitous are most likely ones where the speaker believes it more likely that the negative response will hold than the positive one. If we assume the addressee to be answering the question in a cooperative fashion (and the speaker to be asking it rationally), then this answer will also be the answer the speaker *expects* to hear.

(221) Is Fred not coming to the party?

However, van Rooÿ & Šafářová (2003) argue that we also have to take into account which answer the speaker *wants* to receive, i.e. which answer would get the speaker closer to her conversational goals (or perhaps the participants’ shared goals). For example, they claim that a question like (222) is felicitous in a context such as a medical questionnaire not because the speaker believes the positive answer to be more likely, but because it would help the medical staff move closer to their conversational goal of diagnosis more efficiently than the negative response. To account for such examples, van Rooÿ & Šafářová (2003) argue that the relevant sort of bias is best captured as a bias of the *expected utility* of answers, where the expected utility of a given answer is

computed from the beliefs and desires of the speaker.

(222) Is your child apathetic?

The account we develop below distinguishes different type of polar questions in terms of what projected issues they make salient in addition to the main issue. In principle, then, the account is relatively agnostic on the question of what kinds of factors influence the decision between different types of polar questions. It is therefore consistent with van Rooÿ & Šafářová (2003)’s notion of expected utility, though it would also be consistent with other theories of bias. This choice, while important, is therefore somewhat orthogonal to the present account. That said, we will see several places in what follows where the data motivate a notion of bias which incorporates both the speaker’s beliefs and desires. Under the richer semantics we develop in what follows, however, which answer the speaker expects or wishes to hold are not the only factors influencing the choice of polar question.

#### 4.2.1 Properties of positive polar questions

Since at least Bolinger (1978), it has been clear that POSQs often convey that the speaker is biased towards the positive answer in a way that other polar questions do not. For example, consider Buring & Gunlogson (2000)’s examples in (223) and an example with a comparative in (224). The observation is that, in the absence of special intonation, (223a) allows for the inference that the speaker thinks it more likely that she is left-handed, while disallowing the opposite inference. The similar example in (223b) allows for the opposite inference, namely that the speaker believes she is right-handed. The same ‘bias to the overt’ pattern holds, *mutatis mutandis* for the comparative in (224).

(223) a. Is she left-handed?

b. Is she right-handed?

(224) a. Is Cutler better than Orton?

b. Is Orton better than Cutler?

These examples (and many others) fall neatly into the ‘bias to the overt’ pattern formulated in (211). However, there are other clear cases where POSQs can be

used in the absence of any such bias, in contradiction to the ‘bias to the overt’ tendency. While this potential for speaker bias does indeed distinguish POSQs from ALTQs, it is nonetheless not obligatory. As observed by Büring & Gunlogson (2000), POSQs are also consistent with contexts with no apparent bias as in their (225) and my (226). In such scenarios, ‘bias to the overt’ predicts POSQs to be infelicitous with the ALTQ predicted to be the only felicitous option.

(225) **Scenario:** S and A are talking long distance on the phone.

- a. What’s the weather like out there? Is it raining?
- b. What’s the weather like out there? Is it sunny?

(226) **Scenario:** Questions on a fair exam.

- a. Is [b] a fricative?
- b. Is [s] a fricative?

Presumably, a fair teacher does not seek to convey any sort of bias towards one answer or the other and S may have no prior beliefs about the weather at A’s location. Büring & Gunlogson (2000)’s observation only addresses epistemic/doxastic bias, but the point still holds under van Rooÿ & Šafářová (2003)’s more complex characterization of bias. Assuming that the teacher’s conversational goal is to assign fair grades to students, neither answer brings the teacher closer to this goal, yet the POSQ is still felicitous. Rather, it seems fair to say that the POSQ has a sort of ‘default’ status which allows it to be used in contexts where the speaker’s neutrality is already evident or unimportant. That the POSQ should have a default status should, of course, come as no surprise since it has a more basic form than other types of polar questions.

Finally, POSQs can be used under certain conditions even when the speaker has a bias of some sort towards the negative response. One such case which has been much discussed in previous literature (see Asher & Reese (2005) and Reese (2007) for recent summaries) are POSQs with an NPI such as *ever*, *any*, *a shred*, or *lift a finger*, as in (227-230). For at least certain NPIs, Asher & Reese (2005) note that intonational focus is additionally required to convey negative bias.<sup>5</sup>

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<sup>5</sup>van Rooÿ & Šafářová (2003) and Asher & Reese (2005) also claim that there are negatively biased POSQs with no NPI, but with intonational focus, as in van Rooÿ & Šafářová (2003)’s example in (i).

- (227) Has John **ever** washed the dishes?
- (228) Does John have **any** sense to him?
- (229) Does John have **a shred** of decency to him?
- (230) Did John **lift a finger** to help?

Such examples raise many questions which we will not be able to address here. Why are NPIs licensed in them? Which ones are licensed? What is the relationship to focus? Why does their presence manipulate bias in the ways that it does? These are all interesting issues, but are fundamentally questions about the semantics and pragmatics of NPIs and focus rather than polar questions per se. My purpose in mentioning them is simply to point out that, while positive polar questions generally give rise to an implication of positive speaker bias, certain elements can ‘override’ this intrinsic tendency. This point will be important in Ch. 5 when we consider HiNEGQs. Like POSQs, HiNEGQs generally have a positive bias (albeit of a different sort), they also license NPIs (though admittedly not exactly the same ones), and the presence of NPIs leads to negative bias of some sort. To summarize, POSQs have the properties in (231).

- (231) **Usage of PosQs:** POSQs can be used: **(i)** to convey a positive bias, **(ii)** with no apparent bias, given sufficient context establishing the speaker’s neutrality, or **(iii)** to convey a negative bias of some sort, provided that it is linguistically marked elsewhere, e.g. by a Negative Polarity Item.

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While such examples are certainly felicitous with focus, it is not clear that they can serve as true information seeking questions, rather than rhetorical questions. For example, the question in (i) is described by van Rooÿ & Šafářová (2003) as conveying the proposition in parentheses to the addressee. The fact that the proposition conveyed by (i) bears no logical relation to any of the question’s semantic answers need not concern us since Caponigro & Sprouse (2007) and Rohde (2006) have both shown that, despite a tendency to convey particular semantic answers, rhetorical questions have the potential to refer to more or less any arbitrary proposition.

- (i) Is JOHN<sub>F</sub> the boss? (I thought Peter was the boss.)

Whether or not these are rhetorical questions, however, their bias clearly arises from the semantics/pragmatics of focus rather than the positive polar question form itself. As such, we will set them aside in what follows.

#### 4.2.2 Properties of alternative questions with ‘or not’

While they clearly ask about the same basic issue, it has been established since at least Bolinger (1978) that POSQs and corresponding ALTQs are not freely interchangeable in many contexts as in his (232-234).

- (232) **Scenario:** Speaker wants to pass on information to the presumably uninformed hearer.
- a. By the way, did you know that Jack Robinson is my cousin?
  - b. #By the way, did you know that Jack Robinson is my cousin or not?
- (233) **Scenario:** Speaker wants to know the date and views the 17th as the most likely date but is uncertain.
- a. Is today the 17th?
  - b. #Is today the 17th or not?
- (234) **Scenario:** Speaker hopes for a successful betrothal to take place.
- a. Will you marry me?
  - b. #Will you marry me or not?

What most of Bolinger (1978)’s scenarios have in common is that they contextually establish the speaker’s bias towards the positive answer. ALTQs are generally inconsistent with the speaker having such bias, instead presenting the speaker as being *neutral* (i.e. finding both answers equally useful/likely/desired). The scenarios in (232-234) all establish the speaker as having a bias, thus explaining the infelicity of the ALTQ.

Conversely, there do not seem to be scenarios which allow the use of the ALTQ, but where the POSQ is infelicitous. Rather, the ALTQ is used in scenarios where the speaker could use the POSQ, but wants to be absolutely certain to avoid giving off the impression that she expects or wishes for the positive answer over the negative one, as in (235-237) from the Davies (2008-)’s Corpus of Contemporary American English (COCA, available online at [www.americanacorpus.org](http://www.americanacorpus.org)).

(235) **Scenario:** A reporter asking the president for his comment.

Q: I had Mitch McConnell out on the show last week and he ridiculed it. Saying that, you know, this is the example of the kind of pork we don't want. Yet, its advocates say, wait a second. It's a construction project. It's ready to go. It's going to create jobs. **Is that the kind of project that you want to fund or not?**

(236) **Scenario:** Question from a Gallup poll.

Q: Would you personally like to belong to a labor union at work, or not?

(237) **Scenario:** News commentator introducing a new topic.

Q: But what about Mrs. Obama – **is she holding a grudge or not?** Find out, next.

In each of these cases, the questioner uses the ALTQ in order to go out of his or her way to present both alternatives on equal footing. For example, in (235), the questioner lays out the case that supporters of a project have made, as well as presenting the case against it. The speaker then asks President Obama for his comment, but wishes to stress that as a journalist, he does not favor one side or the other. In the second case, (236), the polling company is trying to ensure that the form of the question does not bias the addressee's response towards the positive response. In the third example, (237), a TV commentator is introducing a brand new topic and poses the question to the viewer as a sort of cliffhanger. Here, it seems, the primary purpose of the ALTQ is to plant in the viewer's mind that both answers are equally likely and therefore that the viewer ought to stay tuned in order to find out which answer is in fact the case. In all of these cases, the speaker could instead have used the corresponding PosQ. Doing so, however, would fail to emphasize the speaker's neutrality in the way that the ALTQ does.

The above data are consistent with the 'bias to the overt' pattern presented in the introduction since both alternatives are overt, and the speaker conveys that she is equally disposed to both. There is, however, another frequent usage of ALTQs which does not seem to clearly fall into this pattern: ALTQs whose purpose is not to emphasize neutrality in any way, but to *insist* on an immediate response, as in the COCA examples

in (238-240).

(238) **Scenario:** A man is held at gun point breaking into a room, currently standing in the window.

Q: Calming scorned women was not one of Cal’s skills. Especially another guy’s scorned women. He had enough trouble keeping his own sex life straight without taking on someone else’s. **“Look, can I step down or not? I’m losing feeling in my legs and my neck is getting stiff.”**

(239) **Scenario:** An entertainment reporter at the end of a segment.

Q: I mean, no woman who ever felt that Jon, felt sorry for Jon because of [what] Kate put him through, is going to be on Jon’s side now. And right now, Kate is doing the best thing she can. She’s laying low. She’s being a mom as she’s doing. Marvet, real quick. Five seconds left, literally. **Is this a big P.R. stunt or not?**

(240) **Scenario:** An impatient man seeks support.

Q: **“Will you support my marriage or not?”** he thundered.

a. “I need an answer.”

The speaker in these examples need not be displaying any neutrality, as we see clearly in (240), where the prior context establishes the man as having been ‘kept ...so long from his heart’s desire’. Similarly in (238), the man in the window is losing feeling in his legs and therefore presumably has a quite strong desire to get down. The other thing to note in these examples is that the issue being asked about can be under discussion in the surrounding discourse (e.g. (240)). However, the questions in (238-239) appear to introduce issues which were not recently under discussion, but do so urgently. For example, in (239), the anchor uses the ALTQ primarily to help ensure that the addressee provide whatever answer she can immediately, since the segment is ending.

One especially clear case of this are ALTQs which immediately follow an unanswered or underanswered POSQ as in (241), what Biezma (2009) dubs ‘cornering’. In this scenario, the speaker first asks the question of the addressee using the POSQ, potentially giving rise to the inference that she is biased towards the positive answer. As a

follow-up to the unanswered POSQ, the speaker asks again about the same main issue, but using the corresponding ALTQ instead of the POSQ. In such a context, it does not seem that the speaker's expectations have suddenly changed from positive to neutral. Rather, the speaker 'corners' the addressee into providing some response, without necessarily abandoning whatever bias she previously had. We discuss such cases in detail in §4.4.4.

- (241) a. You: Are you making pasta?  
       b. John: (Silence and dubitative faces)  
       c. You: Are you making pasta or not?

While such examples are especially easy to construct with overt POSQs preceding them in discourse, this is not a necessary condition as the COCA examples show. In some of these examples, the issue is clearly under discussion previously, while in others this does not seem to be the case. ALTQs can convey insistence on their own, without the issue being previously under discussion in the discourse. To summarize, ALTQs are subject to the descriptive condition in (242).

- (242) **Usage of AltQs:** ALTQs can be used **(i)** in contexts where the speaker wishes to emphasize her neutrality, or **(ii)** insist on a response from the addressee, including following an un(der)answered POSQ.

### 4.2.3 Properties of low negation polar questions

Whereas POSQs often give rise to a weak positive bias, LONEGQs are somewhat the opposite, conveying a weak negative bias as in the examples in (243-245). As we have seen with both POSQs and ALTQs, LONEGQs also exhibit a bias towards the alternative which is overt in the question's form.

- (243) Does Billy not like chocolate cake?  
 (244) Will Jim not like this new direction?  
 (245) Do you not have any friends? Then click on this button... (van Rooÿ & Šafářová (2003))



Furthermore, as we have seen with most ALTQs (and in contrast to POSQs), LONEGQs are inconsistent with scenarios where the speaker has a contextually clear neutral or positive stance as seen in (246-248).<sup>6</sup> Once again, we see a contrast between the default status of the POSQ and the more narrowly proscribed usage conditions of the polar question varieties which are more marked in form.

- (246) **Scenario:** S and A are talking long distance on the phone.
- a. #S: What's the weather like out there? Is it not raining?
  - b. #S: What's the weather like out there? Is it not sunny?
- (247) **Scenario:** A enters S's windowless computer room wearing a dripping wet raincoat.
- a. #S: What's the weather like out there? Is it not raining?
  - b. ?S: What's the weather like out there? Is it not sunny?
- (248) **Scenario:** Questions on a fair exam.
- a. #Is [b] not a fricative?
  - b. #Is [s] not a fricative?

Thus far, we have seen that LONEGQs are, broadly speaking, the polar opposites of POSQs, which convey positive bias. However, there is, I believe, an important asymmetry between the two which has gone unnoticed in previous literature. Whereas POSQs can be felicitously used in any context where the speaker believes the positive is more likely, LONEGQs are subject to an additional restriction. A negative bias is a necessary condition for the felicitous use of a LONEGQ, but there are scenarios with a clear negative bias where they are nonetheless inappropriate. The LONEGQ is relatively

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<sup>6</sup>Romero & Han (2004) seem to dispute this characterization, claiming that a LONEGQ such as (256) is in fact neutral. However, the conditional continuation — 'And if she didn't, why not?' — seems to give a strong indication that this is not so. If we replace this continuation with a positive one as in (i), the result is decidedly odd. The key empirical point which Romero & Han (2004) make about such examples, though, is that the LONEGQ in this scenario does not exhibit the same *kind* of urgent bias that the corresponding HINEGQ does, which their examples quite clearly show, I think.

(i) # Did she not write poetry in the '70s? And, if she did, why?

infelicitous in scenarios where the speaker has reason to believe that the response will be a simple ‘No’ with no further discussion. For example, consider the scenario in (249):

(249) I didn’t see Bill at the party. John, you greeted everyone who was at the party, and you have a perfect memory.

Q: #? Was Bill not there?

Q’: Was Bill there?

Here, the speaker has a hunch that Bill did not attend the party, but is not sure and decides to ask John. As the prompt establishes, John has perfect knowledge of who attended and therefore should be able to answer the question without any further discussion or difficulty. Despite the speaker’s hunch, the LONEGQ is still fairly odd-sounding if the context is such that a straight *yes/no* answer can be expected. If we consider a different context where the addressee’s ability to answer the question fully is more indeterminate, as in (250), the LONEGQ becomes much better.<sup>7</sup>

(250) I didn’t see Bill at the party. John,

Q: Was Bill not there?

Q’: #? Was Bill there?

A further example seems to show the same pattern — negative speaker bias alone is not a sufficient condition to license LONEGQs. Since Shakespeare’s first folio is quite rare, the speaker is plausibly epistemically biased towards the negative answer, yet the LONEGQ is infelicitous.

(251) **Scenario:** Question to a librarian with knowledge of the library’s major holdings:

Q: # Does the library not have a copy of Shakespeare’s first folio?

Q’: Does the library have a copy of Shakespeare’s first folio?

However, as van Rooÿ & Šafářová (2003) argue, bias in polar questions is not concerned with beliefs alone, but rather with a mixture of beliefs and desires. Under

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<sup>7</sup>I have marked the version in (Q’) as being of questionable felicity in this scenario in the absence of focus intonation. As discussed in §4.2.1, however, such examples are made felicitous — though likely with a slightly different perceived meaning — by the addition of focus.

the scenario as specified, the librarian might plausibly take the speaker to have a strong desire to find the book and persist in asking, even if her knowledge would suggest that the positive answer is more likely. That is, the default pragmatics of asking for a book at the library might make a negative bias seem implausible, even if it is quite reasonable to expect the negative response.

What we need, then, is a scenario under which both the speaker's beliefs and desires both favor the negative answer, as in (252). Since the speaker's goal in the scenario in (252) is to find a library without a copy of the first folio, there would seem to be no possibility for positive epistemic or bouletic bias on the part of the speaker (assuming this information is known to the librarian). In this richer scenario, the LONEGQ remains infelicitous, even though the negative answer is known by the speaker to be more likely and would move the speaker closer to her goal of finding a suitably needy library.

(252) **Scenario:** Speaker has a large sum of money and is trying to find a library to which she can donate it, but does not want to give it to an already wealthy library. Only wealthy libraries have the first folio.

Q: # Does the library not have a copy of Shakespeare's first folio?

Q': Does the library have a copy of Shakespeare's first folio?

Finally, we can consider the scenario in (253) where a vegan at a café asks about the ingredients in the focaccia bread. Focaccia bread generally does not contain dairy products, and the speaker's stated veganism makes clear her desire for dairy-free bread (to a sufficiently knowledgeable employee). One final point worth noting is that the strangeness of the LONEGQ in (253) seems to be a fact about the low negation itself, not about the content of the question per se, since minimally different examples in (254) are felicitous in the same scenarios.

(253) **Scenario:** A strict vegan at a café.

Q: Excuse me, I'm vegan. #Does your focaccia not have dairy in it?

Q': Excuse me, I'm vegan. Does your focaccia have dairy in it?

(254) Q: Excuse me, I'm vegan. Is your focaccia vegan?

Q': Excuse me, I'm vegan. Is your focaccia dairy-free?

While the examples are admittedly quite subtle and the scenarios fairly elaborate, I hope to have established two related points. First, even when the context makes the speaker's negative bias sufficiently clear (and rules out a bouletic bias as well), LONEGQs are not necessarily felicitous. Second, the contexts where they are felicitous are ones where the speaker expects or aims to stimulate more protracted discussion. The vegan in (253) simply wishes to establish unequivocally that the bread has no dairy of any sort in it, not to stimulate more protracted discussion.

This more limited distribution of LONEGQs should not be entirely surprising since, as we will see in §4.2.4, LONEGQs do not allow for the felicitous use of particle answers like 'yes' and 'no'. Therefore, if the speaker anticipates a straight and unequivocal 'no' answer, the LONEGQ is a bad strategy since the addressee cannot simply respond 'No', but must give a more lengthy response. Another way to think of this asymmetry is that the LONEGQ is most felicitous when the speaker thinks the negative response is most likely and is expecting to begin a more protracted discussion to establish this fact or further conversation about the conditions under which the negative answer may hold. That is, LONEGQs are used to begin discussions about the details of the evidence that supports the negative answer, to commiserate about it, or otherwise engage in a more protracted discussion regarding it.

For this reason, LONEGQs have been taken by some authors to constitute a single, unified class with ('inner' negation readings of) HINEGQs since these too invoke discussion of the details of the evidence supporting the negative answer, as argued by Büring & Gunlogson (2000) and more recently by Walkow (2009). While they do have certain properties in common, there are significant differences which result in contexts where LONEGQs are felicitous while 'inner' HINEGQs are not. The bias conveyed by a LONEGQ is a weak bias, seemingly of the same sort as what we find in positively-biased POSQs. That is, LONEGQs are felicitous when the speaker has only a hunch or suspicion that the negative answer holds, but still exhibits genuine uncertainty. Furthermore, the evidence under discussion in LONEGQs need not be recent and mutually available.

In contrast, as we will see in Chapter 5, HINEGQs exhibit a different, intuitively stronger sort of bias coupled with the speaker's prior belief that the positive

answer had held. As Romero & Han (2004) describe it, a HiNEGQ can be used to ask if the addressee wants to ‘double-check’ if it is for sure that the negative answer should be added to the common ground (i.e. to double-check that the speaker should *revise* her prior, positive belief). This sort of question requires that the evidence under discussion meets more specific conditions than that discussed in LONEGQs.

We see these differences manifested quite clearly in contexts where this weaker bias condition is met, but where the stronger one (or its related prior positive belief) is not. This is exactly what Romero & Han (2004) do in their examples in (255-256). We will return to this point when we discuss HiNEGQs in more detail in Chapter 5, but the clear result from Romero & Han (2004)’s examples is that LONEGQs are felicitous in such contexts, while HiNEGQs are not. The usage conditions for LONEGQs can be summarized as in (257).

(255) **Scenario:** The speaker is organizing a party and she is in charge of supplying all the non-alcoholic beverages for teetotalers. The speaker is going through a list of people that are invited. She has no previous belief or expectation about their drinking habits. A says “Jane and Mary do not drink.”

- a. S: OK. What about John? Does he not drink (either)?
- b. #S: OK. What about John? Doesn’t he drink either?
- c. #S: OK. What about John? Doesn’t he not drink (either)?

(256) **Scenario:** S interviews A on TV about Rosa Montero.

A says: Mrs. Rosa Montero’s writing career is closely related to the political episodes that Spain has lived through since 1936. There were times when she simultaneously worked on prose and poetry, but there were other times full of journalistic prose and completely devoid of poetry.

- a. S: Please tell us more about those poetic gaps, and about what exactly caused them. For example, did she not write poetry in the ‘70s? And, if she didn’t, why not?
- b. #S: Didn’t she write (some/any) poetry in the ‘70s? And, if she didn’t, why not?

- (257) **Usage of LoNegQs:** LoNEGQs can be used in contexts where the speaker wishes to convey a (weak) bias towards the negative answer **and** anticipates further discussion of the details of this answer or the evidence supporting it.

Looking across these three varieties of polar question, we see an overarching pattern: the speaker conveys a bias towards the alternative or alternatives which are overt in the question's form. While 'bias to the overt' is the overarching pattern, we have seen several ways in which this pattern is an oversimplification. First, POSQs have a far broader distribution than this, as we have seen in the phonetics test example. Second, ALTQs are often used not to convey neutrality, but, rather, *insistence*. Third, LoNEGQs require not only a negative bias, but also some sort of indeterminacy or expectation that the negative answer will only be established with some difficulty. The task in providing an account of these three kinds of questions is to understand both the general pattern and these specific exceptions to it.

#### 4.2.4 Particle answers like 'yes' and 'no'

One additional property which distinguishes POSQs, ALTQs, and LoNEGQs is the felicity and interpretation of particle answers such as 'yes' and 'no'. In POSQs, 'yes' and 'no' are, of course, both felicitous, with 'yes' picking out the positive response and 'no' picking out the negative one as in (258).

- (258) Is John baking a cake?
- a. Yes.            (= 'John is baking a cake')
  - b. No.            (= 'John is not baking any cake')

In contrast to this, ALTQs do not allow for either bare particle answer, as in (259). There is a clear intuition that 'yes' and 'no' fail to select one of the two choices, even though these choices are distinguished only by their polarity. Furthermore, responses with a particle answer followed by a full clause (or a full clause with VP-Ellipsis) as in (260) are quite odd, though perhaps not as categorically infelicitous as the bare responses.

(259) Is John baking a cake or not?

a. #Yes.

b. #No.

(260) Is John baking a cake or not?

a. #? Yeah, he is (baking a cake).

b. #? No, he is not (baking a cake).

The felicity and meaning of ‘yes’ and ‘no’ responses to LONEGQs has been the subject of recent work by Kramer & Rawlins (to appear), who claim that both ‘yes’ and ‘no’ neutralize in this case, with both responses picking out the negative response as in (261). While it is certainly clear that ‘yes’ and ‘no’ do not pick out the same responses as in POSQs, there is a strong feeling for many speakers, myself included, that either of these bare particle responses on its own (i.e. without a following clause of some sort) is quite odd. Either bare particle answer on its own seems likely to lead to confusion as to which response the addressee intends. There is an intuition that the speaker is, somehow, contradicting herself in uttering either of these answers on its own.

(261) Is John not baking a cake?

a. Yes. (= he isn’t)

b. No. (= he isn’t)

Unlike in the case of ALTQs, however, particle responses followed by whole or elliptical clauses are quite felicitous, and we do indeed see in (262) that both ‘yes/yeah’ and ‘no’ most readily pick out the negative response. That said, the use of ‘yes’ in such a scenario is still somewhat odd to my ear. Far better is the complex particle ‘yeah, no’ which we might paraphrase as “your suspicion was right, the answer is ‘no.’”. A full account of ‘yes’ and ‘no’ is beyond the scope of the present work, but we will offer some tentative thoughts on them in §4.4 (see also Farkas & Bruce (2010) and Farkas (2010)).

(262) Is John not baking a cake?

a. ?Yes, he’s not. // Yeah, no, he’s not.

b. No, he’s not. // ?No, he IS<sub>F</sub>.

### 4.3 Previous Accounts

Recent literature has seen many attempts at characterizing the meaning/use of polar questions. While this literature has been quite successful at illuminating particular aspects of particular varieties of polar questions, it has been relatively silent about how particular patterns of meaning/use are related to particular morphosyntactic forms. Compounding this problem have been two factors: (i) fairly widespread (though rarely discussed) disagreement about what varieties of polar questions need to be distinguished, and (ii) the fact that nearly all authors provide an account of only a subset of forms, as seen in the table in (263).

(263) Varieties of polar questions discussed in recent literature:

Question type	POS	ALT	LoNEG	‘inner’ HiNEG	‘outer’ HiNEG
Büring & Gunlogson (2000)	✓	✗		✓	✓
Krifka (2001)	✓	✓	✗	✗	✗
van Rooÿ & Šafářová (2003)	✓	✓		✓	
Romero & Han (2004)	✗	✗	✓	✓	✓
Reese (2007)	✓	✗		✓	✓
Biezma (2009)	✓	✓	✗	✗	✗
Farkas & Bruce (2010)	✓	(✗) <sup>8</sup>	✓	✗	✗

One of the central challenges in providing an analysis of these varieties of question is how to reconcile the various inferences each question conveys with the fact that most mainstream question semantics (e.g. Hamblin (1973), Groenendijk & Stokhof (1984)) not only don’t predict the inferences we in fact find, they don’t predict any difference whatsoever between the different types of questions. To bridge this gap, then, there are essentially three possible analytical options for any given question type.

**Option 1:** a given inference could be a purely pragmatic phenomenon which assigns uses to different question types based solely on their *syntactic form* despite their identical semantics. **Option 2:** it could be the direct result of the compositional semantics

<sup>8</sup>Farkas & Bruce (2010) do not discuss alternative questions with ‘or not’, but it is fairly clear how their account of weak bias could be extended to do so by having ALTQs place both the positive and negative sentence radicals on the table.



itself. **Option 3:** it could be the result of a pragmatics which makes reference to distinct compositional semantics for different kinds of questions.

For HiNEGQs, the literature has been essentially unanimous<sup>9</sup> that the inferences we see are due at least in part to a distinct semantics, as we will see in Ch. 5. For POSQs, ALTQs, and LONEGQs, however, it is less clear *a priori* that a different semantics is required. In particular, many authors have tried to account for the ‘bias to the overt’ pattern in purely pragmatic terms (e.g. van Rooÿ & Šafářová (2003), AnderBois (2009a), Farkas & Bruce (2010)).

A pragmatic approach to the ‘bias to the overt’ pattern is developed most explicitly by Farkas & Bruce (2010). Farkas and Bruce posit discourse structures which, among other components, relies on a construct they term ‘the Table’. In addition to managing the Question Under Discussion stack (in the sense of Roberts (1996), Ginzburg (1996), Büring (2003), and others), the Table contains a record of (at least certain aspects of) the syntactic form of preceding utterances.

For questions, the Table stores not the entire question, but rather the sentence radical. For a POSQ, then, the Table will contain the positive sentence radical along with a diacritic indicating that the sentence that it came from was itself interrogative. Similarly, for a LONEGQ, the Table contains the negative sentence radical since the sentence’s syntactic form is negative. They do not discuss ALTQs, but it seems plausible (at least given an alternative semantics for disjunction) in this framework to assume that both the positive and negative sentence radicals are placed on the Table in such questions.

Responding to assertions and questions, then, makes use of speech act operators which manipulate the various components of the discourse structure. The two moves which are immediately relevant to us are *polar question confirmation* and *polar question reversing*. Assuming other discourse participants agree to it, the confirmation move adds to the common ground the proposition denoted by the sentence radical. The reversing move, on the other hand, negates the proposition denoted by the sentence radical and adds this to the common ground. Bias in polar questions, then, arises be-

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<sup>9</sup>The one exception is van Rooÿ & Šafářová (2003), who claim to provide an account of HiNEGQs that is purely pragmatic. Their account, however, does not address several major components of HiNEGQs, as discussed in detail by Romero (2005).

cause the confirmation move is formally simpler than the reversing move. Bias of this sort will always be towards the alternative which is overt in the question's form, since it is the sentence radical (rather than its denotation) which confirmations and reversals target. In ALTQs, then, neither answer is simpler to add than the other since both are present in the question's form.

While Farkas & Bruce (2010)'s primary aim is to elucidate the formal connections between responding to assertions and polar questions, their approach gives a clear and explicit account of the 'bias to the overt' pattern of POSQs, ALTQs, and LONEGQs. Moreover, the account does this without positing semantic/pragmatic mechanisms which are not independently motivated. That said, the approach leaves two key questions unanswered.

First, the account does not address HINEGQs, and it is not immediately clear how it could be extended to cover them. One of the key questions we address in Chapter 5 is why HINEGQs are exceptional at all. Second, as we have seen in §4.2, the pattern of inferences conveyed by these three kinds of questions is not always as simple as a bias to the overt alternative. For each of the three types, we have seen that there are systematic exceptions to the bias to the overt pattern (e.g. the lack of neutrality in 'cornering' ALTQs, the additional restrictions on LONEGQs). It is hard to see how the account could be extended to account for these observations (the default behavior of POSQs being a possible exception). What we desire is an account which captures the 'bias to the overt' pattern as well as the places where this general tendency breaks down.

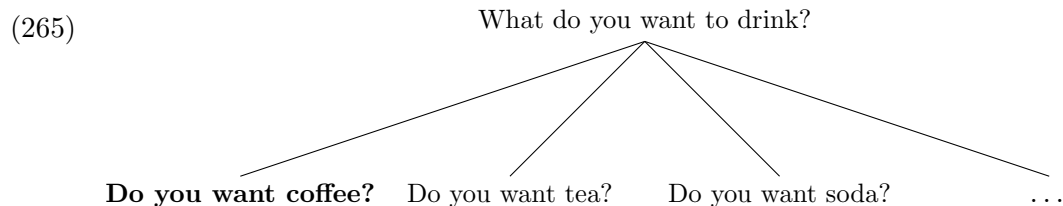
In contrast to Farkas & Bruce (2010)'s purely pragmatic, a number of authors have proposed in various ways that POSQs and ALTQs do in fact have different compositional semantics (Krifka (2001), Roelofsen & van Gool (2009), Biezma (2009), Rawlins & Biezma (2010) *inter alia*).<sup>10</sup> Of these, only Rawlins & Biezma (2010) discuss the difference in bias/neutrality in any detail. Their idea is that the compositional semantics

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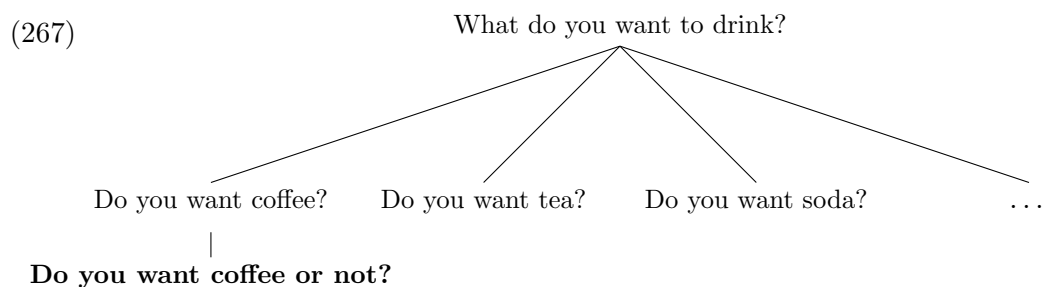
<sup>10</sup>While he does not entirely reject the possibility that the differences between POSQs and ALTQs are ultimately pragmatic, Bolinger (1978) does suggest at several points that the differences between POSQs and ALTQs might be semantic in nature. In particular, he suggests that ALTQs might be analyzed as conjunctions of POSQs. The specifics of how this would work, however, are not really spelled out in sufficient detail to evaluate further.

of POSQs and ALTQs ensure that the two will differ in the discourse structures (formalized using Büring (2003)’s d-trees) in which they occur. For example, a POSQ like (264) is argued to have sister questions as in (265), while the corresponding ALTQ does not, as in (267).

(264) Do you want coffee?



(266) Do you want coffee or not?



Given these structures, then, their idea is that the positive bias arises pragmatically in (264) because the speaker chose to utter that particular question rather than one of its sisters, which also address the same super-question (i.e. “What do you want to drink?”). In contrast, (266) has no competing sister questions which the speaker could have uttered instead, explaining the lack of positive bias.

While the account may be appropriate for polar questions with an intonationally focused element, it is not clear how it can apply to polar questions without such an element. It is easy to see how the sister questions in (265) could be derived from the focus alternatives of ‘coffee’ when this word is focused. In cases without a focused element, however, it is not clear why these alternatives are the relevant ones and not others. For instance, why is the corresponding LONEGQ not a sister question? It differs minimally in form and addresses the same super-question. Consider also a case like ‘Is it raining?’; what would the relevant sister questions be? Relatedly, the account relies crucially on the existence of a super-question, ‘What do you want to drink?’ in this case. While it will of course always be possible to construct such a question, this question

might not be relevant in a given conversation. For example, I might ask (264) because I want to know whether or not I should plug in the coffee machine, and I may not have any other drinks that I can offer. In such a scenario, I would have no reason to utter any of the sister questions, yet my question may still convey a positive bias.

For Yucatec Maya, we have seen clear evidence that polar questions with a focused element are potentially quite different than those without such an element. The bias facts, however, are common to both kinds (both in English and in YM) and a unified explanation is therefore desirable. Rawlins & Biezma (2010)’s account may well provide tools to help understand the interactions between intonation and polar questions, but it does not seem a promising starting point<sup>11</sup> for understanding the bias/neutrality of polar questions more generally.

The rest of this chapter pursues an account where bias is derived from pragmatic competition between independently motivated compositional semantics for all three types of questions. The resulting account captures both the ‘bias to the overt’ tendency and its systematic exceptions. In addition, we will see in Chapter 5 that the semantic tools which the account relies on can be applied to HiNEGQs with no additional semantic mechanisms required.

## 4.4 Bias and projected issues

The central puzzle for any comprehensive account of polar questions is an empirical tension between two sets of facts. On the one hand, we have seen that POSQs, ALTQs, and LONEGQs all convey different inferences about the questioner’s beliefs, expectations, or desires. On the other hand, otherwise identical questions of all three types request information about the same main issue. Intuitively, they are different ways of asking the same question.

The single-tiered inquisitive semantics developed in Ch. 2 made some progress towards resolving this tension by positing that sentence denotations include two components: (truth-conditionally) *informative* and *inquisitive*. This semantics, then, allows us to distinguish positive and negative polar questions in terms of their inquisitive contri-

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<sup>11</sup>I say starting point since Rawlins & Biezma (2010) explicitly do not provide an account of negative polar questions, high or low.

butions. While this represents progress in our understanding of the differences between such questions, it poses a problem as well: the single-tiered semantics no longer captures the clear sense that they are in some way the same, an intuition reflected in the possible answers to these questions. While the single-tiered semantics poses this problem, it also presents us with an opportunity, since we begin to tease apart the different types of questions.

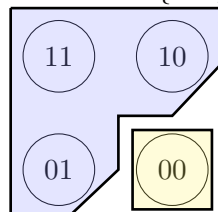
In the remainder of this chapter, we develop a more structured approach to issues, which we dub ‘Two-tiered Inquisitive Semantics (TIS)’. As in the classical Hamblin semantics, all three question types present the same *main* ‘yes’/‘no’ issue. This is the top-tier, which we term the ‘Main Issue’ for obvious reasons. As in the single-tiered inquisitive semantics of Ch. 2, however, questions also make salient other sets of alternatives corresponding to positive or negative details of the proposition in question. This secondary tier we dub the ‘Projected Issue’ since it *projects* discourse futures where a given alternative set is useful or relevant. While the function is in some ways distinct, the name is intended to evoke Farkas & Bruce (2010)’s ‘projected set’, since both aim to capture ways in which questions and at-issue assertions encode certain information about how the speaker *projects* the immediate future of the discourse to unfold.

#### 4.4.1 A two-tiered semantics for PosQs

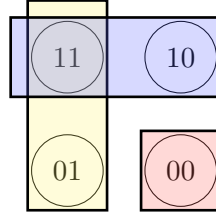
Under a classical Hamblin semantics, a PosQ like (268) receives the interpretation pictured in (269). This set of two alternatives corresponds directly to the two basic answers to the question, ‘yes’ and ‘no’. The single-tiered inquisitive semantics, on the other hand, assigns such a question the richer interpretation in (270).

(268) Is John baking a cake?

(269) **Hamblin:** {Yes, No}



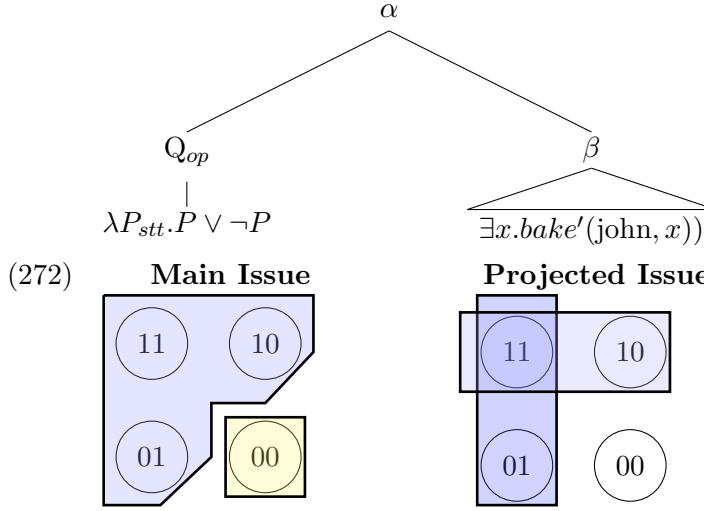
(270) **Single-tiered inquisitive semantics:** {Chocolate, Vanilla, ..., No}



The richer denotation pictured in (270) serves as a proposal to update the common ground with a set of alternatives of two kinds. First, the proposal contains an unspecified number of propositional alternatives introduced by the indefinite *a cake*, which are each of the form ‘John is baking  $x$ ’ and such that  $x$  is a cake (two such alternatives are depicted in (270)). Second, there is the single alternative ‘John didn’t bake any cake.’ introduced by the  $Q_{op}$  since it is the negation of the set of alternatives in the complement of  $Q_{op}$ .

As discussed above, however, this does not seem to be the right result. Instead, what we want is to separate the two classes of alternatives, while retaining both. This separation is a natural one since these alternatives come from different points in the semantic composition. The two main alternatives (‘yes’ and ‘no’) are introduced by the disjunctive  $Q_{op}$  itself. Meanwhile, the *projected* alternatives are introduced by the indefinite ‘a cake’ inside the question radical. The idea, then, is that we retain both alternative sets, but formally recognize the subordinated status of the projected issue, as pictured in (272).

(271) Schematic composition of (268):



We achieve this aim by taking the question's semantic contribution consists of an ordered pair of Chapter 2 denotations, i.e. an ordered pair of sets of sets of possible worlds. The first member of the pair is the classical Hamblin denotation containing two alternatives: one positive, one negative. The second member of the pair — the projected issue — consists of the propositional alternatives introduced by the indefinite *a cake*. For the sake of clarity, we illustrate the account with an overt indefinite as the inquisitive element. Given the arguments in Chapter 2 that inquisitive quantification is present also in covert existential quantification — including that of the event argument — the account readily extends to polar questions with no such overt inquisitive element.

In §4.5, we will develop semantic rules of interpretation which compose two-tiered denotations for all formulas, by changing our interpretive rules for all inquisitive elements. That is, we will make the case that the two-tiered characteristic we see in polar questions is part of a more general pattern: inquisitive operators which are *nested*. Polar questions are a special instance of this configuration since they (generally) involve an inquisitive question radical which combines with a disjunctive question operator. Before presenting the compositional system, however, we will examine the outcome of this system for our three types of polar questions in order to clarify the content and status of the projected issue.

One ad-hoc way to produce the intended denotations for polar questions, while retaining the underlying single-tiered logic elsewhere, is to posit a special denotation for the Q-operator which separates out the main issue and the projected issue in (273).

$$(273) \quad \mathbf{Q\text{-}operator (tentative): } Q_{op} \rightsquigarrow \lambda P_{stt}. \langle \overbrace{(!P \vee \neg !P)}^{\text{Main Issue}}, \overbrace{P}^{\text{Projected Issue}} \rangle$$

Under this conservative change, the Q-operator takes a set of alternatives (i.e. a set of classical propositions) and returns an ordered pair  $\langle \mathcal{M}, \mathcal{P} \rangle$ , i.e.  $\langle \mathbf{Main Issue}, \mathbf{Projected Issue} \rangle$ . The main issue consists of a set of two alternatives, one being the non-inquisitive closure of the formula to which it applies (i.e. its classical denotation) and the other being its negation. That is, the main issue returned by this ad-hoc  $Q_{op}$  is a set consisting of the ‘yes’ and ‘no’ alternatives as spelled out in the first member of the pair in (274).

The projected issue is a set of alternatives of unspecified cardinality consisting of the alternatives which were in the denotation of the question radical, i.e. the sister of  $Q_{op}$ . Since the question radical contains a wide-scope indefinite ‘a cake’, the projected alternatives will correspond to different cakes, as in the second member of (274). Putting the two tiers together, then, this definition gives a question like (268) the denotation paraphrased in (274) and pictured above in (272).

$$(274) \quad \llbracket (268) \rrbracket = \langle \overbrace{\{\text{John is baking some cake or other, John is not baking any cake}\}}^{\text{Main Issue}}, \overbrace{\{\text{John is baking a chocolate cake, John is baking a vanilla cake, } \dots \}}^{\text{Projected Issue}} \rangle$$

#### 4.4.2 Weak Bias in PosQs

In the previous section, we have proposed a novel, two-tiered interpretation where POSQs make salient an additional set of alternatives — the *projected* issue — in addition to their classical contribution — the *main* issue. In §4.5, we will argue that such a semantic representation can be derived from independently motivated concerns. For the moment, however, we have produced this semantics by tweaking the interpretation of the  $Q_{op}$  in a relatively ad-hoc way, in order to first investigate the top-level result.

Given this top-level semantics, I will demonstrate in this subsection how the weak positive bias in POSQs can be derived pragmatically. In particular, I argue that



speaker bias of the sort we see in POSQs is an implicature calculated by the addressee on the assumption that the speaker is deciding which alternatives to project in a cooperative manner. Consider an example of a potentially biased POSQ as in (275).

(275) Did Yesenia bring a date to the party?

The semantics developed in §4.4.1 holds that this sentence’s interpretation will be an ordered pair consisting of the main issue — {Yesenia did bring some date or other to the party, Yesenia didn’t bring a date to the party} — and a projected set of alternatives — {Yesenia brought Juan to the party, Yesenia brought Fred to the party, Yesenia brought Ray to the party, ...}. The alternatives in the projected issue can only be relevant to the future of the conversation in case the addressee is going to provide a positive answer. If the addressee provides a positive response, then the projected issue may be relevant to the future conversation. If, on the other hand, the addressee replies negatively, then the propositional alternatives in the projected issue won’t serve any purpose since the addressee already will have claimed them all to be false. Given this, a rational speaker will only choose to project this issue if she expects the answer to be positive.

One way to think about this pragmatics is in terms of the expected utility of the projected alternative set. By projecting a given alternative set, the speaker signals that they expect the projected issue to be useful in the immediate future of the discourse. Moreover, in polar questions, speakers have the choice of several competing question types which, as we will see shortly, present the same main issue while manipulating the projected alternatives. Clearly the set of alternatives of the form ‘Yesenia brought *x* to the party’ will only be useful in discourse futures where the main issue is resolved positively.

The idea is related to the account of van Rooÿ & Šafářová (2003) who argue that POSQs are felicitous in scenarios where the expected utility value of the positive answer exceeds that of the negative one. Speaking in terms of our two-tiered semantics, van Rooÿ & Šafářová (2003)’s account holds that POSQs are felicitous if the expected utility of the positive alternative in the main issue exceeds that of the negative one.<sup>12</sup>

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<sup>12</sup>van Rooÿ & Šafářová (2003) do not explicitly indicate how these configurations of relative utility

That is, the choice between different types of polar question is conditioned by the *relative* expected utility of the two responses in the main issue.

In our account, on the other hand, it is not relative expected utility which matters, but *absolute* expected utility. A speaker should choose to project a given issue if and only if the absolute expected utility of those alternatives to the future discourse exceeds some given threshold. Realizing this, the addressee will make the inference that the speaker expects the projected issue to be immediately useful, and therefore that the speaker believes/expects/hopes the positive answer will hold.

The above cases relied on the addressee assuming that the speaker had chosen to project a given issue rather than another in a relevance-driven way. A rational speaker, however, might also choose to utter a POSQ not because its projected issue is expected to be useful, but because it is the simpler in form than other varieties of polar question. That is, the POSQ might be the best choice because it best obeys the Gricean Maxim of Manner, not because of the relevance or utility of the alternatives it projects. This ulterior motivation for choosing the POSQ helps explain one of the puzzles discussed above: not all POSQs exhibit a positive bias (in contrast to the negative bias of LONEGQs). For example, we can see this in our test question examples from above, repeated in (276).

(276) **Scenario:** Questions on a fair exam.

- a. Is [b] a fricative?
- b. # Is [b] not a fricative?

Here, the speaker chooses the POSQ because it is most mannerly, not because she believes that the projected alternatives (i.e. the details of how/why/under what conditions ‘[b] is a fricative’ is true) will be useful. There is, of course, a potential risk in pursuing this strategy: the addressee might misunderstand the speaker’s intentions and compute the positive bias implicature. Given this, a rational speaker will use this strategy generally only in contexts, like the test scenario in (276), where the speaker’s bias is independently clear or else unimportant. We will return to this point in §4.4.4 when we extend the approach to ALTQs.

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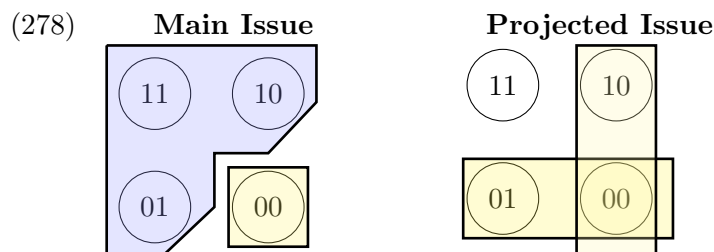
values map to different varieties of polar questions. Presumably, though, this would be accomplished by direct reference to the syntactic form of the question in some way.

### 4.4.3 LoNegQs project negative alternatives

In §4.4.1, we developed a two-tiered semantics for polar questions distinguishing two contributions: the *main issue* and the *projected issue*. For PosQs, this allowed us to separate the two types of alternatives present in the single-tiered semantics from Ch. 2, thus capturing the intuitively subordinate nature of the projected alternatives. In §4.4.2, we argued that the presence of this positive projected issue is what gives rise to the pragmatic inference that the speaker is (weakly) biased towards the positive response since they project the issue of how it holds to be potentially useful. In this section, we argue that the weak negative bias we found in LoNEGQs in §4.2.3 can be similarly accounted for under a semantics where LoNEGQs project a set of *negative* alternatives.

Specifically, we claim that a LoNEGQ such as (277) makes the same main issue as a corresponding PosQ, but instead of projecting positive alternatives of the form ‘John is baking  $x$ ’, where  $x$  is a variety of cake, it projects negated alternatives of the form ‘John isn’t baking  $x$ ’ as in (278).

(277) Is John not baking a cake?



While the projected alternatives in LoNEGQs are the mirror image of PosQs, there is nonetheless a significant asymmetry that emerges at this point. Each projected alternative set of worlds in the PosQ was a proper subset of a positive alternative of the main issue. This meant that the main issue of the PosQ is logically prior to its projected issue. That is, the issue of what kind of cake John is baking can only be addressed *after* it has been determined that he is baking some kind of cake or other. The projected issue in PosQs presents a set of further alternatives to address beyond the direct answer the questioner seeks.

In LONEGQs, the alternative set which is projected bears quite a different relationship to the main issue. Rather than projecting alternatives which address further details of one resolution of the main issue, the LONEGQ projects alternatives which are *partial answers* to the main issue. That is, the issue which the LONEGQ projects is itself logically prior to the main issue. In order to establish that John is not baking any cake, one must first address the truth/falsity of each of the individual negative alternatives ‘John is not baking  $x$ ’.

This asymmetry between positive and negative questions is not accidental; it is a reflection of a quite widely-held feeling discussed at length by Horn (1989) for assertions: that negative sentences are somehow weaker or less informative than their positive counterparts. Two-tiered semantics provides a way to capture this intuition, while not abandoning the position that the two are indeed equally informative in the truth-conditional sense. Negative sentences are as informative as their positive counterparts, but they push the discourse forward less than positive sentences do. A POSQ presents a main issue and makes salient discourse futures where particular details of a given answer are discussed. A LONEGQ presents the same main issue, but fails to move the conversation forward beyond that. We will see how this arises compositionally in §4.5, but for now we will explore the pragmatic consequences of the special relationship between projected and main issues in LONEGQs.

Given this semantics, under what conditions should a cooperative speaker use a LONEGQ instead of some other polar question? That is, under what conditions should a speaker expect a set of alternatives of the form ‘John isn’t baking  $x$ ’ to be immediately useful in the conversation. Just as we argued with positive alternatives in §4.4.2, a cooperative speaker should only project negative alternatives if she expects a negative answer more than a positive one. If this condition is not met, then either the POSQ or the ALTQ will be a better choice. This explains the observation in §4.2.3 that LONEGQs exhibit a consistent bias towards the negative response.

Believing or desiring the negative answer to hold is a necessary condition for a cooperative speaker to utter a LONEGQ, but not a sufficient one. The speaker should only utter a LONEGQ if she believes the negative answer to be more likely and expects that the conversation will delve into the details of the projected issue. That is, the

LONEGQ should be used only if the negative answer is expected but the speaker believes that establishing it will require further discussion or qualification, or otherwise will engage the *details* of the negative answer, i.e. the alternatives in the projected issue.<sup>13</sup> If, on the other hand, the speaker believes that the addressee should answer with an unequivocal negative response (i.e. one with no qualifications or discussion), she should still use the POSQ. The fact that the projected issue is logically prior to the main issue in LONEGQs means that they have no utility once the main issue is resolved.

Empirically, this prediction captures the observation we made in §4.2.3 that LONEGQs are not felicitous in just any context where the speaker is negatively biased. We see this in the example in (279), repeated from (249) (we also saw it in the first folio and vegan examples, (252) and (253) respectively). Here, the speaker has reason to expect the negative answer to be more likely to hold. However, the context makes clear that the addressee, John, would be expected to be able to easily resolve the main issue without any extended discussion. Given this, we correctly predict the infelicity of the example, despite the speaker’s negative bias. As discussed in §4.3, this more restrictive distribution of LONEGQs cannot be easily derived under an account where bias is related directly to the syntactic form of the question.

(279) I didn’t see Bill at the party. John, you greeted everyone who was at the party and you have a perfect memory.

Q: #? Was Bill not there?

Q’: Was Bill there?

Beyond this, the proposed semantics also gives us the beginnings of an explanation for why particle responses such as ‘yes’ and ‘no’ do not work straightforwardly in LONEGQs as they do in POSQs. Following Farkas & Bruce (2010), we can distinguish two types of polarity: *absolute* and *relative*. For Farkas & Bruce (2010), absolute polarity refers to the polarity of the semantic answer being encoded — either positive, [+], or negative, [-]. Relative polarity refers to the relationship between the absolute polarity

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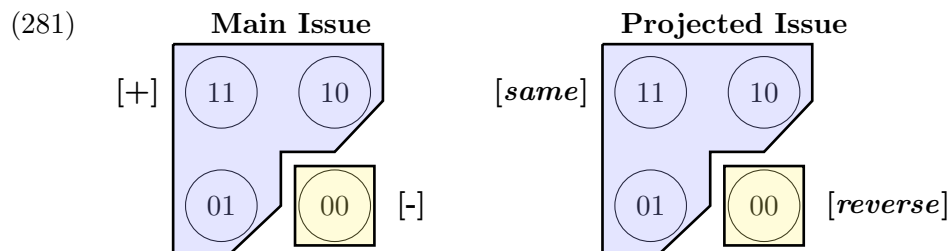
<sup>13</sup>This seems related to Walkow (2009)’s idea that HiNEGQs with NPIs (so-called ‘Inner’ HiNEGQs) are sensitive to *indeterminacy* of contextual evidence. I leave a detailed comparison to future work, as it requires a more detailed investigation of the contribution of NPIs in ‘inner’ HiNEGQs than the present work provides.

of the response and — in the case of polar questions — the polarity of the question radical. They make use of two features to describe relative polarity: *[same]* and *[reverse]*. Just as bias for Farkas & Bruce (2010) is determined based on the syntactic form of the question with no mediation by semantics, so too for relative polarity, at least for polar questions.

Under the current semantics, both relative and absolute polarity can be defined in purely semantic terms (i.e. with no direct reference to the syntactic forms of the questions involved). Absolute polarity describes which one of the two alternatives in the main issue is selected by the response along the same lines as Farkas & Bruce (2010). Relative polarity can be recast in terms of the alternatives in the projected issue, with *[same]* indicating that the projected set of alternatives contains at least one true alternative. On the other hand, *[reverse]* marks that there does not exist an alternative in the projected issue containing the actual world. We leave a precise account of ‘yes’ and ‘no’ to future work, but following Farkas & Bruce (2010), we take them to be sensitive in some way to both kinds of features, with ‘yes’ realizing *[same]* and *[+]* in some fashion, and ‘no’ realizing *[reverse]* and *[-]*.

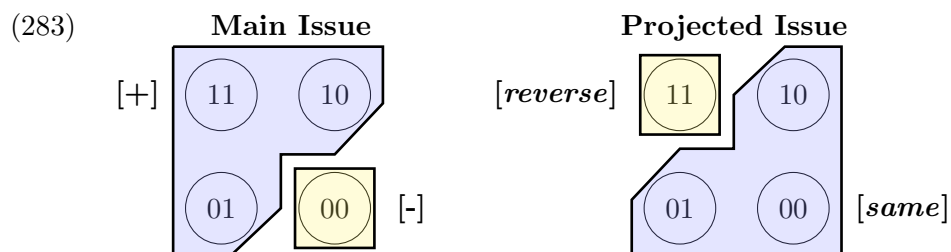
In PosQs, the two kinds of polarity coincide since the projected alternatives are all sub-alternatives of the positive alternative in the main issue. In such questions, then, bare particle responses ‘yes’ and ‘no’ are felicitous with ‘yes’ conveying both that the positive main alternative holds (i.e. *[+]* absolute polarity) and that there is some true alternative in the projected issue (i.e. *[same]* relative polarity). In contrast, ‘no’ indicates that the negative main alternative holds and that the projected set of alternatives contains no true alternatives, *[reverse, -]*. We illustrate this in (281) for (280).

(280) Is John baking a cake?



In LONEGQs, however, things go wrong. Absolute and relative polarity no longer coincide, as is clear from (278). Since the question introduces the same main issue as a corresponding POSQ, the features  $[+]$  and  $[-]$  would pick out the same sets of worlds as in the POSQ. The relative polarity features  $[reverse]$  and  $[same]$ , however, refer to the set of negated alternatives and should therefore pick out, respectively, the set of worlds where *all* of the positive alternatives hold and the set where at least one negated alternative holds. To see this more clearly, we illustrate in (283) the two kinds of polarity for the example in (277), repeated in (282). A full account of particle answers is beyond the scope of the present work, but the fact that relative and absolute polarity do not neatly coincide in exactly the cases where bare particle responses feel ‘contradictory’ (as discussed in §4.2.4), seems to be a welcome result.

(282) Is John not baking a cake?

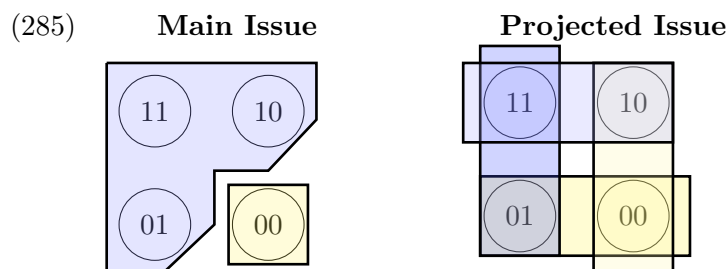


In this section, we have argued that the semantics of LONEGQs has the same main issue as a corresponding POSQ, but projects a set of negated alternatives. This explains straightforwardly why LONEGQs give rise to an inference of weak speaker bias towards the negative response, the mirror image of the positive bias in POSQs. At the same time, however, the relationship between the main and projected issues helps explain their more limited distribution, and infelicity in contexts where a simple yes/no answer is desired or expected. Through the use of two-tiered inquisitive semantics, the account captures the competing intuitions that such questions are the same as corresponding POSQs (since they have the same main issue) as well the clear differences between the two (since they project different issues).

#### 4.4.4 AltQs project both positive and negative alternatives

Thus far in this section, we have analyzed POSQs and LONEGQs in a two-tiered semantics where each present the same main issue, but project positive and negative alternatives, respectively. In this section, we show that the account can be extended to ALTQs, which we argue project both the positive alternatives of the corresponding POSQ and the negative alternatives of the corresponding LONEGQ as in (285).

(284) Is John baking a cake or not?



The ALTQ projects both positive and negated alternatives comprising all of those present in both the POSQ and the LONEGQ. Why should a cooperative speaker choose to project a set containing both positive and negative alternatives? One possible reason, parallel to what we have seen in POSQs and LONEGQs is because she expects the issue to be relevant to future discourse. Given that she could have opted instead to project only the positive or the negative ones by using a different polar question, it must be that her expectation is that both sets of alternatives are equally likely to be useful, i.e. that she is neutral as to which answer she expects and/or desires. We see this scenario illustrated in the corpus example in (286), repeated from above where the pollster aims to explicitly indicate the organization's neutrality.

(286) **Scenario:** Question from a Gallup poll.

Q: Would you personally like to belong to a labor union at work, or not?

We therefore capture the fact that ALTQs fit into this general pattern of 'bias to the overt' alongside POSQs and LONEGQs. As in the case of POSQs, however, there is another reason why a cooperative speaker might choose the ALTQ over other competing polar questions: it has the most alternative-rich meaning. While we have not



defined entailment for our two-tiered semantics, it is reasonable to think of an ALTQ as obeying the (inquisitive) Maxim of Quantity better than the corresponding POSQ or LONEGQ would. That is, every aspect of the denotation of the corresponding POSQ is present in the ALTQ, while the reverse does not hold.

The ALTQ, then, better ensures that the conversation will move forward since it projects an array of propositions which either partially or fully resolve the issue in the main issue. While the ALTQ provides this richer structure, it does so at the expense of brevity. As such, the speaker must have some particular reason to go out of the way to provide this richer semantics. This explains why ALTQs often seem to insist on a response from the addressee (even if that response is only a partial one) in a way that other POSQs and LONEGQs do not. We see this, for example, in the corpus example repeated in (287), where the context makes clear that the speaker has a strong positive bias, but he is clearly insisting on an immediate answer.

(287) **Scenario:** An impatient man seeks support.

Q: “**Will you support my marriage or not?**” he thundered.

a. “I need an answer.”

It also makes sense of Biezma (2009)’s ‘cornering’ dialogues where an ALTQ follows an un(der)answered POSQ, as in (288). Here, the speaker utters the ALTQ in (288c) but does not seem to convey that she is neutral with respect to which answer holds. Rather, the speaker has found that the less rich structure of the POSQ in (288a) failed to elicit an adequate response in (288b). The speaker, therefore, resorts to the ALTQ since this projects all possible alternatives, thereby cajoling the addressee into giving at least a partial answer to the question. It is as though the speaker is telling the addressee ‘Look, I have made salient all the positive and negative propositions bearing on the main issue!’ Since ALTQs project all possible alternatives — positive and negative — this explains Biezma (2009)’s intuition that their usage in such conversations leads to a conversational ‘cul de sac’; all the alternatives are out in the open. In this particular example, the feeling of insistence is enhanced by the fact that John presumably knows whether or not he is making pasta. The additional alternatives provided by the questioner are therefore not likely to be genuinely helpful to John.

- (288) a. You: Are you making pasta?  
 b. John: (Silence and dubitative faces)  
 c. You: Are you making pasta or not?

Summing up, we have seen that the two-tiered semantics we have proposed allows for a pragmatic account of a variety of inferences associated with POSQs, LONEGQs, and ALTQs. On the one hand, we capture the overarching tendency we have dubbed ‘bias to the overt’. POSQs can express positive bias because they project an issue consisting of positive alternatives, LONEGQs convey negative bias due to their negated alternatives, and ALTQs convey neutrality by projecting both kind of alternatives. On the other hand, the two-tiered semantics we propose also captures two key ways in which the pattern of inferences conveyed by these question types are more nuanced than this tagline suggests. First, LONEGQs not only convey negative bias, but also that the speaker expects the negative answer may require protracted discussion to establish. Second, ALTQs sometimes do not convey neutrality, but rather insistence or ‘cornering’. While the ‘bias to the overt’ pattern could be accounted for in a purely pragmatic fashion (see §4.3), accounting for these further inferences requires different semantics for each.

## 4.5 Composing the projected issue

Thus far in this chapter, we have argued that the properties of various types of polar questions can be accounted for with minimal pragmatic assumptions given a semantics which makes use of two components: the *main issue* and an additional set of alternatives, which we have termed the *projected issue*. We have argued that minimally different positive, low negative, and alternative questions with *or not* all contribute the same main issue: the classical Hamblin alternative set. In addition to this main issue, however, we have analyzed various polar questions as additionally projecting various additional alternatives corresponding to disjunctions, indefinites, and other existential quantifiers inside the question radical. For example, while POSQs project an issue consisting of positive alternatives, LONEGQs project an issue consisting of negated versions of these. This approach allows us to understand both why these polar questions

often express the speaker’s bias to the overt alternative, but also several cases where this tendency is broken.

The distribution of projected alternatives in previous sections has a clear connection to the syntactic form of the question (e.g. positive polar questions project positive alternatives). In this section, we make explicit these connections, developing a compositional two-tiered inquisitive semantics which produces the semantic representations relied upon above. While we have demonstrated the effects of this system for varieties of polar questions, none of the compositional details that follow are particular to questions. Rather, the use of the projected issue is motivated by more general intuitions about the semantics of issues and their interactions with other operators, principally higher inquisitive operators. The guiding intuition is that an inquisitive element in the scope of another still makes an inquisitive contribution, but one which is subordinate to that of the higher one.

#### 4.5.1 Two-tiered Inquisitive Semantics

At the outset of this chapter, one of the motivations we gave for moving to a two-tiered semantics was that the single-tiered semantics in Ch. 2 fails to capture the intuitive sense in which the issue introduced by an indefinite such as *a cake* in (289) is subordinate to the issue introduced by the question operator itself. That is, (289) is fundamentally about *whether* John baked some cake or other, and only secondarily about *which kind* of cake John baked. The single-tiered semantics, however, collapses both sets of alternatives into a single, flat representation: a *set* of alternatives.

(289) Is John baking a cake?

This problem, however, is in no way specific to inquisitive elements inside of polar questions. Consider for instance a *wh*-question with an indefinite as in (290). Here, there are two inquisitive elements — the interrogative *which boy* and the indefinite *a girl*. Again, the single-tiered semantics predicts that both sets of alternatives will be collapsed into a single set of alternatives of the form ‘*x* met with *y*’ where *y* is a girl and *x* is a boy. The fact that the question is asking for the name of a boy and merely pointing out the issue of the girl’s identity is obscured.

(290) Which boy talked to a girl?

A similar situation obtains outside of questions as well in examples like (291). In this case, there are three inquisitive elements in the sentence — the two indefinites, *a donor* and *a grantee*, and the disjunction headed by *or*. A single-tiered semantics collapses all three issues into a single set of alternatives of the form ‘Jenny is meeting with  $x$  in the coffee shop.’ where  $x$  is either a donor or a grantee. There is a clear intuition, however, that the issue introduced by the disjunction is more prominent, at least on the most salient reading.

(291) Jenny is meeting with  $a_2$  donor or<sub>1</sub>  $a_2$  grantee in the coffee shop.

Another case where we might want to distinguish two tiers of inquisitive content is in the case of disjunctions of three disjuncts as in (292). With a ‘flat’ prosody where the three disjuncts by prosodic boundaries of equal strength (indicated with the pipe symbol ‘|’ with ||), such a sentence produces a single set consisting of three alternatives, one per disjunct (see Wagner (2007) for detailed discussion of the prosody involved). On the other hand, we can also have a stronger boundary between two of the disjunctions, as in (293). For conjunctions, inserting this stronger boundary potentially has truth-conditional effects as discussed by Wagner (2007). For disjunctions, it’s not clear there is any truth-conditional effect, but the version in (293) clearly feels different from (292) in a way not unlike what we see in (294). While we will not pursue a compositional account of these here, the two-tiered system gives us a way to capture the intuition that the ‘bread or toast’ disjunction is subordinate in (293).

(292) Shelby ate cake | or bread | or toast.

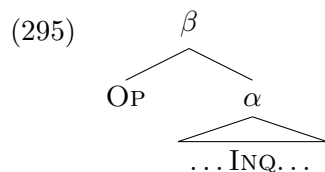
(293) Shelby ate cake || or bread | or toast.

(294) Shelby ate cake || or she ate bread | or toast.

Common to all of these cases is that they involve an inquisitive element (an indefinite in these examples) *nested* inside another inquisitive element. A single-tiered inquisitive semantics lumps together the issue introduced by the higher inquisitive element and those introduced by the lower element, leading to the problem we have

identified. It is equally counter-intuitive, however, to simply discard the issue introduced by the lower inquisitive element altogether. An indefinite inside the scope of a polar question operator as in (289), a wh-phrase as in (290), or a disjunction as in (291) is intuitively like any other, it simply happens not to introduce the most important issue in the sentence in which it occurs.

From a theoretical perspective, the problem we face is to characterize what kinds of interactions are possible between an operator, OP, and a non-singleton set of alternatives introduced by an inquisitive element, INQ, in its scope,  $\alpha$ , as schematized in (295). Under a single-tiered semantics, there are only two (reasonable) options available. First, OP could pass the alternatives up the tree, by quantifying over them existentially, leaving them available for future computation (as  $\exists$ ,  $\vee$ ,  $\forall$ , and  $\wedge$  all do in Ch. 2). Second, OP could collapse the alternatives by quantifying over them universally (as  $\neg$  and  $!$  do in Ch. 2).



The inferences conveyed by various polar question and the intuitive characterization of (289-291) shows that these two options alone are not enough. At least in cases where OP is  $\vee$  or  $\exists$ , the fine-grained alternatives in  $\alpha$  are not passed up to  $\beta$  unchanged, nor are they eliminated entirely. Rather, the fine-grained alternatives in  $\alpha$  are no longer part of the truth-conditional main issue, but are nonetheless present, albeit with a secondary status. The role of the *projected issue* is to record the fine-grained alternatives in the scope of an operator which the operator otherwise closes off.

To formalize this, then, we assign to a formula  $\varphi$  an ordered pair of sets of sets of possible worlds (i.e. an ordered pair of the set-based inquisitive denotations in Ch. 2) where the first member in the pair is the ‘main issue’,  $\mathcal{M}$ , and the second member is the ‘projected issue’,  $\mathcal{P}$ :  $\langle \mathcal{M}, \mathcal{P} \rangle$ .<sup>14</sup>

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<sup>14</sup>The choice to limit ourselves to two tiers is a somewhat arbitrary one. As far as I can tell, the account would be consistent with a logic, say, where sentences were interpreted as stacks of issues (i.e. where the projected issue were given a more fine-grained hierarchical structure). It is not clear, however, whether or not such a move is necessary, so we stick to the two-tiered system in what follows.

Since the projected issue arises in cases where particular operators embed other inquisitive operators, the projected issue will in some cases be empty. For example, the semantic interpretation of an atomic formula in this two-tiered inquisitive semantics will be as in **Sem1**. The first member of the ordered pair, the *main issue*, is just the Ch. 2 denotation for  $\varphi$ , consisting of the maximal<sup>15</sup> set of possible worlds where the sequence  $\llbracket x_1 \rrbracket, \dots, \llbracket x_n \rrbracket$  is in  $\llbracket \mathbf{R}^n \rrbracket$ . The second member of the ordered pair is the empty set, since an atomic formula does not contain any inquisitive sub-formulas.

$$(296) \quad \mathbf{Sem1}: [\mathbf{R}^n(\gamma_1, \dots, \gamma_n)]^{\mathcal{M},g,w} = \\ \langle \text{ALT}\{\alpha \subseteq W \mid \text{for all } w' \in \alpha : \langle \llbracket \gamma_1 \rrbracket^{\mathcal{M},g,w'}, \dots, \llbracket \gamma_n \rrbracket^{\mathcal{M},g,w'} \rangle \in \llbracket \mathbf{R}^n \rrbracket^{\mathcal{M},g,w'}\}, \{ \} \rangle$$

Since the definitions for the two-tiered semantics bear regular relationships to their single-tiered counterparts, we will define the former in terms of the latter. To distinguish between the two kinds of denotations, we will introduce the typographical convention of using double brackets (e.g.  $\llbracket \varphi \rrbracket$ ) to refer to single-tiered denotations and double angled brackets (e.g.  $\langle\langle \varphi \rangle\rangle$ ) to refer to the two-tiered ordered pair denotation of the current chapter. Finally, for readability's sake we write denotations not in ordered pair notation, but in fraction notation with the main issue as numerator and the projected issue as denominator (i.e.  $\frac{\mathcal{M}}{\mathcal{P}}$ ). For example, we can rewrite **Sem1** as in (297).

$$(297) \quad \mathbf{Sem1}: \langle\langle \varphi \rangle\rangle^{\mathcal{M},g,w} = \frac{\{\alpha \subseteq W \mid \alpha \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w}\}}{\emptyset}$$

The definition states that the two-tiered interpretation of an atomic formula,  $\varphi$ , consists of an ordered pair of two components. Above the line, the first member of the pair is the main issue which in this case is the same as its Ch. 2 denotation (we include non-inquisitive closure for symmetry with other definitions, but it is vacuous here since atomic formulas necessarily denote singleton sets of alternatives). Below the line is the projected issue, which is the empty set in this case.

The cases that interest us presently are those where an inquisitive operator takes as its argument a non-singleton set of alternatives. We argued that disjunction

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<sup>15</sup>This is the contribution of Groenendijk & Roelofsen (2009)'s alternative-closure operator, ALT.

in such cases not only introduces a new issue into the composition, it also causes issues in its arguments to be put forth as projected issues, rather than part of the main issue. This intuition is captured by the two-tiered definition for disjunction in (298).

$$(298) \quad \textbf{Sem5: } \llbracket \varphi \vee \psi \rrbracket^{\mathcal{M},g,w} = \frac{\{\alpha \subseteq W \mid \alpha \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} \text{ or } \alpha \in \llbracket !\psi \rrbracket^{\mathcal{M},g,w}\}}{\{\alpha \subseteq W \mid \text{there is some } \gamma \text{ in } \llbracket \varphi \rrbracket \text{ or } \llbracket \psi \rrbracket \text{ such that } \gamma \notin \llbracket !\varphi \rrbracket \text{ and } \gamma \notin \llbracket !\psi \rrbracket \text{ and } \gamma = \alpha\}}$$

The main issue consists of two alternatives: the maximal set of worlds where  $\varphi$  holds in some way or other and the maximal set of worlds where  $\psi$  holds in some way or other. The projected issue consists of all of the individual alternatives of the two disjuncts which are not present in the main issue. If both disjuncts are themselves classical, this will again be the empty set. On the other hand, if either or both disjuncts themselves are inquisitive, these alternatives will be projected. One important detail to note in the definition is that it collects all of the alternatives which are in either the main issue or the projected issue of the individual disjuncts (indicated in the definition by the angled brackets).

We see this semantics illustrated in (299b) for the nested disjunction in (299a).<sup>16</sup> The main issue consist of two alternatives, one for the alternative on the left of the largest intonational boundary ('cake') and one for the right side ('bread or toast'). The projected issue contains the two alternatives contributed by the disjunction inside the right disjunct of the highest disjunction.

$$(299) \quad \begin{array}{ll} \text{a.} & \text{Shelby ate cake || or bread | or toast.} \\ \text{b.} & \frac{\{ \{w' : \text{S. ate cake in } w'\}, \{w' : \dots \text{bread/toast in } w'\} \}}{\{ \{w' : \dots \text{bread in } w'\}, \{w' : \dots \text{toast in } w'\} \}} \end{array}$$

<sup>16</sup>The variant of (299a) with flat prosody would be assigned the semantics in (i), which does not follow under the present definition for disjunction. One appealing solution would be to claim that this is due to a syntactic difference, i.e. that such cases involve ternary disjunction rather than binary branching. Given these complications, I leave a compositional analysis of such cases to future work.

$$(i) \quad \begin{array}{ll} \text{a.} & \text{Shelby ate cake | or bread | or toast.} \\ \text{b.} & \frac{\{ \{w' : \text{S. ate cake in } w'\}, \{w' : \dots \text{bread in } w'\}, \{w' : \dots \text{toast in } w'\} \}}{\emptyset} \end{array}$$

Another important property that follows from the way we have defined our two-tiered semantics is that the projected issue is necessarily either inquisitive or empty. That is, it is not possible under this definition for disjunction to project a single alternative no matter what kind of formulas the two disjuncts are; the projected issue must truly be an *issue*. If a disjunct denotes a singleton set, it makes no contribution to the projected issue. This makes sense intuitively since no fine-grained inquisitive information is lost in the course of composition in the case of a singleton set. In contrast, when there are multiple alternatives which would be collapsed by a higher operator, this inquisitive content would otherwise be lost.

One of the useful properties of negation as defined in Chapter 2 is the fact that it closes off the alternatives in the formula to which it applies, leaving a singleton set as its denotation. One of things that we have seen in this chapter thus far is that negation is perhaps more complicated than the single-tiered logic lets on. We will discuss the semantics of low negation in detail in §4.5.3. Since the  $Q_{op}$  includes negation in one of its disjuncts, we will define this negation in (300).<sup>17</sup>

$$(300) \quad \text{Sem2a (high including } Q_{op}\text{): } \frac{\langle\langle \neg_{hi}\varphi \rangle\rangle^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{for all } \beta \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\}}{\emptyset}$$

The main issue of a formula  $\neg_{hi}\varphi$  consists of the maximal alternative which has no intersection with *any* of the alternatives in the single-tiered denotation of  $\varphi$ . The non-inquisitive closure operator in the definition of the main issue is vacuous (as in the case of atomic formulas) and could be safely left out, since  $\neg_{hi}$  already universally quantifies over alternatives anyway. In this semantics for negation, there is no projected issue, a fact which we will return to shortly.

#### 4.5.2 Composing two-tiered denotations for PosQs

At this point, we have all of the pieces we need in order to interpret a positive polar question such as (301). We include the disjunction ‘tacos or tamales’ in order to demonstrate the effect of inquisitive content inside the question radical. Crucially,

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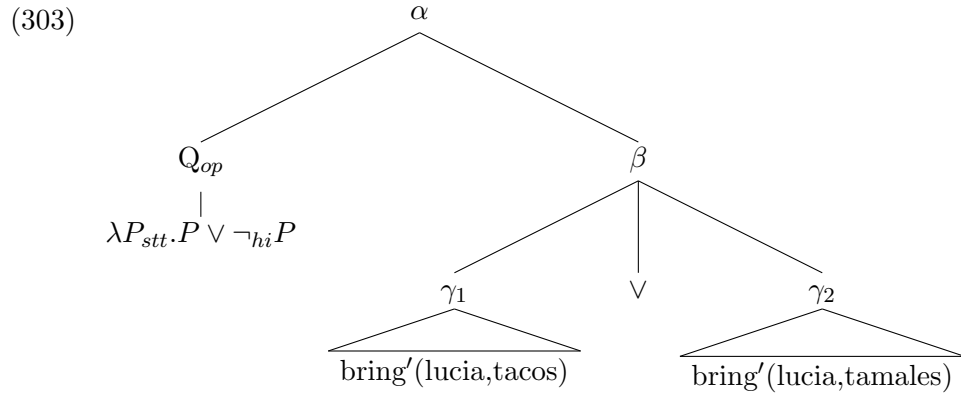
<sup>17</sup>In Ch. 5, I will argue that while this definition is not right for low negation, it is exactly right for *high* negation. That is, the negation inside the  $Q_{op}$  is an instance of high negation, which is of course consistent with its position in the clause.



however, it the polar question reading which we are concerned with (i.e. the reading that can be given a *yes/no* response). We assign to (301) the LF in (303), yielding the formula in (302). According to the interpretive rules we have given for two-tiered semantics, then, this LF is interpreted as in (304).<sup>18</sup>

(301) Did Lucia bring tacos or tamales?

(302)  $(\text{bring}'(\text{lucia}, \text{tacos}) \vee \text{bring}'(\text{lucia}, \text{tamales})) \vee$   
 $\neg_{hi}(\text{bring}'(\text{lucia}, \text{tacos}) \vee \text{bring}'(\text{lucia}, \text{tamales}))$



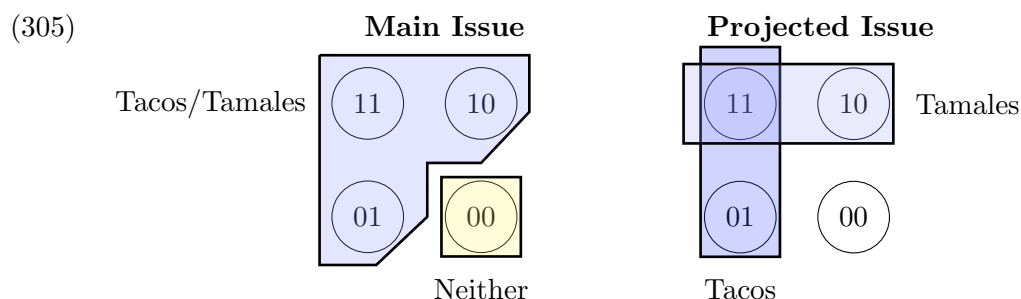
(304) a.  $\langle\langle\gamma_1\rangle\rangle = \frac{\{ \{w' : \text{Lucia brought tacos in } w'\} \}}{\emptyset}$   
b.  $\langle\langle\gamma_2\rangle\rangle = \frac{\{ \{w' : \text{Lucia brought tamales in } w'\} \}}{\emptyset}$   
c.  $\langle\langle\beta\rangle\rangle = \frac{\{ \{w' : \text{Lucia brought tacos in } w'\}, \{w' : \text{Lucia brought tamales in } w'\} \}}{\emptyset}$   
d.  $\langle\langle\alpha\rangle\rangle =$   
 $\frac{\{ \{w' : \text{Lucia brought tacos and/or tamales in } w'\}, \{w' : \text{Lucia brought neither in } w'\} \}}{\{ \{w' : \text{Lucia brought tacos in } w'\}, \{w' : \text{Lucia brought tamales in } w'\} \}}$

Since  $\gamma_1$  and  $\gamma_2$  are atomic formulas,  $\langle\langle\gamma_1\rangle\rangle$  and  $\langle\langle\gamma_2\rangle\rangle$  do not project any alternatives, each contributing only a single-alternative main issue. Moving up the tree, we see that, per **Sem5**,  $\langle\langle\beta\rangle\rangle$  will also not project any alternatives, since both of the two disjuncts themselves are singleton set-denoting atomic formulas. The first member of  $\langle\langle\beta\rangle\rangle$ , its main issue, consists of two alternatives, one per disjunct. Up to this point, the two-tiered semantics has had no effect since  $\beta$  contains only one operator which

<sup>18</sup>For clarity's sake, we ignore here the existentially quantified neo-Davidsonian event argument.

potentially impacts the projected issue. Since  $Q_{op}$  introduces another such operator, however,  $\langle\langle\alpha\rangle\rangle$  will make crucial use of the projected issue, storing all of the alternatives in  $\langle\langle\beta\rangle\rangle$  which will not be part of the main issue of  $\langle\langle\alpha\rangle\rangle$ . Since the (high) negation in the  $Q_{op}$  eliminates alternatives in the formula to which it applies, the projected issue of  $\langle\langle\alpha\rangle\rangle$  will contain only the two positive alternatives. The issue suppressing character of the negation inside the  $Q_{op}$  is in this sense the source of the overt pattern.

The semantics we have developed in this section compositionally derives the representations we proposed for POSQs in §4.4.1. Consider the diagram for the interpretation of the positive polar question like (301), in (305). The main issue consists of two alternatives contributed by the highest disjunction (the  $Q_{op}$ ), corresponding to the answers ‘yes’ and ‘no’. The projected issue consists of the two positive sub-alternatives contributed by the disjunction inside  $\beta$ .



The two-tiered semantics we ascribed to POSQs, then, arises naturally, with no need to posit any sort of question-specific covert morpheme or compositional method. Rather, the behavior of nested inquisitive operators more generally warrants a two-tiered semantics. Since polar questions are particular kinds of disjunctions, they make use of this more general compositional mechanism. While there is nothing question-specific *per se* about this, the presence of the projected issue does seem to be most clearly felt in polar questions. This occurs, in the present theory, because polar questions involve disjunctions of clauses which are identical other than their polarity. As such, there are many different ways to construct questions which propose identical main issues, manipulating only which issue is projected. The PosQ includes one such issue projection, and we now turn to consider the composition of other kinds of polar questions we have discussed above, which project different issues.

### 4.5.3 Composing Low Negation Polar Questions

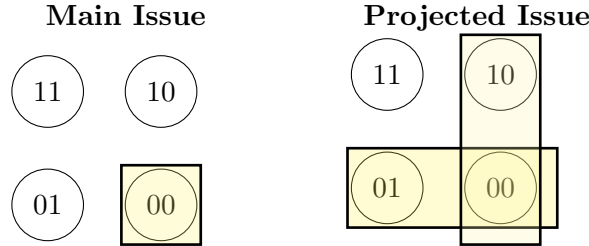
The definition we have provided for negation inside the  $Q_{op}$  eliminates the fine-grained inquisitive structure of the formula to which it applies. This is, in a sense, the source of the ‘bias to the overt’ pattern in PosQs. Since the unpronounced main alternative is composed with this negation, it cannot contribute any projected issues. For LoNEGQs, however, negated alternatives are exactly what we are after. To achieve this, then, low or ordinary negation must interact with issues differently than the (high) negation of the  $Q_{op}$ . However, it must also have the same effect on the main issue, since LoNEGQs present the same main issue as corresponding PosQs, as we have seen above. To achieve this, I propose the semantics for low or ordinary negation in (306).

$$(306) \quad \textbf{Sem2b (low): } \llbracket \neg_{lo} \varphi \rrbracket^{\mathcal{M},g,w} = \frac{\text{ALT}\{\alpha \subseteq W \mid \text{for all } \beta \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\}}{\text{ALT}\{\alpha \subseteq W \mid \text{there is some } \gamma \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \gamma = \emptyset\}}$$

Under this semantics, an assertion with ordinary negation like (307) projects alternatives as in (308). As in Single-tiered Inquisitive Semantics, the main issue of such an assertion consists of a single alternative and therefore does not license sluicing (unlike the wide scope reading of the indefinite). Support for this semantics for low negation will be discussed in §5.3.2 when we compare it to high or preposed negation.

(307) Marcela didn’t bake a cake.

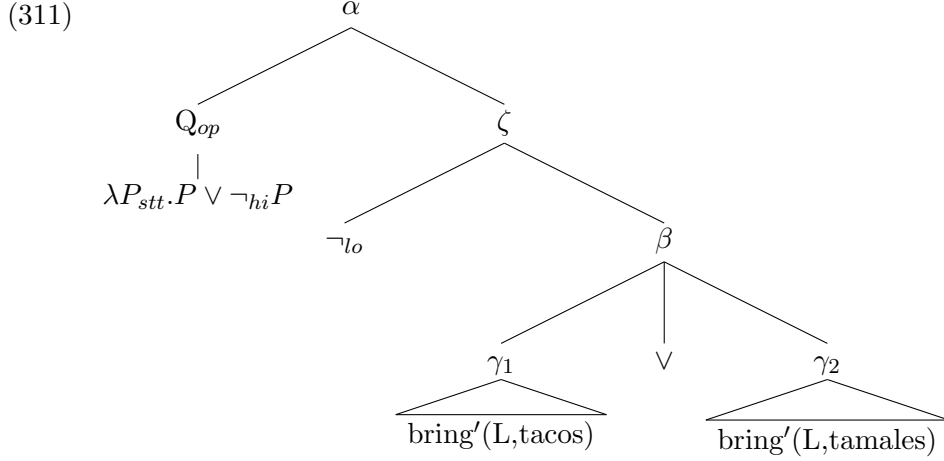
(308) **Indefinite takes narrow scope, low negation** ( $\neg_{lo}$ )



Given this definition for low negation in general, we compositionally derive the intended two-tiered interpretation for LoNEGQs. For example, the LoNEGQ in (309), is assigned the formula in (310) derived from the LF in (311).

(309) Did Lucia not bring tacos or tamales?

(310)  $\neg_{lo}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales})) \vee$   
 $\neg_{hi}\neg_{lo}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales}))$

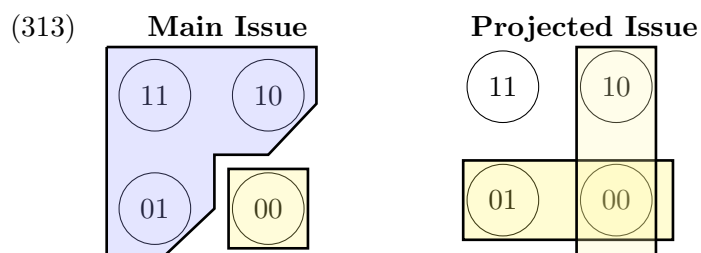


(312) a.  $\langle\langle\gamma_1\rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos in } w'\} \}}{\emptyset}$   
b.  $\langle\langle\gamma_2\rangle\rangle = \frac{\{ \{w' : L \text{ brought tamales in } w'\} \}}{\emptyset}$   
c.  $\langle\langle\beta\rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos in } w'\}, \{w' : L \text{ brought tamales in } w'\} \}}{\emptyset}$   
d.  $\langle\langle\zeta\rangle\rangle = \frac{\{ \{w' : L \text{ brought neither tacos nor tamales in } w'\} \}}{\{ \{w' : L \text{ didn't bring tacos in } w'\}, \{w' : L \text{ didn't bring tamales in } w'\} \}}$   
e.  $\langle\langle\alpha\rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos and/or tamales in } w'\}, \{w' : L \text{ brought neither in } w'\} \}}{\{ \{w' : L \text{ didn't bring tacos in } w'\}, \{w' : L \text{ didn't bring tamales in } w'\} \}}$

$\langle\langle\beta\rangle\rangle$  is computed as above, consisting of a main issue with two alternatives — one per disjunct — and with no alternatives projected. Low negation passes up the tree a main issue consisting of a single alternative where none of the alternatives in the main issue of  $\langle\langle\beta\rangle\rangle$  holds. However, low negation also projects an alternative set containing the negation of each individual alternative, as in (312d). In a way, then, the projected issue in low negation mimics Kratzer & Shimoyama (2002)-style pointwise functional application.<sup>19</sup>

<sup>19</sup>Note, however, that the actual mode of composition is ordinary functional application. Since inquisitive alternatives are part of the metalanguage interpretation, rather than the metalanguage translation,

Finally, the  $Q_{op}$  composes with  $\zeta$ , creating the same main issue as in other corresponding types of polar questions. The disjunction in the semantics of the  $Q_{op}$  ensures that the projected issue will consist of all of the individual alternatives in  $\langle\langle\zeta\rangle\rangle$  which are not passed on to the main issue, namely the ones in the projected issue of  $\langle\langle\zeta\rangle\rangle$ . Since the positive main alternative (in the absolute sense) is introduced via the negation of the  $Q_{op}$ , it will not contribute any alternatives. The result is a main issue consisting of the same two alternatives as corresponding POSQs, but projecting a set of negative alternatives, as spelled out in (312e) and pictured in (313).



#### 4.5.4 Alternative Questions with ‘or not’

All three of the types of question we have considered thus far have been composed from the disjunctive  $Q_{op}$  —  $\lambda P_{stt}.P \vee \neg_{hi}P$  — and a formula whose denotation possibly includes a further set of alternatives. In each case, therefore, one of the two alternatives in the main issue is introduced via the negated disjunct of the  $Q_{op}$  and therefore contributes no inquisitive structure of its own. As such, true polar questions can project only a single type of alternatives: positive ones in POSQs, negated ones in LoNEGQs.

Alternative questions, on the hand, have a quite different composition, with the two main alternatives arising directly from the *overt disjunction*. As in the case of Yucatec Maya focused disjunctions discussed in Ch. 2, then, we need something to render this disjunction uninformativ. Following Pruitt (2007), Rawlins & Biezma (2010) and other recent work, I take this something to be an existential presupposition over this set of alternatives, contributed by the characteristic list intonation alternative questions have (see Pruitt (2007) for details). For convenience, I represent this contribution in

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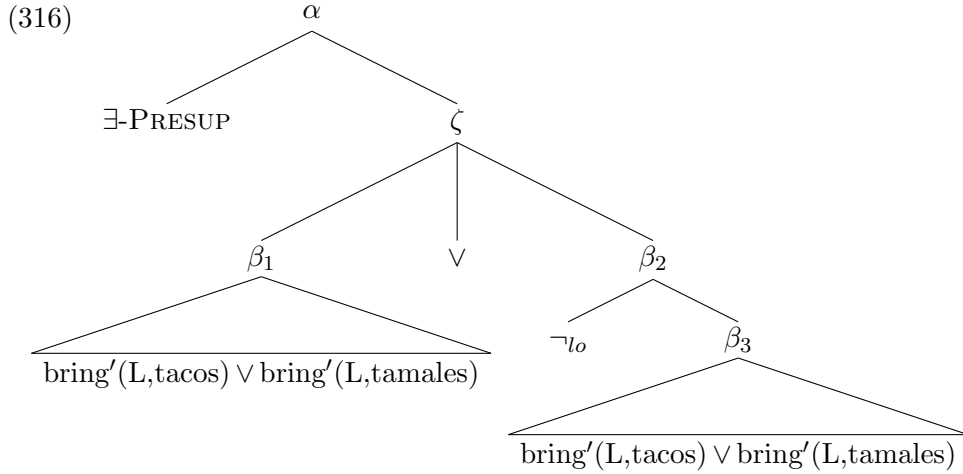
no special compositional mode is needed.

the logical form as  $\exists$ -PRESUP.

Because the main issue in alternative questions consists of alternatives which are overt (though elliptical) in the logical form, neither main alternative is subject to  $\neg_{hi}$ . Therefore, an alternative question with *or not* will project both the positive alternatives from the full disjunct and the negative alternatives from the elliptical *or not* disjunct. Consider the ALTQ in (314), which we assign the formula in (315) derived from the LF in (316).

(314) Did Lucia bring tacos or tamales or not?

(315)  $(\text{bring}'(\text{L}, \text{tacos}) \vee \text{bring}'(\text{L}, \text{tamales})) \vee$   
 $\neg_{lo}(\text{bring}'(\text{L}, \text{tacos}) \vee \text{bring}'(\text{L}, \text{tamales}))$



(317) a.  $\langle\langle\beta_1\rangle\rangle = \langle\langle\beta_3\rangle\rangle =$

$$\frac{\{ \{w' : \text{L brought tacos in } w'\}, \{w' : \text{L brought tamales in } w'\} \}}{\emptyset}$$

b.  $\langle\langle\beta_2\rangle\rangle = \frac{\{ \{w' : \text{L brought neither tamales nor tacos in } w'\} \}}{\{ \{w' : \text{L didn't bring tamales in } w'\}, \{w' : \text{L didn't bring tacos in } w'\} \}}$

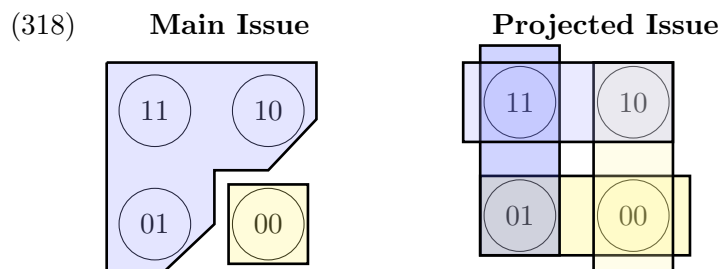
c.  $\langle\langle\zeta\rangle\rangle =$

$$\frac{\{ \{w' : \text{L brought tacos and/or tamales in } w'\}, \{w' : \text{L brought neither in } w'\} \}}{\{ \{w' : \text{L brought tacos in } w'\}, \{ \dots \text{tamales in } w'\}, \{w' : \text{L didn't bring tacos in } w'\}, \{ \dots \text{tamales in } w'\} \}}$$

Here, the left disjunct's interpretation,  $\langle\langle\beta_1\rangle\rangle$ , consists of a main issue with two alternatives — 'Lucia brought tacos' and 'Lucia brought tamales' — and no projected issue. The negated right disjunct,  $\beta_2$ , consists of ordinary/low negation (translated

with  $\neg_{lo}$ ) and the material of the left disjunct, which we take to be subject to ellipsis of some sort, but nonetheless present in the LF. The interpretation of this disjunct, then, consists of a single alternative main issue and a projected issue consisting of two negated alternatives, as in (317b).

Syntactically,  $\zeta$ , consists of overt disjunction of these two alternative-rich disjuncts. The main issue of  $\langle\langle\zeta\rangle\rangle$  has two alternatives: the non-inquisitive closure of the left disjunct and of the (already single-alternative right disjunct). The projected issue of  $\langle\langle\zeta\rangle\rangle$  will gather all of the alternatives from both disjuncts which are not reflected in its main issue, namely the two positive alternatives in the main issue of  $\langle\langle\beta_1\rangle\rangle$  and the two negative alternatives in the projected issue of  $\langle\langle\beta_2\rangle\rangle$ . The resulting semantics is spelled out in (317c) and realized graphically in (318).



## 4.6 Conclusion

At this chapter's outset, we described a tension between two competing sets of observations regarding the varieties of polar questions in (319). On the one hand, there is a clear sense that all three of the questions fundamentally are requests for the same information (NB: on the polar question readings for (319a) and (319c)). That is, each divides the logical space into two main alternatives, as Hamblin (1973), Groenendijk & Stokhof (1984) and other classical question semantics hold. At the same time, the various questions in (319) cannot always be used interchangeably, and each conveys distinct inferences about the speaker's expectations for the future direction of the discourse in which they are situated.

- |       |   |      |
|-------|---|------|
| (319) | a. Did Lucia bring tacos or tamales?        | PosQ |
|       | b. Did Lucia bring tacos or tamales or not? | ALTQ |

Building on previous literature, we have seen that these varieties of polar questions each conveys a bias towards whichever alternative or alternatives are overt in the question's form. If the pattern were truly this simple, it would be readily amenable to a purely pragmatic account along the lines of those proposed by van Rooÿ & Šafářová (2003), Farkas & Bruce (2010), and others. What we have found, however, is that the pattern is more complicated in two ways which motivate a different semantics for these three question types.<sup>20</sup> First, alternative questions can be used not only to express the speaker's neutrality, but also to insist on an immediate response, sometimes following an un(der)answered POSQ. Second, the felicitous use of LoNEGQs not only requires the speaker to be biased towards the negative answer, it also requires a discourse where more protracted discussion of the negative answer is anticipated or desired. Purely pragmatic accounts straightforwardly predict perfect symmetry between the three types of question, and it is not clear how they could be amended to account for places where this is not so.

In this chapter, we have argued for an account which addresses each of these concerns through a semantics with two components: the *main* 'yes'/'no' issue and an additional set of alternatives made salient in composition, which we have dubbed the *projected issue*. The 'bias to the overt' pattern arises because, in addition to the main issue, POSQs project a set of positive alternatives, LoNEGQs project negated alternatives, and ALTQs project both. The use of ALTQs to insist on an immediate response (including Biezma (2009)'s 'cornering' cases) follows from the fact that ALTQs make salient the richest set of responses possible. The more restricted distribution of LoNEGQs follows from the fact that they project a set of alternative propositions which are logically weaker than the answer the speaker seeks to establish and therefore not useful if the addressee is expected to provide a simple negative response.

These results have at the core a semantics where POSQs, ALTQs, and LoNEGQs manipulate the projected issue in various ways. In Chapter 5, we will argue that perhaps

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<sup>20</sup>We have also noted a third deviation from the 'bias to the overt' pattern: the default status of POSQs. This observation, which we have explained by appeal to the Maxim of Manner, can be readily explained without appeal to different semantics.



the most perplexing variety of polar question — those with preposed or high negation — can be analyzed under a semantics where high negation *eliminates* this fine-grained inquisitive content altogether.

## Chapter 5

# Verum Focus and Preposed Negation

In Chapter 4, we proposed a semantic account of positive polar questions, low negation polar questions, and alternative polar questions in English. Empirically, the analysis aimed to capture both the overarching tendency of bias towards the answer which is overt in the question's form, and the systematic exceptions to this general pattern. Polar questions with preposed negation (HiNEGQs), however, break even this general tendency, and do so in dramatic fashion. Despite the presence of negation, a HiNEGQ like (320) not only fails to convey a negative bias, it conveys inferences of an entirely different sort than the other polar questions discussed so far. Romero & Han (2004) intuitively characterize a question like (320) as generally serving to 'double-check' the truth of the proposition in question (in this case, 'John is baking a cake').

(320) Isn't John baking a cake?

The stark difference we see between HiNEGQs and other polar questions does not seem to be a peculiarity of English, as Romero & Han (2004) report similar effects for parallel examples in Bulgarian, German, Korean, Modern Greek, and Spanish. While Yucatec Maya seems not to exhibit low negation polar questions<sup>1</sup>, negative po-

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<sup>1</sup>The only potential examples of LoNEGQs are polar questions where some element occurs in the focus/cleft construction, preceding negation as in (1). The negation in such examples, however, occurs inside the relative clause-like coda of the cleft, not the main clause. Such questions, therefore, are best analyzed as *positive* polar questions which happen to contain negation within an embedded constituent. Note that the translations I have given in (1) using English cleft questions are clearly positive questions, as seen by the fact that they have both high and low negative counterparts (i.e. '*Isn't it Lucia that*

lar questions like (321) apparently exhibit the same double-checking effect as English HiNEGQs.

- (321) ma'-wáaj t-a beetik ch'uujuk waaj?  
 NEG-wáa PFV-A2 make sweet bread  
 'Didn't you make a cake?'

The presence of negation should therefore be a crucial component of any analysis of HiNEGQs, not a mere coincidence. Previous accounts generally rely on covert operators of some sort (e.g. a VERUM operator), with negation itself being ultimately vacuous (due to the presence of another negation contributed by the polar question itself). Given this, we should expect to find languages which form questions which have all the properties of HiNEGQs, but which consist of an overt operator with no negation. Even if such a language does exist (I am not aware of such a language), the fact that so many languages form such questions with negation nonetheless warrants an explanation.

The challenge, then, is to understand two questions: (i) What precisely does this 'double-checking effect' consist of? and (ii) How is it related to the compositional semantics of HiNEGQs, in particular, to the presence of negation? In this chapter, I address both questions, arguing that inferences associated with HiNEGQs are partly due to compositional semantics and partly due to pragmatics. Semantically, the key insight is that whereas the polar questions in Ch. 4 each project a certain issue for possible future discussion, HiNEGQs explicitly avoid doing so, the result being added emphasis on the main 'yes/no' issue. The account I propose derives this semantics compositionally based upon independently motivated interactions between inquisitive alternatives and (preposed) negation. Other properties of HiNEGQs arise pragmatically, based on Gricean competition with other varieties of polar question, usually the corresponding PosQ.

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*doesn't drink it?' and 'Is it not Lucia that doesn't drink it?')*

- (i) Lucia-wáaj ma' u yuk'ik  
 Lucia-wáa NEG A3 drink-STATUS  
 'Is it Lucia that doesn't drink it?'

§5.1 presents in detail the various inferences associated with HiNEGQs discussed by previous literature. §5.2 presents a novel semantics for HiNEGQs and *verum focus* more generally. §5.3 shows how this semantics can be derived compositionally from (double) negation first in Single-tiered Inquisitive Semantics and then in the two-tiered version developed in Chapter 4. Given this semantics, §5.4 shows how the other properties of HiNEGQs can be derived from pragmatic competition over this semantics. §5.5 compares the account to the only previous comprehensive account of HiNEGQs (Romero & Han (2004)). Finally, §5.6 concludes.

## 5.1 Properties of high negation polar questions

Previous literature has identified four interrelated meaning components for HiNEGQs, which we address one by one: exceptional emphasis on the *truth value* of the proposition in question, §5.1.1; the inference that the speaker previously expected or believed the positive answer to hold, §5.1.2; the felicity of HiNEGQs in two different sorts of contexts (so-called ‘inner’ and ‘outer’ HiNEGQs) first identified by Ladd (1981), §5.1.3; and, finally, in §5.1.4, the observation that HiNEGQs occur in two kinds of contexts: (i) ones where some piece of ‘contextual evidence’ conflicts with the speaker’s prior belief and (ii) ones where the speaker *suggests* that the addressee provide the positive answer.

### 5.1.1 Verum focus

Romero & Han (2004) argue that the central property distinguishing HiNEGQs from other varieties of polar questions is the presence of so-called ‘Verum Focus’. Verum focus is the name given by Höhle (1992) for the phenomenon exhibited by (German versions of) sentences like Romero & Han (2004)’s (322b). Höhle (1992)’s intuition (as reported by Romero & Han (2004) and Gutzmann & Castroviejo Miró (2009)) is that such sentences involve an additional emphasis of some sort on the *truth value* of the proposition in question. According to Höhle (1992)’s intuition, then, an assertion with verum focus like (322b) can be closely paraphrased by the phrases ‘*It is true that ...*’ or ‘*It is the case that ...*’ as in (323-324).

- (322) a. A: Peter claims Kimiko went to the Himalayas.  
       b. S: She  $\text{DID}_F$  go to the Himalayas.
- (323) It is true that Kimiko went to the Himalayas.
- (324) It is the case that Kimiko went to the Himalayas.

Before proceeding, there is one terminological matter to be cleared up. The term ‘verum focus’ was introduced to describe sentences like (322b) which are distinguished by two characteristics: one syntactic, one semantic. Syntactically, such sentences in English are signaled by the presence of intonational focus on the polarity of the sentence (here instantiated by *did*). Semantically, such sentences are felt to convey an added emphasis on the truth value of the proposition in question. Following Romero & Han (2004)’s usage, it is this latter feature which we refer to with the term ‘verum focus’. While it is indeed the presence of intonational focus which contributes this meaning in (322b), this is not a necessary state of affairs. Indeed, it is not clear how any mainstream theory of focus semantics can be compositionally used to arrive at this meaning.

Romero & Han (2004) argue that HiNEGQs also contain verum focus in their semantics. For example, a HiNEGQ like (325) has very close paraphrases as in (326-327). Romero & Han (2004) also offer the paraphrase in (328), though several caveats are in order regarding such examples. First, Romero & Han (2004) analyze English *really* as being ambiguous between a verum focus reading and two other unrelated meanings (the *intensifier* reading and what they term the ‘in-actuality’ reading). Second, they claim that the relevant reading only arises when *really* is intonationally focused. Third, even when the intended reading is obtained, such questions are the exact opposite in another respect: the polarity of the prior expectation/belief they assume (see §5.1.2 for discussion). Given these confounds, we set aside the *really* paraphrase in what follows, since those in (326-327) are unambiguous and closer to HiNEGQs both intuitively and according to Romero & Han (2004)’s analysis.

- (325) Isn’t John baking a cake?
- (326) Is it the case that John is baking a cake?
- (327) Is it true that John is baking a cake?

(328) Is John really baking a cake?

As in English, Yucatec Maya speakers report that negative polar questions can be given close, though not perfect, paraphrases using expressions like *jaj* ‘true’, *jach* ‘very, really’, and *tu jajil* ‘in truth’ in (329-331).<sup>2</sup>

(329) **jach**-wáa leti-o’ob najalt-e téetil-o’  
really-wáa he/she-PL win-DEF election-DISTAL  
‘Did they really win the elections?’

(330) **jaj**-wáa leti-o’ob najalt-e téetil-o’  
true-wáa he/she-PL win-DEF election-DISTAL  
‘Is it true that they won the elections?’

(331) **jach**-wáa t-u jaj-il najalt-e téetil-o’  
really-wáa to-A3 true-REL he/she-PL win-DEF election-DISTAL  
‘Is it really true that they won the elections?’

While the intuition that HINEGQs in both English and Yucatec Maya involve added emphasis on truth value is (I think) quite clear, it is not clear what exactly this ‘emphasis’ consists of. We feel a clear difference between ‘It’s true that *p*’ and *p* (after all, why else would we ever use the former?) and yet the two have the same truth-conditions and would therefore seem to have the same semantics. This puzzle is addressed in §5.2 where I argue that verum focus (at least of the sort found in HINEGQs) does indeed preserve truth conditions, but obviates the issue-raising potential of inquisitive elements to which it applies. By suppressing the inquisitive contribution of the sentence, verum focus produces unusual emphasis on the informative, truth conditional meaning component.

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<sup>2</sup>One important note about these examples is that despite the structural differences in their English glosses, the YM questions are all likely multiclausal with the bolded expression acting as main predicate and taking the clause meaning ‘they win the elections’ as its argument. That is, they all seem to have complex structures akin to (326-327) rather than the monoclausal (328). If this is right, we might also take negative polar questions like (321) to be multiclausal.

### 5.1.2 Prior belief

The second property of HiNEGQs, first described by Ladd (1981), is the inference that the speaker had previously believed or expected the positive response to hold. Consider the two HiNEGQs in (332-333). In each case, the speaker's use of the HiNEGQ in the (b) examples necessarily gives rise to the inference that the speaker had previously believed or expected that the positive answer had held or would hold. In these examples, the inference, paraphrased in (c) is that the speaker expected or believed that Jane was coming.

- (332) a. A: Ok, now that Stephan has come, we are all here. Let's go!  
b. S: Isn't Jane coming too?  
c. **Inference:** The speaker believed or expected that Jane is coming.
- (333) **Scenario:** Pat and Jane are two phonologists who are supposed to be speaking in our workshop.  
a. A: Pat is not coming. So we don't have any phonologist in the program.  
b. Isn't Jane coming either?  
c. **Inference:** The speaker believed or expected that Jane is coming.

The descriptive generalization can be stated as in (334):

- (334) **Inference of Prior Belief (IPB):** HiNEGQs without additional low negation (or other specific markers such as *really*) regularly contribute the inference that the questioner previously believed or expected that the positive answer was true.

In contrast, while PosQs and LONEGQs are consistent with scenarios where the speaker previously believed the positive answer to hold, this is not a necessary property, as in (335-336):

- (335) a. Is Jane coming too?  
b. **No prior belief necessary.**
- (336) a. Is Jane not coming?  
b. **No prior belief necessary.**

In Yucatec Maya, we find that the same inference is present in negative polar questions. For example, one consultant provides the scenario in (337a) as a typical one in which to utter the negative polar question in (337b). In contrast, if the scenario is altered so that the speaker has no prior experience buying tortas at the restaurant (and no other reason to believe they sold them), the sentence is judged infelicitous. Negative polar questions in YM, then, give rise to the same prior belief inference as their English counterparts.

- (337) a. **Scenario:** Juan goes to a restaurant that he used to eat at in the past. At the time, they sold tortas, but now that he returns, he doesn't see any.
- b. ma'-wáa a kon-ik torta  
 NEG-wáa A2 sell-STATUS torta  
 'Didn't you sell tortas?'

One interesting thing which Romero & Han (2004) point out about the IPB in English is that it consistently indicates the speaker's prior belief that the *positive* response held. This is so even though the suggested resolution of the issue can be either positive, as in (332), or negative, as in (333) (see §5.1.3 for discussion of these two types of HiNEGQ). That is, regardless of which answer the speaker is 'double-checking', the prior belief is uniformly positive. There is, however, one case where this generalization breaks down and a HiNEGQ gives rise to an inference that the speaker had previously believed the *negative* proposition had held: HiNEGQs which also contain low negation, as in (338).

- (338) Isn't Jane not coming?

In this example, the speaker conveys a prior belief that the negative response held, i.e. that "Jane is not coming". Aside from the polarity of this prior belief, questions with both high and low negation behave very much parallel to other HiNEGQs. In particular, they involve verum focus and convey that the speaker previously believed the issue to be resolved. This case, which has been largely ignored in previous literature (though see Romero & Han (2004), pp. 618-619), will be discussed in detail in §5.4.3.



### 5.1.3 ‘Inner’ and ‘outer’ negation and strong bias

One of the most discussed — but least understood — aspects of the semantics/pragmatics of HiNEGQs is Ladd (1981)’s distinction between two sub-types, which he terms ‘outer’ and ‘inner’.<sup>3</sup> Ladd’s intuition is that HiNEGQs are *ambiguous* between two different semantic readings. The first reading — ‘outer’ negation — occurs when the speaker seeks to resolve the issue under discussion by adopting the positive proposition, as in (339). The second reading — ‘inner’ negation — occurs when the speaker seeks to resolve the issue under discussion by adopting the negative proposition, as in (340). The names are intended to correlate with the intuition that the negation in the second case is intuitively somehow ‘inside’ the proposition which the speaker hopes to adopt, i.e. her suggested resolution. In the first case, Ladd’s intuition is that negation is ‘outside’ the proposition under question (or perhaps not present at all), hence the name ‘outer’.

- (339) a. Doesn’t Jake like red wine?  
b. **Speaker’s favored resolution:** Jake likes red wine.
- (340) a. Doesn’t Jake like red wine either?  
b. **Speaker’s favored resolution:** Jake doesn’t like red wine.

A useful way to think of the difference between the two cases is in terms of how they propose to alter the belief state of the speaker and the common ground. As we just saw in §5.1.2, by using a HiNEGQ at all, the speaker is conveying that she previously believed or expected the positive proposition, *p*, to hold. This is true for both the ‘outer’ and ‘inner’ interpretations. Generally, then, a HiNEGQ is used when there is some piece of recent contextual evidence which conflicts with this prior belief, as we will discuss in §5.1.4 and as discussed by Büring & Gunlogson (2000) and Romero & Han (2004). The distinction between ‘outer’ and ‘inner’ uses, then, boils down to how the speaker prefers to resolve this conflict.

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<sup>3</sup>It should be reiterated that while various authors have treated at least some LoNEGQs with ‘inner’ HiNEGQs, we have seen ample evidence that LoNEGQs are indeed distinct. See §4.1 for discussion of this point and of the terminology itself.

In the ‘outer’ case, the speaker conveys a strong<sup>4</sup> bias toward retaining her prior belief, in spite of whatever publicly available evidence there may be to the contrary. In the example in (339), this means continuing the conversation with the proposition ‘Jake likes red wine’ in the common ground, as the speaker had previously believed (though likely privately). As we will see shortly, this is the default case, and with good reason. As rational speakers, we strive to maintain our prior beliefs unless they are proven wrong. Since the speaker of a HiNEGQ goes out of her way to indicate a prior belief, it makes sense that she would, in general, strive to keep that belief. That is, addressees assume that the principle in (341) holds.

- (341) **Default bias principle for HiNegQs:** A speaker who utters a HiNEGQ conveying a prior belief is taken by default to have a (strong) bias towards retaining that belief.

In cases of ‘inner negation’, then, the speaker explicitly indicates that she wishes to override this default principle. That is, in examples like (340) the speaker conveys that the contextual evidence is so persuasive that she seeks to abandon her prior belief that  $p$  and instead proceed with  $\neg p$  among her beliefs and in the common ground. In the example in (340), this means revising her prior belief that Jake liked red wine, continuing the conversation with the proposition ‘Jake doesn’t like red wine’ being in the common ground.

One of the central questions to be addressed, then, is under what conditions the principle in (341) can be overridden. Ladd (1981) and Romero & Han (2004) both argue in essence that this default can be overridden by context alone. Specifically, both claim that the ‘outer’/‘inner’ distinction is a semantic ambiguity inherent to HiNEGQs with the two readings both being generally available in basic cases, depending on context. In cases where a polarity item is present, they further claim that polarity items can serve to disambiguate the two readings with the presence of a PPI being indicative an ‘outer’ HiNEGQ, and an NPI being indicative of an ‘inner’ HiNEGQ, as indicated in (342).<sup>5</sup>

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<sup>4</sup>By this, I simply mean to distinguish the sort of bias conveyed in HiNEGQs from the intuitively weaker bias conveyed by other polar questions analyzed in Chapter 4.

<sup>5</sup>See §5.5.2 for discussion of Romero & Han (2004)’s NPI-licensing condition itself.

- (342) a. Isn't Jane coming too? [PPI] → Outer negation  
 b. Isn't Jane coming either? [NPI] → Inner negation

In the absence of polarity items, however, both Ladd (1981) and Romero & Han (2004) claim that the two biases should be readily available. That is, the presence of polarity items is merely a means of clarifying which reading was intended in order to avoid ambiguity. Contrary to this, however, there seems to be a clear asymmetry between the two readings in the absence of a polarity item. A HiNEGQ like (339) without a polarity item is readily interpreted as a case of 'outer negation', with the 'inner reading' being difficult or impossible to obtain. Indeed, some researchers examining 'inner' HiNEGQs (e.g. Walkow (2009)) explicitly limit their discussion to those cases with an NPI. Surveying previous literature, I find only one putative example of an 'inner' reading arising in the absence of an NPI: Ladd's original example in (343).<sup>6</sup>

- (343) **Situation:** Bob is visiting Kathleen and Jeff in Chicago while attending CLS.
- a. Bob: I'd like to take you guys out to dinner while I'm here — we'd have time to go somewhere around here before the evening session tonight, don't you think?
  - b. Kathleen: I guess, but there's not really any place to go in Hyde Park.
  - c. Bob: **Oh, really, isn't there a vegetarian restaurant around here?**
  - d. Kathleen: No, about all we can get is hamburgers and souvlaki.

Even with this very rich context, it is not clear that (343) is actually an instance of 'inner' negation. Rather, it seems to be an instance of 'outer negation', but one

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<sup>6</sup>Ladd (1981) also offers the example in (i) which does not contain an NPI. It does, however, make crucial use of 'even, which like NPIs in many theories (see Guerzoni (2004) and references therein) manipulate scales in some fashion. Removing *even* from (i) appears to yield an unambiguous case of 'outer' negation. The example, then, may be quite useful in understanding *what aspects* of the semantics/pragmatics of NPIs allow them to give rise to 'inner' readings, but it does not bear on the issue of whether such items are necessary for such readings. The licensing and effects of NPIs in both PosQs and HiNEGQs are important issues, but ones which are fundamentally about the syntax/semantics/pragmatics of NPIs and other scalar items, which is beyond the scope of this work.

(i) Didn't he even vote for Reagan?

which shows the importance of a pragmatics which, following van Rooÿ & Šafářová (2003), takes into account both the speaker's beliefs and conversational goals.<sup>7</sup> The impression that one gets in this example is that Bob is still holding out hope that his prior expectation that there is indeed a vegetarian restaurant near the conference site will still pan out. One important aspect of this example which helps make this possible, noted by Walkow (2009), is the presence of *hedges* in the surrounding context: *I guess* and *really*. These hedges give a high degree of uncertainty to Kathleen's assertion, making it reasonable for Bob to still believe there to be some chance that there is a vegetarian restaurant nearby despite Kathleen's statement to the contrary.

It is here that we must consider not only the speaker's epistemic/doxastic state, but also his conversational goals, as argued by van Rooÿ & Šafářová (2003). It would seem from the rich context here that the goal of the conversation is to find a place to eat dinner which meets everyone's requirements, and, furthermore, that Bob shares this goal. Given this, it seems quite likely that Bob has a very strong desire that his question in (343) be resolved positively. The purpose of Bob's question in (343) is to verify the positive answer because it would help the conversation to reach its goals (indeed, it may be the only way for the conversation to reach its goals, assuming there is a vegetarian in the dining party). Despite the odds being against there being a vegetarian restaurant, he persists in asking the 'outer' negation question in (343), then, because: (i) there is some uncertainty with regards to Kathleen's statement, and (ii) the positive resolution of the issue is the most expedient — and possibly the only — way for the conversation to reach its goals.

We can contrast this with two different similar versions of Bob's question: a ('inner' negation) HINEGQ with an NPI in (344) and a rising negated declarative in (345). In both cases, it seems clear that rather than clinging to the hope that there will be a restaurant, Bob is probably doing one of two things: (i) trying to get Kathleen to be more precise, since her utterance, unhedged, would result in a failure to achieve their shared goals<sup>8</sup>, or (ii) expressing frustration, incredulity, or some other such emotion at the lack of a vegetarian restaurant.

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<sup>7</sup>van Rooÿ & Šafářová (2003) seem to suggest something like this about Ladd's example, though their discussion focuses on German versions of (343), which may or may not have the same properties.

<sup>8</sup>See Walkow (2009) for detailed discussion of this modified example.

(344) Oh, really, isn't there any vegetarian restaurant around here?

(345) Oh, really, there isn't any vegetarian restaurant around here?

The generalization that emerges from this discussion is that the only true cases of 'inner' negation (i.e. where the speaker believes/wants the addressee to provide the negative answer) are those with NPIs or similar scalar operators. That is, while Ladd (1981) and Romero & Han (2004) characterize the presence of an NPI as merely a *sufficient* condition for an 'inner' negation reading, it seems it is a *necessary* one as well.<sup>9</sup> The empirical generalization can therefore be stated as in (346):

(346) Overriding the default bias principle for HiNEGQs in (341) requires an NPI or other overt linguistic marking.

The situation, then, is quite parallel to that of PosQs, as discussed in §4.2.1. Though the two biases are different in their nature and source, both PosQs and HiNEGQs generally exhibit a bias towards the positive response. However, the presence of at least certain NPIs<sup>10</sup> can override this default positive bias and cause the question as a whole to convey a negative bias of some sort. The question of *how* and *why* NPIs have this effect on both kinds of questions remains an open one, one which I will not address in the present work. Empirically, however, I hope to have shown that the presence of NPIs is a necessary condition for 'inner' HiNEGQs, rather than a mere diagnostic for an independent ambiguity.

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<sup>9</sup>In §5.4.3, I will present one further argument to this effect, drawing on data from HiNEGQs which also contain low negation. Polarity item licensing is much more limited in such cases, and we correspondingly find that such questions only allow for one 'reading'.

<sup>10</sup>As Ladd (1981) points out, there is a slight difference in which NPIs are licensed in each. In particular, the HiNEGQ licenses *either* while the PosQ does not. Outside of this one item, however, many NPIs are licensed in either kind of question and have similar — though not identical — effects. The licensing and effects of these items remains an open issue for theories of NPIs in general, not simply for HiNEGQs.

### 5.1.4 Contextual evidence and suggestions

Thus far, we have seen that HiNEGQs give rise to the inference that the speaker previously believed or expected that the positive answer held and is presently seeking to double-check that the issue can be resolved either positively (the default) or negatively (in the presence of an NPI). What we have not yet discussed, however, is what sorts of contexts are required in order to make this a rational strategy. Out of the blue, a HiNEGQ such as (347) is infelicitous with or without an NPI. What conditions, then, need to hold of the context in order for a HiNEGQ to be felicitous? Given the other properties of HiNEGQs we have discussed, we can also think of this question in terms of what aspects of the context make it a rational strategy to go out of one's way to point out a prior belief while simultaneously requesting that the speaker address the truth or falsity of this belief.

(347) #Excuse me, isn't there {a/any} vegetarian restaurant around here?

Previous literature has identified two types of contexts which readily allow for HiNEGQs. First, there are contexts where there is what Büring & Gunlogson (2000) term 'compelling contextual evidence' which conflicts with the speaker's prior belief. Second, there are contexts where there is no contextual evidence, but the speaker's intent is to *suggest* that a given answer be adopted so that some sort of joint action can be taken on that basis. Though Büring & Gunlogson (2000) do not distinguish between the two cases, we find it useful to distinguish them (as Romero & Han (2004) do descriptively), though there is, as we will see, a common core.

The first case where HiNEGQs are used is when there is 'compelling contextual evidence' against the speaker's prior positive belief. Büring & Gunlogson (2000) define compelling contextual evidence in two parts in (348).<sup>11</sup>

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<sup>11</sup>Their exact formulation of the use conditions on HiNEGQs, in (i), is a fair bit more complicated than what we present for reasons that will be clear shortly.

- (i) Evidence conditions for HiNEGQs (Büring & Gunlogson (2000))
  - a. **'Outer' HiNegQ:** there is no compelling evidence for  $p$
  - b. **'Inner' HiNegQ:** there is compelling evidence against  $p$

(348) Compelling contextual evidence (adapted from Büring & Gunlogson (2000))

- a. **Contextual evidence:** Evidence that has just become mutually available to the participants in the current discourse situation.
- b. **Compelling:** Evidence against  $p$  is compelling if, considered in isolation, it would allow the participants to assume  $\neg p$  (i.e. the evidence could reasonably be considered to justify the inference that  $\neg p$ ).

Romero & Han (2004) have a similar intuition about the use conditions for HiNEGQs, though their account emphasizes the reliance of HiNEGQs on scenarios where an ‘epistemic conflict’ is present. Since their epistemic conflicts consist of contextual evidence and a prior belief, however, the account is quite similar for these cases. Consider again the HiNEGQ in (349), repeated from (332) above. As we saw above, the question in (349b) gives rise to the inference of prior belief paraphrased in (349c). The recently available contextual evidence in this example, in (349d), then, conflicts with the speaker’s prior belief. The HiNEGQ serves as a way of resolving this conflict by (i) pointing out the speaker’s possibly private prior belief, and (ii) asking the addressee only about the truth-value of the proposition in question. Since there is no NPI in the example (i.e. this is a case of ‘outer’ negation), the speaker is taken to support resolving the issue positively, by retaining his/her prior belief. The bias conveyed by the HiNEGQ arises since we expect that speakers, by default, prefer not to revise their beliefs, as formulated in (341).

- (349)
- a. A: Ok, now that Stephan has come, we are all here. Let’s go!
  - b. S: Isn’t Jane coming (too)?
  - c. **Inference:** S believed or expected that Jane is coming.
  - d. **Contextual evidence:** A has said that the entire group is present despite Jane’s absence.

The second type of context where HiNEGQs can be felicitously used is as *suggestions*, as in Romero & Han (2004)’s example in (350). Here, the question conveys that the speaker has a previous belief that Frege has reviewed for the journal (indeed, it would be quite odd to *suggest* a resolution to the issue in this way if this were not

so). However, there does not need to be any contextual evidence which has called this prior belief into question in order for such uses to be felicitous.

(350) **Scenario:** Dialog between two editors of a journal in 1900.

- a. A: I'd like to send this paper out to a senior reviewer, but I'd prefer somebody who has experience with our regulations.
- b. S: **Hasn't Frege already reviewed for us?** He'd be a good one.

Finally, Romero & Han (2004) also show that there is a clear interaction between these two types of scenarios for HiNEGQs and the 'inner'/'outer' distinction just discussed (see also Reese (2007) for detailed discussion of this point). While 'outer' negation HiNEGQs can be felicitously used as suggestions, 'inner' negation HiNEGQs cannot, as seen in Romero & Han (2004)'s example in (351b). To these two data points, we can add Romero & Han (2004)'s observation that HiNEGQs which also contain low negation are also felicitous as suggestions, as in (351c).

(351) **Scenario:** Dialog between two editors of a journal in 1900

- a. A: I'd like to send this paper out to a senior reviewer, but I'd prefer somebody new.
- b. S: **#Hasn't Frege reviewed for us yet?** He'd be a good one.
- c. S: **Hasn't Frege not reviewed for us yet?** He'd be a good one.

Empirically, we can summarize the situation as in (352).<sup>12</sup>

Ex.	Prior belief	Favored resolution	Felicitous as suggestion?
(350)	+	+	<i>yes</i>
(351b)	+	—	<i>no</i>
(351c)	—	—	<i>yes</i>

The generalization, then, is that HiNEGQs are felicitous as suggestions only if the polarity of the speaker's prior belief *matches* that of her suggested resolution to the issue. For reasons that are not entirely clear, Romero & Han (2004) take this asymmetry between the first two cases as evidence for their claim that the 'inner'/'outer' distinction

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<sup>12</sup>The fourth logically possible combination (a negative prior belief and positive favored resolution) is not attested, as discussed in §5.4.3.



is indeed a semantic ambiguity inherent to HiNEGQs. While this pattern may be consistent with their claim, I believe, however, that it can be naturally understood pragmatically with no recourse to semantic ambiguity.

Consider the case of the infelicitous ‘inner’ HiNEGQ with an NPI in (351b). In (351b), the speaker conveys her prior belief or expectation that the positive answer would hold. There is no contextual evidence against  $p$  in this case, so a rational speaker would have no reason to change this belief. The presence of the NPI in (351b) conveys that the speaker favors a negative resolution to the issue at hand. Taken together, these two inferences amount to the speaker proposing a *revision* to her prior beliefs in the absence of any contextual evidence that they were faulty. Clearly, this is not a rational course of action for a speaker to pursue and we expect ‘inner’ HiNEGQs like (351b) to require contextual evidence in order to be licensed.

In contrast, the felicitous suggestions in (350) and (351c) both involve no revision to the speaker’s belief state. Rather, they serve to make a proposition in the speaker’s private belief state become publicly agreed upon, with no revision to the speaker’s prior beliefs. Once this belief is publicly agreed upon, it is then presumably available for joint action based upon the newly shared information. For example, in (350), the speaker’s prior belief that Frege reviewed for the journal is put on the table so that the addressee will agree to it, thereby enabling joint action on that basis (e.g. asking Frege to review for the journal). The ability of HiNEGQs to serve as suggestions — and the asymmetry between ‘outer’ and ‘inner’ HiNEGQs in this regard — follows from fairly minimal pragmatic assumptions, together with the inference of prior belief. Any account which correctly predicts the inference of prior belief (including its polarity), then, will be able to successfully capture the use of HiNEGQs as suggestions.

## 5.2 Verum at the core

We have seen that HiNEGQs make two seemingly conflicting contributions to conversation. On the one hand, they convey that the speaker previously believed or expected that the positive answer held. On the other, they request that the interlocutor address this very issue, and give special emphasis to this issue’s truth/falsity in doing so. One of the central decision points for a semantic/pragmatic account of HiNEGQs, then,

is to determine which of these two contributions is part of the compositional semantics of HiNEGQs, and which (if any) arise from more general pragmatic reasoning.

In what follows, I develop an account in which added emphasis on truth-value is part of the compositional semantics of HiNEGQs, with the inference of prior belief arising pragmatically. This basic semantic/pragmatic division follows that of Romero & Han (2004), who also take verum focus to be the semantic core of HiNEGQs (see §5.5 for a systematic comparison of the two accounts). While this basic semantic/pragmatic division of labor mirrors Romero & Han (2004)’s account, the parallel essentially ends there. The present account differs in the content of the semantics for verum focus, its compositional connection to high negation, and in the pragmatic mechanisms by which other properties arise.

The remainder of §5.2 argues for a particular semantic conception of the verum focus effect in terms of the suppression of inquisitive content (alternatively, the isolation of informative content). §5.3 shows that this semantics can be obtained compositionally from (double) negation under the two-tiered inquisitive semantics developed in Chapter 4. In §5.4, I propose to derive properties of HiNEGQs besides verum focus (most directly, the inference of prior belief) from independently motivated pragmatic assumptions regarding belief and belief revision. Finally, §5.5 contrasts the current account with previous ones, principally Romero & Han (2004).

### 5.2.1 Verum focus as non-projection of (sub-)issues

In section §5.1.1, we reviewed arguments by Romero & Han (2004) that one property distinguishing HiNEGQs from other polar questions is the presence of an ‘emphasis on truth-value’. While I agree with this intuition, it simply raises a deeper question: what is this emphasis relative to? That is, emphasis would seem to be an inherently *relative* notion; presumably a sentence with verum focus does not somehow simply convey more emphasis than a corresponding sentence without it. Conversely, then, we might wonder: what part of the sentence’s meaning is left unemphasized in sentences with verum focus?

Under a purely truth-conditional conception of sentence meaning, it is not clear what this something could possibly be. If semantic content is equated directly

with truth conditions, emphasizing truth would mean emphasizing semantic content. Given the richer notion of sentence meanings as comprising both informative and inquisitive content, however, a potential answer emerges — *verum* focus is the emphasis of a sentence’s informative component (i.e. its truth-conditions) *relative* to its inquisitive content. A sentence with *verum* focus explicitly avoids making the issue-raising contribution which its *verum*-less counterpart makes.

This idea of *verum* focus as issue-suppression is perhaps easiest to explain for assertions. In Chapter 2, we developed a semantics where assertions contribute not only truth-conditional information, but also make salient *issues* introduced by indefinites and disjunctions. That is, indefinites and disjunctions identify particular aspects of a proposition as *potential* future topics of conversation. In Chapter 3, we have seen that the clearest empirical support for this position is the potential of these elements to license Sluicing, even though some truth-conditionally equivalent expressions do not. However, Sluicing can target not only overt indefinites and disjunctions, but unspoken details of an event previously described in discourse (the subtype of Sluicing known as ‘Sprouting’). Nearly any description of an event, then, naturally projects potential discourse futures where the details of the event are discussed or elaborated, a dynamic we formalized above in terms of inquisitive existential quantification of a neo-Davidsonian event argument.

It is generally true, then, that in making an assertion, we not only provide truth-conditional information (ideally, to resolve existing issues), we push the discourse forward by making salient some further issue or issues which would elaborate on this information in some way if addressed or else help establish this information in the first place. Since this inquisitive contribution is present in even covert existential quantification, raising issues is therefore the default state of affairs. Low negation, as defined in Chapter 4, constitutes one way of avoiding this forward-looking default, by projecting a set of negated alternatives logically prior to proposition being asserted. The fact that negated sentences have this weaker inquisitive contribution is a reflection of the more general idea that negated sentences are somehow weaker than their positive counterparts.

*Verum* focus, then, is a way of explicitly avoiding this forward-looking con-

tribution altogether. An assertion with verum focus is a special way to *slow down* conversation, privileging the resolution of prior issues in discourse at the expense of moving the conversation forward in the customary way. The issue suppression provided by verum focus is more pronounced than that of ordinary negation. Whereas a sentence with low negation still makes some inquisitive contribution (via the projected issue), a sentence with verum focus makes no inquisitive contribution in either its main issue or its projected issue. Returning to polar questions, then, a question with verum focus slows down conversation by not leaving the door open to further sub-issues in the way that other varieties of polar questions do (as argued in Ch. 4). Importantly, we do not conceive of this slow-down as some sort of permanent avoidance of sub-issues. Rather, it signals to the addressee what information she might provide in the following turn, in essence signaling ‘Right now, just tell me whether  $p$  holds in some way or other.’

In this view, then, the semantic content of HiNEGQs does not, strictly speaking, involve focus or other emphasis on the truth or falsity of the proposition in question. Rather, it consists of an explicit avoidance or lack of emphasis on all further (sub-)issues. Importantly, this lack of emphasis on further issues should not be equated with *disinterest*, at least not semantically. A question like (353) might well be uttered in a context where the issue of who John is bringing to the party is very much of interest to the speaker. However, this issue would be made salient by virtue of the context itself, rather than the contribution of the question itself, as we argued for PosQs in Ch. 4. In this way, then, the theory matches Höhle (1992)’s intuition that Verum Focus involves emphasis on the truth-value of the proposition in question, but crucially conceives of it as emphasis *relative to inquisitive content*.<sup>13</sup>

(353) Isn’t John bringing a date to the party?

Before proceeding, a quick caveat is in order about the scope of the present

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<sup>13</sup>The account also appears to have parallels with Gutzmann & Castroviejo Miró (2009), who analyze verum focus in assertions with intonationally focused polarity (and main verbs) in German and English in terms of effects on questions under discussion. Specifically, they claim that verum focus encodes an instruction to the addressee to downdate the issue of whether  $p$  from the QUD stack. This idea is possibly related to the present account, though it is not clear how to extend the account from assertions to HiNEGQs, since these, of course, also propose particular manipulations of the QUD stack. As such, I leave a detailed comparison to future work.

theory. Previous literature has identified a rather motley group of constructions which intuitively give rise to added emphasis on truth value, as in (354). The assumption made in previous literature is that the intuitive emphasis on truth value perceived in each of these constructions has identical semantics despite their quite different forms. That said, it remains quite possible that further investigation will reveal verum focus to be a family of similar meanings rather than a single unified one. For example, it may well be the case that the literal semantics of, say, intonationally focused polarity, does somehow involve emphasis on truth, rather than avoidance of inquisitive content. In what follows, I argue that the present theory of verum focus applies to preposed negation (in both questions and assertions) and provide a compositional semantics which delivers this meaning. There is every reason to expect that the top-level semantics I provide can be extended to other instances of verum focus in (354), though I leave this to future work.

- |       |   |  |
|-------|---|--|
| (354) | a. Never has John bought a house.           | <b>Preposed negation</b>               |
|       | b. It is the case that John bought a house. | ‘...the case/true that ...’            |
|       | c. John DID <sub>F</sub> buy a house.       | <b>Intonationally focused polarity</b> |
|       | d. John <i>really</i> bought a house.       | <b>Adverbs like ‘really’</b>           |

### 5.2.2 Evidence of non-projection in HiNegQs

In the previous section, I have laid out informally a theory of verum focus contributed by preposed negative elements, particularly the preposed negation in HiNEGQs. Rather than literally emphasizing truth-value, I have claimed that verum focus consists of an explicit non-projection of inquisitive content. At its most basic, this characterization is simply a particular way of fleshing out Höhle (1992)’s original characterization of verum focus as emphasis on truth-value. While the primary effect we receive from verum focus is this relative emphasis, there nonetheless also exists more direct evidence for issue non-projection in HiNEGQs. In this section, I present three supporting arguments that such non-projection indeed holds of HiNEGQs.

### **Infelicitous as ‘speculative’ questions**

First, Gunlogson (2001) notes that POSQs readily serve as what she terms ‘speculative’ questions, as in (355). In her words, such questions can be felicitously used as “questions designed to instigate thought and/or discussion without necessarily being answered or answerable”. In terms of the account of POSQs developed in Ch. 4, we might think of speculative questions as ones which nominally propose a main yes/no issue, but whose true purpose in discourse is to encourage discussion of sub-issues (e.g. what evidence supports the main claim, under what conditions, in what way).

- (355) a. Does God exist?  
b. Did Oswald act alone?

Unlike POSQs, however, HiNEGQs do not make good speculative questions, as in (356). The verum focus in HiNEGQs explicitly avoids making salient the details of how the main issue does or does not hold. Since the discourse purpose of a speculative question is to encourage discussion of exactly these sub-issues, they are expected to be infelicitous.

- (356) a. # Doesn’t God exist?  
b. # Didn’t Oswald act alone?

### **Felicity of responses to sub-issues**

The second piece of evidence comes from the fact that responses addressing issues contributed by inquisitive elements inside the question. First, recall that, as argued in Ch. 4, POSQs make salient sub-issues corresponding to inquisitive elements. As such, responses addressing such sub-issues are felicitous more or less regardless of context, as seen in (357-359). Intuitively, such answers serve to more fully address the issues which the speaker has presented.

- (357) a. Is John baking a cake?  
b. Yeah, chocolate.

- (358) a. Will José bring a date to the party?  
b. Yeah, Mary.
- (359) a. Should Barney plant a tuber in his garden?  
b. Yeah, sweet potato.

In contrast to POSQs, HiNEGQs do not themselves license such responses, as seen in (360-362).<sup>14</sup> Such responses are, of course, still possible in particular contexts. Even in these cases though, such responses often do not intuitively serve to better address the issues raised by the questioner as in the case of POSQs.

- (360) a. Isn't John baking a cake?  
b. ??Yeah, chocolate.
- (361) a. Won't José bring a date to the party?  
b. ??Yeah, he will, Mary.
- (362) a. Shouldn't Barney plant a tuber in his garden?  
b. ??Yeah, he should, sweet potato.

Rather, it seems that felicitous responses of this sort to HiNEGQs generally serve one of two purposes. First, such responses might be felicitous because the issue they address is one which the context independently renders salient. For example, if (361) is uttered in a discussion about who is going out with who, the (b) response improves considerably. Second, such responses might be felicitous not because of the issue they themselves resolve, but rather because they better establish the speaker's authority to address the main issue. Since HiNEGQs are ordinarily attempts to resolve an epistemic conflict as discussed in §5.1.4, the speaker's authority to definitively address the issue is of heightened importance. The (b) responses are not really responses to the speaker's projected issues, but rather particular ways to establish the answerer's

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<sup>14</sup>N.B. minimally different responses containing an overt *inquisitive* element are far better, as in (i).

- (i) a. Isn't John baking a cake?  
b. Yeah, a chocolate one.

credibility, akin to responses like ‘Yeah, I saw him.’ or ‘Yeah, he told me so.’ The distinction is a subtle one, but the point is that the (b) sentences require independent motivation in response to HiNEGQs, but not POSQs.

### **Lack of alternative HiNegQs**

Finally, whereas POSQs and LoNEGQs both allow for alternative question readings (with appropriate intonation) in (363-364), minimally different HiNEGQs do not, (365), as observed by Han & Romero (2004).

- (363) a. Do you want coffee or tea?  
b. Coffee.
- (364) a. Do you not want coffee or tea?  
b. Coffee (I can’t stand it).
- (365) a. Don’t you want coffee or tea?  
b. # Coffee.

Whether this observation constitutes evidence in favor of the present account depends on the compositional semantics assumed for English alternative questions more generally, a matter which is beyond the scope of the present work. Certain previous works such as Beck & Kim (2006) take focus to be responsible for introducing the alternatives into the composition. Given the account of alternative questions in Yucatec Maya, however, it seems at least as plausible to take the disjunction itself — ‘coffee or tea’ — as the locus of alternatives in such questions. Under this assumption, then, the fact that high negation blocks the alternative question reading can be seen as part of the more generally issue-suppressing character of verum focus contributed by high negation.

Given the analysis from Chapter 3, one other place we might expect to find support for the issue suppressing character of verum focus in HiNEGQs is from sluicing itself. That is, by examining whether or not disjunctions and indefinites inside of HiNEGQs can serve as inner antecedents for sluicing, as in the example in (366). At first glance, such examples seem to provide counter-evidence, since sluicing is possible and appears to have the indefinite *a student* as inner antecedent.



- (366) a. A: Didn't Bill talk to a student?  
 b. B: Yes, but I don't know who ~~Bill talked to~~.

There is, however, another possible source of antecedent material in these cases: the 'Yes.' response by speaker B itself. Since A has asked B a question, B has an obligation to address the main issue prior to discussing other issues. Whether this occurs by ellipsis (as argued by Kramer & Rawlins (to appear)) or by some other anaphoric process (as argued by Farkas & Bruce (2010)), the 'yes' response takes the place of a sentence such as 'Yes, Bill is talking to a student.', which would provide a licit inner antecedent, since it lacks verum focus. Given this, the sluice in (366) provides no evidence either way regarding the claim that verum focus in HiNEGQs involves issue-suppression.<sup>15</sup>

### 5.3 Composing high negation polar questions

Having proposed a theory of the content of verum focus in HiNEGQs, we turn now to one of the most puzzling aspects of verum focus: their composition. As we saw in §5.1.1, the connection between the verum focus effect and (preposed) negation seems to be cross-linguistically robust, if not universal. A semantic account of HiNEGQs, therefore, ought to derive the semantics of verum focus from that of ordinary negation to the extent possible. Previous accounts of verum focus in HiNEGQs (Romero & Han (2004)) and more generally (e.g. Gutzmann & Castroviejo Miró (2009)) posit covert VERUM operators in logical form where (to my knowledge) no language has such

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<sup>15</sup>With respect to other kinds of verum focus in assertions, the evidence is less clear. For one thing, elements which are claimed to contribute verum focus reading are generally claimed to have other readings. For example, Romero & Han (2004) claim that intonationally focused polarity has an additional 'contrastive focus' reading distinct from the verum focus reading. Moreover, while these other elements intuitively also emphasize truth in some way, it remains possible that further investigation will reveal that different verum focus constructions have subtly different semantics. This seems all the more possible given the diverse morphosyntactic means are claimed to realize verum focus. Within English alone, we have clausal complements like *It's true that ...*, the adverb *really*, intonationally focused polarity, and preposed negation.

elements overtly.<sup>16</sup> Even in Yucatec Maya, where preposing negation is not possible, we have seen that verum focus effect still arises (along with concomitant properties such as the inference of prior belief). Negation it would seem, or rather, *double* negation, must play a central role in producing this meaning.

### 5.3.1 Double negation yields verum focus

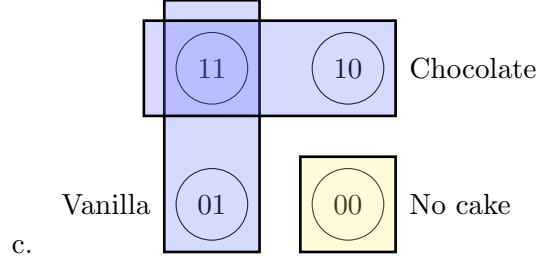
In §5.2, I proposed that the semantic content of the verum focus contributed by preposed negation should be conceived of not directly in terms of emphasis on truth-conditions, but rather in terms of the suppression of inquisitive content. We saw that this claim was supported directly by several observations regarding HiNEGQs. This shift in our perspective on the content of verum focus, however, also opens the door to an understanding of how it arises *compositionally* in HiNEGQs. The problem previous accounts have faced is that there does not seem to be any direct connection between negation and emphasis on truth value. Under the single-tiered inquisitive semantics developed in Ch. 2, however, there is a quite clear connection between negation and issue suppression, which we build on presently. The remainder of this subsection formalizes this intuitive connection in single-tiered inquisitive semantics, §5.3.2 recasts the idea in the two-tiered semantics of Ch. 4, and presents a step-by-step interpretation of a HiNEGQ under this semantics.

Setting aside for a moment the concerns which motivated a two-tiered semantics in Ch. 4, it seems uncontroversial to translate questions like (367a) as (367b) and (368a) as (368b).

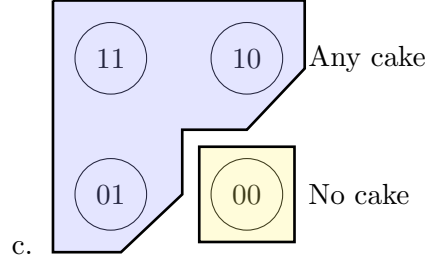
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<sup>16</sup>The only potential argument in the literature for a covert VERUM operator comes from Romero & Han (2004)’s account of Ladd’s ‘inner’/‘outer’ ambiguity. They analyze the two readings as arising from a scopal ambiguity between VERUM and negation itself. As discussed in detail in §5.5, however, this approach: (i) wrongly predicts the distribution of the two readings and its relationship to polarity items, and (ii) predicts unattested ambiguities for assertions with preposed negative elements.

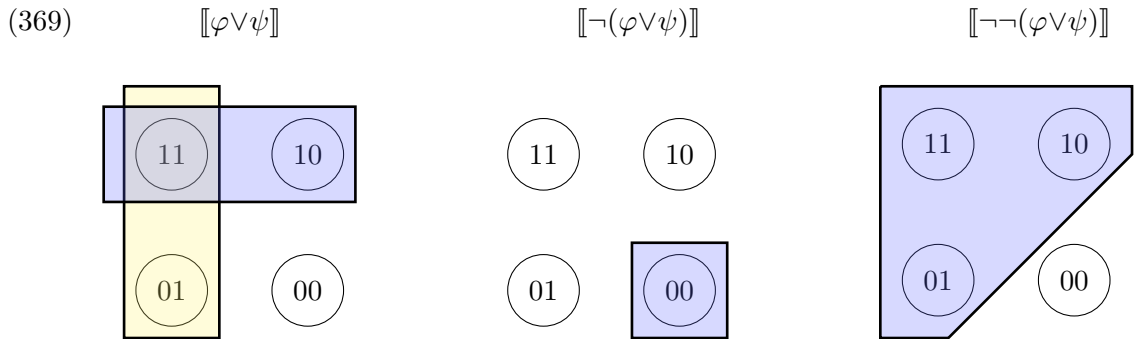
- (367) a. Is John baking a cake? (POSQ)  
 b.  $\llbracket \exists x.\text{bake}'(\text{john}, x) \vee \neg \exists x.\text{bake}'(\text{john}, x) \rrbracket$



- (368) a. Isn't John baking a cake? (HINEGQ)  
 b.  $\llbracket \neg \exists x.\text{bake}'(\text{john}, x) \vee \neg \neg \exists x.\text{bake}'(\text{john}, x) \rrbracket$



Under a single-tiered inquisitive semantics, then, these formulas of the metalanguage will be interpreted as in the pictures in (367c) and (368c) respectively. As argued in detail in Ch. 4, the POSQ projects a set of alternatives corresponding to inquisitive elements inside the question radical. In (367a), this set is contributed by the overt indefinite ‘a cake’, though this inquisitive contribution will be present more generally due to the inquisitive existential quantification of the event argument. In (368a), on the other hand, the presence of double negation eliminates these fine-grained alternatives as shown step-by-step in (369).



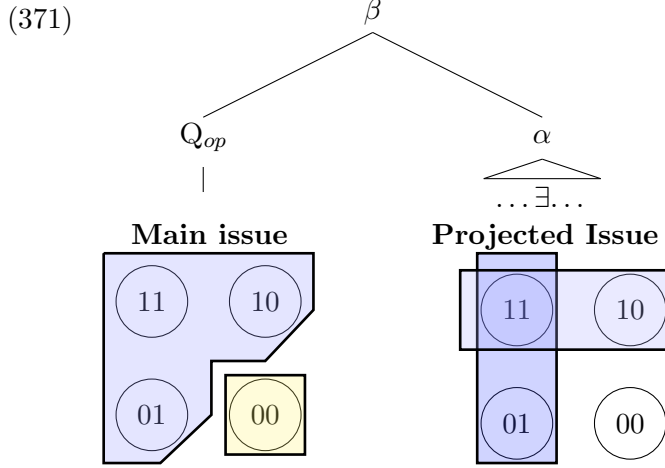
High negation has the effect of suppressing projected issues in HINEGQs, then, not because of the presence of negation *per se*, but rather because of the presence of *double* negation in the right hand disjunct of (368b). A classical question semantics provides appropriately different translations to (367a) and (368a), but wrongly predicts these translations to have the same interpretation due to the vacuity of double negation. Because double negation has a semantic (though non-truth-conditional) effect in inquisitive semantics, we no longer retain the equivalence between (367b) and (368b).

While we have seen that single-tiered inquisitive semantics allows us to distinguish between positive and negative polar questions, we still suffer from the same problem as in Ch. 4: the need to distinguish main issues from projected issues. HINEGQs make this problem all the more evident since we also need to distinguish HINEGQs from LONEGQs, as analyzed in §4.5.3. The relevant distinction can be made straightforwardly under a two-tiered inquisitive semantics as we will see.

### 5.3.2 Preposed negation in two-tiered semantics

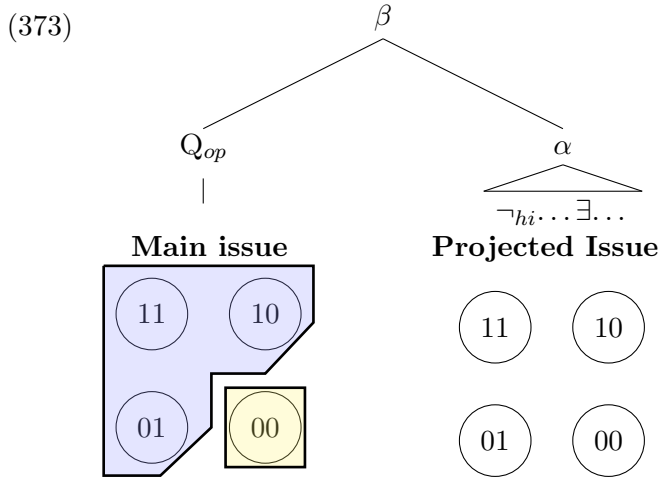
In Ch. 4, I argued for a ‘two-tiered’ inquisitive semantics in order to capture the differences in meaning between POSQs and corresponding LONEGQs and ALTQs, while retaining the clear sense in which all three present the same main issue. For example, a POSQ such as (370) contributes two types of issues, as in (371): the *main* ‘yes’/‘no’ issue contributed by the disjunctive question operator (left) and the *projected* issue introduced by the indefinite ‘a cake’ (right).

(370) Is John baking a cake?



In contrast to the POSQ, the corresponding HiNEGQ suppresses any projected issues, as in (373). Note that the proposed denotation also contrasts with the LoNEGQ, which we argued in Ch. 4 projects a set of (pointwise) negated alternatives.

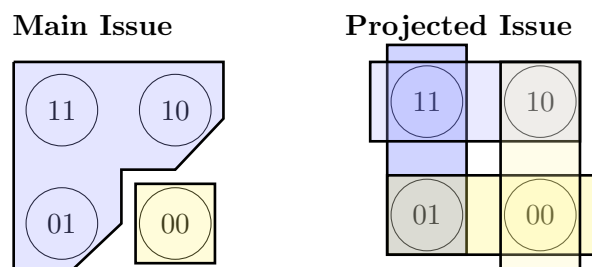
(372) Isn't John baking a cake?



We can also contrast this proposed semantics with that of the ALTQ in Ch. 4, repeated in (374). Like the ALTQ, the projected issue of the HiNEGQ is ‘balanced’, i.e. it contains positive and negative alternatives to an equal degree. Despite this parallel, the semantics and pragmatics of the two are quite different, as we would expect. The ALTQ puts all alternatives on the table, doing everything possible to encourage some

response from the addressee, even if it a partial one. The ALTQ does not aim to slow down conversation, rather it stresses that the discourse is at what Biezma (2009) terms a conversational ‘cul-de-sac’. The addressee must address the projected issue in some way in order to move the discourse forward.

(374) Semantics for ALTQ:



In contrast, the HiNEGQ goes out of its way to slow down the conversation, by not projecting any further issues as safe for the discourse to immediately address. Even though it presents a balanced projected issue, it is not a good way for a speaker to express her neutrality since it projects no additional issues. The ALTQ is useful for expressing neutrality since it highlights further issues for the discourse to address for either resolution of the main issue. The HiNEGQ presents neither sort of issue, thereby signaling that the speaker is in a special conversational state where ordinary elaborations are not necessarily useful, at least in the short term.

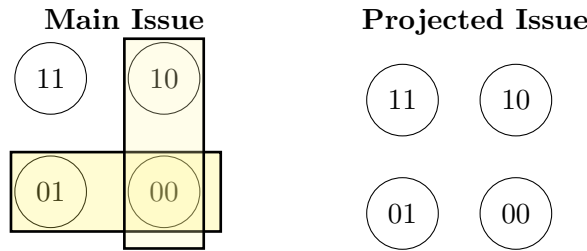
We return to these pragmatic issues shortly, however, first we provide an independently motivated semantics for preposed/high negation,  $\neg_{hi}$ , which produces the intended denotations for HiNEGQs. The aim is to combine the insights of the two-tiered semantics of Ch. 4 with the issue-suppressing character that negation had under a single-tiered inquisitive semantics, as discussed in §5.3.1. The two-tiered semantics allows for three kinds of interactions between an operator and an alternative set to which it applies: it can (i) pass alternatives up the tree as part of the main issue, (ii) eliminate them entirely by quantifying over them universally, or (iii) pass them up the tree with a secondary, ‘projected’ status.

In principle, then, a formula with an existential in the syntactic scope of negation could receive three different interpretations. Option (i) yields the wide-scope read-

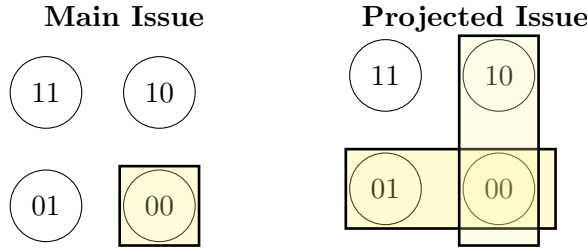
ing for the existential, as in (375a).<sup>17</sup> We already argued in Ch. 4 that option (iii) gives us the correct semantics for low negation under the narrow-scope reading of the indefinite, as in (375b). Option (ii) has the same main issue as option (iii) (and thus has the same truth-conditions), but eliminates the alternatives of the existential altogether. Given this, I propose that high/preposed negation be given this interpretation, as in (375c).

(375) Three kinds of negation:

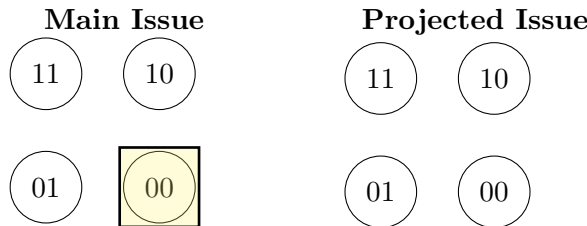
a. **Indefinite takes wide-scope** ( $\neg_{pointwise}$ )



b. **Indefinite takes narrow scope, low negation** ( $\neg_{lo}$ )



c. **Indefinite takes narrow scope, high negation** ( $\neg_{hi}$ )




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<sup>17</sup>While adopting this semantics for negation would potentially allow for an account of exceptional wide-scope of in-situ indefinites and disjunctions, such an account is beyond the aims of the present work. I include it simply to show the results of the three types of alternative interactions possible under a two-tiered inquisitive semantics.

Formally, we can define these three potential negations as unary operators taking two-tiered inquisitive propositions as arguments:

$$(376) \quad \textbf{Sem2a (pointwise): } \langle\langle \neg_{\textit{pointwise}} \varphi \rangle\rangle^{\mathcal{M},g,w} = \frac{\text{ALT}\{\alpha \subseteq W \mid \textit{there is some } \gamma \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \gamma = \emptyset\}}{\emptyset}$$

$$(377) \quad \textbf{Sem2b (low): } \langle\langle \neg_{\textit{lo}} \varphi \rangle\rangle^{\mathcal{M},g,w} = \frac{\text{ALT}\{\alpha \subseteq W \mid \textit{for all } \beta \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\}}{\text{ALT}\{\alpha \subseteq W \mid \textit{there is some } \gamma \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \gamma = \emptyset\}}$$

$$(378) \quad \textbf{Sem2c (high): } \langle\langle \neg_{\textit{hi}} \varphi \rangle\rangle^{\mathcal{M},g,w} = \frac{\text{ALT}\{\alpha \subseteq W \mid \textit{for all } \beta \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\}}{\emptyset}$$

Outside of polar questions, we can find empirical support for this semantics from cases of so-called negative inversion (Haegeman (2000), Büring (2004) *inter alia*). As Romero & Han (2004) observe, an example like (379a), where *never* is preposed also exhibits the verum focus effect. That is, the preposed version emphasizes the truth of the claim in a way that (379b) does not. The contrast between the naturally occurring example from the Corpus of Contemporary American English (COCA, Davies (2008-)), (380a), and its constructed counterpart in (380b) exhibits the same difference.

(379) a. Never would Mary reveal the secret.

b. Mary would never reveal the secret.

(380) **Scenario:** A commentator discusses an auction of militia accoutrements.

a. Never has there been an auction of this sort on this scale. **(COCA)**

b. There has never been an auction of this sort on this scale. **(Constructed)**

More specifically, the speaker in (380a) chooses the form with the preposed negative element over the ordinary low negative in order to emphasize that the differences between the various auctions are not relevant to establish the main claim. That is, we can consider all of the different alternative previous auctions of militia accoutrements together as a single alternative, with no need to even bother thinking about the individual cases. The constructed version with *never* following the auxiliary, on the



other hand, is more neutral. While the two sentences appear to be true under the same conditions, it would be relatively odd (or perhaps just misleading) to use the version in (380a) in a scenario where, for example, its truth-conditions were met, but only because one previous auction was cancelled at the last minute, another was split into several smaller auctions, etc. Preposing *never* explicitly indicates that the fine-grained alternatives which would be projected by (380b) will not be relevant to future conversation (e.g. as partial answers).

Another piece of evidence which potentially supports this semantics comes from the scopal behavior of preposed negative elements. As observed by Haegeman (2000), an example with preposed negation, such as (381), only permits the narrow-scope reading of the indefinite. In Haegeman (2000)’s terms, preposed negative elements always have ‘sentential scope’. In contrast, the non-preposed version in (382) also allows for a wide-scope reading for the indefinite. In our terms, the ordinary/low negative version in (382) has a reading where it contributes a main issue consisting of a set of negated alternatives of the form ‘John never talked to  $x$ ’ where  $x$  is a professor (being consistent with the continuation ‘but I don’t know who.’). That is, the same set of alternatives which are *projected* on the narrow-scope reading of the indefinite in (382) are *proposed* in wide-scope reading. (381) does not project this set of alternatives and correspondingly lacks the wide-scope reading. In the absence of a full account of scope in these terms, this evidence must be regarded as merely suggestive. However, it seems hardly accidental that the forms we claim project a set of alternatives are exactly those which have a reading where those alternatives are the main issue.

(381) Never has John talked to a professor. ( $\checkmark$  NEVER $\gg\exists$ ,  $\times$   $\exists\gg$ NEVER)

(382) John has never talked to a (certain) professor. ( $\checkmark$  NEVER $\gg\exists$ ,  $\checkmark$   $\exists\gg$ NEVER)

In this section, we have seen that two-tiered inquisitive semantics permits three kinds of interactions between an operator (e.g. negation) and alternatives in its syntactic scope (e.g. those introduced by an indefinite). Two of these options are truth-conditionally equivalent, differing only in whether or not they project a set of alternatives. We have argued that these two negations correspond to low and high negation and supported this claim with data from assertions with negative inversion.

Given this semantics for high/preposed negation, we return now to our central puzzle: the semantics of HiNEGQs.

### 5.3.3 A compositional account of HiNegQs

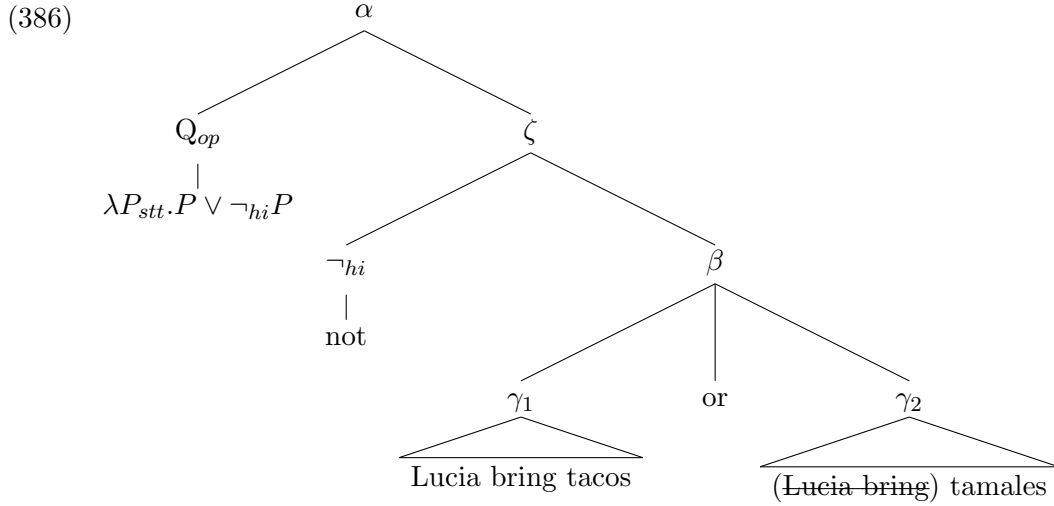
So far in this section, we have seen that the ordinary semantics of (high) negation eliminate inquisitive content in its syntactic scope, leaving only the truth-conditional information of the sentence. The perceived result of this is an emphasis on the truth-value of the assertion or question to which it is applied, i.e. *verum focus*. In this section, we put together this semantics for high negation with the account of polar questions from Ch. 4 to show that it yields the appropriate denotation.

As in the accounts of PosQs and LoNEGQs in Ch. 4, I assume logical forms consisting of a disjunctive question operator,  $Q_{op}$ , and a question radical,  $\zeta$ . In order to see the issue-suppressing effects of high negation clearly, we illustrate this semantics for a question, (383) containing a disjunction ‘tacos or tamales’. As discussed above, this question has only the intended polar question reading, lacking the alternative question reading possessed by corresponding PosQs and LoNEGQs. The question operator is the same as in Ch. 4, repeated in (384). The only difference is that we have now seen that the negation internal to the question operator has the semantics we have ascribed to preposed negation, which we therefore write with  $\neg_{hi}$ .

(383) Didn’t Lucia bring tacos or tamales?

(384)  $Q_{op} \rightsquigarrow \lambda P_{stt}. P \vee \neg_{hi} P$

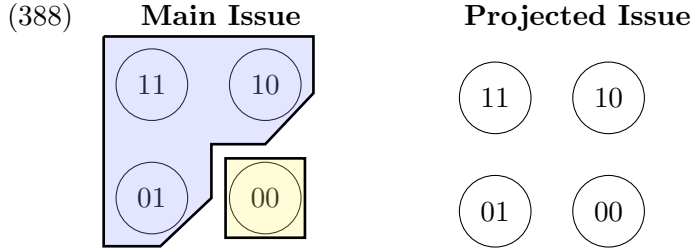
(385)  $\neg_{hi}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales})) \vee$   
 $\neg_{hi} \neg_{hi}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales}))$



Working step-by-step through the tree, we see that the two disjuncts,  $\gamma_1$  and  $\gamma_2$ , are composed straightforwardly, since they are each atomic. Since each disjunct is singleton-denoting, the disjunction in  $\beta$  produces a set of two alternatives as its main issue, with no projected issue. Preposed negation then applies, eliminating the inquisitive contribution of the disjunction altogether in  $\langle\langle\zeta\rangle\rangle$ . Note that it was at this step in the composition that the low negation in the corresponding LONEGQ applied, producing the same single-alternative main issue, but also projecting a set of (pseudo-) pointwise negated alternatives. Finally, the  $Q_{op}$  applies, disjoining the single negative alternative with a single positive alternative. Since  $\langle\langle\zeta\rangle\rangle$  has no proposed or projected alternatives, the projected issue of  $\langle\langle\alpha\rangle\rangle$  is empty, as seen in (388), leaving only the main *yes/no* issue.

(387)

- $\langle\langle\gamma_1\rangle\rangle = \frac{\{ \{w' : \text{L brought tacos in } w'\} \}}{\emptyset}$
- $\langle\langle\gamma_2\rangle\rangle = \frac{\{ \{w' : \text{L brought tamales in } w'\} \}}{\emptyset}$
- $\langle\langle\beta\rangle\rangle = \frac{\{ \{w' : \text{L brought tacos in } w'\}, \{w' : \text{L brought tamales in } w'\} \}}{\emptyset}$
- $\langle\langle\zeta\rangle\rangle = \frac{\{ \{w' : \text{L brought neither tacos nor tamales in } w'\} \}}{\emptyset}$
- $\langle\langle\alpha\rangle\rangle = \frac{\{ \{w' : \text{L brought tacos and/or tamales in } w'\}, \{w' : \text{L brought neither in } w'\} \}}{\emptyset}$



In this section, I have argued that the compositional semantics of HiNEGQs includes an exceptional emphasis on the truth-value of the proposition in question, i.e. verum focus. More precisely, I have argued that HiNEGQs are perceived as emphasizing the truth or falsity of the main *yes/no* issue because their literal content does not make salient any further sub-issues, something which polar questions ordinarily do. This semantics not only accounts directly for a number of observations about HiNEGQs, it also allows for a compositional semantics deriving verum focus from the semantics of *negation*. To my knowledge, this is the first account compositionally relating the meaning of HiNEGQs to negation itself, rather than positing a silent VERUM morpheme (see §5.5 for a detailed comparison with previous accounts). This point is worth stressing since the connection between this meaning and negation appears to be quite consistent cross-linguistically.

## 5.4 The pragmatics of HiNegQs

Building on the two-tiered inquisitive semantics developed in Ch. 4, we have argued that verum focus (under a certain conception of its content) arises from the compositional semantics of double negation. Given this semantics, we turn now to show that the other properties of HiNEGQs — particularly the inference of prior belief — can be derived via pragmatic competition with the corresponding PosQ (§§5.4.1-5.4.2). Having done this, §5.4.3 turns to a body of facts which have been under-appreciated in prior literature on HiNEGQs: negative polar questions with both high and low negation (e.g. ‘Isn’t John not coming?’). Here, we find that the semantics we have developed for high and low negation together with the same pragmatic reasoning correctly predicts what we observe for such questions with no additional assumptions needed.

### 5.4.1 The inference of prior belief arises pragmatically

The core pragmatic property common to all HiNEGQs is what we termed the *inference of prior belief* in §5.1.2. For example, a HiNEGQ like (389a) conveys that the speaker had previously believed or expected that the positive answer had held. The question to be addressed is why this inference arises from the use of a HiNEGQ. The answer, I claim, is that this inference arises from pragmatic competition with other varieties of polar questions, specifically, the corresponding PosQ.<sup>18</sup>

- (389) a. Isn't Bill going to file the report?  
b. **Inference:** Speaker believed or expected that Bill was going to file the report.

A speaker who utters a HiNEGQ could have instead chosen the corresponding PosQ which makes a richer contribution to the discourse since it projects a set of alternatives, allowing further discussion.<sup>19</sup> Relative to the default PosQ, a HiNEGQ *slows down* the conversation, limiting the immediate discussion to the 'yes'/'no' main issue. Indeed, in the single-tiered semantics in §5.3.1, a positive polar question entails a corresponding negative one since each alternative introduced by an inquisitive element in the PosQ will be properly contained by the single alternative in the HiNEGQ where *p* holds in some way or other. We have not defined entailment for two-tiered semantics, but it is clear that the entire contribution of the HiNEGQ is recoverable from that of the PosQ, while the reverse is not true since the fine-grained inquisitive content is not present in the HiNEGQ.

Another way to think about this is that PosQs give greater informational salience to the positive answer by giving it a rich inquisitive structure. In Ch. 4, we saw that this informational asymmetry was responsible for the weak speaker bias often conveyed by PosQs (see also van Rooÿ & Šafářová (2003)). HiNEGQs, on the other hand, exceptionally avoid this customary asymmetry, giving equal prominence to both

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<sup>18</sup>While the details of the pragmatic account we offer are quite different, the basic outline is somewhat parallel to that of Romero & Han (2004). See §5.5 for a detailed comparison.

<sup>19</sup>I assume that the PosQ is the pragmatic competitor since it differs minimally in its form (only differing in the presence or absence of high negation). The one exception to this is a HiNEGQ which also contains low negation, where I take the LoNEGQ to be the pragmatic competitor (see §5.3.3).

answers. While the speaker signals that the negative answer is of unusual importance, she does not assign it more informational salience than the positive answer (as the LONEGQ would do).

The speaker of a HiNEGQ like (389a) signals that she is in a special conversational state where the negative answer is unusually important. At the same time, the speaker has conveyed a desire to limit the immediate discussion to this main issue. To paraphrase, then, the HiNEGQ conveys something like ‘Just tell me whether  $p$  holds, especially if the answer is negative.’ The first part of this paraphrase is the literal semantics we have ascribed to *verum focus*. The second part arises from the addressee’s pragmatic reasoning about why the speaker avoided the simpler POSQ.

While the speaker of a HiNEGQ conveys that the informational salience of the negative answer is heightened, she does not signal that the negative answer is what she expects/desires, as the LONEGQ would do. Rather, the speaker has in fact conveyed that finding out the negative answer would be unusually important, despite not being particularly expected or desired more than the positive one. The obvious scenario in which this contribution is non-contradictory is if the speaker previously believed the positive answer. In this case, the negative response is not particularly expected/desired, but would be very important to the speaker, since it would force her to *revise* this prior belief.

Summing up, I have argued that the combination of the literal semantics for HiNEGQs and pragmatic competition with corresponding POSQs produces the inference of prior belief. The *positive* polarity of the prior belief arises because it is the *negative* response which is given added informational salience. We will see the same reasoning with the opposite polarities in §5.4.3 when we examine HiNEGQs which also contain low negation. In the following section, we will examine in more detail what kinds of discourse contexts are rational ones in which to convey such a prior belief while asking a question.

### 5.4.2 Contextual evidence and suggestions

So far, we have seen that uttering a HiNEGQ has two primary effects: conveying a prior belief that  $p$  and simultaneously asking the addressee whether or not  $p$  holds. While these two components are not strictly speaking contradictory, there is an inherent tension between them. As such, a HiNEGQ can only be felicitously uttered under particular discourse conditions, as discussed in §5.1.4. Now that we have characterized both main effects made by HiNEGQs, we are in position to examine their felicity conditions. In §5.1.4, we identified two types of scenarios where HiNEGQs are felicitous: (i) epistemic conflicts and (ii) suggestions.

#### Epistemic Conflicts

The first type of context in which HiNEGQs are felicitous is when there is recently available *contextual evidence*, in the sense of Büring & Gunlogson (2000) which poses an *epistemic conflict* with the speaker's prior belief. Consider, for example, the dialogue in (390), slightly modified from one in Romero & Han (2004).

- (390) a. A: Ok, now that Stephan has come, we are all here. Let's go!  
b. S: Isn't Jane coming?  
c. **Inference:** S believed or expected that Jane is coming.  
d. **Contextual evidence:** A has said that the entire group is present despite Jane's absence.

In (390b), the speaker requests that the addressee weigh in on the issue of whether or not Jane is coming. At the same time, by using the HiNEGQ, she conveys her prior belief/expectation (390c). This combination is rational in this scenario since there is publicly available contextual evidence in (390d) which has cast doubt on the speaker's prior belief. The HiNEGQ, then, accomplishes two related functions in this context. First, it points out the speaker's (likely private) prior belief, thus making public the speaker's epistemic conflict. Second, the question's literal content invites the addressee to resolve the conflict, by answering the question.

In the absence of any specific indication to the contrary (such as an NPI or other scalar term such as *even*), the speaker is taken to have a strong bias to resolve this

issue in favor of the positive alternative. As discussed above, this bias arises because of a general dynamic in discourse: all else being equal, speakers prefer to maintain their current belief state. Belief revision is, of course, possible, but is not the normal state of affairs, therefore requiring explicit marking to be achieved, e.g. with an NPI. Note that one sentence the speaker might have used in (390) to achieve the first function is to directly encode her past belief with a sentence like (391). While such a move would make public the epistemic conflict, it differs in that it does not display any deference to the addressee in resolving the conflict.

(391) (b') S: I thought Jane was coming.

In contrast, consider a minimally different situation with no contextual evidence conflicting with the speaker's prior belief as in (392). Here, the speaker conveys that she has a prior belief that Jane is coming and simultaneously asks the speaker whether Jane is coming. With no evidence that her prior belief may be incorrect, it is odd for the speaker to ask the addressee whether her belief holds. We can of course add further assumptions to the context which would make the question in (392b) felicitous (e.g. if Stephen normally gives Jane a ride). This, however, simply confirms the importance of contextual evidence to the felicity of such examples.

(392) a. A: Stephan has arrived.

b. S: #Isn't Jane coming?

c. **Inference:** S believed or expected that Jane is coming.

## Suggestions

The second type of scenario where HiNEGQs are felicitous is as *suggestions*, as in (393). The speaker again conveys a prior belief that the positive answer would hold (in this case, that Frege has already reviewed for the journal). The context does not contain any information that would meet Büring & Gunlogson (2000)'s definition of compelling contextual evidence. Why then can the HiNEGQ be felicitously used in this context and why does it have the feeling of a *suggestion* in such a context?



(393) **Scenario:** Dialog between two editors of a journal in 1900.

- a. A: I'd like to send this paper out to a senior reviewer, but I'd prefer somebody who has experience with our regulations.
- b. S: **Hasn't Frege already reviewed for us?** He'd be a good one.

While there is no compelling contextual evidence in such scenarios, Romero & Han (2004) claim that such scenarios nonetheless involve an epistemic conflict, but of a different sort. Rather than having evidence against the prior belief, they claim, the speaker in such cases lacks sufficient grounds in order to felicitously assert the prior belief. While this is plausibly true of (393) and of the other examples they discuss, I do not believe this is a necessary condition in the general case. One class of examples which do not seem to fall in this category arise with predicates of personal taste, as in (394).

- (394)
- a. Isn't my baby beautiful?
  - b. Don't you love the smell of jasmine?
  - c. Isn't this pie delicious?

Here, there does not seem to be any clear sense in which the speaker lacks sufficient evidence to have asserted the positive answer. The mother in (394a) can (and, in fact, probably is) quite confident in the baby's beauty, enough so to make the assertion 'My baby is beautiful'. Even if the addressee is publicly known to find the baby beautiful, the question still remains felicitous. Similarly, (394c) can be uttered felicitously in a context where both speaker and addressee are already clearly enjoying the pie. Beyond predicates of personal taste, we can construct examples where the speaker is quite sure of the truth of the proposition in question. For example, speaker A can utter the questions in (395) in order to point out to the addressee, B, what follows from two premises, neither of which need be in doubt.

- (395) **Context:** The speaker is trying to convince the addressee that Hesperus is Phosphorus based upon two premises which are presumed to be shared.
- a. A: Isn't Hesperus the same star as the Evening Star?
  - b. B: Yes.

- c. A: Isn't Phosphorus the same star as the Evening Star?
- d. B: Yes.
- e. Therefore, you must believe that Hesperus is the same star as Phosphorus.

Here, again, there does not seem to be any epistemic conflict and yet the HiNEGQ is felicitous and has the feeling of a suggestion. To understand such cases, we must consider the discourse effects of questions and assertions in greater detail. While questions are fundamentally about information exchange, a question is not directly an attempt to acquire information. Rather, it is an attempt to bring it about that the addressee make an *assertion* containing a given piece of information. In the epistemic conflict cases, it is this piece of information which the questioner seeks (since the information itself was in doubt). In suggestions, however, the speaker's intention is to bring about the addressee's *assertion* itself. That is, the speaker's goal is to bring it about that the addressee is *publicly committed* to believing the proposition in question.

The distinction between the two cases reflects Stalnaker (1978)'s distinction between the 'essential effect' an assertion makes and various 'secondary effects'. The essential effect of an assertion, according to Stalnaker, is "to reduce the context set in a particular way", i.e. to update the common ground with a particular piece of information. In cases of epistemic conflict, it is this essential effect that the speaker intends to bring about by having the addressee assert either of the two expected answers.

In suggestion contexts, however, it is a secondary effect of the addressee's assertion which the speaker seeks to bring about. More specifically, we follow Gunlogson (2001) and others in taking one such secondary effect of assertion to be adding the informational content of the sentence to the speaker's list of *public commitments*. In using a HiNEGQ as a suggestion, the speaker seeks to bring it about that that the addressee asserts the positive answer and therefore adds it to their public commitment list. The inference of prior belief indicates which answer the speaker believes, and in the absence of any evidence to the contrary, she expects the addressee to assert this same answer.

For example, in the discourse in (395), the speaker's intention is to point out to the addressee that a certain conclusion, (395e), from the premises which the speaker already believes. The premises themselves need not be in any doubt. In the examples

from (394), the speaker wants to bring it about that the addressee assert that the baby is beautiful or that the pie is tasty. Here too, the speaker need not be in any doubt as to the beauty of the baby or the deliciousness of the pie in order for the suggestion to be felicitous.

Summing up, we have seen that HiNEGQs are felicitous in two types of contexts: (i) those where there is an epistemic conflict due to some piece of recent contextual evidence and (ii) as suggestions, where no such evidence is required. We have related these two cases to Stalnaker (1978)’s distinction between the essential effect of assertion and secondary effects.

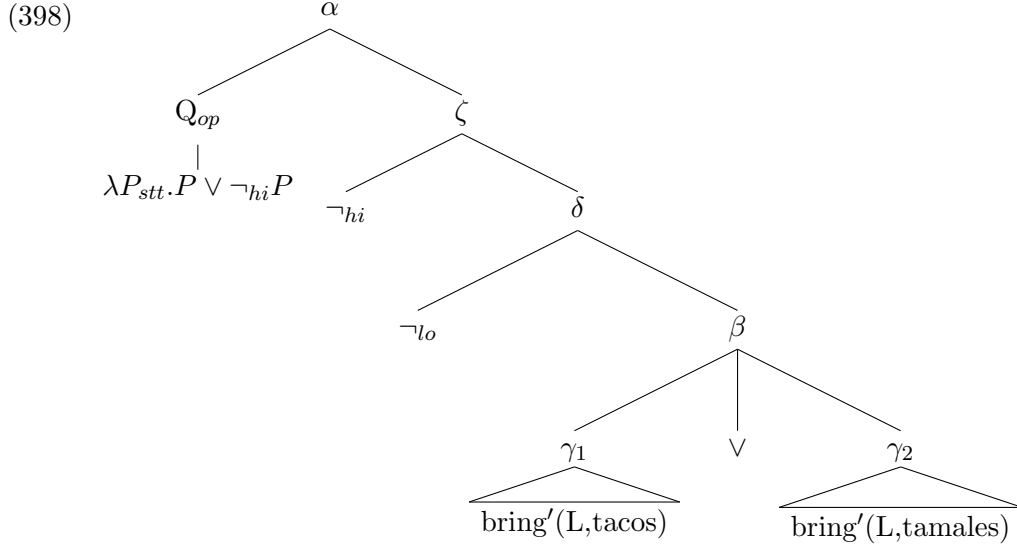
### 5.4.3 Questions with both high and low negation

In §§5.4.1-5.4.2, I have argued that the perceived meaning of HiNEGQs is partially semantic and partially pragmatic. In this section, we examine a previously understudied class of HiNEGQs which provides supporting evidence for this divide: polar questions with both high and low negation (HiLoNEGQs), such as (396). Semantically, our account predicts that such questions will have the same denotations as other HiNEGQs since high negation still eliminates negative alternatives the same as positive ones. Pragmatically, the account predicts that such questions should give rise to all of the same kinds of inferences as other HiNEGQs, but that they should be of the opposite polarity. As we will see, both predictions are borne out; HiLoNEGQs exhibit the *verum* focus effect and convey that the speaker previously believed or expected the *negative* answer to hold.

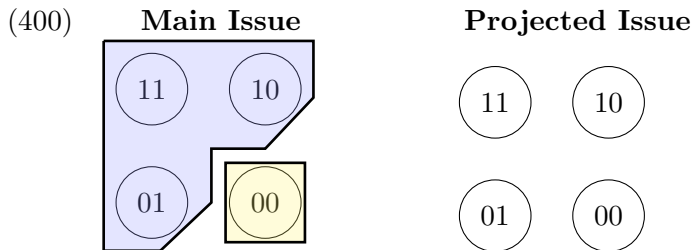
(396) Didn’t Lucia not bring tacos or tamales?

The logical form for a question like (396) is the same as the corresponding LoNEGQ, but with an additional high negation occurring on top of the question radical, as in (398). As such, the composition (working upward) proceeds the same as a LoNEGQ through (399d). At this point, high negation applies, again eliminating the inquisitive content of the formula to which it applies. The result is that the top-level meaning in (399f), and pictured in (400), is identical to any other HiNEGQ.

$$(397) \quad \neg_{hi} \neg_{lo} (\text{bring}'(\text{L}, \text{tacos}) \vee \text{bring}'(\text{L}, \text{tamales})) \vee \\ \neg_{hi} \neg_{hi} \neg_{lo} (\text{bring}'(\text{L}, \text{tacos}) \vee \text{bring}'(\text{L}, \text{tamales}))$$



$$(399) \quad \begin{aligned} \text{a. } \langle\langle \gamma_1 \rangle\rangle &= \frac{\{ \{w' : \text{L brought tacos in } w'\} \}}{\emptyset} \\ \text{b. } \langle\langle \gamma_2 \rangle\rangle &= \frac{\{ \{w' : \text{L brought tamales in } w'\} \}}{\emptyset} \\ \text{c. } \langle\langle \beta \rangle\rangle &= \frac{\{ \{w' : \text{L brought tacos in } w'\}, \{w' : \text{L brought tamales in } w'\} \}}{\emptyset} \\ \text{d. } \langle\langle \delta \rangle\rangle &= \frac{\{ \{w' : \text{L brought neither tacos nor tamales in } w'\} \}}{\{ \{w' : \text{L didn't bring tacos in } w'\}, \{w' : \text{L didn't bring tamales in } w'\} \}} \\ \text{e. } \langle\langle \zeta \rangle\rangle &= \frac{\{ \{w' : \text{L brought tacos and/or tamales in } w'\} \}}{\emptyset} \\ \text{f. } \langle\langle \alpha \rangle\rangle &= \\ &\frac{\{ \{w' : \text{L brought tacos and/or tamales in } w'\}, \{w' : \text{L brought neither in } w'\} \}}{\emptyset} \end{aligned}$$



We predict, then, that HiLoNEGQs will also exhibit verum focus with an inference of prior speaker belief arising pragmatically, as seen in (401). The prior belief, however, is in this case a *negative* one, as paraphrased in (401c).

- (401) a. A: Ok, Stephan is here, so we are waiting on one more person, Jane.  
 b. S: Isn't Jane not coming?  
 c. **Inference:** S believed or expected that Jane is not coming.

This is expected under the pragmatic explanation we have given in previous sections. While low negation has no semantic effect in these cases, it does have a pragmatic effect: determining which of the various semantically richer polar questions is sufficiently similar in form to serve as its pragmatic competitor. For ordinary HiNEGQs above, this was the POSQ, since it differs only in one syntactic element: the presence of high negation. With the additional presence of low negation, however, a question like (401b) is most similar in form not to the POSQ, but to the LoNEGQ. As such, HiNEGQs with additional low negation are perceived as giving additional salience to the *positive* answer, giving rise to the inference that the questioner previously believed  $\neg p$ , as in (401c). The reasoning is the same as above, only the polarities are reversed.

Just as we saw for ordinary HiNEGQs, HiLoNEGQs are felicitous in two sorts of scenarios: epistemic conflicts and as suggestions. We have already seen the epistemic conflict case in (401), where some piece of compelling contextual evidence casts doubt on the prior belief. The HiLoNEGQ seeks to remove this doubt by asking the addressee to weigh in on the issue. Parallel to ordinary HiNEGQs, the speaker is assumed by default to strive to maintain her previous belief state, giving rise to a strong bias on the part of the speaker. In this case, however, the prior belief is negative, so it is the negative main alternative which the speaker is taken to prefer.

Like HiNEGQs, HiLoNEGQs can readily serve as suggestions, as noted by Romero & Han (2004) (p. 619) and seen in their example in (402).

- (402) **Scenario:** Dialog between two editors of a journal in 1900  
 a. A: I'd like to send this paper out to a senior reviewer, but I'd prefer somebody new.  
 b. S: **Hasn't Frege not reviewed for us yet?** He'd be a good one.

In one significant respect, however, HiLoNEGQs differ from other HiNEGQs: there is no counterpart to Ladd’s ambiguity. For polar questions with only high negation, we saw in §5.1.3 that the presence of an NPI serves to override the speaker’s default bias towards retaining her prior belief. Since the polarity of the prior belief is reversed in HiLoNEGQs, we might expect PPIs to have a parallel effect, overriding the default negative bias. What we find, however, is that PPIs are not licensed in this environment, as seen in (403), and correspondingly that there is no analog to the ‘inner’/‘outer’ distinction in HiLoNEGQs.

- (403) a. #Isn’t John not *rather* tall?  
 b. #Isn’t Bill not *a little bit* sorry?

Regardless of how we account for the lack of PPIs, here, this observation provides further support that the ‘inner’/‘outer’ distinction is indeed a fact about NPIs themselves. In contrast, we will see in §5.5.2 that Romero & Han (2004)’s account wrongly predicts an ambiguity in these cases, since they treat polarity items merely as diagnosing an independent ambiguity.

The properties of HiLoNEGQs follow from the account we have given of HiNEGQs in general with no further assumptions. While we predict them to have identical issue-suppressing semantics as HiNEGQs, those with low negation as well are most similar in form to LoNEGQs and therefore trigger pragmatic inferences of the opposite polarity. Such questions, then, provide confirmation that the positive polarity of the prior belief in ordinary HiNEGQs does indeed arise from pragmatic competition with the corresponding PosQ, as we have argued.

## 5.5 Comparison with prior approaches

In this chapter, I have presented a comprehensive semantic/pragmatic account of the inferences associated with negative polar questions. While many previous papers have had insights into particular aspects of the meaning/use of HiNEGQs as discussed in preceding sections, Romero & Han (2004) is the only paper, to my knowledge, which attempts a similarly comprehensive account of HiNEGQs. Here, we review their account in §5.5.1 and compare it to the present account in §5.5.2. While the two accounts more

or less agree in their division of labor between semantics and pragmatics, we find that the current account has several empirical advantages over Romero & Han (2004)’s and is compositional in a way that their account is not. Finally, in §5.5.3, I develop a multidimensional version of Romero & Han (2004)’s account (following a suggestion in Romero (2005)), and show that such a fix fails, at least without significantly altering the basic structure of Romero & Han (2004)’s account, including the content of verum focus.

### 5.5.1 Romero & Han (2004)’s account

One of the ways in which the present account builds on Romero & Han (2004) is the central role that verum focus plays in HiNEGQs. Based upon this semantics, Romero & Han (2004) aim to derive other aspects of HiNEGQs via pragmatic reasoning about why a rational speaker would employ verum focus in a question. While the two accounts share this basic architecture, they differ in three major respects: (i) the semantic content associated with verum focus, (ii) how this content arises compositionally, and (iii) what pragmatic mechanisms are relied on to derive other properties of HiNEGQs.

#### Semantics

As noted by Höhle (1992), the central puzzle of verum focus is to account for the fact that such sentences feel like they are paraphrasable with expressions like ‘It is true that ...’ and ‘It is the case that ...’ even though these expressions appear to be truth-conditionally vacuous. To avoid this problem of vacuity, Romero & Han (2004) propose that verum focus is a ‘meta-conversational’ epistemic modal which is used to “assert that the speaker is certain that  $p$  should be added to the Common Ground”. They formalize this meaning as an operator VERUM, as in (404) and the shorthand notation in (405).

$$(404) \quad \llbracket \text{VERUM}_i \rrbracket^{gx/i} = \lambda p_{st} \lambda w. \forall w' \in \text{Epi}_x(w) [\forall w'' \in \text{Conv}_x(w') [p \in CG_{w''}]]$$

$$(405) \quad \llbracket \text{VERUM}_i \rrbracket^{gx/i} = \text{FOR-SURE-CG}_x$$

## Composition

Compositionally, Romero & Han (2004) assume a covert VERUM morpheme in the logical form of HiNEGQs. Their account takes the ‘inner’/‘outer’ distinction to be a semantic ambiguity inherent to HiNEGQs (see §5.1.3). In order to capture this distinction, they argue that HiNEGQs are always ambiguous, as represented schematically in (406). The two readings created by this covert ambiguity are Romero & Han (2004)’s way to directly realize Ladd (1981)’s analytical intuition that negation in ‘inner’ uses of HiNEGQs is somehow part of the proposition in question, while in ‘outer’ uses, it is ‘outside’ the proposition in question (and therefore vacuous).

- (406) a.  $[Q_{op} [\neg [VERUM [\varphi]]]] \quad \Leftarrow \text{‘Outer’ negation}$   
 b.  $[Q_{op} [VERUM [\neg [\varphi]]]] \quad \Leftarrow \text{‘Inner’ negation}$

Based on these logical forms, they argue that the correlation of polarity items with the inner/outer distinction follows. Though they do not spell out the details of the licensing, the assumption is that negation licenses NPIs in ‘inner’ HiNEGQs, but that VERUM intervenes in ‘outer’ HiNEGQs, preventing NPIs, but allowing PPIs. The blocking behavior of VERUM is assumed by analogy with ordinary (i.e. non-‘meta-conversational’) modals like *certain*, which show a similar blocking effect in assertions.

## Pragmatics

The third main component of the analysis is a pragmatic explanation for the inference of prior belief. Romero & Han (2004) propose that since VERUM is a ‘meta-conversational’ operator, its use is governed by the conversational principle in (407). Given this principle, then, a HiNEGQ can only be used when ‘necessary’, i.e. in cases of epistemic conflict or as suggestions<sup>20</sup>.

- (407) **Principle of Economy:** ‘Do not use a meta-conversational move unless necessary (to resolve epistemic conflict or to ensure Quality)’

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<sup>20</sup>The ‘or to ensure Quality’ disjunct is intended to cover the suggestion uses of HiNEGQs given Romero & Han (2004)’s claim that such cases always involve speakers who lack ground to assert a given proposition. As we have already seen in §5.4.2, however, this condition does not seem to be a necessary one.



The fact that the speaker’s prior belief is derived based on certain assumptions about what a speaker of a certain question *intends* as follows:

(408) **Romero & Han (2004)’s explanation of the positive prior belief:**

When the intent of a question is to ask the addressee for conclusive evidence for a proposition  $p$ , that proposition  $p$  is the addressee’s implied proposition and the complement proposition  $\neg p$  is the epistemic implicature of the speaker. When the intent of a question is to ask the addressee for any possible (weak or strong) doubts about a proposition  $p$ ,  $p$  is the original belief of the speaker and its complement  $\neg p$  is the addressee’s proposition.

### 5.5.2 Three (related) problems

Having summarized Romero & Han (2004)’s account of HiNEGQs, I turn now to examine three interrelated problems for their account which the current account solves. First, the semantics which Romero & Han (2004) assign verum focus makes incorrect predictions regarding the answers to HiNEGQs (as noted by Romero (2005) and Reese (2007)). Second, the logical forms which the account requires are not tightly related to the morphosyntactic form of HiNEGQs. Third, their account of the ‘inner’/‘outer’ distinction predicts unattested ambiguities.

#### The content of verum focus

One of the ways that Romero & Han (2004)’s account constitutes a large step forward in our understanding of the meaning/use of HiNEGQs is its recognition of the central role played by verum focus. However, Romero & Han (2004)’s implementation of Verum Focus as a ‘meta-conversational’ epistemic modal wrongly predicts the meaning of ‘yes’/‘no’ answers. As detailed by Romero & Han (2004), the result of this semantics is that HiNEGQs are predicted to partition the logical space into two alternatives corresponding to degrees of certainty over the proposition in question, as in (409) (on the ‘outer’ reading).

$$(409) \quad \{ \text{FOR-SURE-CG}_x(\varphi), \neg \text{FOR-SURE-CG}_x(\varphi) \}$$

This partition, however, predicts that the answers to HiNEGQs, as revealed by particle answers like ‘yes’ and ‘no’, should correspond to degrees of certainty. What we

find, though, as noted by Romero (2005), is that ‘yes’ and ‘no’ pick out the exact same sets of worlds as they do in corresponding POSQs. For example, if ‘yes’ and ‘no’ referred to the proposition  $\text{FOR-SURE-CG}_x(\varphi)$  as paraphrased in (410b), then responses like (410c) should be possible. While they clearly do emphasize truth value, HINEGQs are fundamentally about the same main ‘yes’/‘no’ issue as other varieties of polar question, and a modal treatment of verum focus does not predict this.

- (410) a. Isn’t John baking a cake?  
 b. ‘Is it for sure that we should add “John is baking a cake” to the common ground?’  
 c. # No, but it’s possible. // # No, but he might be.

Beyond this empirical problem, it is not clear that the content Romero & Han (2004) ascribe to VERUM matches the intuition that verum focus involves *emphasis* on the truth or falsity of a given proposition.<sup>21</sup> Emphasizing a proposition’s truth-value and being certain about it are distinct (though pragmatically related) notions. Romero & Han (2004)’s account plainly treats verum focus as involving certainty of some sort, whereas the present account is truly about *emphasis*. In assertions, the two notions are clearly related. A cooperative speaker should only make an assertion that  $p$  while emphasizing the truth of  $p$  if she is certain that  $p$  is true (or that it should be added to the c.g.). Nonetheless, I believe that the two are distinct notions and the meanings of HINEGQs and their answers provide empirical support for a semantics of verum focus as emphasis, not certainty.

## Compositionality

A second problem for Romero & Han (2004)’s account is that it makes use of logical forms which are stipulative in several respects. First, the verum focus effect in

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<sup>21</sup>Not speaking German, I am not sure exactly how tightly this paraphrase relates to Höhle (1992)’s original intuition. Gutzmann & Castroviejo Miró (2009) describe his intuition as being that verum focus conveys “an emphasis on the truth of the propositional content of the sentence”. On the other hand, Romero & Han (2004) characterize his position as being that the function of verum focus “is to emphasize *or insist* on the truth or falsity of the proposition” [italics are mine]. Depending on what is meant by ‘insist’, these potentially represent quite different intuitions.

their account arises solely from a covert operator, VERUM, whose presence in the LF is stipulated (a fact explicitly acknowledged by Romero & Han (2004)). The result of this is that *negation* plays no compositional role, despite its ubiquity in such questions across languages (as discussed in §5.1). That is, I am not aware of a language which forms such questions using an overt VERUM operator (whether or not negation is also present). Negation is consistently present in such questions and this connection is a key explanandum for any theory of HiNEGQs. An account of HiNEGQs should not only explain why they have the semantics they have, it should explain why they are so fundamentally different from the other types of polar questions in the first place.

Not only does Romero & Han (2004)’s account posit a covert VERUM operator, it also posits a scopal ambiguity between VERUM and negation itself.<sup>22</sup> There is no external evidence supporting this ambiguity, however, since the most comparable overt element under their account — one reading of the adverb ‘really’ — does not exhibit such an ambiguity. Furthermore, such an ambiguity is clearly untenable for cases of negative inversion. For example, a sentence like (411a) plainly lacks a reading like (411b) where negation takes scope outside of VERUM.

- (411) a. Never has Bill eaten pesto.  
 b. #‘It’s not for sure that we should add the proposition “Bill has eaten pesto.” to the c.g.’

A related problem arises for Romero & Han (2004) in HiNEGQs which also have low negation. Though they do not discuss such questions in detail (indeed, they are only discussed as foils for ‘inner’ HiNEGQs), their account make clear predictions. Semantically, Romero & Han (2004) predicts that HiNEGQs with low negation should have the same denotations as corresponding questions without low negation. For them, however, this means that they predict that such questions will have two readings derived from the scopal ambiguity between VERUM and negation. Since such questions involve preposed negation, they contribute a VERUM operator in the logical form in addition to their negation. On top of this, low negation contributes another negation, leading to

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<sup>22</sup>The motivation for this is to capture the ‘inner’/‘outer’ distinction. We discuss the empirical problems with this approach to Ladd’s ambiguity shortly.

the two logical forms for a question like (401b), as in (414)<sup>23</sup>.

(412) **Romero & Han (2004)’s predicted LFs for HiLoNegQs:**

- a.  $[Q[VERUM[\neg[\neg[\phi]]]]]$
- b.  $[Q[\neg[VERUM[\neg[\phi]]]]]$

As in ordinary HiNEGQs, the presence of negation outside of VERUM has no effect since the Q-operator ensures that both the positive and negative alternatives will be present (and double-negation is vacuous for them). Furthermore, the vacuity of double negation in their account ensures that the LF in (a) is equivalent to the ‘outer’ reading of ordinary HiNEGQs (despite the fact that the relative scope of the negation and VERUM contributed by high negation in this reading is the one which ordinarily gives rise to the ‘inner’ reading). The LF in (b) receives the same interpretation as an ordinary ‘inner’ HiNEGQ does for them (again, despite the scope reversal), since the negation outside of VERUM has no effect. For Romero & Han (2004), then, the additional presence of low negation ultimately yields the same two readings as in questions without it, differing only in that its presence reverses which readings arise from which relative scope of  $\neg$  and VERUM.

While they do not discuss the licensing of PPIs in sufficient detail to know whether they should be licensed here, this is not actually relevant to their account. For them, the ‘inner’/‘outer’ distinction is not a fact about polarity items at all, but rather a fact about HiNEGQs themselves. Even if we could correctly rule out PPIs in such examples, Romero & Han (2004) still predict two readings for such questions.

This prediction does not appear to be upheld. Such questions unambiguously signal that the speaker has a prior belief that  $\neg p$  and a bias for the addressee to resolve the question negatively as well. The missing reading is one where the speaker still conveys a prior negative belief, but is sufficiently swayed by some contextual evidence that she wishes to convey a bias towards resolving the issue positively, thus revising her beliefs. Revisiting our example above, Romero & Han (2004)’s prediction is that the question in (413b) can be used in a contradiction scenario like (413a) to convey that the

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<sup>23</sup>This is under the assumption that VERUM always scopes over low negation. If not, a third LF is predicted with both negations outside of VERUM. Such a reading, however, would have the same interpretation as the (a) reading, so we ignore this.

speaker wishes it to be agreed upon that Jane is, in fact, coming. That is, the predicted reading which seems to be missing is one paraphrased by (413c). For the speakers I have consulted, (413b) simply cannot be used to mean this.

(413) **Scenario:** S previously believed that Jane was not coming, but is convinced this belief was mistaken in light of A's claim.

a. A: Ok, Stephan is here, so we are waiting on one more person, Jane.

b. S: #Isn't Jane not coming?

c. S: Oh, is Jane coming?

### NPIs and 'inner' HiNegQs

In §5.1.3, I argued that the 'inner'/'outer' distinction was not due to some ambiguity intrinsic to HiNegQs, but rather to the semantics and/or pragmatics of NPIs themselves. That is, I have argued that 'inner' HiNegQs arise only in the presence of an NPI or a similar operator, such as *even*. An account of 'inner' HiNegQs, then, will require not only an account of HiNegQs themselves, but also a theory of the syntax, semantics, and pragmatics of the various NPIs which give rise to 'inner' readings. As such, it is beyond the scope of the present work to provide a full characterization of the meaning of 'inner' HiNegQs and the licensing of NPIs in HiNegQs. Since Romero & Han (2004) claim to provide such an account, a few words are in order regarding their account.

Romero & Han (2004)'s analysis holds that NPIs are licensed under the 'inner' reading of a HiNegQ, as schematized in (414a), but not under the 'outer' reading in (414b). While the details of the licensing are not spelled out, the account relies on two tacit assumptions. First, the account assumes that local negation is the only possible licenser for NPIs in HiNegQs. Second, the account takes an intervening VERUM to be sufficient to block this licensing. As we will see, neither claim is unproblematic.

(414) NPI-licensing in Romero & Han (2004):

- |                                       |  |
|---------------------------------------|--|
| a. $[Q[\text{VERUM}[\neg[\varphi]]]]$ | $\Leftarrow$ NPIs licensed in $\varphi$ by $\neg$        |
| b. $[Q[\neg[\text{VERUM}[\varphi]]]]$ | $\Leftarrow$ NPI-licensing in $\varphi$ blocked by VERUM |

First, it is far from clear that negation should be the only possible licenser of NPIs in HiNEGQs since a wide range of NPIs are licensed without negation in positive polar questions with no negation present (aside from that of the  $Q_{op}$ ). Romero & Han (2004) (and Ladd (1981) before them) focus exclusively on *either* to make this case, but *either* is the exception rather than the rule.<sup>24</sup> Many NPIs are licensed in POSQs, as seen in (415), and discussed by Krifka (1995), Guerzoni (2004), and many others (see also §4.2.1 for further discussion). Moreover, the presence of NPIs often leads to a negative bias of some sort in these cases (see Asher & Reese (2005) for a recent discussion) despite the fact that POSQs, like HiNEGQs, otherwise have a positive bias of some sort. Since NPIs are licensed in polar questions without negation, it seems entirely possible that negation is not responsible for all NPI-licensing in HiNEGQs either.

- (415) a. Does Juan *lift a finger* to help you in your time of need?  
 b. Will Bill *ever* learn his lesson?  
 c. Do you come to class *at all anymore*?  
 d. Are you sure Bill ate *anything*?

The second component of Romero & Han (2004)’s account of NPI licensing in HiNEGQs is the claim that the intervening VERUM in the proposed LFs for ‘outer’ HiNEGQs blocks NPI licensing by negation (and by whatever licenses NPIs in polar questions more generally). The basis for this claim, they argue, is that overt modals like *certain* block NPIs in assertions like their (416) (NB: the relevant missing reading is one where *either* takes scope below *certain*).

- (416) \*It is not certain [that Jane is coming either]

However, this asymmetry is not always the case with modals in *questions*, as we saw in (415d). More importantly, Romero & Han (2004)’s account relies elsewhere on there being significant differences between VERUM and ordinary epistemic modals. For example, the special ‘meta-conversational’ status of VERUM is what causes it — but not other modals — to be subject to a special pragmatic constraint in (407). The

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<sup>24</sup>Furthermore, it should be noted that a significant subset of speakers with whom I have consulted reject HiNEGQs with ‘either’, instead preferring the declarative ‘Jane isn’t coming either?’ with rising intonation. These speakers nonetheless accept examples with other NPIs.

special nature of VERUM is also invoked to explain the contrast between it and true epistemic modals in first-person uses such as their examples in (417).

- (417) a. ? I am sure I am tired.  
 b. I really am tired.

Given that we have seen reasons to doubt that a modal semantics is right for VERUM at all, this connection is all the more tenuous. It should be noted also that if VERUM's contribution is indeed something other than at-issue meaning (as discussed below), the situation is worse yet. Following Horn (2002), much recent work on the licensing of polarity items has argued that NPI-licensing is sensitive primarily or exclusively to at-issue content. If VERUM is taken to contribute non-at-issue content, it is not clear that it should have any effect on the licensing of polarity items at all.

### 5.5.3 A multidimensional fix?

In response to the problem with 'yes'/'no' answers (e.g. the data in (410c)), the conclusion of Romero (2005) alludes to a potential remedy: multidimensionality. In particular, Romero (2005)'s idea is that the contribution of VERUM is not part of the at-issue assertion, but rather is a conventional implicature in the sense of Potts (2005). The idea seems plausible enough in the case of assertions, as schematized in (418). The proposition itself would be the at-issue content of the speaker's utterance, while the verum focus inference occurs as a conventional implicature, which I roughly paraphrase as in (418c) (see Gutzmann & Castroviejo Miró (2009) for a detailed compositional implementation).

- (418) Multidimensional interpretation of a formula [ VERUM [  $\varphi$  ]]
- a. **At-issue:**  $\varphi$
  - b. **CI:** FOR-SURE-CG<sub>x</sub>( $\varphi$ )
  - c. 'It being for sure that we should add  $\varphi$  to the cg, (I assert that)  $\varphi$ '

Applying this idea to questions, however, is less than straightforward. Though Romero (2005)'s suggestion is intended to account for HiNEGQs, she explains it using assertions, so it is not entirely clear how it is intended to apply to questions. The

basic question is what proposition(s) are to serve as argument(s) for VERUM. Using Romero & Han (2004)'s LFs in (419) and no other changes, yields the interpretations in (420-421).

- (419) a.  $[Q_{op} [\neg [VERUM [\varphi]]]] \Leftrightarrow \text{'Outer' negation}$   
 b.  $[Q_{op} [VERUM [\neg [\varphi]]]] \Leftrightarrow \text{'Inner' negation}$

(420) Multidimensional interpretation of (419a):

- a. **At Issue:**  $\{\varphi, \neg\varphi\}$   
 b. **CI:** FOR-SURE-CG<sub>x</sub>( $\varphi$ )  
 c. 'It being for sure that we should add  $\varphi$  to the cg, does  $\varphi$  hold?'

(421) Multidimensional interpretation of (419b):

- a. **At Issue:**  $\{\varphi, \neg\varphi\}$   
 b. **CI:** FOR-SURE-CG<sub>x</sub>( $\neg\varphi$ )  
 c. 'It being for sure that we should add  $\neg\varphi$  to the cg, does  $\varphi$  hold?'

This solves the problem with 'yes'/'no' answers since the at-issue content of the question on both readings is the same as in the case of the corresponding POSQ, rather than partitioning the logical space according to degrees of certainty. However, there does not seem to be any sense in which we want to say that a HiNEGQ entails that it is certain that we ought to add one answer or the other to the common ground. While a speaker of a HiNEGQ does indeed convey a prior belief that the positive answer held, such questions are often used in scenarios where this belief has been called into question. Moreover, HiNEGQs are often genuine information-seeking questions, displaying the customary deference to the authority of the addressee in resolving the issue at-hand. This implementation clearly yields the wrong result, at least without significantly altering the content of VERUM.

Another multidimensional option which we might consider<sup>25</sup> would be to have the interpretation of the outer reading of a HiNEGQ be something more like (422).

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<sup>25</sup>The brief discussion in Romero (2005) seems to suggest that this second option is what she has in mind, though it is not entirely clear.



(422) Multidimensional interpretation of (419a) with augmented LF

**At Issue:**  $\{ \varphi, \neg\varphi \}$

b. **CI:**  $\{ \text{FOR-SURE-CG}_x(\varphi), \neg\text{FOR-SURE-CG}_x(\varphi) \}$

c. ‘It being for sure that we should add either  $\varphi$  or  $\neg\varphi$  to the cg, does  $\varphi$  hold?’

There are two problems which I see for such an account, at least under the basic framework of Romero & Han (2004). First, the obvious way to achieve this result compositionally would be to have VERUM occur outside of the question in logical form, (423-424), applying to the question meaning in a pointwise manner. Once we have posited a covert VERUM morpheme, there doesn’t seem to be any inherent harm in inserting it outside the  $Q_{op}$ . In order to get the right meaning for the ‘outer’ HiNEGQ, however, we have to remove negation from the logical form altogether, as in (423). This clearly seems to a step backwards in terms of compositionality since this is the only overt element present in the question across languages.

(423)  $[ \text{VERUM} [ Q_{op} [ \varphi ] ] ]$   $\Leftarrow$  ‘Outer’ negation

(424)  $[ \text{VERUM} [ Q_{op} [ \neg [ \varphi ] ] ] ]$   $\Leftarrow$  ‘Inner’ negation

The second problem is that the non-at-issue/CI meaning which this approach would seem to require is itself *inquisitive*. In examining the best-studied case of CI content — appositive relative clauses — we argued (Ch. 3) that these make a contribution which is inherently non-inquisitive. On the other hand, the CI-content this approach requires would seem to be inquisitive. One potential way out of this concern is proposed in recent work by Gutzmann & Castroviejo Miró (2009), who propose the semantics for VERUM as in (425).

(425) Gutzmann & Castroviejo Miró (2009)’s semantics for VERUM:

$\llbracket \text{VERUM}(\varphi) \rrbracket = \text{Speaker wants to downdate } ?\varphi \text{ from QUD}$

Under this semantics, then, Gutzmann & Castroviejo Miró (2009) attempt to produce a similar semantics to (422), but using the logical form in (420)<sup>26</sup>. While this

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<sup>26</sup> Assuming that downdating  $?\varphi$  is equivalent to downdating  $?\neg\varphi$ , this also means doing away with Romero & Han (2004)’s variable-scope approach to the ‘inner’/‘outer’ distinction, as in the current account.

idea seems potentially related to the semantics contributed by double negation in the above account, it is lacking key details which would enable such a comparison. First, it is not clear what precisely it means to issue an instruction to the addressee to downdate a given question from the questions under discussion stack (QUDs). Assertions themselves generally aim to bring about the removal of a question from the QUD stack in a certain way. In HiNEGQs, it is even less clear what this is intended to mean. A HiNEGQ would seem to simultaneously issue an instruction to downdate  $? \varphi$  from the QUD (VERUM’s contribution) and add the same question  $? \varphi$  to the QUD stack (the polar question’s contribution). Finally, it is no longer clear on such an account how the inference of prior belief can be derived, in particular, its positive polarity.

Romero (2005) is right to take the data from ‘yes’/‘no’ answers as arguing against an approach which treats verum focus as an at-issue epistemic modal. An account of verum focus in HiNEGQs must capture the fact that HiNEGQs request the same truth-conditional information as corresponding PosQs. However, simply treating verum focus as a non-at-issue content — in essence, assimilating it to appositive relative clauses — does not resolve the problem.

The problem with Romero & Han (2004)’s account isn’t that it treats verum focus as *at-issue* information, rather, it’s that it treats it as truth-conditional information at all. The current account resolves this problem not through Pottsian multidimensionality, but instead by adopting a richer notion of at-issue meaning as encompassing not just truth-conditional information, but also inquisitive content. This approach not only provides an adequate semantics for the verum focus effect, it assigns (high) negation a compositional role in doing so. Since projection past operators like negation is one of the core, defining properties of non-at-issue content (e.g. Simons et al. (to appear)), it is hard to see how this could be possible under a multidimensional approach.

## 5.6 Conclusion

In this chapter, I have provided a comprehensive account of polar questions with high or preposed negation like (426), HiNEGQs for short. The central challenge for such an account is to explain the clear sense that such questions ask about the same main piece of information as corresponding PosQ, LoNEGQ, or ALTQ, but also convey

several inferences which make them dramatically different from other polar questions. For example, a question like (426a): (i) conveys that the speaker previously believed or expected that the positive answer,  $p$ , held and (ii) emphasizes the truth value of the proposition  $p$  (i.e. exhibits the verum focus effect). (426b) conveys two similar inferences, differing only in that the prior belief is that the negative answer held.

- (426) a. Isn't John baking a cake?  
b. Isn't John not baking a cake?

In Chapter 4, we analyzed the inferences conveyed by other varieties of polar questions using a semantics where each type manipulates the projected issue in different ways. HiNEGQs, then, emerge naturally because high negation eliminates this fine-grained alternative contribution altogether. Moreover, this semantics for high negation is natural given the connections between issue-suppression and negation we have seen in previous chapters. The account therefore provides a compositional role to *negation*, something which has been missing from prior accounts. The importance of compositionality here is especially worth stressing since cross-linguistically (including in Yucatec Maya), negation is tied to similar or identical inferences as the ones we describe for English HiNEGQs. Finally, based on this semantics, we have argued that other properties of HiNEGQs follow from pragmatic competition with other polar questions.

## Chapter 6

### Conclusion

In this chapter, I briefly recap the major results of this dissertation, highlight some of the most prominent themes which have emerged, and mention several directions for future research. In short, this final chapter is more *inquisitive* than *informative*, aiming to raise issues for future discussion.

#### 6.1 Main results

The main claim of this dissertation is that the compositional semantics of disjunctions, indefinites, and other existential quantification in natural language includes an issue-raising capacity or *inquisitiveness*, parallel to that of questions. In this way, the present work builds directly on other research in *inquisitive semantics* (e.g. Groenendijk (2007), Mascarenhas (2009), Groenendijk & Roelofsen (2009), and Ciardelli (2009)), which in turn builds on work in *Hamblin semantics* (e.g. Hamblin (1973), Simons (2005), and Alonso-Ovalle (2006)). In locating inquisitiveness in the semantics (as opposed to, say, pragmatics), we allow for a rich set of interactions between issues and other meaning-bearing elements of the sentence (e.g. high and low negation, presupposition, apposition, and other inquisitive elements).

Empirically, I motivated the core of this theory directly through the compositional semantics of questions in Yucatec Maya (YM), in Chapter 2. Alternative and wh-questions are composed of a disjunction or indefinite wh-word (respectively) occurring in a focus/cleft construction. While some of the facts we have seen are fairly unique

to YM (e.g. the polyfunctionality of focused disjunctions), similar connections between these elements and questions are seen across the world's languages both synchronically and diachronically. To capture the meaning of such questions compositionally, we developed an account where disjunctions and indefinites contribute the alternative evoking, inquisitive core of questions. The role of focus, then, is to isolate this inquisitive contribution, by presupposing the informative contribution that disjunctions/indefinites potentially make.

Even though English does not show the tight morphosyntactic connections that Yucatec Maya does, Chapter 3 makes the case that we can also detect the inquisitive contribution of disjunctions and indefinites in the ellipsis process known as sluicing. In particular, I have argued that sluicing involves the anaphoric retrieval of issues raised by inquisitive elements in prior discourse. I have implemented this idea by proposing a symmetric entailment condition on sluicing (following Merchant (2001)), but one which makes use of the single-tiered inquisitive semantics developed in Chapter 2. This approach improves on previous accounts by capturing several observations about sluicing: (i) disjunctions license sluicing, (ii) doubly negated indefinites do not, and (iii) apposition blocks otherwise licit inner antecedents for sluicing. Finally, we have extended the account to sluices with no overt inquisitive element (i.e. sprouting) by proposing that various sorts of covert existential quantification (e.g. of a neo-Davidsonian event argument). The result of this investigation is that (positive) at-issue assertions are, in general, inquisitive.

The widespread nature of inquisitive quantification combined with the issue-suppressing semantics of negation predict subtly different semantics for positive and negative polar questions. Chapters 4 and 5 develop a richer, 'two-tiered' inquisitive semantics which leverages this prediction in order to account for the range of subtly different polar questions in (427).

- |       |    |                               |        |
|-------|----|-------------------------------|--------|
| (427) | a. | Is John baking a cake?        | PosQ   |
|       | b. | Isn't John baking a cake?     | HiNEGQ |
|       | c. | Is John not baking a cake?    | LoNEGQ |
|       | d. | Is John baking a cake or not? | ALTQ   |

The leading idea is that we need a semantics which retains the inquisitive

contribution of disjunctions and indefinites inside the question (e.g. *a cake* in (427)), but assigns it a secondary status relative to the main issue, contributed by the (disjunctive) polar question operator. While the questions in (427) all contribute the same main issue, they differ in the secondary issues they contribute, which we term the *projected issue*. For example, the POSQ in (427a) projects a set of alternatives of the form ‘John is baking *x*’, making salient the issue of which of these alternatives in fact hold. Pragmatically, this contribution is what leads to the weak bias we often find in POSQs (e.g. Bolinger (1978), Büring & Gunlogson (2000), and van Rooij & Šafářová (2003)). In contrast, the LONEGQ in (427c) projects a set of negative alternatives (of the form ‘John isn’t baking *x*’). Pragmatically, this allows us to account not only for the negative bias of LONEGQs, but also their further restriction to contexts where the speaker does not expect a simple yes/no answer. ALTQs like (427d) project both sorts of alternatives, pragmatically conveying neutrality and/or insistence.

Chapter 5 addresses perhaps the most puzzling variety of questions: HiNEGQs like (427b). Previous literature on HiNEGQs highlights two primary features: (i) an added emphasis on truth value known as *verum focus* (Romero & Han (2004)) and (ii) the inference that the speaker previously believed or expected the positive answer to hold and (by default) seeks to retain this belief (Ladd (1981) *et seq.*). One of the central puzzles posed by such questions is understanding the connection between these two inferences and negation, which consistently encodes them across languages. I argue that the issue-suppressing nature of (double) negation in inquisitive semantics contributes *verum focus*, by eliminating the inquisitive content that the POSQ would project. Finally, I argue that the inference of prior belief and concomitant properties arise based on pragmatic competition between the HiNEGQ and the corresponding POSQ.

## 6.2 Themes

While each of these ideas have been discussed at various points in the preceding chapters, I would like to stress here a few of the prominent themes that recur throughout the dissertation:

## Theme 1: Assertions are forward-looking proposals

According Stalnaker (1978), the *essential effect* of an at-issue assertion is to narrow down the possible ways the world might be (i.e. to reduce the *context set*), by proposing to eliminate previously extant possibilities. While Stalnaker (1978) emphasizes the *eliminative* nature of assertions, several recent works (e.g. Clark & Schaefer (1989), Ginzburg (1996), Gunlogson (2001), and Farkas & Bruce (2010)) has emphasized the other aspect of this picture: the idea that assertions are *proposals* about future states of the conversation. In this dissertation, I have argued that at-issue assertions not only make a proposal about information to be added to the common ground, but also about issues which the conversation will potentially go on to address.

## Theme 2: Inquisitive potential parallels anaphoric (but not exactly)

In recent decades, it has become common to conceive of semantic meaning not directly in terms of truth-conditions, but instead in terms of what Heim has termed a sentence's *Context Change Potential (CCP)*. The core claim of this dissertation is that inquisitiveness is part of the CCP of disjunctions, indefinites, and other existential quantification.

This inquisitive potential is in many ways parallel to one of the central phenomena which originally motivated the 'meaning as CCP' view: anaphoric or dynamic potential. Both inquisitive and dynamic semantics attribute to indefinites a piece of non-truth-conditional meaning which affects the future of the discourse beyond the sentence in which it occurs. Furthermore, both kinds of contributions can be eliminated through compositional interactions with negation, universal quantifiers, and other sentential operators. While there are deep similarities between inquisitive and dynamic semantics, we have seen two places where the two pull apart: double negation and appositive relative clauses. In both cases, inquisitive content (as diagnosed by sluicing) is suppressed while dynamic content (as diagnosed by pronouns and definite descriptions) is ignored by these operators. Despite the deep parallels between the two notions, they cannot be readily unified into a single combined notion.

### Theme 3: Negative sentences are ‘weaker’ than affirmative ones

As Horn (1989) recounts, there is an age-old idea that negative sentences are somehow ‘weaker’ than their positive counterparts, despite the apparent impossibility of this being truth-conditionally so. The semantics developed in this dissertation for negation reflects both parts of this apparent paradox. In terms of informative content, negative and positive sentences are on equal footing. In terms of inquisitive content, however, positive sentences push the discourse forward by making an issue-rich contribution. In contrast, negative sentences go out of their way to suppress this inquisitive content in various ways. While the primary focus in previous literature has been on positive vs. negative assertions, our account has analyzed the asymmetries between positive and negative polar questions in terms of the same fundamental asymmetry.

## 6.3 Future directions

Finally, I would like to point out two broad directions for future research building on the preceding chapters.

### Free choice indefinites and NPIs

I have provided an analysis where *ordinary* indefinites make an inquisitive contribution in addition to their truth-conditional one. This raises the possibility that Free Choice and related special indefinites might be distinguished in part by *not* making this additional contribution which ordinary indefinites make. For example, it makes sense to think of a Free Choice (FC) indefinite like English *any* in a sentence like (428) as conveying the irrelevance or unimportance of the differences between the alternatives it evokes (i.e. possibilities of the form ‘You can pick  $x$ .’).<sup>1</sup> In a sense, this hypothesis is the opposite of the approach taken by Kratzer & Shimoyama (2002), who argue that FC indefinites are special in that they make use of alternatives, while ordinary indefinites do not.

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<sup>1</sup>Free choice indefinites also cannot serve as inner antecedents for sluicing. While this is consistent with the hypothesis that FC indefinites lack inquisitive content, it does not provide prima facie evidence for it since FC indefinites generally take narrow scope with respect to some other operator (e.g. the modal *can* in (428)).



(428) You can pick any card.

Another kind of special indefinite that might be amenable to a similar analysis are NPIs such as English *any*. Under the two-tiered inquisitive semantics of Ch. 4-5, an ordinary indefinite within the scope of (low) negation, as in (429), contributes a projected issue consisting of alternatives of the form ‘John didn’t talk to *x*’. It is reasonable, then, to think of the NPI as a way of avoiding this projected issue which the ordinary indefinite would otherwise contribute. Under this hypothesis, NPIs would make a contribution similar to verum focus, but differing in that verum focus suppresses all issues in its scope, while NPIs target a particular issue.

(429) John didn’t talk to anyone.

It remains unclear how this idea can be related to other properties that FC indefinites and NPIs have been claimed to have and, in particular, to their need to be licensed (or antilicensed). Moreover, much work in recent decades has shown both FC indefinites and NPIs to be internally heterogeneous classes of items. Nonetheless, I believe the basic hypothesis that FC indefinites and NPIs suppress inquisitive content in either the main or projected issue has much to recommend it.

### Sluicing and at-issue content

One novel empirical result of the dissertation is the interaction between appositive relative clauses and sluicing. In particular, we found that even overt indefinites and disjunctions inside of appositive relative clauses cannot serve as inner antecedents for sluicing outside of the appositive. We might wonder, then, if these are other environments which exhibit similar interactions with sluicing (but do allow ellipsis of non-inquisitive material, as in VPE). Preliminarily, it seems that various sorts of clausal adjuncts illustrate just such an asymmetry, as seen in (430-432).

#### **Absolute Adjuncts:**

- (430) a. Having defeated a masked enemy, the valiant knight wondered who \*(it was).  
b. Having defeated a masked enemy, the valiant knight’s comrades were inspired to defeat ~~a masked enemy~~ too

#### **Conditional Antecedents:**

- (431) a. If a strange man comes into the bar, the bartender will wonder who \*(it is).  
 b. If a strange man comes into the bar, his girlfriend probably will ~~come into~~  
~~the bar~~ too.

**Unconditional Antecedents:**

- (432) a. Whichever man comes to the party, John will know who \*(he is).  
 b. Whoever comes to the party, Jane will want to ~~come to the party~~ too in  
 order to meet them.

Assuming closer inspection confirms these patterns, this raises the possibility that the semantics of clausal adjuncts can be thought of as involving an issue-suppressing operator of some sort, analogous to the COMMA operator we have posited in the case of appositives. There are, of course, many differences between appositives and clausal adjuncts, but these data suggest an analysis where conditional antecedents and other adjuncts enjoy a backgrounded status of some sort, not unlike that of appositives.

Both of these cases appear to involve the suppression of certain inquisitive content by other elements within the sentence, a dynamic that has surfaced throughout this dissertation, but especially in the analyses of sluicing and verum focus. Interactions of this sort demonstrate that adopting the richer semantic representations provided by inquisitive semantics has two sorts of benefits. First, the presence of inquisitive content allows for a better understanding of the properties of disjunctions and indefinites themselves (e.g. their morphosyntactic connection to questions in languages like Yucatec Maya, their ability to license sluicing). Second, the interactions between inquisitive content and other elements (particularly ones which eliminate it) can have various semantic/pragmatic effects (e.g. verum focus, appositives).

It is fitting that the analysis presented in this dissertation raises a great many issues for future work to address. It is my hope, however, that it also makes an informative contribution, helping to resolve issues in the semantics of disjunctions, indefinites, and questions.

# Appendix A

## Single-tiered Inquisitive Semantics

The following definitions extend the propositional logic of Groenendijk & Roelofsen (2009) to the first-order case (with some minor notational variations). They assume a standard syntax plus two operators:  $\text{COMMA}()$  and  $\text{INFO}()$ .

A Model  $\mathcal{M}$  for inquisitive semantics is a finite<sup>1</sup> 3-tuple  $\langle \mathcal{D}_e, \mathcal{I}, \mathcal{W} \rangle$

Alternative Closure:  $\text{ALT}\mathcal{P} = \{\alpha \in \mathcal{P} \mid \text{for no } \beta \in \mathcal{P} : \alpha \subset \beta\}$

Atomic formulas:

$$\mathbf{S1:} \llbracket \mathbf{R}^n(\gamma_1, \dots, \gamma_n) \rrbracket^{\mathcal{M}, g, w} = \text{ALT}\{\alpha \subseteq \mathbf{W} \mid \forall w' \in \alpha : \langle \llbracket \gamma_1 \rrbracket^{\mathcal{M}, g, w'}, \dots, \llbracket \gamma_n \rrbracket^{\mathcal{M}, g, w'} \rangle \in \llbracket \mathbf{R}^n \rrbracket^{\mathcal{M}, g, w'}\}$$

Conjunction:

$$\mathbf{S2:} \llbracket \varphi \wedge \psi \rrbracket^{\mathcal{M}, g, w} = \text{ALT}\{\alpha \subseteq \mathbf{W} \mid \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M}, g, w} : \alpha \subseteq \beta \text{ and } \exists \gamma \in \llbracket \psi \rrbracket^{\mathcal{M}, g, w} : \alpha \subseteq \gamma\}$$

Universal Quantifier:

$$\mathbf{S3:} \llbracket \forall u \varphi \rrbracket^{\mathcal{M}, g, w} = \text{ALT}\{\alpha \subseteq \mathbf{W} \mid \text{for all } d \in \mathcal{D}_e \text{ s.t. } \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M}, g[u/d], w} : \alpha \subseteq \beta\}$$

Disjunction:

$$\mathbf{S4:} \llbracket \varphi \vee \psi \rrbracket^{\mathcal{M}, g, w} = \text{ALT}\{\alpha \subseteq \mathbf{W} \mid \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M}, g, w} : \alpha \subseteq \beta \text{ or } \exists \gamma \in \llbracket \psi \rrbracket^{\mathcal{M}, g, w} : \alpha \subseteq \gamma\}$$

---

<sup>1</sup>For a largely parallel inquisitive semantics for first-order logic which does not require the restriction to finite models, see Ciardelli (2009).

Existential Quantifier:

$$\mathbf{S5:} \llbracket \exists u \varphi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{there is some } d \in \mathcal{D}_e \text{ s.t. } \exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g[u/d],w} : \alpha \subseteq \beta\}$$

Negation

$$\mathbf{S6:} \llbracket \neg \varphi \rrbracket^{\mathcal{M},g,w} = \text{ALT}\{\alpha \subseteq W \mid \text{every } \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} \text{ is such that } \alpha \cap \beta = \emptyset\}$$

COMMA operator:

$$\mathbf{S7:} \llbracket \text{COMMA}(\varphi) \rrbracket = \{w \mid \text{there is some alternative } \alpha \in \llbracket \varphi \rrbracket \text{ s.t. } w \in \alpha\}$$

Non-inquisitive closure (! or INFO):

$$\mathbf{S8:} \llbracket \text{INFO}(\varphi) \rrbracket^{\mathcal{M},g,w} \equiv \llbracket \neg \neg \varphi \rrbracket^{\mathcal{M},g,w} \equiv \{\text{COMMA}(\varphi)\}$$

**Definition of truth:**  $\varphi$  is true relative to a world  $w$  and a model  $\mathcal{M}$  iff  $\exists \beta \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : w \in \beta$

## Appendix B

### Two-tiered Inquisitive Semantics

This appendix sketches a set of interpretive rules to compositionally provide two-tiered inquisitive denotations needed for POSQs, HiNEGQs, LoNEGQs, and ALTQs.

- For ease of exposition, the definitions are given in terms of single-tiered inquisitive semantics (represented with straight double brackets,  $\llbracket \varphi \rrbracket$ ).
- For a formula  $\varphi$ , its two-tiered interpretation,  $\langle\langle \varphi \rangle\rangle$  is an ordered pair  $\langle \mathcal{M}, \mathcal{P} \rangle$  where:
  - The main issue,  $\mathcal{M}$ , is a non-empty set of sets of possible worlds (i.e. a set of alternatives).
  - The projected issue,  $\mathcal{P}$  is a (possibly empty) set of sets of possible worlds (i.e. a set of alternatives).
- For readability, we will write such pairs in fractional notation:  $\langle\langle \varphi \rangle\rangle = \frac{\mathcal{M}}{\mathcal{P}}$
- The syntax of the language is entirely standard, the only exception being that we distinguish two unary operators,  $\neg_{lo}$  and  $\neg_{hi}$ , corresponding to English low and high negation respectively.

**Atomic Formulas:**

$$\mathbf{Sem1:} \quad \langle\langle \varphi \rangle\rangle^{\mathcal{M},g,w} = \frac{\{\alpha \subseteq W \mid \alpha \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w}\}}{\emptyset}$$

**Low Negation:**

$$\begin{array}{l} \textbf{Sem2a: } \langle\langle \neg_{lo} \varphi \rangle\rangle^{\mathcal{M},g,w} = \\ \text{ALT}\{\alpha \subseteq W \mid \text{for all } \beta \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\} \\ \hline \text{ALT}\{\alpha \subseteq W \mid \text{there is some } \gamma \in \llbracket \varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \gamma = \emptyset\} \end{array}$$

**High Negation:**

$$\begin{array}{l} \textbf{Sem2b: } \langle\langle \neg_{hi} \varphi \rangle\rangle^{\mathcal{M},g,w} = \\ \text{ALT}\{\alpha \subseteq W \mid \text{for all } \beta \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} : \alpha \cap \beta = \emptyset\} \\ \hline \emptyset \end{array}$$

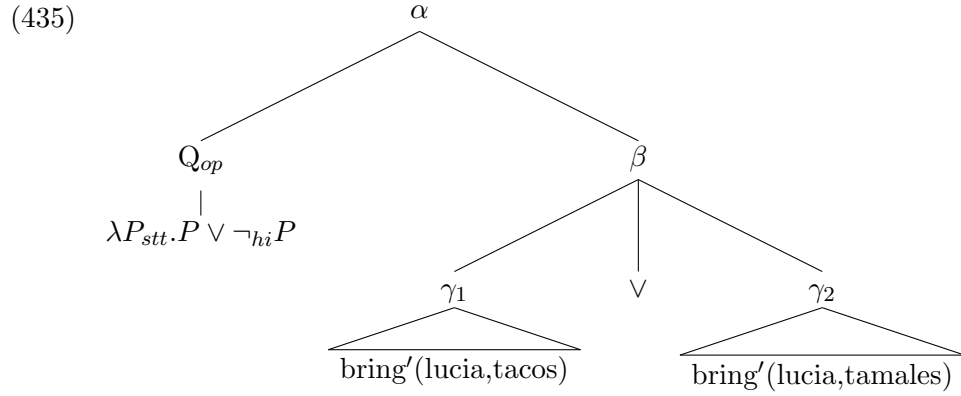
**Disjunction:**

$$\begin{array}{l} \textbf{Sem5: } \langle\langle \varphi \vee \psi \rangle\rangle^{\mathcal{M},g,w} = \\ \{\alpha \subseteq W \mid \alpha \in \llbracket !\varphi \rrbracket^{\mathcal{M},g,w} \text{ or } \alpha \in \llbracket !\psi \rrbracket^{\mathcal{M},g,w}\} \\ \hline \{\alpha \subseteq W \mid \text{there is some } \gamma \text{ in } \langle\langle \varphi \rangle\rangle \text{ or } \langle\langle \psi \rangle\rangle \text{ such that } \gamma \notin \llbracket !\varphi \rrbracket \text{ and } \gamma \notin \llbracket !\psi \rrbracket \text{ and } \gamma = \alpha\} \end{array}$$

### Interpretation of a PosQ<sup>1</sup>:

(433) Did Lucia bring tacos or tamales?

(434)  $(\text{bring}'(\text{lucia}, \text{tacos}) \vee \text{bring}'(\text{lucia}, \text{tamales})) \vee$   
 $\neg(\text{bring}'(\text{lucia}, \text{tacos}) \vee \text{bring}'(\text{lucia}, \text{tamales}))$

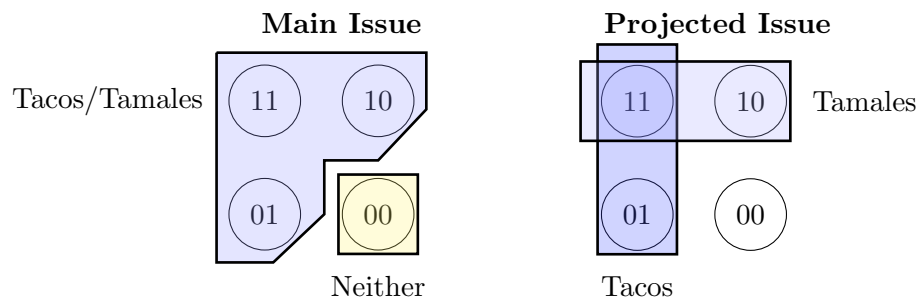


- (436) a.  $\langle\langle\gamma_1\rangle\rangle = \frac{\{ \{w' : \text{Lucia brought tacos in } w'\} \}}{\emptyset}$
- b.  $\langle\langle\gamma_2\rangle\rangle = \frac{\{ \{w' : \text{Lucia brought tamales in } w'\} \}}{\emptyset}$
- c.  $\langle\langle\beta\rangle\rangle = \frac{\{ \{w' : \text{Lucia brought tacos in } w'\}, \{w' : \text{Lucia brought tamales in } w'\} \}}{\emptyset}$
- d.  $\langle\langle\alpha\rangle\rangle =$   
 $\frac{\{ \{w' : \text{Lucia brought tacos and/or tamales in } w'\}, \{w' : \text{Lucia brought neither in } w'\} \}}{\{ \{w' : \text{Lucia brought tacos in } w'\}, \{w' : \text{Lucia brought tamales in } w'\} \}}$

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<sup>1</sup>The derivation is for the polar question reading, not the alternative question reading.

(437)

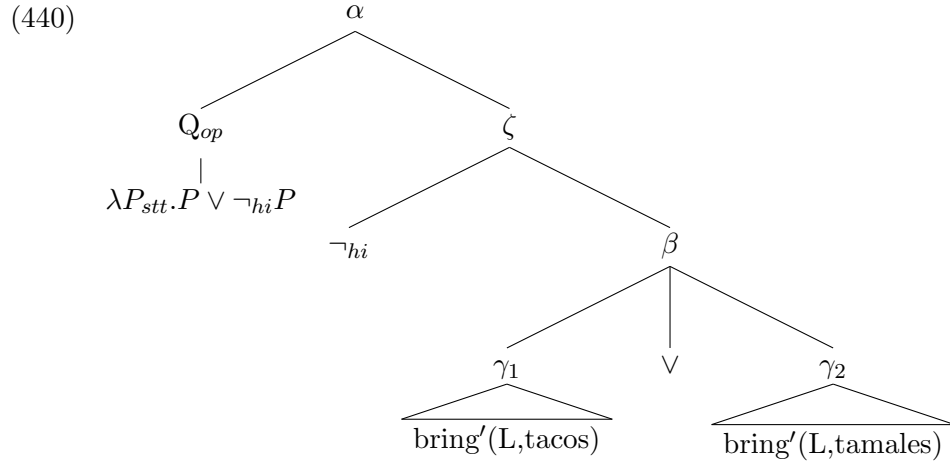




### Interpretation of a HiNegQ:

(438) Didn't Lucia bring tacos or tamales?

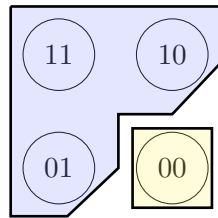
(439)  $\neg_{hi}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales})) \vee$   
 $\neg_{hi}\neg_{hi}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales}))$



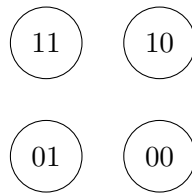
- (441) a.  $\langle\langle \gamma_1 \rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos in } w'\} \}}{\emptyset}$
- b.  $\langle\langle \gamma_2 \rangle\rangle = \frac{\{ \{w' : L \text{ brought tamales in } w'\} \}}{\emptyset}$
- c.  $\langle\langle \beta \rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos in } w'\}, \{w' : L \text{ brought tamales in } w'\} \}}{\emptyset}$
- d.  $\langle\langle \zeta \rangle\rangle = \frac{\{ \{w' : L \text{ brought neither tacos nor tamales in } w'\} \}}{\emptyset}$
- e.  $\langle\langle \alpha \rangle\rangle =$
- $\frac{\{ \{w' : L \text{ brought tacos and/or tamales in } w'\}, \{w' : L \text{ brought neither in } w'\} \}}{\emptyset}$

(442)

**Main Issue**



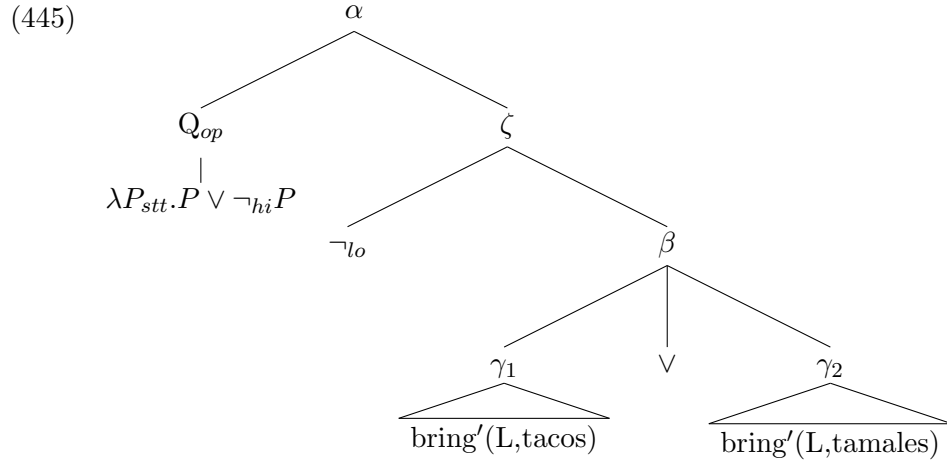
**Projected Issue**



### Interpretation of a LoNegQ:

(443) Did Lucia not bring tacos or tamales?

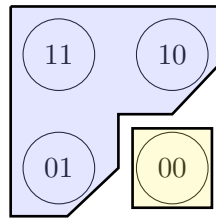
(444)  $\neg_{lo}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales})) \vee$   
 $\neg_{hi}\neg_{lo}(\text{bring}'(L, \text{tacos}) \vee \text{bring}'(L, \text{tamales}))$



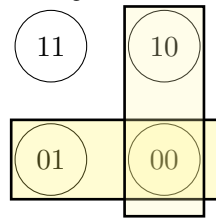
- (446) a.  $\langle\langle \gamma_1 \rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos in } w'\} \}}{\emptyset}$
- b.  $\langle\langle \gamma_2 \rangle\rangle = \frac{\{ \{w' : L \text{ brought tamales in } w'\} \}}{\emptyset}$
- c.  $\langle\langle \beta \rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos in } w'\}, \{w' : L \text{ brought tamales in } w'\} \}}{\emptyset}$
- d.  $\langle\langle \zeta \rangle\rangle = \frac{\{ \{w' : L \text{ brought neither tacos nor tamales in } w'\} \}}{\{ \{w' : L \text{ didn't bring tacos in } w'\}, \{w' : L \text{ didn't bring tamales in } w'\} \}}$
- e.  $\langle\langle \alpha \rangle\rangle = \frac{\{ \{w' : L \text{ brought tacos and/or tamales in } w'\}, \{w' : L \text{ brought neither in } w'\} \}}{\{ \{w' : L \text{ didn't bring tacos in } w'\}, \{w' : L \text{ didn't bring tamales in } w'\} \}}$

(447)

**Main Issue**



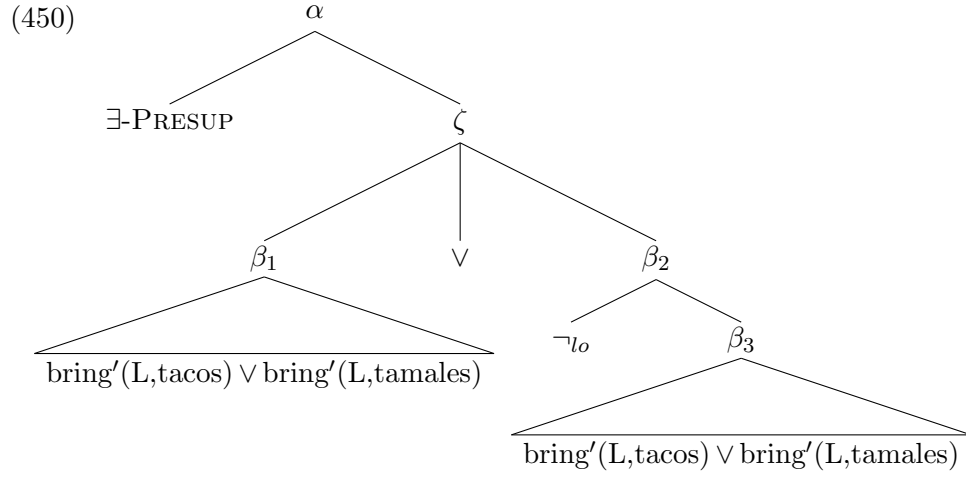
**Projected Issue**



### Interpretation of an AltQ:

(448) Did Lucia bring tacos or tamales or not?

(449)  $(\text{bring}'(\text{L}, \text{tacos}) \vee \text{bring}'(\text{L}, \text{tamales})) \vee$   
 $\neg_{lo}(\text{bring}'(\text{L}, \text{tacos}) \vee \text{bring}'(\text{L}, \text{tamales}))$



(451) a.  $\langle\langle\beta_1\rangle\rangle = \langle\langle\beta_3\rangle\rangle =$

$$\frac{\{ \{w' : \text{L brought tacos in } w'\}, \{w' : \text{L brought tamales in } w'\} \}}{\emptyset}$$

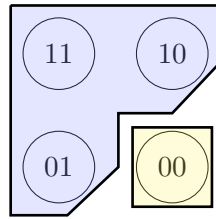
b.  $\langle\langle\beta_2\rangle\rangle = \frac{\{ \{w' : \text{L brought neither tamales nor tacos in } w'\} \}}{\{ \{w' : \text{L didn't bring tamales in } w'\}, \{w' : \text{L didn't bring tacos in } w'\} \}}$

c.  $\langle\langle\zeta\rangle\rangle =$

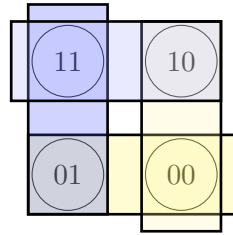
$$\frac{\{ \{w' : \text{L brought tacos and/or tamales in } w'\}, \{w' : \text{L brought neither in } w'\} \}}{\{ \{w' : \text{L brought tacos in } w'\}, \{ \dots \text{tamales in } w'\}, \{w' : \text{L didn't bring tacos in } w'\}, \{ \dots \text{tamales in } w'\} \}}$$

(452)

**Main Issue**



**Projected Issue**



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