Final version to appear in *Natural Language Semantics*
Please cite published version.

Focus and Uninformativity in Yucatec Maya Questions

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Received: date / Accepted: date

Abstract Cross-linguistically, questions frequently make crucial use of morphosyntactic elements which also occur outside of questions. Chief among these are focus, disjunctions, and wh-words with indefinite semantics. This paper provides a compositional account of the semantics of wh-, alternative, and polar questions in Yucatec Maya (YM), which more or less consist solely of these elements. Key to the account is a theory of disjunctions and indefinites (extending work by Groenendijk and Roelofsen (2009), Kratzer and Shimoyama (2002), Alonso-Ovalle (2006), and others) which recognizes the inherently *inquisitive* nature of these elements. While disjunctions and indefinites are inquisitive, they differ from questions since they are also truth-conditionally *informative*. Compositionally, then, the role of focus in YM questions is to presuppose the informative component of an indefinite wh-word or disjunction, rendering the inquisitive component the question's only new contribution to the discourse. In addition to deriving question denotations compositionally, the account also captures a potentially surprising fact: focused disjunctions in YM can function as either questions or assertions, depending solely on the discourse context.

Keywords Questions · Alternatives · Focus · Disjunction · Indefinites · Assertion

1 Introduction

The 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 to add to the common ground, a question presents the addressee with a non-singleton set of alternatives (roughly its answers) and directs the addressee to select one (or more) of these. One observation which follows from this basic characterization is that questions require an overt response from the addressee in order for the common ground to be enriched. Given the standard assumption that

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the primary goal of discourse is to add information to the common ground, this means that questions require a response from the addressee in order for the discourse to be felicitous. Ideally, this response provides a complete answer to the question, but even if the speaker is not in a position to provide this, they are nonetheless obliged to respond in some way. While assertions allow the addressee to respond, no overt response is required in order for the discourse to be well-formed.

In many languages, this difference 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 show a clear diachronic connection to disjunctive coordinators.

In this paper, 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 causes a sentence to be a question.

The account we propose builds on work in inquisitive semantics (most directly, Groenendijk and 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 uninformativity by presupposing the informative component of the indefinite/disjunction. Since the indefinite/disjunction's truth-conditional information is linguistically marked as presupposed, the alternative set and the issue of which alternative holds remain as the sentence's sole at-issue contributions.

This paper explores and motivates 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 (1) 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 form.[1]

(1) [máax]$_F$ 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 (2).

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

(2) [le kuul maangooj *wáa* le kuul puut]$_F$ 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 (2) is able to function either as a question, as in (2), or as a disjunctive assertion, as in (3). The sentence is identical in the two examples[2], 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.

(3) [le kuul maangooj *wáa* le kuul puut]$_F$ 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 (2)/(3) 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 (2), since the proposed set of alternatives *exhausts* those which are present in the existential presupposition (given its contextual restriction), the sentence cannot be informative and therefore functions as a question. In (3), on the other hand, the proposed alternative set is a proper subset of the presupposed background and therefore functions as an assertion which proposes to eliminate the additional alternatives (the orange tree in (3)). The fact that this sort

[1] Elements in the focus-cleft syntactic position are notated with a subscript F, [...]$_F$, though this does not imply any sort of intonational prominence. The following abbreviations are used in glosses: 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, PROG: progressive aspect, TERM: terminative aspect.

[2] This includes the sentence's intonation as well. That intonation does not clearly distinguish the uses in (2) and (3) is not surprising given that focus more generally in Yucatec Maya has been shown to lack any particular intonational marking (Avelino (2009), Gussenhoven and Teeuw (2008), Kuegler et al (2007) *inter alia*). Instead, intonational prominence in Yucatec Maya is given to topic phrases.

of polyfunctionality is possible in the case of focused disjunctions is expected because disjunctions, unlike indefinites, specify an exact number of alternatives.

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 question 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 (4). For polar questions, however, there is another potential path to uninformativity besides focus: creating a disjunction of the $p \vee \neg p$ as in (5).

(4) [Juan *wáaj*]$_F$ uk' le sa'-o'
Juan Or drink.Agent.Focus the atole-Distal
'Was it Juan who drank the atole?'

(5) táan-*wáaj* u yuk'-ik le sa'-o' Juan
Prog-Or A.3 drink-Status Def atole-Distal Juan
'Is Juan drinking the atole?'

Road map:

§2 develops a particular account of the issue-raising capacity of disjunctions and indefinites, creating an inquisitive semantics for first-order predicate logic extending Groenendijk and Roelofsen (2009)'s propositional logic; **§§3-4** derive the interpretations of alternative and wh-questions in Yucatec Maya through the interaction of this semantics with the presuppositional semantics of the focus/cleft construction; **§5** distinguishes two types of polar questions and provides a semantic account of each; and **§6** concludes.

2 Inquisitive Semantics for Disjunction and Indefinites

Based on the morphosyntax of quantificational expressions in Japanese, Kratzer and Shimoyama (2002) argue that indefinites locally introduce a set of alternatives, while their existential quantificational force is provided by a non-local existential closure operator. While the syntax-semantics interface robustly supports this analysis within 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.

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 and 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 the traditional boolean semantics. 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 and 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 and 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. Even within Japanese, it has been argued by Yamashina and 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 (2009), Mascarenhas (2009), Groenendijk and 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 ultimately makes the same contribution to discourse 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. Beyond providing a compositional semantics for questions and focused disjunctions in YM, one of the central goals of this paper is to show that this intuition has empirical consequences. Before proceeding with this goal, we would like to mention two kinds of data which have been argued to support this view in previous literature. Groenendijk (2009) mentions briefly that disjunctive assertions like (6-a) readily allow for elliptical 'secondary responses' like those in (6-b). Sentences with indefinites like 'someone' allow for similar responses as in (7). In contrast to (6)-(7), a truth-conditionally equivalent sentence without an indefinite, (8), does not readily allow for such responses.

(6) a. Bill or Fred talked to Joe.
b. It was Fred // Yeah, Fred // Fred // Probably Fred

(7) a. Someone talked to Joe.
b. It was Fred // Yeah, Fred // Fred // Probably Fred

(8) a. It's not the case that no one talked to Joe.
b. #It was Fred // #Yeah, Fred // #Fred // #Probably Fred

While secondary responses of this sort are suggestive of the nature of inquisitive content, they cannot be taken as diagnostic at this point. There are a wide variety of

syntactic, semantic, and pragmatic factors influencing the felicity of such responses and while inquisitivity is likely among them, it is not the only one. While secondary responses do not diagnose inquisitive content, AnderBois (2011a) and AnderBois (2010) argue that Sluicing does provide just such a diagnostic. Sentences with widest-scope disjunctions or indefinites readily serve as antecedents for Sluicing, (9)-(10), while truth conditionally equivalent (but non-inquisitive) sentences like (11) do not.

(9) Bill or Fred talked to Joe, but I don't remember which.

(10) Someone talked to Joe, and I'm going to find out who.

(11) # It's not the case that no one talked to Joe, and I'm going to find out who.

We mention these data here primarily to lend further support to the idea that disjunctions and indefinites make an issue-raising contribution to discourse. The remainder of the paper shows that the inquisitive capacity of questions in YM arises compositionally from indefinites and disjunctions, providing an empirical argument for such a semantics.

2.1 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 and Shimoyama (2002).[3] 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 §2.5, this formal step is a natural one given a conception of assertion (Stalnaker (1978), Gunlogson (2001), Farkas (2003), and Farkas and 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 and Roelofsen (2009).

The remainder of this section presents the rule 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 inquisitivity at this stage. The semantic rules we present differ from those of Groenendijk and 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

[3] 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 promises to avoid 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), Novel and Romero (2010) *inter alia*).

benefit of making explicit the procedure for determining the extension of a given formula in a given possible world, a procedure left implicit in Groenendijk and 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 and 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):
S1: $[\![\mathrm{R}^n(\gamma_1, \ldots, \gamma_n)]\!]^{\mathcal{M},g,w} = \{\,\{w' : \langle [\![\gamma_1]\!]^{\mathcal{M},g,w'}, \ldots [\![\gamma_n]\!]^{\mathcal{M},g,w'}\rangle \in [\![\mathrm{R}^n]\!]^{\mathcal{M},g,w'}\}\,\}$

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):
S1: $[\![\mathrm{R}^n(\gamma_1, \ldots, \gamma_n)]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \mathrm{W} \mid \textit{for all } w' \in \alpha : \langle [\![\gamma_1]\!]^{\mathcal{M},g,w'}, \ldots, [\![\gamma_n]\!]^{\mathcal{M},g,w'}\rangle \in [\![\mathrm{R}^n]\!]^{\mathcal{M},g,w'}\}$

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 and Roelofsen (2009), we accomplish this by adding the alternative closure operator in (12) 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.

(12) $\quad \textsc{Alt}\mathcal{P} = \{\alpha \in \mathcal{P} \mid \textit{for no } \beta \in \mathcal{P} : \alpha \subset \beta\}$

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 §2.4.

Negation:
S2: $[\![\neg\varphi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \text{W} \mid \textit{for all } \beta \in [\![\varphi]\!]^{\mathcal{M},g,w}\textit{:}\ \alpha \cap \beta = \emptyset\}$

When φ and ψ 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 complications are irrelevant for present purposes, we refer the reader to Groenendijk and Roelofsen (2009) (see especially pp. 7-9). Since we will be dealing with indefinites shortly, we will need to extend Groenendijk and 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: $[\![\varphi \wedge \psi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \text{W} \mid \textit{there is some } \beta \in [\![\varphi]\!]^{\mathcal{M},g,w} : \alpha \subseteq \beta \textit{ and there is some } \gamma \in [\![\psi]\!]^{\mathcal{M},g,w} : \alpha \subseteq \gamma\}$

Universal Quantifier:
S4: $[\![\forall u\varphi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \text{W} \mid \textit{for all } d \in \mathcal{D}_e\textit{: there is some } \beta \in [\![\varphi]\!]^{\mathcal{M},g[u/d],w} : \alpha \subseteq \beta\}$

2.2 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 (13), with a disjunction in the canonical subject position is, like its English translation, unambiguously interpreted as an assertion.

(13) 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.'

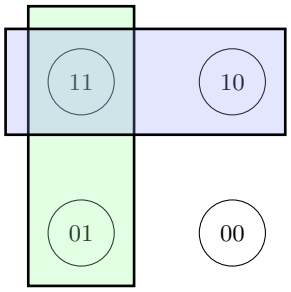
Intuitively, our semantics should deliver two alternatives in this case, one per disjunct. The denotation for (13) that we are trying to derive, then, is a set containing two alternatives: {juan drank the atole, daniel drank the atole}. This is exactly what the

semantic rule in **S5** provides[4]. In the most basic case where both φ and ψ are classical, this definition gives us two sets of worlds, one where φ holds and one where ψ 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:
S5: $[\![\varphi \vee \psi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \mathrm{W} \mid \exists\beta \in [\![\varphi]\!]^{\mathcal{M},g,w} : \alpha \subseteq \beta \textit{ or } \exists\gamma \in [\![\psi]\!]^{\mathcal{M},g,w} : \alpha \subseteq \gamma\}$

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 (14) where circles represent possible worlds in the model, the numbers within circles are the truth values of two atomic propositions (φ and ψ) 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 $[\![\,(\psi \vee \varphi) \vee \zeta\,]\!]$ will denote a set of three alternatives, rather than collapsing ψ and φ into a single alternative.

(14) $[\![\varphi \vee \psi]\!]^{\mathcal{M},g,w} =$



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 and 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 and Roelofsen (2009)'s definition in (15). 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

[4] While we cannot define conjunction in a parallel fashion, as Groenendijk and Roelofsen (2009) point out, we could alternatively define disjunction in terms of set union as in (i).

(i) $[\![\varphi \vee \psi]\!]^{\mathcal{M},g,w} = [\![\varphi]\!]^{\mathcal{M},g,w} \cup [\![\psi]\!]^{\mathcal{M},g,w}$

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, a sentence may *present itself* as providing truth-conditional information, even if it happens not to do so in a given context.

(15) **Informativity (absolute):** A formula φ is *informative iff* :
(i) $\bigcup[\![\varphi]\!] \subset$ W and
(ii) $\bigcup[\![\varphi]\!] \neq \emptyset$

Groenendijk and 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 (16). In words, the definition states that a formula φ is informative relative to a presupposition ψ if and only if accepting φ will eliminate worlds not from W — as was the case for absolute informativity — but rather from W as updated with ψ.

(16) **Informativity (relative):** A formula φ is *informative* relative to a semantic presupposition ψ *iff* :
(i) $\bigcup[\![\varphi]\!] \subset (\text{W} \cap \bigcup[\![\psi]\!])$ and
(ii) $\bigcup[\![\varphi]\!] \neq \emptyset$

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. The notion of relative informativity is a natural fit with a dynamic semantic account of presuppositions in the spirit of Heim (1982), especially given the deep parallels between dynamic and inquisitive semantics stressed throughout the present work. However, nothing in the present account appears to be incompatible with other theories of presuppositions. For this reason, we will leave a fully explicit account of presuppositions in inquisitive semantics to future work.

Since inquisitivity and informativity are orthogonal to one another, Groenendijk and Roelofsen (2009) define labels for the four logically possible categories of formulas, as in (17). While two of the names – 'Question' and 'Assertion' – are clearly intended to evoke certain speech acts, for Groenendijk and Roelofsen (2009), they are simply labels for classes of formulas having particular formal properties.

(17) **Groenendijk and Roelofsen (2009)'s 4 categories:**

	Inquisitive	Uninquisitive
Informative	Hybrid	Assertion
Uninformative	Question	Insignificant

Here, we argue that these two properties (with one refinement to be discussed in §5.4) refined so as to provide a means to *semantically* classify which sentence denotations will be questions and which will be assertions. This definition, which we term the 'Inquisitive Principle', does not define what it means to function as a question or as an assertion (i.e. a theory of speech acts), but simply which sentences will fall into which category.[5]

Similar definitions are present at least implicitly in previous work in question semantics as well. For Hamblin (1973), questions are sentences which denote non-singleton sets of alternatives, whereas assertions are those sentences which denote singleton sets. For Groenendijk and Stokhof (1984) (as well as Hamblin-inspired semantics such as Lahiri (2002)), the distinction is made through types: assertions are of type *st*, whereas questions are of type *stt* (Lahiri (2002)) or *sst* (Groenendijk and Stokhof (1984)).[6]

(18) **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 and 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 a non-disjunctive tautology both function in discourse like assertions.[7] 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.

[5] An anonymous reviewer points out that a copular sentence like (i) is inquisitive and appears to be uninformative, yet clearly is not a question.

(i) Someone is the pope.

While a full analysis is outside the scope of this paper, there seem to be at least two possible ways in which (i) might be truth-conditionally informative, depending on what kind of copular sentence this is. First, we might take this to be an equative copular clause, in which case the truth-conditional information conveyed would be the fact that the two discourse referents are identical. Second, we might take this to be a predicational copular clause, in which case the information conveyed is that the property of being the pope holds of a particular discourse referent. All that the current account requires is that the sentence has some truth-conditional at-issue contribution, which seems quite plausible given the rich literature on the various meanings conveyed by copular clauses (see Mikkelsen (2011) for a summary).

[6] Thanks to an anonymous reviewer for discussion of this point.

[7] Disjunctive tautologies also function as assertions, contrary to the definition in (18). See §5.4 for a refined version of the Inquisitive Principle which addresses these.

2.3 Indefinites

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

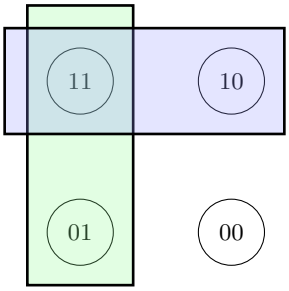
Indefinite:
S6: $[\![\exists u\varphi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \mathrm{W} \mid \textit{there is some } d \in \mathcal{D}_e \textit{ s.t. } \exists \beta \in [\![\varphi]\!]^{\mathcal{M},g[u/d],w} : \alpha \subseteq \beta\}$

As with disjunctions, sentences with widest scope indefinites are interpreted as assertions according to the principle in (18). A sentence with an indefinite, like (19), introduces one alternative per d in $\mathcal{D}_e$ (modulo contextual restriction). Like we saw 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.

(19) 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 (20).

(20) $[\![\exists u\varphi]\!]^{\mathcal{M},g,w} =$



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 and 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 or other which holds in the world of evaluation, as in (21). 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 and Shimoyama (2002), but locates the existential force in the interpretive system, rather than in the logical form itself.

(21) Definition of truth: φ is true relative to a world w and a model $\mathcal{M}$ and an assignment g iff $\exists \beta \in [\![\varphi]\!]^{\mathcal{M},g,w}$: $w \in \beta$

2.4 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 one(s) hold(s). 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. The fact that it is only *widest scope* indefinites which raise issues follows formally from the semantic rule for negation, repeated in (22).

(22) $[\![\neg\varphi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \mathrm{W} \mid \textit{for all } \beta \in [\![\varphi]\!]^{\mathcal{M},g,w}\colon \alpha \cap \beta = \emptyset\}$

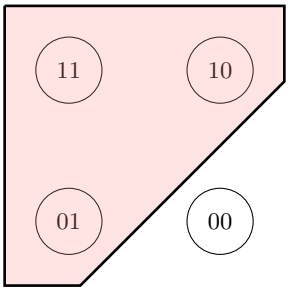
This definition ensures that no matter how many alternatives are in $[\![\varphi]\!]$, $[\![\neg\varphi]\!]$ will only contain one alternative (recalling again that alternative closure gives us the *maximal* set of worlds where no alternative in $[\![\varphi]\!]$ holds). We saw this above for the negation of an atomic formula, but it similarly holds for the negation of a disjunction or indefinite, (23).

(23) $[\![\exists u\varphi]\!]^{\mathcal{M},g,w}$ $[\![\neg\exists u\varphi]\!]^{\mathcal{M},g,w}$

Since negation always returns only a single alternative, double negation is no longer vacuous (a fact we saw reflected above by the impossiblity of Sluicing in (11)). $[\![\neg\neg\varphi]\!]$ has the same informative component as $[\![\varphi]\!]$, but eliminates the inquisitive component as seen in (24). 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.[8]

[8] While this property holds of most dynamic logics, it makes the wrong prediction with respect to anaphora to doubly negated indefinites. See Krahmer and Muskens (1995) for discussion of the data and a potential solution.

(24) $[\![\neg\neg\exists u\varphi]\!]^{\mathcal{M},g,w}$



Since these properties of double negation will be useful to us in subsequent sections, we can define, following Groenendijk and Roelofsen (2009), a non-inquisitive closure operator ! as in (26). 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 (26). As the name describes, non-inquisitive closure of a formula φ returns a singleton set with a single alternative comprised of all of the worlds contained in any of the alternatives in φ and no others.

(25) **Non-inquisitive closure (!):** $[\![!\varphi]\!] := [\![\neg\neg\varphi]\!] = \{\bigcup[\![\varphi]\!]\}$

2.5 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 and Bruce (2010) *inter alia*). Empirically, Farkas and Bruce (2010) provide a clear motivation for such a theory: 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 (26). As noted at the outset, one fundamental difference between questions and at-issue assertions is that such a response is expected in the case of questions, rather than merely possible.

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

The possible responses to assertions as in (26) demonstrate 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 aspect of assertion, modeling both questions and assertions as sets of sets of possible worlds (i.e. of type *stt*). Building on Farkas and Bruce (2010), we hold that not only questions, but also assertions with widest scope disjunctions or indefinites propose a non-singleton set of alternative ways to update

the common ground. As we will see in §3-4, it is precisely this common property which allows for a compositional account of the role of disjunctions and indefinite wh-words in questions in YM.

3 Focused Disjunctions in Yucatec Maya

In §2, 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 context change potential 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 fact that such sentences are questions (given the definition in (18)) from the interaction of 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 the notion of *relative* informativity spelled out in §2. That is, 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 §4, this allows us to explain how questions can arise compositionally from non-interrogative elements 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 §3 explores these interactions in detail.

3.1 Questions, assertions and focused disjunctions

As we saw in (2)-(3) (repeated below as (27)-(28)), 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[9]; there is not a separate alternative question construction apart from focused disjunctions.

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

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

(27) [le kuul maangooj *wáa* le kuul puut]$_F$ 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.

(28) [le kuul maangooj *wáa* le kuul puut]$_F$ 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 sentence with a disjunction in argument position, as in (29), can only be interpreted as an assertion regardless of context.

(29) 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 again in (30)-(31) with a focus/clefted version of (29).

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

(30) [Juan *wáa* Daniel]$_F$ uk' le sa'-o'
Juan OR Daniel drink.AGENT.FOCUS DEF atole-DISTAL
'Was it Juan who drank the atole or was it Daniel?'

Scenario B: Addressee and speaker both agree that one of the speaker's three siblings (Juan, Daniel, and Maribel) drank the atole that was on the table.

(31) [Juan *wáa* Daniel]$_F$ uk' le sa'-o'
Juan OR Daniel drink.AGENT.FOCUS DEF atole-DISTAL
'It was Juan or Daniel who drank the atole.'

Before proceeding, however, a few words are in order regarding the empirical basis for the claim that (30) is a question, whereas (31) is an assertion. The central piece of evidence which supports this claim is whether or not it is felicitous for the addressee to continue the discourse without providing an answer or other overt response (e.g. "I don't know."). As noted above, whereas assertions in no way require any overt response, questions oblige the addressee to respond in order for the discourse to be

well-formed. We can tell that (30) is a question because speakers judge it infelicitous for the addressee to remain silent following the speaker's uttering (30). In contrast, (31)– like other assertions – allows the speaker to remain silent with no repercussions for the discourse.

This felicity judgment task is supported by evidence from two secondary sources. First, in a back-translation task, when presented with (30), speakers consistently use Spanish questions. Second, speakers have a clear metalinguistic intuition that the sentence is a question in (30), but not a question in (31) (even when it is emphasized that it is the same sentence). While semantic fieldworkers have quite rightly been skeptical of metalinguistic judgments of many kinds (e.g. whether a given sentence is ambiguous), questionhood is a notion which speakers plausibly do have access to. Given these three kinds of evidence, we take it that (30) truly is a question, whereas (31) is an assertion.

One important thing to note about this alternation is that, despite initial appearances, it is not clear that it is a true semantic ambiguity. Once the discourse context is fixed, the sentence can only function as either a question or as an assertion. More specifically, such sentences function as a question if and only if the set of alternatives in their proposed update — {drink-atole$'$($juan$), drink-atole$'$($daniel$)} — *exhaust* those which are possible in the prior context.

Before we move on the analysis of this alternation, however, we first need to examine the semantics of the focus/cleft construction in its own right. In order to understand what happens to disjunctions in this position, we first examine the semantics of this construction apart from questions, i.e. when plainly non-inquisitive expressions occur there. We undertake this in §3.2 and also briefly contrast the semantic contribution of the YM focus/cleft construction with that of a superficially similar construction: the English *it*-cleft.

3.2 Focus/cleft position in Yucatec Maya

This section aims to characterize the aspect of the Yucatec Maya focus/cleft construction which we claim is relevant for questions: its existential presupposition. Compare the sentence in (32), which has an ordinary, non-inquisitive element in the focus position, with its unfocused counterpart in (33).

(32) [Juan]$_F$ uk' le sa'-o'
Juan drink.AGENT.FOCUS the atole-DISTAL
'It was Juan who drank the atole.'

(33) Juan-e' t-u yuk'-aj le sa'-o'
Juan-TOP PFV-A3 drink-STATUS DEF atole-DISTAL
'Juan drank the atole.'

In terms of the sentence's form, there are several differences between (32) and (33) which indicate the presence of focus in (32) but not in (33). First, the focused element (the agent *Juan*) surfaces in preverbal position with no topic marking. Second, since the focused element is the agent of a transitive verb, the verbal complex appears in the so-called 'Agent-Focus' form. 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 (nomina-

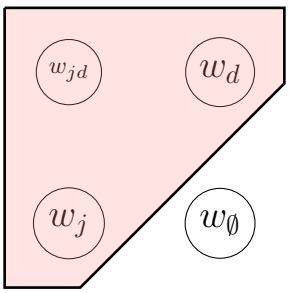
tive/ergative) agreement marker and (ii) the appearance of the verb itself without the so-called 'status' suffix, *-aj*.

In terms of semantics, a number of recent works have emphasized that even well-studied presuppositions in English can be sensitive to pragmatic factors such as the Question Under Discussion (e.g. Simons (2007), Simons et al (2010)). As Tonhauser (2011) illustrates, this means that establishing the presuppositionality (or not-at-issueness more generally) of a given element through elicitation with linguistically naïve consultants is a tall order. While I leave a detailed investigation of this sort to future work, it is clear at first blush that the focus/cleft construction does contribute an existential presupposition (that there is someone who drank the atole in (32)). Speakers reject sentences like (32) in contexts where it is not previously established or easily accommodatable that there is some individual of which the main predicate holds.

Moreover, the presence of an existential presupposition here is unsurprising given that it is a focus construction, and focus has long[10] been claimed to contribute an existential presupposition. Indeed, Geurts and van der Sandt (2004) argue that an existential presupposition is the *only* semantic contribution which focus makes. While we do not adopt such a radical view, it makes clear that it is well within the mainstream of focus semantics to assume that focus contributes at least an existential presupposition, likely in addition to other meaning components such as Roothian focus alternatives (see Abusch (2010) for one recent account of focus which is explicit on this point).

Crucially, we analyze this existential presupposition as a classical existential quantifier rather than an inquisitive one. The focus/cleft construction in (32) 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). Given this, we can formalize the presupposition of (32) as in (34) where ! is the non-inquisitive closure operator defined in §2.4. 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.

(34) Presupposition of the Focus/Cleft for (33): $!\exists x$:drink-atole$'(x)$



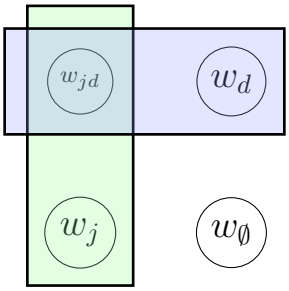
We have claimed that the existential presupposition for the Yucatec Maya focus/cleft should be captured in the logic with a classical existential quantifier, rather

[10] For example, as discussed by Abusch (2010), Chomsky (1972) provides informal logical forms for English sentences with focus which indicate the presence of an existential presupposition.

than an inquisitive one. Having introduced inquisitivity into our logical language, however, 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 just such a construction. A sentence like (35) 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 (36).

(35) It was John who drank the atole.

(36) Presupposition of the *it*-cleft for (35): $\exists x$: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 and 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 §3.5, 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.[11]

Independent of examples involving focused inquisitive elements, we have seen that the focus/cleft construction contributes a purely informational existential presupposition. Recalling that one way to define the non-inquisitive closure operator $!\varphi$ is in terms of double negation, a close paraphrase is that the focus/cleft construction presupposes that "it's not the case that no one drank the atole". When the focused element is classical (i.e. only has an informative component), as in (35), the at-issue effect of the sentence is to *identify* who drank the atole. The at-issue update is informative in this case because it proposes to take the conversation from a state containing only worlds where someone or other drank the atole and update it to one including only worlds where Juan drank the atole.

[11] 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 (i), 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.

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

3.3 Usage as a Question

Having examined the semantics of examples with non-inquisitive elements in the focus/cleft construction, we turn to the semantics of examples where the focused element is itself inquisitive: disjunction. As we saw in §3.1, examples with a focused disjunction, like (30)/(31), can function either as a question or as an assertion depending on whether the alternatives in the disjunction exhaust those which are available from context. We examine first the contexts like (37) where (30)/(31) functions as a question.

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

(37) [Juan *wáa* Daniel]$_F$ uk' le sa'-o'
Juan Or Daniel drink.Agent.Focus Def atole-Distal
'Was it Juan who drank the atole or was it Daniel?'

As argued above, the focus/cleft construction contributes a non-inquisitive existential presupposition; in this case, that there is someone who drank the atole. We assume that this existential presupposition is subject to contextual restriction, meaning that the presupposed input context contains only worlds where it's the case that Juan and/or Daniel drank the atole. Formally, we capture this by assuming a model with only two individuals as in (38). The focus/cleft presupposes that the input state for (37) (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 (18).

(38) Presupposition (left) and at-issue (right) semantics for (37):

Presupposition: $[\![!\exists x{:}\text{drink}'(x)]\!]$ At-issue: $[\![\text{drink}'(\text{juan}) \vee \text{drink}'(\text{daniel})]\!]$

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 (37) 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.

3.4 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 (31), repeated as (39).

Scenario B: Addressee and speaker both agree that one of the speaker's three siblings (Juan, Daniel, and Maribel) drank the atole that was on the table.

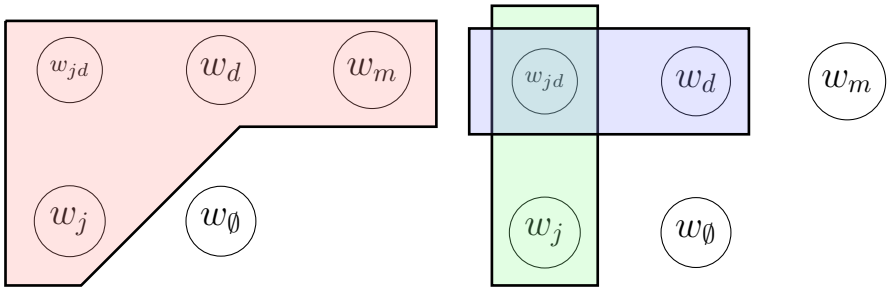
(39) [Juan *wáa* Daniel]$_F$ uk' le sa'-o'
Juan OR Daniel drink.AGENT.FOCUS DEF atole-DISTAL
'It was Juan or Daniel who drank the atole.'

As above, the focus/cleft presupposes that $w_\emptyset$ is already excluded from the context set. Here, however, the context also contains worlds where some individual other than Juan or Daniel drank the atole, namely Maribel. The focused disjunction in (39), then, has another path to informativity: eliminating worlds where Maribel drank the atole (instead of Juan or Daniel). As in Scenario A, the focused disjunction is interpreted as a proposal to update the common ground with a set of two alternatives. In this context, however, this same output state is truth-conditionally informative relative to the presupposed input state. (39) therefore functions as an assertion according to the Inquisitive Principle. In this scenario, the addressee need not provide any response and the proposal put forth by (39) can add information to the c.g.

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.[12] As seen in (40), the at-issue component of the assertion reading is the same as the question reading in (39). The only difference is the contextual restriction of the existential presupposition.

(40) Presupposition (left) and at-issue (right) semantics for (31):

Presupposition: $[\![!\exists x{:}\text{drink}'(x)]\!]$ At-issue: $[\![\text{drink}'(\text{juan}) \vee \text{drink}'(\text{daniel})]\!]$



While the at-issue proposal remains the same in this scenario, (31) is *informative* in this scenario because it proposes to eliminate w_m from the presupposed input state. According to the principle in (18), then, (31) is correctly predicted to be interpreted as

[12] There will of course be several such worlds (w_{mj}, w_{mjd}, and w_{md}); we show only one in order to make the pictures maximally clear.

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 what happens in the case of an ordinary, non-focused disjunction, as in (41), repeated from (13).

(41) 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.

3.5 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, and 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 (42) 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.

(42) #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.

This first reason clearly cannot be the explanation for the observation that (42) 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 §3.2. 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 (43). Intuitively, the at-issue contribution of (42) is not informative in this scenario, but it is also *not inquisitive* relative to its presupposition.

(43) Presupposition (left) and at-issue (right) semantics for (42)

Presupposition: $[\![\exists x{:}\text{drink}'(x)]\!]$ At-issue: $[\![\text{drink}'(\text{juan}) \vee \text{drink}'(\text{daniel})]\!]$

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 (44). 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 (44) 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 (44). If this is right, then, this would be an instance of the first of the the three possible explanations we gave above — the combination of disjunction and intonational focus is not possible for independent reasons.

(44) [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 (44), there is another way in which intonational focus in English has been argued by some 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.

4 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 (45)-(46).

(45) [máax]$_F$ il-ech
who see.Agent.Focus-B.2
'Who saw you?'

(46) [ba'ax]$_F$ t-u yuk'-aj
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 (45)-(46) which derives their interpretation as questions from the interaction of the semantics for indefinites proposed in §2 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.

4.1 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 mains types of evidence — typological and formal semantic. Typologically, research by Haspelmath (1997) and Bhat (2000) has shown (building on observations by Ultan (1978) and others) 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, non-specific or dependent indefinites, and free choice indefinites in (47)-(49), respectively.

(47) yan máax t-u yuk'-aj le sa'-o'
exists who Pfv-A.3 drink-Status Def atole-Distal
'Someone drank the atole'

(48) tak in jantik wáa ba'ax
want A.1 eat Or what
'I want to eat something or other'

(49) je'en máax-ak j-u beeytal u bin ich kool meyaj-e'
any 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 wh-words as indefinites. Karttunen (1977), of course, does this quite directly. While Hamblin (1973) does not treat wh-words as indefinites, Kratzer and Shimoyama (2002)'s Hamblin semantics for indefinites has shown a tight connection between indefinites and wh-questions in the Hamblin approach.[13] While Groenendijk and Stokhof (1984) do not draw a close parallel to indefinites, other dynamic accounts of questions have. For example, van Rooij (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 and Stokhof (1984)-based dynamic semantic framework.

For us, however, indefinites and wh-words are alike not only in their subsentential use of alternatives and anaphoric properties, but also in their issue-raising capacity. 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.

[13] As an anonymous reviewer points out, Kratzer and Shimoyama (2002) also extend their account to apparent cases of universal quantification, as in their (i). 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 and 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.

(i) [[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 and Shimoyama (2002) propose for Japanese. See Haida (2008) for further discussion of the relationship between indeterminate pronouns in Kratzer and Shimoyama (2002) and indefinites in more dynamically-oriented accounts.

4.2 Wh-questions as focused indefinites

In the theory developed in §2, 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, repeated in (50):

(50) $[\![\exists u\varphi]\!]^{\mathcal{M},g,w} = \textsc{Alt}\{\alpha \subseteq \mathrm{W} \mid \textit{there is some } d \in \mathcal{D}_e \textit{ s.t. } \exists \beta \in [\![\varphi]\!]^{\mathcal{M},g[u/d],w} : \alpha \subseteq \beta\}$

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 (50) 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 (51), 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 (52) will function as a question since it is both *inquisitive* and *uninformative*.

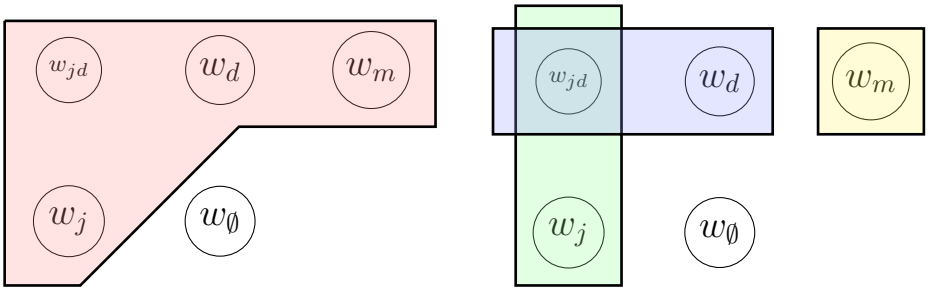
(51) [máax]$_F$ uk' le sa'-o'
someone/who drink.Agent.Focus the atole-Distal
'Who drank the atole?'

(52) Presupposition of (51) in $\mathcal{M}_A$ At-issue component of (51) 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 (30). Unlike in the case of focused disjunctions, however, a sentence like (51) with a focused indefinite can only function as a question. To see why, lets consider the same example interpreted in a context (scenario B from above) with three individuals (Juan, Daniel, and Maribel) as in (53). 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.

(53) Presupposition of (51) in $\mathcal{M}_B$: At-issue component of (51) in $\mathcal{M}_B$:



Whereas the focus/clefted two-disjunct disjunction, (31), 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 and 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.

4.3 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.[14]

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* (e.g. Haspelmath (1997), Bhat (2000)). 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

[14] Though it should be noted that the present account does not address *intervention effects*, the primary empirical focus of Beck (2006).

clearly do possess a ordinary semantic value, and it is hard to see how the two can be compositionally related in a principled way. The focus semantic value Beck and others propose for wh-words is the same as the ordinary 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 and Kim (2006) present an extension along these lines in their analysis of English alternative questions, under the assumption that they contain focused disjunctions.[15] 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 (54)-(55), where the sentences clearly convey that alternatives other than the two disjuncts do not hold (as indicated in parentheses). Beck and Kim (2006)'s example in (56) suggests the same conclusion.

(54) It was coffee$_F$ or tea$_F$ that Frank brought. (i.e. Not something else)

(55) Frank only brought coffee$_F$ or tea$_F$. (i.e. He didn't bring anything else.)

(56) a. Who did Hans invite?
b. Hans invited Anna$_F$ or Sally$_F$.

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

[15] This assumption itself has been disputed by Pruitt (2007) and other recent work, which argues that focus intonation is neither a necessary nor a sufficient condition for English alternative questions. Instead, these authors argue that the final falling pitch on the last disjunct is crucial.

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.[16]

5 Polar Questions in Yucatec Maya

Having examined the polyfunctionality of focused disjunctions in YM in §3, 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 (57) and (58) make use of a word *wáa(j)* which is at least homophonous with the ordinary disjunctive coordinator.[17]

(57) [Juan-*wáaj*]$_F$ uk' le sa'-o'
Juan-OR drink.AGENT.FOCUS the atole-DISTAL
'Was it Juan who drank the atole?'

(58) 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 §5.1, *wáa* in polar questions like (57) (but not (58)) occurs immediately following a focus/clefted syntactic constituent. To capture these syntactic and semantic parallels, §5.2 pursues an analysis of polar questions with a focused element, like (57), as versions of focused disjunctions with a single overt disjunct. In polar questions like (58) with no focused element, the position of the disjunctive coordinator, *wáa*, is determined prosodically rather than syntactically. In §5.3 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 §5.4

[16] 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.

[17] The coda [h] in polar questions (orthographic 'j') is part of a regular process of phonological phrase-final [h]-epenthesis, see AnderBois (2011b) for details.

5.1 Two classes of polar question in Yucatec Maya

Superficially, the two polar questions in (57)-(58) 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 or prosodic, we might expect that a single generalization could capture the distribution of *wáa(j)* across both cases. As argued in AnderBois (2009), however, we take the position of *wáa(j)* in polar questions to be syntactically determined in questions like (57) with a focus/clefted element, but prosodically determined in questions with no such element, as in (58). While the reader is referred to AnderBois (2009) for more detailed arguments to this effect, we briefly outline the syntactic justification for this distinction.

The clearest argument that the position of *wáa(j)* is prosodically determined in polar questions without focus comes from examples, such as (59), involving a free variation of the phonological form of certain aspect markers such as the terminative aspect marker, *ts'o'ok*. In (59), this morpheme appears in a full CVC form which meets minimal word requirements, and *wáa(j)* appears attached to it phonologically. In (60), 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 instead occurs immediately following the main verb.

(59) 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-*wáah* ti leti'

(60) 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'

As there is no discernible semantic difference between (59) and (60), 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 (61).

(61) a. [le ts'ooya'an sakpile'en maak-*wáaj*]$_F$ 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]$_F$ t-u yuk'aj le sa'o'
c. *[le ts'ooya'an *wáaj* sakpile'en maak]$_F$ t-u yuk'aj le sa'o'
d. *[le ts'ooya'an sakpile'en *wáaj* maak]$_F$ t-u 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.

5.2 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 (62). The approach we take is to treat such questions as versions of focused disjunctions consisting of a single overt disjunct (*juan* in (62)). 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 (63). While we make use of the strikethrough notation schematically, we do not take the empty disjunct to literally be the result of ellipsis.

(62) [Juan-wáaj]$_F$ uk' le sa'-o'
Juan-OR drink.AGENT.FOCUS the atole-DISTAL
'Was it Juan who drank the atole?'

(63) [Juan wáa ~~ANYONE ELSE~~]$_F$ uk' le sa'-o'

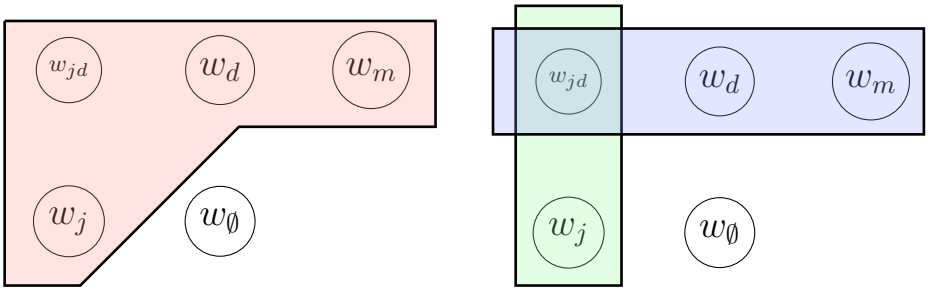
This interpretation for the empty disjunct is the result of grammaticalization of inferences that have been argued to hold (at least pragmatically) of ordinary disjunctions across languages (see, for example, Zimmermann (2000), Geurts (2005), and Simons (2000)). More specifically, we take the empty disjunct 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 (64). The denotation as given combines with an individual (Juan in (63)) 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.

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

Recall that the questioning nature of wh- and alternative questions in previous sections was derived from the combination of a hybrid expression contributing inquisitivity — 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 inquisitivity 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 (64)) 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 (62) in (65) (the presupposed input state is in the left figure; the at-issue component in the right figure).

(65) $!\exists x.\text{drink-atole}'(x)$ $\text{drink-atole}'(\text{j}) \vee !\exists x.[\text{drink-atole}'(x) \wedge \{x \neq \text{j}\}]$



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[18] the semantic rule for interpreting the 'empty' disjunct in (64).

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 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.

5.3 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

[18] Cross-linguistic support for this grammaticization can also be found in a parallel process that occurred historically with conjunction in Oceanic languages. Moyse-Faurie and 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 and 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.

(66) which have no focus/clefted element. Recall from §5.1 that the position of *wáa(j)* in such questions is determined prosodically rather than directly by syntax.

(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?'

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 (66), 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 (66) (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 (67), where the polarity of the sentence is realized overtly. In these cases, *wáa(j)* attaches to this overt polarity as seen in (67).

(67) ma'-*wáaj* t-a beet-ik chuuhuk waaj?
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 (67), similar to their English translations, appear to convey a different sort of question than their positive counterparts. We focus on positive polar questions in what follows. 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 disjoined 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 (66), for example, will have the semantics in (68).

(68) $\{\text{drink-atole}'(juan), \neg\text{drink-atole}'(juan)\}$

More generally, disjunction of polarity will take the union of $[\![\varphi]\!]$ and (the single alternative-denoting) $[\![\neg\varphi]\!]$. In the case of polar questions where the polarity itself is what is disjoined, the semantics produced is the same as that contributed by Groenendijk and 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.

5.4 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 in the sense defined in §2.2 due to the very nature of negation. While we argued above that it is relative uninformativity to

which the inquisitive principle refers, it should be noted that absolute uninformativity will derive the same results in polar questions with no focused element. While this seems sensible in theory, we know that ordinary disjunctions of this form are possible, (69)-(71), and without special intonation, function as tautologous assertions, generally with some additional pragmatic effect (see Ward and Hirschberg (1991) for some discussion of these pragmatic effects).

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

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

(71) *Either a ham has a bone or it doesn't have a bone.* Where'd they get a name like 'semi-boneless' from? Ward and 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 inquisitivity. 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.[19]

One option we might consider would be to extend the analysis from §5.2 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 (72) 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 (72) 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 be quite odd. In (71), 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.

(72) 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 (69)-(71), the two disjuncts are entire clauses (or elliptical versions thereof). In con-

[19] An anonymous 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 φ, one for ψ, 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.

trast, polar questions in YM like (72) 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 (73). 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.

(73) $\left\{ \begin{array}{c} \lambda P_{stt}.\neg P, \\ \lambda P_{stt}.P \end{array} \right\} (\varphi)$

The fact that the polar question in (72) is uninformative, then, can be determined independent of the content of φ. In contrast, to determine the tautological nature of the disjunctions in (69)-(71), one must ensure that the lexical material in both disjuncts is the same. The distinction between sentences whose tautological nature can be determined based solely on its logical items and those where it cannot be has been made for entirely different cases by Gajewski (2009) (and Gajewski (2002)).[20] He terms the former class of uninformative sentences 'L-trivial' and proposes that such sentences are not merely tautologies, they are ungrammatical. It is not entirely clear how the class of 'logical items' in a given language is to be defined in general. However this distinction is made, though, disjunction and negation would certainly seem to be among them. Polar questions are unacceptable as assertions, then, because they are not just uninformative, they are L-trivial. We can formalize this idea by revising the Inquisitive Principle from (18) as in (74).

(74) **Inquisitive Principle (final):**

a. A formula φ is a *question* iff **(i)** φ is inquisitive, and **(ii)** φ 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, 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.[21]

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, the revised inquisitive principle allows us to capture an otherwise puzzling observation: English examples like (75)-(76) are unable to serve as tautological assertions in the way that (69)-(70)

[20] 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.

[21] 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.').

could.[22] 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 ungrammatical.

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

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

Summing up, by revising the inquisitive principle to be sensitive not just to uninformativity, but uninformativity via L-triviality, we draw a principled distinction between merely tautological disjunctive assertions like (69)-(71) and sentences like (72) and (75)-(76) 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.

6 Conclusion

We have provided an account of the semantics and pragmatics of the major types of questions in Yucatec Maya: wh-, alternative, polar questions with a focused element, and polar questions with no focused element. Our account derives this question semantics based on the interaction of the semantic contribution of their two components: disjunctions/indefinites and focus. For indefinites/disjunctions, we make use of an independently motivated inquisitive semantics for disjunctions and indefinites in which they are hybrid expressions. That is, they not only make their classical, truth-conditional contribution, but also evoke a set of alternatives, raising the issue of which one holds. The role of focus, then, is to obviate the truth-conditional informative potential that these hybrid expressions ordinarily contribute by presupposing it to already hold.

Like other work in inquisitive semantics, the semantics makes no fundamental distinction between questions and assertions (i.e. they are of the same semantic type). In order to capture this distinction, then, we instead proposed a principle, the Inquisitive Principle, which defines the class of illocutionary questions as an emergent category based on two semantic properties: inquisitivity and uninformativity of a particular sort. Treating the assertion/question divide in this way has two main empirical benefits with regards to questions in Yucatec Maya. First, we were able to derive the interpretation of wh- questions from the interaction of two components — indefinite wh-words and the focus/cleft construction — neither of which is itself inherently interrogative. While we have focused on questions in Yucatec Maya, these two elements are quite common in wh-questions across languages. Second, the account also captures a surprising

[22] While this judgment is somewhat variable across speakers, the majority of speakers I have consulted with share the judgment that (75)-(76) cannot be used as assertions. One possible explanation is that the speakers that do not share this judgment are applying focus or some other special intonation to the disjuncts in (75)-(76). This possibility is supported by the fact that for all speakers, the addition of *either* allows these sentences to be 'rescued' as tautological assertions, similar to (69)-(70).

fact more particular to Yucatec Maya: a focused disjunction can function either as a questions or an assertion depending solely on the discourse context.

In formulating the inquisitive principle, we have relied on a notion of (un)informativity which is *relativized* to a sentence's semantic presuppositions. In this regard, the present account contrasts with previous inquisitive semantics accounts of questions (Mascarenhas (2009), Groenendijk and Roelofsen (2009), and Ciardelli (2009) *inter alia*). Like the present work, these accounts build questions within the semantics from a hybrid core provided by an indefinite wh-word or a disjunction. Both accounts, then, share the core idea that a question is an indefinite or disjunction whose truth-conditionally informative component has been somehow removed or obviated. Where they differ is in the source and nature of this uninformativity. For the above authors, uninformativity arises in all cases because a question operator in the logical form inserts the alternative which would have been excluded. While no longer a *partition* semantics (since it is not necessarily transitive), this yields a question semantics which is similar to Groenendijk and Stokhof (1984) in that the alternative set of a question exhausts the entire space of possible worlds.

The present theory, in contrast, arises at uninformativity because the indefinite or disjunction's truth-conditional component is *presupposed*. The result of this decision is that the semantic contribution of an ordinary wh-question, for example, is much like that of Hamblin (1973). As in the Groenendijk and Stokhof (1984)-based inquisitive accounts, uninformativity plays a central role in functioning as a question. The difference in our theory is that it is uninformativity *relative to the sentence's presupposition* which matters. The alternatives of the question exhaust the limited space of possible worlds meeting the sentence's presuppositions. While Hamblin (1973) characterized wh-questions as having an existential presupposition, there was no semantic reason in his account for why such a presupposition would be *necessary*. For us, this presupposition, contributed compositionally by focus, is essential to achieving truth-conditional uninformativity, thereby isolating the inquisitive component of the sentence.

Acknowledgements Many thanks to all of the Yucatec Maya consultants on this project for their patience, thoughtfulness, and willingness to share their language with me. Thanks also to Pranav Anand, Judith Aissen, Jürgen Bohnemeyer, Adrian Brasoveanu, Donka Farkas, Kyle Rawlins, and audiences at CILLA IV, CUSP 1, SSILA 2009, SULA 5, and UMass for helpful feedback on portions of this and related work. I am also very grateful to 3 anonymous NLS reviewers whose detailed comments greatly improved the paper. All remaining errors are, of course, my own.

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