PREPOSITIONS AND PERPETUAL VIRGINITY: UNTIL AS A SCALAR ITEM IN MATT 1:25

Travis Wright

Patrick Henry College, Purcellville, VA

Abstract: I examine the grammar of Matt 1:25 and argue there is an obligatory scalar inference meaning 'after but not before.' I conclude the grammar of Matt 1:25 contradicts the view that Mary remained a virgin after the birth of her son. (Article)

1. *The Semantics/Pragmatics Interface*[1]

Meaning in natural language can be distinguished between semantic (truth-conditional) and pragmatic (use-conditional) meaning. The boundary between semantic and pragmatic meaning is called the semantics/pragmatics interface.[2] Although understanding the semantics/pragmatics interface is essential to biblical interpretation and translation, it has not been widely discussed in biblical studies.[3] For the purposes of the present

---

1.   I wish to thank Peter Williams and Kevin Grasso, without whom this article would not be possible.

2.   For discussion of the so-called 'border wars' between semantics and pragmatics, see Horn, "The Border Wars," 21–48. On issues at the semantics/ pragmatics interface, see Horn, "Said and the Unsaid," 163–92; Horn, "Implying and Inferring," 69–86; Bach, "Semantics-Pragmatics Distinction," 33–50. A useful recent introduction can be found in Jaszczolt, *Semantics, Pragmatics, and Philosophy*, esp. 1–17, 236–90.

3.   Discussion of issues in pragmatics relevant to New Testament studies can be found recently in Porter, *Linguistic Descriptions*, esp. 68; Porter,

argument, semantic meaning is typically associated with the code of an utterance: it is created using the explicit resources of a language's grammar and lexicon. Pragmatic meaning is produced when linguistic code interacts with logic to produce various types of inference, such as presupposition and implicature, and entailment.[4] As a design feature, these inferences solve an important problem in language called the articulatory bottleneck: we compute information faster than we can articulate it in speech production. To make communication as efficient as possible, we use inference: "[I]nference is cheap, articulation expensive, and thus the design requirements are for a system that maximizes inference."[5]

While biblical scholars have studied discourse-based inferences, other types of inference, such as scalar and conversational inferences, have not received equal treatment. In fact, there remain areas in pragmatics that have not received focused attention in biblical studies at all.[6] In this article I discuss one such case: the scalar inference generated by the *until*-phrase

---

Linguistic Analysis, esp. 57; Fresch, *Typology*, 397–400; Fantin, *Greek Imperative*, 43–65; Estes, *Questions and Rhetoric*, 72–88, 270–330; Runge, *Discourse Grammar*, esp. 7–9.

4.   Horn, "On the Semantic Properties," esp. 92–98; Levinson, *Presumptive Meanings*, 79–111; Potts, *Presupposition and Implicature*, 168–202.

5.   Levinson, *Presumptive Meanings*, 6, 27–30 (here 29).

6.   This is not an indictment of biblical studies. Most areas in postclassical Greek linguistics, for example, remain understudied. See the call in Rafiyenko and Seržant. "Postclassical Greek," 1–16. Although the following argument contains technical issues that may be unfamiliar to biblical scholars, it is important to note that the technical nature of linguistics is not a unique problem. As Barr ("The Ancient Semitic Languages," 39) wrote, "We would do wrong if we followed our philologist of the old school and imagined that modern linguists had introduced a complex and lengthy vocabulary into a subject which had previously been free from terminological complexities and inconsistencies." On the need for a new Archimedean point in New Testament philology, see Porter ("Where Have All the Greek Grammarians Gone?" esp. 17).

in Matt 1:25. This particular inference has long puzzled and divided interpreters. I analyze it in detail below.[7]

2. *Analysis of the Preposition Until*

Because much has been written on the behavior of the *until*-phrase, I note here only key findings relevant to New Testament interpretation.[8] Cross-linguistically, the preposition *until* is a boundary adverbial that behaves like a definite description by selecting the most informative interval of an event for comment, which is typically the interval at which an event either began to transpire or ceased to transpire. This interval is located at the right boundary (RB) of a topic time called the Until Time Span, which is set by an argument that can be a noun phrase or an entire clause.
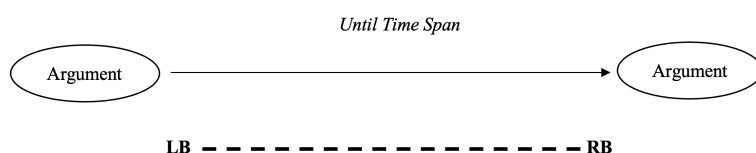
Until Time Span

Argument ———————————————▶ Argument

LB — — — — — — — — — — — — — — **RB**

Figure 1: The Until Time Span

---

7. Confusion among commentators about the grammar of Matt 1:25 is a direct result of overlooking the contribution of linguistics to biblical studies. As we shall see, the *until*-phrase has been studied extensively since the 1970s, but this literature has been completely ignored in discussions of Matt 1:25.

8. Aspects of the following discussion summarize Staniszewski, "Until-Phrases," and Wright, "Lexical Ambiguity and Lexicalizations of Until." On the history of analysis of the *until*-phrase, see Karttunen, "Until"; Mittwoch, "Negative Sentences with Until"; Hitzeman, "Aspect and Adverbials"; Declerck, "Problem of *not . . . until*"; de Swart, "Meaning and Use of *not . . . until*"; Giannakidou, "UNTIL, Aspect, and Negation"; Condoravdi, "Punctual until as a Scalar NPI"; Iatridou and Zeijlstra, "Complex Beauty."

2.1 *Puzzles of Until*

In the literature, linguists have identified three puzzles of *until*. The first puzzle is that some predicates are judged unacceptable with an *until*-phrase.

(1)   #He arrived until 9PM.[9]

However, when we introduce negation, the *until*-phrase becomes acceptable.

(2)   He didn't arrive until 9PM.

A solution to this puzzle comes from Mittwoch, who proposes that a predicate is compatible with the *until*-phrase if and only if it has the subinterval property: where some event holds for one interval *t*, it also holds for all subintervals of *t* as well (*t1, t2, t3,* etc.).[10] This means that an event either holds or does not hold for the entire duration of the Until Time Span.
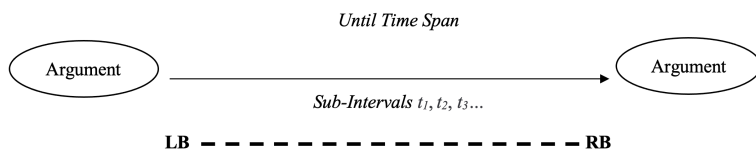

Figure 2: The Subinterval Requirement

The reason why (2) is acceptable with *until* but (1) is not is because telic predicates like *arrive* do not yield the subinterval property except under negation. The result otherwise is illogical: the event *arrive* cannot be continually completed until 9PM.

The second puzzle is that the *until*-phrase generates different types of scalar inference. A scale is a set of values ordered in a linear (or dense) relation as degrees of measurement. A scalar inference is generated when an utterance is informationally weaker than its alternative on an implicit scale.[11] For example,

---

9.   The symbol = is used to indicate a possible reading, whereas # is used to indicate a semantically unacceptable reading (e.g. it is disallowed).

10.   Mittwoch, "Negative Sentences with Until."

11.   For discussion of scalar inferences, the standard treatment is still

the quantifier *some* implicates the informationally stronger *not all* as a scalar inference.

> (3) Some students did not pass the exam > not all students passed the exam.

In such cases, the scalar inference is produced because the listener assumes that the speaker is following Gricean principles of communication (e.g. the quantity maxim, 'make your contribution as informative as required'). As a result, the hearer enriches the logical form of the code, which is underdetermined, to recover its intended interpretation.[12]

Like the quantifier *some*, the preposition *until* is a scalar item because it generates a scalar inference: the final boundary of one event is the initial boundary of another, and *vice versa*. Notice there is a termination inference meaning *before but not after* in (4a).

> (4a) He ran until he noticed the fire.

The *until*-phrase triggers a scalar inference that the final boundary of *run* was the initial boundary of *noticed the fire*. The result is that the event *run* was true *before but not after* the event *noticed the fire*. In addition to the termination inference, the *until*-phrase can also generate a contrapositive inference referred to as the actualization inference.

> (4b) He didn't run until he noticed the fire.

When we introduce negation in (4b), the *until*-phrase triggers a scalar inference that the final boundary of *noticed the fire* was the initial boundary of *run* (the event *run* transpired 'after but not before' the event *noticed the fire*).

Hirschberg, *Theory of Scalar Implicature*. It is also worth noting there is considerable debate about the nature and computation of scalar inferences. For recent discussion of the issues, see Van Tiel, Pankratz, and Sun, "Scales and Scalarity."

12. Grice, *Studies in the Way of Words*, 27; Levinson, *Presumptive Meanings*, 37.

New Testament interpreters often rely on the defeasibility (or absurdity) of a scalar inference to prove that it is not present.[13] But the third puzzle is that sometimes the scalar inference is obligatory (it cannot be cancelled or excluded). One test that linguists use to determine whether an inference is defeasible is the cancellation test.[14] If an inference can be cancelled by adding an apparently conflicting proposition, it is not obligatory.

(5a) He ran until he noticed the fire.

(5b) =And he ran after he noticed the fire, too.

There is no contradiction derived from (5b), allowing the termination inference in (5a) to be cancelled. Yet notice that in (6a) the actualization inference cannot be cancelled without deriving a contradiction.

(6a) I didn't leave until I saw the fire. #And I didn't leave after I saw it, either!

This contradiction arises because the scalar inference in (6a) is a logical entailment rather than a mere implication. Necessarily, once the speaker saw the fire, they left.

13. For example, Merkle ("Romans 11," 716), commenting on Rom 11:25, writes that "Paul is not suggesting a time when the hardening will be reversed but a time when the hardening is eschatologically fulfilled." Yet as we shall see, the question is not whether such an inference is present but whether it is cancelled (Paul does not cancel this inference in Rom 11:25). The same is true of attempts at *reductio ad absurdum* using texts like 1 Cor 11:25 and 15:25, or 1 Tim 6:14. The question is not whether the inference is present, but whether it is cancelled, which must be proven using linguistic decisions in the surrounding context.

14. Jaszczolt ("Cancelability," 259): "[I]n spite of the recent criticism, Grice's cancellability test remains a reliable and effective criterion" for identifying pragmatic meaning. See also Zakkou, "Cancellability Test."
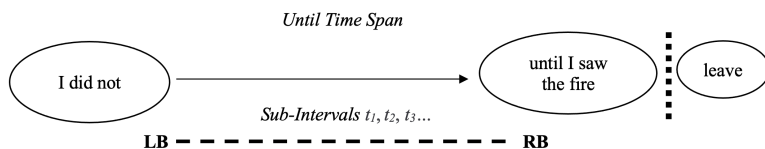
Figure 3: The Actualization Inference

Biblical interpreters have sometimes assumed that if a meaning is not coded, it must be a mere implication. Yet as (6a) demonstrates, some inferences affect the truth-conditions of an utterance because they are entailments, not mere implications.

2.2 *Durative vs. Punctual Until*

For this reason, in the literature, a distinction is made between durative and punctual *until*. Technically, the distinction does not involve the preposition itself but a cluster of properties that generate the relevant scalar inferences.[15] However, because the literature uses these conventions, I adopt them here. Roughly, durative *until* (5a) refers to an *until*-phrase that is combined with an unbounded predicate. The scalar inference of durative *until* (which can be either termination or actualization) is defeasible. It can be cancelled without deriving a contradiction. Punctual *until* (6a) is distinguished from durative *until* by two facts: (1) It requires negation (or an operator like it), and (2) the predicate is bounded.[16] When combined with *until*, a bounded predicate under the scope of negation generates an actualization inference that is obligatory.

A full explanation of why different types of scalar inference are generated, and why the actualization inference in particular is obligatory, is still a matter of further research. One recent

15. Further discussion can be found in Iatridou and Zeijlstra, "Complex Beauty."

16. Technically, the environments that license punctual *until* are anti-additive (e.g. punctual *until* is unacceptable with *few*). For discussion, see Iatridou and Zeijlstra, "Complex Beauty," esp. 118. To test for boundedness, one needs to examine aktionsart, the semantics of verbal arguments, and the logical properties of the predicate, not grammatical aspect alone. I discuss ways to bound a predicate in 3.2.2.

explanation comes from Staniszewski, although one does not need to accept his proposal to evaluate the argument of this article.[17] Staniszewski argues that a covert focus operator called EXH (short for exhaustification) is responsible for the difference between durative and punctual *until*. Roughly, EXH interacts with two types of alternatives: weaker alternatives called subdomain alternatives and stronger alternatives called superdomain alternatives.[18] As a focus operator, EXH takes a statement (the "prejacent") and a set of possible alternatives and negates the alternatives that can be excluded without contradicting the prejacent ("innocently excludable" alternatives), while also asserting alternatives that can be included without causing contradiction ("innocently includable" alternatives).[19] Because the *until*-phrase generates superdomain alternatives, and negation reverses the usual entailment patterns, EXH excludes the superdomain rather than the subdomain alternatives. Yet by excluding the superdomain alternatives, EXH entails that the subdomain alternatives in fact occurred (punctual *until*). In contrast, EXH in positive contexts (e.g. those that are upward entailing) does not necessarily exclude the superdomain alternatives.[20] Here the usual entailment patterns hold, making the scalar inference an implication (durative *until*).

For our purposes, the facts relevant to interpretation are: (1) an unbounded predicate must be durative *until*, and it generates a

17. Staniszewski, "Until-phrases."

18. For example, a smaller temporal interval is a subdomain (*9PM*), while a larger temporal interval (*three days*) is a superdomain.

19. Fox ("Free Choice," 80) writes, exh "facilitate[s] communication in a pragmatic universe governed by [the Gricean maxim of quantity]." On exh, see Spector, "Scalar Implicatures." Exh derives from a grammatical theory of scalar implicatures, but it is not necessary to discuss this theory here. See Chierchia, "Scalar Implicatures."

20. An upward-entailing context is an environment where the truth of a proposition is preserved when a subset is replaced by a superset, allowing inference from specific to general: *owning a wildebeest* also means owning *an animal*. A downward-entailing context is an environment where the truth of a proposition is preserved when a superset is replaced by a subset, allowing inference from general to specific: *not owning an animal* also means *not owning a wildebeest*.

cancellable scalar inference; (2) punctual *until* requires negation (or an operator like it) and a bounded predicate, and it generates an obligatory scalar inference meaning 'after but not before.' The difference between durative and punctual *until* is summarized in Table 1.

	Scalar Inference	Require negation	Bounded
Durative *Until*	Cancellable	No	No
Punctual *Until*	Obligatory	Yes	Yes

Table 1: The *Until*-Phrase

Scholars have long felt the presence of these inferences in the New Testament but have debated them unproductively, often conflating durative and punctual *until*. However, there have been significant advances in the last five decades on the nature of the *until*-phrase that provide clarity for biblical interpretation. When we turn to the New Testament, an utterance containing an *until*-phrase can be parsed using the temporal and logical properties of the predicate. If the utterance is positive or contains an unbounded predicate, it must be parsed as durative *until*. In such cases the scalar inference is cancellable. However, if the utterance contains a bounded predicate under the scope of negation (or an operator like it), it must be parsed as punctual *until*. In that case, an actualization inference 'after but not before' is obligatory. We turn now to the New Testament to examine these inferences in more detail.

3. *The Until-Phrase in the New Testament*

The most common scalar inference generated by the *until*-phrase in the New Testament is the termination inference.[21]

---

21. In the Gospels, examples of the termination inference can be found in Matt 2:9, 13, 15; 10:11; 13:30, 33; 14:22; 18:30, 34; 24:38; 26:36; Mark 6:10, 45; 14:32; Luke 4:13; 12:50; 13:8, 21; 15:4, 8; 16:16; 17:8, 27; 21:24; 23:44; 24:49; John 2:10; 9:4; 21:22, 23. Examples of the actualization inference can be found in Matt 5:18, 26; 10:23; 16:28; 17:9; 23:39; 24:34, 39; 26:29; Mark 9:1; 13:30; 14:25; Luke 1:20, 80; 9:27; 12:59; 13:35; 21:32; 22:16, 18, 34; John

(7) ἐγερθεὶς παράλαβε τὸ παιδίον καὶ τὴν μητέρα αὐτοῦ καὶ φεῦγε εἰς
Αἴγυπτον καὶ ἴσθι ἐκεῖ ἕως ἂν εἴπω σοι·
Rise, take the child and his mother, and flee to Egypt, and remain
there until I tell you. (Matt 2:13)
=And I want you to stay in Egypt after I tell you, too.

(8) ἕως ἔρχομαι πρόσεχε τῇ ἀναγνώσει, τῇ παρακλήσει, τῇ διδασκαλίᾳ.
Until I come, be devoted to the public reading, exhortation, and
teaching of scripture. (1 Tim 4:13)
=And be devoted to these things after I come, too.

Both examples should be seen as durative *until*, because they
lack negation. The termination inference is present but
technically cancellable: Joseph might have stayed in Egypt *after*
he was told to leave, and Paul might have added that Timothy
was to continue teaching *after* he came. No contradiction would
arise. Yet there is nothing in the surrounding context that cancels
the inference: Joseph and Mary obviously did not remain in
Egypt after receiving further instructions, and Timothy
presumably stopped teaching after Paul arrived (e.g. because
Paul himself was teaching). There is no question that the scalar
inference is present in (7) and (8). The question is whether the
surrounding context cancels it.[22]

Punctual *until* is present in the New Testament but not as
common as durative *until*. One example is the bounded state in
(9).

(9) Οὐκ ἐπίστευσαν οὖν οἱ Ἰουδαῖοι περὶ αὐτοῦ ὅτι ἦν τυφλὸς καὶ
ἀνέβλεψεν ἕως ὅτου ἐφώνησαν τοὺς γονεῖς αὐτοῦ.
So then the Jews did not believe concerning him that he was blind
and received sight until they called his parents. (John 9:18)
#And they didn't believe that he was blind after they called his
parents, either.

When a bounded predicate is combined with the *until*-phrase
and placed under the scope of negation, it necessarily generates

13:38.
22. For example, although the scalar inference is cancelled in Matt 24:21,
in Matt 26:29 and John 9:4 it is actually reinforced.

an actualization inference meaning 'after but not before.' According to Marín and McNally, "A bounded state predicate denotes a state whose onset is lexically entailed to coincide with or be posterior to the onset of the reference time for the predicate."[23] In (9) that reference time is set by the *until*-phrase, which selects a clausal argument (ἐφώνησαν τοὺς γονεῖς αὐτοῦ) that explicitly bounds the state οὐκ ἐπίστευσαν by creating an endpoint. Once the event ἐφώνησαν τοὺς γονεῖς αὐτοῦ culminates, the polarity of οὐκ ἐπίστευσαν is reversed, generating an actualization inference (the onset of ἐπίστευσαν). We know an actualization inference is generated because the Jews presuppose it in v. 24 when they command the parents to glorify God (δὸς δόξαν τῷ θεῷ) because of the healing. They also presuppose it in v. 26 when they ask, πῶς ἤνοιξέν σου τοὺς ὀφθαλμούς ('How did he open your eyes?'). The change of state is not stated explicitly but produced as a scalar inference in v. 18. From these data it is clear that the *until*-phrase generates scalar inferences in the New Testament. The question that arises for interpreters is what—if any—difference existed between different lexicalizations of *until* in postclassical Greek.[24]

3.1 *Different Lexicalizations of Until in the New Testament*

Unlike English, the Greek *until*-phrase is over-differentiated: one could select ἕως, μέχρι, or ἄχρι to lexicalize the Until Time Span. Recent work on the diachrony of *until* in Ancient Greek suggests

---

23. Marín and McNally, "Aktionsart," 217.

24. I lay aside *until*-phrases without an eventive clausal argument because they either denote a physical boundary of some kind (glossed *up to* or *to the point of*) or indicate that a pair of eventualities are co-instantiated at the topic time (e.g. in the case of habits/states, glossed *while*). For example, in 2 Tim 2:9 the *until*-phrase selects the argument δεσμῶν because it represents a physical boundary that is the upper-bound limit on an implicit scale: ἐν ᾧ κακοπαθῶ μέχρι δεσμῶν ὡς κακοῦργος ('For which I suffer *to the point of* chains, like a criminal'). See also Matt 24:39: Ἴσθι εὐνοῶν τῷ ἀντιδίκῳ σου ταχύ ἕως ὅτου εἶ μετ' αὐτοῦ ἐν τῇ ὁδῷ ('Settle terms with your accuser quickly *while* you are with him on the road'). The gloss *while* is given because the eventualities are overlapping: the activity Ἴσθι εὐνοῶν τῷ ἀντιδίκῳ σου occurs during the state εἶ μετ' αὐτοῦ ἐν τῇ ὁδῷ. These data are disanalogous to Matt 1:25.

multiple historical origins for these lexicalizations: ἄχρι probably arose from Ionian, μέχρι was originally Attic, and ἕως derived from proto-Indo-European.[25] In middle postclassical Greek (e.g. first century CE), ἕως, μέχρι and ἄχρι appear to be in free variation as lexicalizations of *until*.[26] For this reason, the exact lexicalization of *until* is not relevant when determining whether to parse an utterance as durative or punctual *until*.[27] A useful example of this phenomenon in the New Testament can be found in (10) and (11).[28] Notice how Matthew uses material from Mark but changes the lexicalization of *until* (and replaces the relativizer οὗ with a modal operator) without altering the scalar inference generated by the utterance.

> (10) οὐ μὴ παρέλθῃ ἡ γενεὰ αὕτη μέχρις οὗ ταῦτα πάντα γένηται.
>   This generation will certainly not pass away until all these things
>   transpire. (Mark 13:30)

25. For discussion, see Wright, "Lexical Ambiguity," 5. I follow John Lee ("Ἐξαποστέλλω," 113) by periodizing Greek as follows: Archaic Greek (8th BCE – 5th BCE), Classical (5th BCE – 4th BCE), Early Postclassical (3rd BCE – 1st BCE), Middle Postclassical (1st CE – 3rd CE), and Late Postclassical (4th CE – 6th CE).

26. Even in classical Greek it is not always clear why an author chose one lexicalization over another (cf. Xenophon, *Symposium* 4.37). See discussion in García Novo, "À la recherche," esp. 54; Wright, "Lexical Ambiguity." Over-differentiation is not an unusual phenomenon. As de Swart et al. state concerning the distribution of *until*-phrases in European languages, "different semantic encodings of the 'not . . . until'-meaning are semantically/ pragmatically equivalent, but originate in different lexicalizations of the construction" ("*Not . . . Until*," 25).

27. Wright ("Lexical Ambiguity," 17, 20–21) concludes about lexicalizations of *until*, "Complementary distribution in Archaic Greek led to eventual partial synonymy in Classical Greek, and free variation in Postclassical Greek, where by analogy [punctual *until*] was lexicalized first for ἕως and μέχρι, and then later for ἄχρι."

28. Other examples of substitution in the Greek Bible are less certain. Hewitt ("Messiah Discourse," 407–9) argues that Paul substitutes ἕως ἄν with ἄχρις οὗ when alluding to Gen 49:19 in Gal 3:19. He suggests one reason for the substitution is that ἄχρι is more appropriate for "the continuation of something until a condition is met," using 2 Macc 14:10, 15, and Job 32:11 as examples. However, the relevant scalar inference can be produced by any lexicalization of *until*. The texts cited in Hewitt also do not form a minimal pair

(11) οὐ μὴ παρέλθῃ ἡ γενεὰ αὕτη ἕως ἂν πάντα ταῦτα γένηται.

This generation will certainly not pass away until all these things transpire. (Matt 24:34)

The inference remains intact despite a different lexicalization of *until* because the inference is not produced by the lexicalization itself. Nor is it sensitive to the presence (or absence, Matt 24:39) of the relativizer. These data demonstrate that when interpreting the New Testament, the lexicalization an author has chosen is not relevant when determining whether the utterance should be parsed as durative or punctual *until*. One can use ἕως, μέχρι, or ἄχρι to generate the relevant inference.[29] For this reason, we are concerned not with the particular lexicalization of *until*, or the relativizer, but with the semantics of the predicate that helps form the Until Time Span. We turn now to the data in Matt 1:25 to determine whether it is an example of durative or punctual *until*.

3.2. *The Scalar Inference in Matt 1:25*

There is a universal consensus among commentators that Matt 1:25 was written to safeguard the virgin birth of Jesus by

---

with Gal 3:19 (e.g. the predicate is unbounded in 2 Macc 14:10, the phrase τὸν ἄχρι αἰῶνος means *forever* in 2 Macc 14:15). Hewitt may be correct, but his philology does not prove the proposed allusion.

29. Commentators have sometimes suggested ἕως is the truth-conditional equivalent of *before* (see the translation decision in Nolland, *Gospel of Matthew*, 103). More research is needed in this area, but two facts are clear: (1) It is durative *until* that is a truth-conditional equivalent of *before*, not punctual *until* (*before* is available in upward-entailing environments); and (2) the equivalence is not exact: durative *until* generates scalar inferences that are not available to *before* because unlike *until*, *before* does not have a late evaluation time. It codes an anterior relation in an event sequence without commenting on the boundary at which the event either ceased or began. The choice to use *before* in Nolland (*Gospel of Matthew*, 103) begs the question about his analysis of ἕως. For discussion of the semantics and inferences of *before*, see recently Ogihara and Steinert-Threlkeld, "Limitations." On the typology and relation between temporal adverbials, see Kortmann, *Adverbial Subordination*, esp. 85; Haspelmath, *From Space to Time*, esp. 32; Wälchli, "'As Long as', 'until' and 'before' Clauses."

asserting that at no point prior to the birth of Jesus did Joseph have conjugal relations with Mary.

> (12) καὶ οὐκ ἐγίνωσκεν αὐτὴν ἕως οὗ ἔτεκεν υἱόν.
>   He did not know her until she birthed a son.

The *crux interpretum* is whether Joseph and Mary had conjugal relations after she gave birth to her son. In other words: did she remain 'perpetually virgin'? There are two positions in the history of interpretation: either (1) there is an actualization inference (Joseph had conjugal relations with Mary 'after but not before' she gave birth), or (2) the text is ambiguous.[30] Despite more than fifty years of discussion, scholars continue to be divided about which view is correct.

> Davies and Allison: "[*Until*] following a negative need not contain the idea of a limit which terminates the preceding action or state . . . [but if] Matthew held to Mary's perpetual virginity . . . he would almost certainly have chosen a less ambiguous expression."[31]

> Luz: "The Catholic thesis of the perpetual virginity of Mary cannot be cogently refuted even here by means of exegesis."[32]

> Morris: "*Until* is a Matthean word; the passage makes it clear that there was no sexual intercourse before the birth of the baby. It does not say whether or not this took place thereafter, but the natural way of taking this passage would indicate that it did."[33]

---

30. Few commentators rule decisively on the basis of linguistic features, such as McNeile, *Gospel According to Matthew*, 10; France, *Gospel of Matthew*, 59; Osborne, *Matthew*, 79–81; Morris, *Gospel According to Matthew*, 32. Most commentators express hesitancy about the role of grammar in the debate: Bruner, *Matthew 1–12*, 48; Keener, *Gospel of Matthew,* 89; Turner, *Matthew*, 73–74; Luz, *Matthew 1–7,* 124–25; Harrington, *Gospel of Matthew*, 36; Mitch and Sri, *Gospel of Matthew*, 47; Davies and Allison, *Gospel According to Saint Matthew: 1–7,* 219; Nolland, *Gospel of Matthew*, 103.

31. Davies and Allison, *Gospel According to Saint Matthew: 1–7*, 219.

32. Luz, *Matthew 1–7*, 124–25.

33. Morris, *Gospel According to Matthew*, 32.

Bruner: "It would seem to a plain reading of this verse that the full marital relationship is honored. The important 'until,' though it most naturally suggests a termination, does not always have to do so."[34]

Nolland: "Ἕως οὗ is conventionally translated 'until', but because the focus is on the period prior to the birth and implies nothing about what happened afterwards, I prefer the translation 'before' here."[35]

Turner: "There is no *grammatical* reason to assume that Joseph was intimate with Mary after the birth of Jesus."[36]

Allison and Castaldo: "The phrase 'until she had given birth' indicates that after Jesus' birth, Joseph engaged in normal sexual intercourse with his wife."[37]

Harrington: "The text neither confirms nor denies the perpetual virginity of Mary; there is no implication about what happened after Jesus' conception and birth."[38]

Many of these commentators defend (2): Matthew's point is that conjugal relations cannot explain the origins of Jesus because those relations did not happen prior to his birth, and the text is silent about what took place afterward.[39] However, one searches the commentaries in vain for a linguistic argument defending this position. Most discussions follow the template laid out by John Chrysostom in his *Homily on Matthew* (5.3). He suggests the text is silent about the possibility of conjugal relations after the birth of Jesus:

34. Bruner, *Matthew 1–12*, 48.
35. Nolland, *Gospel of Matthew*, 103.
36. Turner, *Matthew*, 73–74.
37. Allison and Castaldo, *Unfinished Reformation*, 98.
38. Harrington, *Gospel of Matthew*, 36.
39. John Calvin (*Harmony of the Gospels,* 70) is representative: "Let one thing suffice for us, that it is foolishly and falsely inferred from the words of the Evangelist, what happened after the birth of Christ."

[Matthew] has used the word *until* here, not that you should suspect that after these things [Joseph] knew [Mary], but to inform you that before birth the Virgin was completely untouched. He said the word *until* to secure what happened before the birth, but what happened after these things he has left you to infer.[40]

Chrysostom proceeds to argue that Matt 1:25 does not require an obligatory actualization inference. As evidence, he uses counterexamples from the Septuagint that contain the *until*-phrase but do not produce the relevant inference.

(14) ἀνατελεῖ ἐν ταῖς ἡμέραις αὐτοῦ δικαιοσύνη καὶ πλῆθος εἰρήνης ἕως οὗ ἀνταναιρεθῇ ἡ σελήνη. (LXX Ps 72:7)

In his days, righteousness and fullness of peace will rise until the moon sets.

(15) ἀπὸ τοῦ αἰῶνος ἕως τοῦ αἰῶνος σὺ εἶ. (LXX Ps 89:2)

You are from age to age.

Unfortunately, Chrysostom's argument is not sound because the examples he provides do not form a minimal pair with Matt 1:25. They lack negation (or an operator like it).[41] In fact, the only example Chrysostom cites that is a possible parallel to Matt 1:25 is Gen 8:7.

(16) οὐχ ὑπέστρεψεν ὁ κόραξ εἰς τὴν κιβωτὸν ἕως οὗ ἐξηράνθη.

The raven did not return to the ark until it had dried.[42]

---

40.   The Greek text reads: Τὸ, Ἕως, ἐνταῦθα εἴρηκεν, οὐχ ἵνα ὑποπτεύσῃς ὅτι μετὰ ταῦτα αὐτὴν ἔγνω, ἀλλ᾽ ἵνα μάθῃς ὅτι πρὸ τῶν ὠδίνων πάντως ἀνέπαφος ἦν ἡ Παρθένος . . . τὸ, Ἕως, εἶπε, τὰ πρὸ τῶν ὠδίνων ἀσφαλιζομένη, τὰ δὲ μετὰ ταῦτα σοὶ καταλιμπάνουσα συλλογίζεσθαι.

41.   The same is true of the counter examples in Prothro, "Semper Virgo?" 78–97. In fact, virtually all commentators (popular and academic) repeat the same fallacious reasoning by selecting verses that do not form a minimal pair with Matt 1:25: the verses either lack negation or the predicate is unbounded, or both.

42.   The Old Greek reads καὶ ἐξελθὼν οὐχ ὑπέστρεψεν ἕως τοῦ ξηρανθῆναι τὸ ὕδωρ ἀπὸ τῆς γῆς ('And going out, it did not return until the water had dried from the land'). See Wevers, *Genesis*, 121.

Chrysostom writes καίτοιγε οὐδὲ μετὰ ταῦτα ὑπέστρεψεν ("and yet neither after these things did it return"). He seems to be referring to the fact that the narrative says nothing explicitly about the raven's return.[43] He takes this as proof that the actualization inference is not required by the grammar of Matt 1:25. Yet the scalar inference does not need to be explicit as code to be truly present in the text. In fact, as recent scholarship demonstrates, the translator of Old Greek Genesis introduced negation (οὐχ) and a bounded predicate (ὑπέστρεψεν) to explicate his *Vorlage* using the actualization inference. The raven indeed returned in the Old Greek version of Gen 8:7.[44]

3.2.1 *The Role of Native Speaker Intuition.* One might object that modern interpreters cannot criticize the linguistic description of native Greek speakers like Chrysostom because they do not have the same intuitions about the language.[45] However as Moisés Silva points out, "Educated speakers are notoriously unreliable in analyzing their own language. If Chrysostom weighs two competing interpretations, his conclusion should be valued as an important opinion and no more."[46] Any linguist who has done fieldwork will confirm what Silva has written. The intuitions of educated native speakers can be unreliable and their descriptions of linguistic structure even worse.[47] Eliciting data from educated

---

43. Pomeroy, *Chrysostom as Exegete,* 131–32.

44. See Wright, "Lexical Consistency," 183–86.

45. For example, Stegman, *Second Corinthians*, 51.

46. Silva, *Philippians*, 27. An example of an appropriate use of native speaker silence about grammatical issues that trouble modern interpreters can be found in Thielman, *Ephesians*, 34; Holloway. *Philippians*, 166; Bockmuehl, *Philippians*, 163.

47. See the methods and advice in Samarin, *Field Linguistics*; Bowern, *Linguistic Fieldwork*; Majid, "Field Work Methods," 56, 79–84. A colleague tells a story from his field work on Neo-Aramaic dialects in Iraq. He once asked a consultant, "How do you say, 'Three men opened the window'?" The consultant replied, "We would never say that. You don't need three men to open a window." Eliciting useful data from consultants is challenging. Silva's point is that when a native speaker makes a descriptive claim, it cannot always be taken at face value—a fact well known by linguists with experience on the field.

native speakers is difficult precisely because they often rely on prescriptivist norms of language use and allow other biases to interfere with description of their language.[48]

This is especially true for controversial matters of theology. Instead of asking whether it is appropriate to question a native Greek speaker about a description of their own language, we should ask why a native Greek would feel the need to explain Greek grammar to other Greeks in the first place. One explanation is that Chrysostom was trying to persuade his audience that their intuitions were wrong—intuitions that he in fact shared. Notice how Chrysostom himself creates the actualization inference in his *Homilies on Repentance*:

> (17) Ταῦτα πολλάκις λέγων οὐ παύσομαι ἕως οὗ διορθωθέντας ἴδω.
>   I will not stop saying these many things until I see that they have
>   been rectified.[49]

Although it is technically an example of durative *until*, this inference ('after but not before') is the same inference that is present in Gen 8:7 (e.g. once his issues have been rectified, the event of stopping will be actualized). Chrysostom digresses to explain Greek grammar to an audience of native Greek speakers because both he and they 'felt' the actualization inference in Matt 1:25. As Silva suggests, Chrysostom's comments in this case are merely those of an educated speaker with a theological bias, and nothing more. Modern interpreters with linguistic arguments are well within their right to object to his conclusions. With that in mind, we turn now to the argument of the present article: Matt 1:25 should be parsed as punctual *until* because it contains a bounded predicate.

3.2.2 *Boundedness and* Aktionsart. Because Matt 1:25 contains negation, the *crux interpretum* is whether the predicate is

---

48. These biases have sometimes played a negative role in New Testament studies. See comments in Porter (*Linguistic Descriptions*, 34), who notes how Caragounis "dismisses many if not most categories of modern linguistics."

49. *Homily 9* (PG 49:343).

bounded.[50] If the predicate is bounded, the utterance should be parsed as punctual *until* and it must generate an obligatory actualization inference meaning 'after but not before.' There are several ways to bound a predicate. A lexical item can refer to an event that has a boundary but no duration: predicates like *arrive*, *reach*, or *find* are called achievements because they refer to non-incremental events that occur instantly. Verbal arguments can also bound the predicate by creating an endpoint. The aktionsart value of *drink* is ambiguous without an argument because *drink* does not have an inherent endpoint. However, adding the argument *the cup of water* creates an endpoint, making *drink* an accomplishment.[51] Grammatical aspect also bounds (or unbounds) an event. Although *drink the cup of water* refers to a bounded event, English can add the progressive form to refer to an unbounded portion of that event, e.g. *drinking the cup of water*.[52] In such cases, the event is unbounded because the

---

50. On boundedness, see Krifka, "Mereological Approach"; Krifka, "Nominal Reference," 75–116; Corver, "Unboundedness"; Croft, *Verbs*, 81; Sasse, "Recent Activity." The view taken here of aktionsart is the 'compositional' view described in Pang, *Revisiting Aspect and Aktionsart*, esp. 41. On this view, aktionsart value of a verb contributes to temporal interpretation but it is not the interpretation itself. For example, the aktionsart of the verb *run* is that it is an activity. Unmodified activities do not have temporal boundaries because there is no natural endpoint: *Isaac is running* does not specify an endpoint. Similarly, achievements are typically unacceptable in the progressive because the progressive requires a duration but the aktionsart value of an achievement is that it has no duration, e.g. **Gideon is recognizing the shoe*. The aktionsart value of the verb may also change depending on its arguments, e.g. *Isaac is running the race* is imperfective but has an endpoint (the finish line). Because the endpoint has not been reached, the clause receives a progressive interpretation. However, the sentence *Isaac ran the race* includes the endpoint (Isaac crossed the finish line). As Rothstein (*Structuring Events*, 4) notes, "[L]exical aspectual classes are not generalizations over verb meanings, but sets of constraints on how the grammar allows us to individuate events. Telicity and atelicity are properties of verb phrases, and the status of the VP with respect to telicity will depend on the interaction of the meaning of the V with other elements in the VP."

51. See Verkuyl, *On the Compositional Nature*, and discussion in Borer, *Normal Course of Events*.

52. On the English progressive and how aspect can influence temporal

endpoint is not contained in the description. To determine the boundedness of the predicate in Matt 1:25, there are two questions that must be answered: (1) Which aktionsart value does the intercourse sense of γινώσκω represent? And (2), What contribution does its grammatical aspect make to the interpretation of the predicate? Answering these questions allows us to determine whether Matt 1:25 should be parsed as durative or punctual *until*.

3.2.3 *Interpreting the Intercourse Sense of* γινώσκω. It is well known that in the Septuagint the verb γινώσκω (usually ἔγνω) can be a euphemism for sexual intercourse.[53] A typical example is (18).

(18)   וַיֵּ֨דַע אָדָ֥ם עוֹד֙ אֶת־אִשְׁתּ֔וֹ וַתֵּ֖לֶד בֵּֽן

   And Adam knew his wife Eve again, and she gave birth to a son.

   Ἔγνω δὲ Αδαμ Ευαν τὴν γυναῖκα αὐτοῦ, καὶ συλλαβοῦσα ἔτεκεν υἱόν.
   Now Adam knew Even his wife, and having conceived, she gave
   birth to a son. (Gen 4:25)

Although selection of the intercourse sense was prompted by contact with the Hebrew equivalent ידע, there is evidence that it was used in compositional Greek as early as the second century BCE.[54] With exception to Matt 1:25, the intercourse sense appears just once elsewhere in the New Testament.

(19) πῶς ἔσται τοῦτο, ἐπεὶ ἄνδρα οὐ γινώσκω;
   How will this be, since I have not had intercourse with a man? (Luke
   1:34)

intervals, see Landman, "Progressive."
   53. Gen 4:1, 17; 19:8; 24:16; 38:26; Num 31:17; Judg 11:39; 19:22, 25; 1 Kgdms 1:19; 3 Kgdms 1:4; Jdt 16:22.
   54. See Evans ("Verbs of Sexual Intercourse") who cites Heraclides Lembus, *Constitutions* 64: τάς τε κόρας πρὸ τοῦ γαμίσκεσθαι αὐτὸς ἐγίνωσκεν ("he used to know the young women sexually before they were given in marriage").

Presupposed by Mary's question is the fact that to become pregnant (e.g. to change into the state of being pregnant), a woman must have intercourse with a man. Mary questions the possibility of this change of state when the cause (γινώσκω) has not happened.[55] In other words, sexual intercourse causes a woman to change (at least) into the state of not being a virgin (e.g. she is now *known*, e.g. LXX Gen 24:16). All events that involve change are causatives, even if the cause is not explicit (e.g. inchoatives) or the cause is the result of an inherent property.[56] Because a cause requires change, and states are static, the intercourse sense cannot be a state.[57] It must be a causative event that can culminate (e.g. it has an endpoint).[58] Once the event is initiated, the object enters a changed state of being *known* or pregnant, or both.

The question then is whether the intercourse sense of γινώσκω is used to form an activity, an accomplishment, or an achievement predicate in Matt 1:25.[59] Roughly, activities and

55. A treatment of Greek causative conjunctions can be found in Kroeger, "Meanings and Functions." He refers to tokens like (19) as the "speech act" function of ἐπεί: Mary is asking the question because she has not had intercourse with a man.

56. E.g. causation entails a change in the object. As Rothstein (*Structuring Events*, 156) notes, "the meaning of accomplishments and achievements that makes them telic… [is] a predetermined endpoint. They are events of change, and the event is over when the change has taken place." See Kratzer, "Building Resultatives."

57. On causation, see Copley and Martin, *Causation*; Bar-Asher Siegal and Boneh, *Perspectives on Causation.*

58. The term *culmination* (sometimes referred to as the set termination point) is preferred when defining telicity because telicity is technically a property of the description of an event rather than an atomic property of the event itself. So Krifka ("Nominal reference," 207), "[It] is misleading to think that a particular event can be called 'telic' or 'atelic'. For example, one and the same event of running can be described by *running* (i.e. by an atelic predicate, or by *running a mile* (i.e. a telic, or delimited, predicate). Hence the distinction between telicity and atelicity should not be one in the nature of the object described, but in the description applied to the object." The term *culmination* was first proposed in Parsons, *Events*. For crosslinguistic data on culmination, see Kardos, "Culmination phenomena."

59. As a verb of perception γινώσκω can yield multiple aktionsart values:

accomplishments culminate over time and achievements culminate instantly. One way to distinguish activities and accomplishments from achievements is to use the notion of incrementality. An incremental event is one whose proper subparts are not the event itself. Susan Rothstein proposes the following definition:

> (20) An event e in the denotation of P has an incremental structure if and only if the stages of e are not themselves in the denotation of P.[60]

Accomplishments and activities are incremental, but achievements are not, as evidenced by their behavior under the so-called imperfective paradox.

> (21a) Accomplishment: Mary is/was building a house DOES NOT ENTAIL Mary built a house.

> (21b) = Mary was building a house when the hurricane tore through her town, so she didn't build it.

> (22a) Activity: Mary is/was running a marathon DOES NOT ENTAIL Mary finished the marathon.

> (22b) = Mary was running a marathon when the hurricane happened, so she didn't finish it.

> (23a) Achievement: Mary finds her friend in the mall ENTAILS Mary found her friend.

> (23b) #Mary finds her friend in the mall, but can't find her friend after looking for hours.

The incrementality of the accomplishment *build* is why the interruption in (21b) does not derive a contradiction: the proper subparts of *build* are not contained in the event itself (one can begin an accomplishment without finishing it). However, achievements (outside the progressive) do possess the relevant entailment because they are non-incremental: the event cannot be

---

it can be either a state (cf. John 17:3) or an achievement (cf. Luke 24:31).

60. Rothstein, *Structuring Events*, 38.

measured out over the object in multiple stages like the accomplishment *build a house*.[61] Every proper subpart of the achievement *finds her friend* is the achievement itself (e.g. the achievement has one stage which is identical to the event itself). If the event happened at all, it reached an endpoint (hence the contradiction in 23b).

These data are relevant to the aktionsart value of the intercourse sense in Matt 1:25. Transitive predicates with ἐγίνωσκεν must be causative achievements because the event cannot be measured out over its object in multiple stages: γινώσκω causes an instant change to a non-incremental object. This means the event cannot be initiated without the object undergoing the change of state from *unknown* to *known* (and possibly *pregnant*). This semantic feature distinguishes it from activities, which do not involve change, and accomplishments, which do involve change but do not possess the relevant entailment. Once initiated, every proper subpart of the event γινώσκω is the event itself.

3.2.4 *An Imperfective Achievement?* If the intercourse sense of γινώσκω is a causative achievement, does the choice of imperfective aspect unbound the event? An answer to this question can be found in recent work by Daniel Altshuler, who demonstrates that imperfective achievements in languages like Russian and Hindi have a culmination entailment.[62] Consider the following example.

---

61. Another way to state this fact is that achievement predicates are quantized while accomplishments are not. The standard definition of quantization is given as follows: "If X is quantized, then if x and y are in the denotation of X, y cannot be a proper part of x." For example, *eat an apple* is quantized because there are no proper subparts of an apple. However, *swim in water* is not quantized because each proper subpart of *water* is still *water*. On quantization, see Krifka, "Nominal Reference."

62. Altshuler, "Typology," 741–46.

(24) K nam priežza-l   otec, no vskore u-exa-l.[63]
     to us arrive.IPF-PST   father but in.a.rush PFV-go-PST
     "Father had come [=was coming] to see us, but went away again
     soon."

As native Russian speakers attest, the interpretation of (24) includes the fact the father arrived, although the verb *priežzal* (*arrived*) is imperfective.[64] Scholars have long known that comparison with Russian is useful for studying the Greek of the New Testament.[65] It is no surprise that when we turn to the New Testament, we find that postclassical Greek like Russian also had a culmination entailment with imperfective achievements. Consider λαμβάνω.

(25) τότε ἐπετίθεσαν τὰς χεῖρας ἐπ᾽ αὐτοὺς καὶ ἐλάμβανον πνεῦμα ἅγιον.
     Then they laid their hands upon them, and they received the Holy
     Spirit. (Acts 8:17)

Because it is an achievement, λαμβάνω is non-incremental: every proper subpart of the event is the event itself. If it happens at all, the endpoint is reached. This is why although λαμβάνω was placed in the imperfective aspect, the event is technically bounded.[66] The disciples certainly received the Holy Spirit.

---

63. Example adapted from Altshuler, "Typology," 741. Abbreviations: IPF = imperfective, PST = past tense, PFV = perfective.

64. Rassudova, *Upotreblenie vidov glagola* (cited in Altshuler, *Typology*, 741).

65. Cf. Porter, *Verbal Aspect*, esp. 91.

66. Scholars have sometimes misunderstood this fact about imperfectivity: "An operator is imperfective if it requires a stage of an event in the extension of the VP that it combines with, but this stage need not be maximal" (Altshuler, "Typology," esp. 43). Filip and Rothstein ("Telicity as a Semantic Parameter") first proposed the maximal stage requirement for perfective operators, which refers to the largest single stage of an event that contains various subevents, ranked by some criterion (like time, amount, or extent). For our purposes, although the perfective necessarily includes the endpoint (it has a maximal stage requirement), the imperfective does not (the endpoint may or may not be included). For discussion of the imperfective in Ancient Greek, and the fact that it does not have the maximal stage requirement, see recently Hollenbaugh, "Development of the Imperfect," esp. 138–39.

One might wonder if the entailment arises from the verb tense rather than the aktionsart value of the predicate. However, tense alone cannot explain this phenomenon. Notice how λαμβάνω has the same behavior in the present tense.

> (26) ἔρχεται Ἰησοῦς καὶ λαμβάνει τὸν ἄρτον καὶ δίδωσιν αὐτοῖς, καὶ τὸ
> ὀψάριον ὁμοίως.
> Jesus comes and he takes the bread, and he gives it to them, and the
> fish likewise. (John 21:13)

Again, achievements are non-incremental and do not have multiple stages. Every proper subpart of the event is the event itself. This is why even in the present tense the achievement entails the culmination of the event (which is an isolate rather than a habitual). For our purposes, (25) and (26) indicate that grammatical aspect alone does not determine the boundedness of the event. These data also indicate that, as with Russian and Hindi, Greek imperfective achievements have a culmination entailment, which necessarily requires them to be bounded.

We are now prepared to apply these findings to the interpretation of Matt 1:25.

> (12) καὶ οὐκ ἐγίνωσκεν αὐτὴν ἕως οὗ ἔτεκεν υἱόν.
> He did not know her until she birthed a son.

Like λαμβάνω, the predicate ἐγίνωσκεν αὐτήν must be a bounded event because it is an imperfective achievement. If γινώσκω happens at all, the endpoint was reached because γινώσκω causes an instant change to a non-incremental object. Moreover, because every proper subpart of γινώσκω is identical to the event itself, there is a culmination entailment. In Matt 1:25, the culmination entailment is denied during the topic time, which is the period prior to the culmination of the event ἔτεκεν υἱόν. However, Matthew selects the *until*-phrase to structure the event sequence so that, once the event ἔτεκεν υἱόν finished culminating, the reader would understand that ἐγίνωσκεν αὐτὴν culminated too: the Until Time Span sets "the boundary at the farthest point at which the sentence can still be

true."[67] In other words, denial of the culmination entailment only lasts during the topic time. Once the topic time is over (i.e. once Mary finishes giving birth), a polarity reversal occurs, and the culmination entailment of the imperfective achievement ἐγίνωσκεν αὐτήν goes through.[68] The result is an obligatory scalar inference meaning 'after but not before': the final boundary of ἔτεκεν υἱόν was the initial boundary of ἐγίνωσκεν αὐτήν.
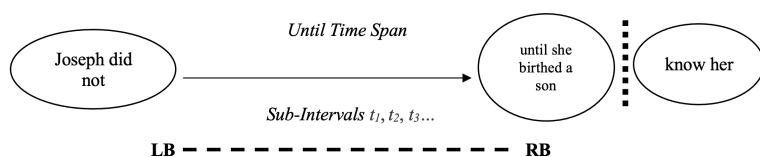

Figure 4: Matt 1:25

Most interpreters claim that grammar alone cannot decide which interpretation of Matt 1:25 is correct. However, if the predicate ἐγίνωσκεν αὐτήν is an imperfective achievement with a culmination entailment, it must be bounded, and if the predicate is bounded, the grammar of Matt 1:25 is not ambiguous. In fact, the actualization inference it generates is not even a mere implication—it is a logical entailment. Although Matt 1:25 safeguards the virgin birth, it nevertheless requires its readers to conclude that conjugal relations later took place.

4. *Why Was Matthew Not More Explicit?*

However, if this is correct, why did Matthew not state this meaning more explicitly? Why does he leave it as an inference? A plausible answer to this question comes from Gricean reasoning. As discussed briefly in 2.1, not only is inference a

---

67. Iatridou and Zeijlstra, "Complex Beauty," 139.

68. In terms of the theory in Staniszewski ("Until-phrases"), exh excludes the superdomain alternatives in Matt 1:25, which entails that the subdomain alternative (ἐγίνωσκεν αὐτήν) in fact occurred. Again, it is not necessary to agree with Staniszewski to grant that the actualization inference in Matt 1:25 is obligatory. This conclusion does not depend on his theory.

rich design feature of natural language, but certain heuristics also guide the exchange of information in communication. One common heuristic relevant to Matt 1:25 is the so-called Q-heuristic:

> Speaker Rule: "Do not provide a statement that is informationally weaker than your knowledge of the world allows, unless providing an informationally stronger statement would contravene the [Informativeness] principle. Specifically, select the informationally strongest paradigmatic alternate that is consistent with the facts."

> Hearer Corollary: "Assume that the speaker made the strongest statement consistent with their knowledge."[69]

The Q-heuristic states that in ordinary circumstances, speakers expect each other to give a relevant amount of information consistent with what they know about the world. Anything less constitutes an infelicitous discourse move:

(27)   *Interlocutor 1*: Where'd you go last week?
    Interlocutor 2: I went away.
    Interlocutor 1: Where to?
    Interlocutor 2: Somewhere.

This is grammatical but infelicitous because it is not an informative exchange: Interlocutor 2 is clearly withholding information from Interlocutor 1. The reason Interlocutor 2 knows this is because Interlocutor 1 is flouting their violation of the Q-heuristic above. Flouting the heuristic allows Interlocutor 1 to calculate an additional inference (a conversational implicature) generated by the linguistic decisions of Interlocutor 2: "I don't want you to know where I went last week."

The reason that Matthew has not made a stronger statement in 1:25 is that he is following the Q-heuristic and expecting the audience corollary. The strongest statement consistent with his knowledge of the world is that marriages typically produce children, unless there is an exception that requires explanation.

---

69. Levinson, *Presumptive Meanings,* 76.

The exception in this case is that Mary's first pregnancy was produced without the agency of a husband. What remains beyond this exception is left to inference because it is typical: "what is simply described is stereotypically exemplified."[70] Matthew's choice to use an inference to communicate the meaning 'after but not before' is based on the Q-heuristic: he does not know by personal knowledge what took place after Jesus' birth, but he does have the right to infer it in the absence of a defeater otherwise. His audience will assume he has made the strongest assertion consistent with his knowledge of the world. It is only necessary for him to mention the atypical aspect of the birth of Jesus, since the typical aspects of a marriage can be assumed. In this sense, Chrysostom was right all along: "what happened after these things he has left you to infer."

5. *Conclusion*

Although the New Testament itself is well-studied, there are many areas of its interpretation that await further treatment using advances from unexplored domains in theoretical linguistics. In this article I have given one example. Although commentators have been divided, the grammar of Matt 1:25 is not ambiguous. There is an obligatory actualization inference that Joseph knew Mary 'after but not before' she gave birth to Jesus.

Bibliography

Allison, Gregg, and Christopher A. Castaldo. *The Unfinished Reformation: What Unites and Divides Catholics and Protestants after 500 Years*. Grand Rapids: Zondervan, 2016.

Altshuler, Daniel. "A Typology of Partitive Aspectual Operators." *Natural Language & Linguistic Theory* 32 (2014) 735–77.

Bach, Kent. "The Semantics-Pragmatics Distinction: What It Is and Why It Matters." In *Pragmatik: Implikaturen und Sprechakte*, edited by Eckard Rolf, 33–50. Wiesbaden: VS Verlag für Sozialwissenschaften, 1997.

70. Levinson, *Presumptive Meanings*, 37.

Bar-Asher Siegal, Elitzur, and Norah Boneh, eds. *Perspectives on Causation: Selected Papers from the Jerusalem 2017 Workshop*. Cham, Switzerland: Springer, 2020.

Barr, James. "The Ancient Semitic Languages: The Conflict Between Philology and Linguistics." *Transactions of the Philological Society* 67, no. 1 (1968) 37–55.

Bockmuehl, Markus. *The Epistle to the Philippians*. London: Bloomsbury, 2006.

Borer, Hagit. *The Normal Course of Events*. Oxford: Oxford University Press, 2005.

Bowern, Claire. *Linguistic Fieldwork: A Practical Guide*. London: Palgrave Macmillan, 2007.

Bruner, Frederick Dale. *Matthew 1–12: The Christbook*. Grand Rapids: Eerdmans, 2004.

Calvin, John. *A Harmony of the Gospels: Matthew, Mark and Luke*. Grand Rapids: Eerdmans, 1994.

Chierchia, Gennaro. "Scalar Implicatures and Their Interface with Grammar." *Annual Review of Linguistics* 3 (2017) 245–64.

Chrysostom, John. *Homilies on Matthew*. PG 57. Paris, 1862.

———. *Homilies on Repentance*, Homily 9. PG 49. Paris, 1862.

Condoravdi, Cleo. "Punctual until as a Scalar NPI." In *The Nature of the Word: Studies in Honor of Paul Kiparsky*, edited by Kristin Hanson and Sharon Inkelas, 631–53. Cambridge, MA: MIT Press, 2008.

Copley, Bridget, and Fabienne Martin. *Causation in Grammatical Structures*. Oxford: Oxford University Press, 2014.

Corver, Norbert. "(Un)Boundedness Across Syntactic Categories." *Theoretical Linguistics* 41 (2015) 151–65.

Croft, William. *Verbs: Aspect and Causal Structure*. Oxford: Oxford University Press, 2012.

Davies, W. D., and Dale C. Allison. *A Critical and Exegetical Commentary on the Gospel According to Saint Matthew: 1–7*. ICC. London: T&T Clark, 1988.

Declerck, Renaat. "The Problem of *not . . . until*." *Linguistics* 33 (1995) 51–98.

de Swart, Henriëtte. "Meaning and Use of *not . . . until*." *Journal of Semantics* 13 (1996) 221–63.

———, et al. "*Not . . . Until* across European Languages: A Parallel Corpus Study." *Languages* 7.56 (2022) (online).

Estes, Douglas. *Questions and Rhetoric in the Greek New Testament: An Essential Reference Resource for Exegesis*. Grand Rapids: Zondervan, 2017.

Fantin, Joseph D. *The Greek Imperative Mood in the New Testament: A Cognitive and Communicative Approach*. New York: Peter Lang, 2010.

Filip, Hana, and Susan Rothstein. "Telicity as a Semantic Parameter." *Formal Approaches to Slavic Linguistics* 14 (2005) 139–56.

France, R. T. *The Gospel of Matthew*. NICNT. Grand Rapids: Eerdmans, 2007.

Fresch, Christopher J. "Typology, Polysemy, and Prototypes: Situating Nonpast Aorist Indicatives." In *The Greek Verb Revisited: A Fresh Approach to Biblical Exegesis*, edited by Steven E. Runge and Christopher J. Fresch, 379–415. Bellingham, WA: Lexham, 2016.

García Novo, Elsa. "À la recherche de l'ἄν perdu : Les syntagmes avec ἄχρι(ς) et μέχρι(ς) dans Galien." *Cuadernos de Filología Clásica: Estudios Griegos e Indoeuropeos* 29 (2019) 53–66.

Giannakidou, Anastasia. "UNTIL, Aspect, and Negation: A Novel Argument for Two *Untils*." *Semantics and Linguistic Theory (SALT)* 12 (2002) 84–103.

Grice, H. P. "Meaning." *The Philosophical Review* 66, no. 3 (1957) 377–88.

Harrington, Daniel J. *The Gospel of Matthew*. Sacra Pagina. Collegeville, MN: Liturgical, 2017.

Haspelmath, Martin. *From Space to Time: Temporal Adverbials in the World's Languages*. Munich: LINCOM Europa, 1997.

Hirschberg, Julia Linn Bell. *A Theory of Scalar Implicature*. New York: Garland, 1991.

Hitzeman, Janet. "Aspect and Adverbials." *Semantics and Linguistic Theory (SALT)* 1 (1991) 107–26.

Hollenbaugh, Ian. "The Development of the Imperfect in Ancient Greek from Simple Past to Imperfective as a Blocking Phenomenon." *Journal of Greek Linguistics* 21 (2021) 58–150.

Holloway, Paul A. *Philippians*. Minneapolis: Fortress, 2017.

Horn, Laurence R. "The Border Wars: A Neo-Gricean Perspective." In *Where Semantics Meets Pragmatics*, edited by Klaus von Heusinger and Ken Turner, 21–48. Amsterdam: Elsevier, 2006.

———. "Implying and Inferring." In *The Cambridge Handbook of Pragmatics*, edited by Keith Allan and Kasia M. Jaszczolt, 69–86. Cambridge: Cambridge University Press, 2012.

———. "On the Semantic Properties of Logical Operators in English." PhD diss., University of California, 1972.

———. "The Said and the Unsaid." *Semantics and Linguistic Theory (SALT)* 2 (1992) 163–92.

Iatridou, Sabine, and Hedde Zeijlstra. "The Complex Beauty of Boundary Adverbials: *In Years* and *Until*." *Linguistic Inquiry* 52 (2021) 89–142.

Jaszczolt, Kasia. "Cancelability and the Primary/Secondary Meaning Distinction." *Intercultural Pragmatics* 6 (2009) 259–89.

———. *Semantics, Pragmatics, Philosophy: A Journey through Meaning*. Cambridge: University of Cambridge Press, 2023.

Karttunen, Lauri. "Until." *Chicago Linguistic Society* 10 (1974) 283–97.

Keener, Craig. *The Gospel of Matthew: A Socio-Rhetorical Commentary*. Grand Rapids: Eerdmans, 2009.

Kortmann, Bernd. *Adverbial Subordination: A Typology and History of Adverbial Subordinators Based on European Languages*. Berlin: Mouton de Gruyter, 1997.

Kratzer, Angelika. "Building Resultatives." In *Event Arguments: Foundations and Applications*, edited by Claudia Maienborn and Angelika Wöllstein, 177–212. Tübingen: de Gruyter, 2005.

Krifka, Manfred. "The Mereological Approach to Aspectual Composition." Paper presented at the "Perspectives on Aspect" conference at the University of Utrecht, 2001.

———. "Nominal Reference, Temporal Constitution, and Quantification in Event Semantics." In *Semantics and Contextual Expressions*, edited by Renate Bartsch, Johan van Benthem, and Peter van Emde Boas, 75–115. Dordrecht: Foris, 1989.

Kroeger, Paul. "On the Meanings and Functions of Backward Causal Connectives." Unpublished Manuscript, 2020.

Landman, Fred. "The Progressive." *Natural Language Semantics* 1 (1992) 1–32.

Lee, John A.L. "Ἐξαποστέλλω." In *Voces Biblicae: Septuagint Greek and its Significance for the New Testament*, edited by Jan Joosten and P. J. Tomson. Leuven: Peeters, 2007.

Levinson, Stephen C. *Pragmatics*. CTL. Cambridge: Cambridge University Press, 1983.

———. *Presumptive Meanings: The Theory of Generalized Conversational Implicature*. Cambridge, MA: MIT Press, 2000.

Luz, Ulrich. *Matthew 1–7: A Commentary*. Minneapolis: Augsburg, 1989.

Majid, Asifa. "Field Work Methods." In *The Oxford Handbook of Linguistic Fieldwork*, edited by Nicholas Thieberger, 54–71. Oxford: Oxford University Press, 2012.

Marín, Rafael, and Louise McNally. "The Aktionsart of Spanish Reflexive Psychological Verbs." *Proceedings of Sinn und Bedeutung* 9 (2005) 212–25.

McNeile, A. H. *The Gospel According to Matthew*. London: Macmillan, 1915.

Mitch, Curtis, and Edward Sri. *The Gospel of Matthew*. Grand Rapids: Baker Academic, 2010.

Mittwoch, Anita. "Negative Sentences with *Until*." *Chicago Linguistic Society (CLS)* 13 (1977) 410–17.

Morris, Leon. *The Gospel According to Matthew*. Westmont, IL: InterVarsity, 1992.

Nolland, John. *The Gospel of Matthew*. NIGTC. Grand Rapids: Eerdmans, 2005.

Ogihara, Toshiyuki, and Shane Steinert-Threlkeld. "Limitations of a Modal Analysis of *before* and *after*." *Semantics and Pragmatics* 17 (2024) 1–21.

Osborne, Grant R. *Matthew*. Grand Rapids: Zondervan, 2010.

Pang, Francis G. H. *Revisiting Aspect and Aktionsart: A Corpus Approach to Koine Greek Event Typology*. LBS 14. Leiden: Brill, 2016.

Parsons, Terence. *Events in the Semantics of English: A Study in Subatomic Semantics*. Cambridge, MA: MIT Press, 1990.

Piñón, Christopher. "Achievements in an Event Semantics." *Semantics and Linguistic Theory (SALT)* 7 (1997) 276–93.

Pomeroy, Samuel. *Chrysostom as Exegete: Scholarly Traditions and Rhetorical Aims in the Homilies on Genesis*. Leiden: Brill, 2021.

Porter, Stanley E. *Linguistic Analysis of the Greek New Testament*. Grand Rapids: Baker Academic, 2015.

———. *Linguistic Descriptions of the Greek New Testament: New Studies in Systemic Functional Linguistics*. LNTG 1. London: T&T Clark, 2023.

———. *Verbal Aspect in the Greek of the New Testament, with Reference to Tense and Mood*. SBG 1. New York: Peter Lang, 1989.

Potts, Christopher. "Presupposition and Implicature." In *The Handbook of Contemporary Semantic Theory*, edited by Shalom Lappin and Chris Fox, 168–202. Hoboken, NJ: Wiley, 2015.

Prothro, James B. "Semper Virgo? A Biblical Review of a Debated Dogma." *Pro Ecclesia* 28 (2019) 78–97.

Rafael, Marín, and Louise McNally. "Inchoativity, Change of State, and Telicity: Evidence from Spanish Reflexive Psychological Verbs." *Natural Language & Linguistic Theory* 29 (2011) 467–502.

Rafiyenko, Dariya, and Ilja A. Seržant. "Postclassical Greek: An Overview." In *Postclassical Greek: Contemporary Approaches to Philology and Linguistics*, edited by Dariya Rafiyenko and Ilja A. Seržant, 1–16. Berlin: de Gruyter, 2020.

Rassudova, Olga P. *Upotreblenie Vidov Glagola*. Bern: Peter Lang, 1981.

Rothstein, Susan. *Structuring Events: A Study in the Semantics of Lexical Aspect*. Malden, MA: Blackwell, 2004.

Runge, Steven E. *Discourse Grammar of the Greek New Testament: A Practical Introduction for Teaching and Exegesis*. Peabody, MA: Hendrickson, 2010.

Samarin, William J. *Field Linguistics: A Guide to Linguistic Field Work*. New York: Holt, Rinehart and Winston, 1967.

Sasse, Hans-Jürgen. "Recent Activity in the Theory of Aspect: Accomplishments, Achievements, or Just Non-Progressive State?" *Linguistic Typology* 6 (2002) 199–271.

Silva, Moisés. *Philippians*. Grand Rapids: Baker Academic, 2005.

Staniszewski, Frank. "Until-Phrases as Obligatory Free Choice Items." *Proceedings of Sinn und Bedeutung* 24 (2020) 271–88.

Stegman, Thomas. *Second Corinthians*. Grand Rapids: Baker Academic, 2009.

Thielman, Frank. *Ephesians*. BECNT. Grand Rapids: Baker, 2010.

Turner, David L. *Matthew*. BECNT. Grand Rapids: Baker Academic, 2008.

Van Tiel, Bob, Elizabeth Pankratz, and Chao Sun. "Scales and Scalarity: Processing Scalar Inferences." *Journal of Memory and Language* 105 (2019) 93–107.

Verkuyl, Henk J. *On the Compositional Nature of the Aspects*. Dordrecht: Springer-Science, 1972.

Vlach, Frank. "The Semantics of the Progressive." In *Tense and Aspect*, edited by Phillip Tedeschi and Annie Zaenen, 271–92. Leiden: Brill, 1981.

Wälchli, Bernhard. "'As Long as', 'until' and 'before' Clauses." *Baltic Linguistics* 9 (2018) 141–236.

Wevers, John William. *Genesis*. SVTG 1. Göttingen: Vandenhoeck & Ruprecht, 1974.

Wright, Travis. "Lexical Ambiguity and Lexicalizations of Until in the Diachrony of Ancient Greek." *Cambridge Occasional Papers in Linguistics* 16 (2024) 1–25.

———. "Lexical Consistency and Scalar Implicatures in Old Greek Genesis." *Journal for Septuagint and Cognate Studie*s 56 (2023) 171–89.

Zakkou, Julia. "The Cancellability Test for Conversational Implicatures." *Philosophy Compass* 13(12) (2018) e12552.