

Getting by without movement: building & interpreting indirect *wh*-dependencies*

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Abstract: This paper examines three cross-clausal *wh*-dependencies in Georgian: *wh*-scope marking, prolepsis with *wh*-doubling, and prolepsis with a gap, and argues that none of them involve true *wh*-movement. I propose syntax and semantics for these constructions, and argue that the key ingredient to forming indirect *wh*-dependencies is having embedded clauses that combine as modifiers of the matrix verb (Elliott 2020, Bochnak & Hanink 2022, a.o.). I propose that Georgian having *wh*-movement intra-clausally but not cross-clausally is a Williams’s Cycle effect (Williams 2003, 2011): *wh*-phrases cannot cross CP boundary because *wh*-movement in Georgian targets a specifier of a lower projection (Borise 2023).

Key words: long-distance A-bar dependencies, clausal embedding, *wh*-scope marking, *wh*-copying, prolepsis, Georgian

1 Introduction

Languages differ in whether they allow cross-clausal *wh*-movement. For example, English allows such dependencies, (1), but Georgian does not: (2) is ill-formed regardless of the

*The data presented in this paper have been collected with 7 native speakers of Georgian in 2022–2024. All of the speakers are students in the US, but have lived most of their lives in Georgia. Acknowledgements to be inserted later.

position of the *wh*-item in the matrix clause. And it's also not the case that Georgian can just leave its *wh*-words in situ: as we see in (3), that is not possible either.

- (1) **What**₁ does Mariam think that Shota is eating **t**₁?
- (2) *<mariam-i> **ra-s**₁ pikrob-s <mariam-i>
 <Mariam-NOM> **what-ACC** think-PRS.3SG <Mariam-NOM>
 [rom šota **t**₁ č'am-s]?
 COMP Shota.NOM eat-PRS.3SG
 'What does Mariam think that Shota is eating?'
- (3) *pikrob-s mariam-i [rom šota **ra-s** č'am-s]?
 think-PRS.3SG Mariam-NOM COMP Shota.NOM **what-ACC** eat-PRS.3SG
 'What does Mariam think that Shota is eating?'

This raises a question of whether there are other morphosyntactic strategies that languages use to build cross-clausal *wh*-dependencies, and whether these other strategies involve movement from the embedded CP into the matrix CP. Could it be that cross-clausal movement is universal, and what varies across languages is how it is spelled out? Or do other strategies in fact lack cross-clausal movement? If the latter is the case, how do these strategies arrive at the meaning of a long-distance question?

In this paper I explore these questions by examining three alternative strategies for building cross-clausal *wh*-dependencies in Georgian: *wh-scope marking*, (4), in which an invariant *ras* 'what' phrase in the matrix clause co-exists with a *wh*-phrase in the embedded CP; *prolepsis* + *wh-doubling*, (5), in which the matrix clause has a proleptic *wh*-argument and the embedded clause contains another *wh*-phrase; and *prolepsis* + *gap*, (6), in which the matrix clause has a proleptic *wh*-argument, and the embedded CP has a co-referential gap.

- (4) *Wh-scope Marking*
- mariami **ra-s** pikrobs, [rom am sakmem **vin** gaağiziana]?
 Mariam.NOM **what-ACC** thinks COMP this.ERG task.ERG **who.NOM** upset

‘Who does Mariam think that this task upset?’
 (lit. ‘What does Mariam think that this task upset who?’)

(5) *Prolepsis + Wh-doubling*

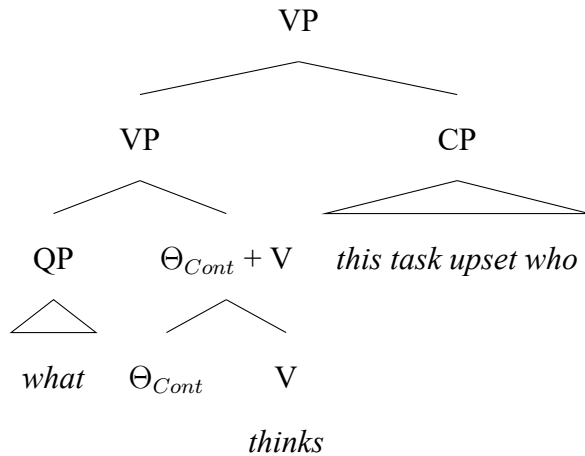
mariami **vis-ze** pikrobs, [rom am sakmem **vin** gaağiziana]?
 Mariam.NOM **who-on** thinks COMP this.ERG task.ERG **who**.NOM upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘About who_i does Mariam think that this task upset who_i?’)

(6) *Prolepsis + Gap*

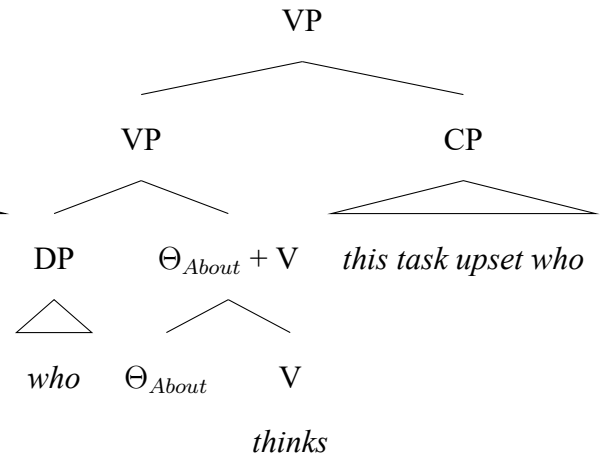
mariami **vis-ze** pikrobs, [rom am sakmem __ gaağiziana]?
 Mariam.NOM **who-on** thinks COMP this.ERG task.ERG __ upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘About who_i does Mariam think that this task upset ___i?’)

I argue that none of these constructions involve cross-clausal movement, and make a proposal about how they arrive at the meaning of a long-distance question without being one. The key idea that I will pursue is that embedded clauses in all the three constructions are verbal modifiers (Kratzer 2016, Bogal-Allbritten 2016, Elliott 2020, Özyıldız 2020, Roberts 2020, Bochnak & Hanink 2022, Bondarenko 2022), and that this is what allows to establish an indirect *wh*-dependency. The structures of the VPs in (4)-(6) are in (7)-(9) respectively.

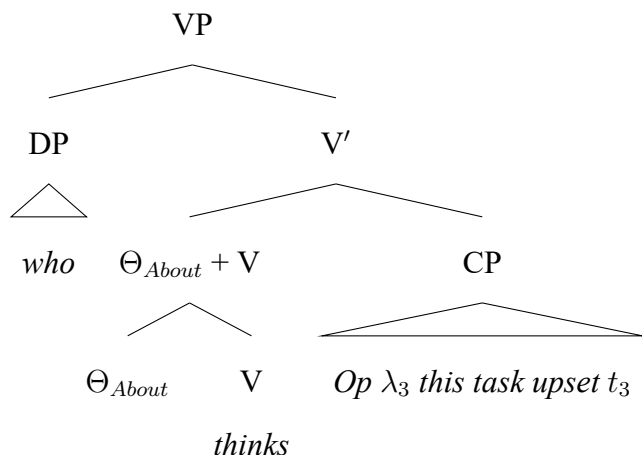
(7) *Wh-Scope Marking*



(8) *Prolepsis+Wh-doubling*



(9) *Prolepsis+Gap*



I propose that in all three constructions the matrix clause has a regular syntax and semantics of a question. In the *wh*-scope marking construction, the matrix question asks about the propositional content associated with the thinking event (an argument introduced by the functional head Θ_{Cont}): *What does Mariam think?* In the two constructions involving prolepsis, the matrix question asks about the individual that the thinking is about (introduced by the functional head Θ_{About}): *About who does Mariam think?*

In all three constructions, the embedded CP is a modifier of the thinking eventuality. In *wh*-scope marking and prolepsis + *wh*-doubling structures, the embedded clause contains a question. I suggest that there is an answerhood operator (ANS) within the CP, and the resulting meaning of the CP is a predicate of events such that their propositional content is *some answer* to the embedded question. When this CP will modify the matrix VP, we will get the meanings paraphrased in (10)-(11). In both cases the indirect dependency is built via the embedded clause restricting the possible answers to the matrix question by specifying the form of the propositional content associated with the thinking event—while we don't know what this content is, it must be some answer to the embedded question.

(10) *Wh-Scope Marking*

Paraphrase: What does Mariam think, such that the content of her thinking is some answer to the question “Who does this task upset”?

(11) *Prolepsis+Wh-doubling*

Paraphrase: About who does Mariam think, such that the content of her thinking is some answer to the question “Who does this task upset”?

In the prolepsis + gap construction, the embedded clause is declarative, and contains a gap. I propose that in such cases there is a null, semantically vacuous operator originating in the argument position corresponding to the gap, and this null operator undergoes movement, creating an abstraction at the edge of the embedded clause. This abstraction allows us to intersectively compose the CP with $\Theta_{About} + V$: in this case the CP is a modifier of the complex head that hasn’t yet merged with the object. When the trace of the proleptic *wh*-DP will merge, it will simultaneously saturate the ABOUT-argument of the matrix verb, as well as the argument of the embedded clause, giving rise to the paraphrase in (12).

(12) *Prolepsis+Gap*

Paraphrase: About which individual x does Mariam think, such that the content of her thinking is “This task upset x ”?

My proposal differs from Dayal’s (1993, 2000) influential account of how sentences with indirect *wh*-dependencies are interpreted. Dayal proposes that in *wh*-scope marking constructions, the embedded CP acts as a restrictor of the *wh*-scope marker, which quantifies over propositions. My account on the other hand suggests that embedded CPs are not directly connected to the *wh*-phrase in the matrix clause at any stage of the derivation. What makes it possible to maintain Dayal’s insight that embedded CPs are restricting the

matrix question is the idea that CPs can function as *verbal modifiers*—they restrict which kinds of events described by the verb we are considering by saying something about their propositional content. This departure from Dayal’s proposal allows us to provide a uniform account of the three constructions in Georgian: note that in the two construction involving prolepsis we can’t treat the embedded CP as the restrictor of the matrix *wh*-phrase, as it ranges over individuals. But we can still view the CP as restricting the matrix question if such restriction happens due to the CP acting as a modifier of the matrix eventuality.

If all three alternative strategies of building cross-clausal *wh*-dependencies in Georgian do not involve true movement, we are confronted with the question of why Georgian lacks cross-clausal *wh*-movement, even though *wh*-phrases undergo movement inside a single clause. I propose that we are dealing with a William’s Cycle effect (Williams 2003, 2011, Poole 2023, Meadows 2023): the reason Georgian bans movement across a finite CP boundary is that the landing site of *wh*-movement in this language is lower than in languages like English—it is a specifier of a projection between CP and VoiceP (Borise 2023). Thus, I suggest that we can explain the lack of cross-clausal *wh*-movement in Georgian by appealing to independently motivated principles of structure-building and timing of the derivation.

The paper is structured as follows. Section 2 provides background on Georgian and the syntax of questions in this language. Section 3 argues that all three constructions under consideration lack cross-clausal movement. In section 4 I make a proposal about the syntax of these structures, and show how it explains the locality restrictions observed in these constructions. In section 5 I propose compositional semantics for the three *wh*-dependencies, and argue that the fact that embedded CPs in these sentences are verbal modifiers is crucial for arriving at the right meanings. Finally, in section 6 I make a proposal about why cross-clausal movement from finite CPs is impossible in Georgian: I suggest that it violates the William’s Cycle (Williams 2011, 2013, Poole 2023, Meadows 2023) due to the lower landing site of *wh*-movement in the language. Section 7 concludes the paper.

2 Background on Georgian

Georgian (Kartvelian family) is a language with generally flexible word order, but it is usually assumed to be underlyingly an SOV language (Pochkhua 1962, Aronson 1990, Nash 1995, Harris 1981, a.o.). Following Borise (2023), I will assume that while the verbal phrase in Georgian is head-final, higher projections in the clausal spine (e.g., T, C) are head-initial. I will also adopt the assumption argued for in (Legate 2008, Nash 2017) that Georgian DPs do not need to leave the verbal phrase for the purposes of licensing or case assignment—they can be case-licensed in situ. Georgian is a language with a three-way split in case alignment, with the split being conditioned by the T(ense)A(spect)M(odality) properties of the clause. The possible patterns are the Nominative-Accusative alignment¹, Ergative-Nominative alignment, with ergative case appearing on both AGENTS of transitive sentences and unergatives, and Dative-Nominative alignment.

The word order in Georgian *wh*-questions conforms to the generalization in (13) (Harris 1981, Borise 2023): *wh*-phrases must immediately precede the verb, but unlike in languages like English, they do not have to be the leftmost element in the clause.

(13) **Generalization: Word order in *Wh*-questions**

Wh-phrases must immediately precede the verb.

Other constituents can precede or follow the [*Wh* + *Verb*] complex.

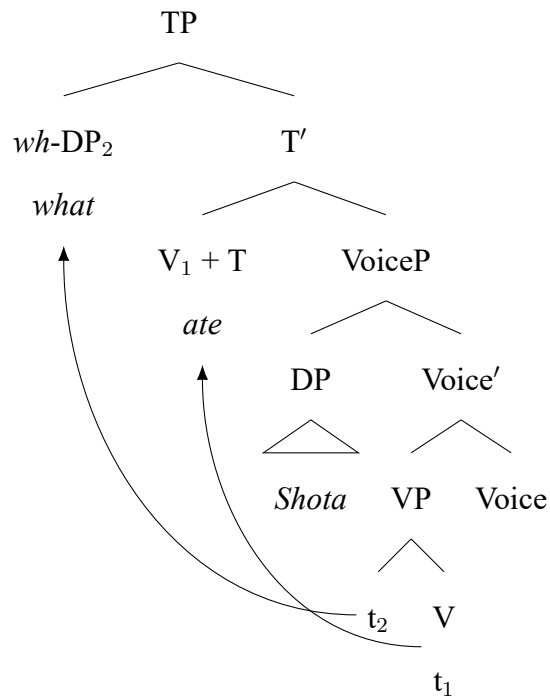
For example, if the *wh*-phrase is a direct object, then SOV and OVS will be possible word orders, but SVO and OSV will be impossible, (14)-(17). The judgments would have been reversed had the *wh*-phrase been the subject of the sentence.

- (14) bebia ras alagebda? ✓SO_{wh}V
 grandma.NOM what.ACC clean.IPFT.3SG
 ‘What did grandma clean?’ (Borise 2023: p. 184)

a *wh*-question like in (20) will be in (21): the *wh*-object moves to Spec,TP and the verb moves to T. This analysis captures the adjacency requirement that we've seen in (14)-(17): since no phrase can be inserted between the head and its specifier, nothing will be able to occur between a *wh*-phrase in Spec, TP and the verb in T.

- (20) ra č'ama šotam?
 what.NOM ate Shota.ERG
 'What did Shota eat?'

- (21) Structure of the *wh*-question in (20)



In section 6 I will suggest that the fact that *wh*-movement in Georgian targets a lower position in the clausal spine compared to a language like English is what makes Georgian incapable of cross-clausal *wh*-movement.

3 Against a direct dependency approach

One hypothesis about *wh*-scope marking, prolepsis + *wh*-doubling and prolepsis + gap constructions could be that these constructions in fact involve a *direct dependency* between the *wh*-phrase in the matrix clause and the *wh*-phrase/gap in the embedded CP (see van Riemsdijk 1983, McDaniel 1989, Wahba 1992, Müller 1997, Cheng 2000, Sabel 2000, a.o.). In this section I would like to argue that this hypothesis cannot be maintained.

Since in *wh*-scope marking and prolepsis + *wh*-doubling constructions both clauses contain *wh*-phrases, we can ask if these constructions observe any *connectivity effects*—such effects would be expected if the two phrases are part of the same chain. We find no connectivity effects in these two constructions. First, there is no case connectivity. In (22) we see that in *wh*-scope marking, each *wh*-phrase receives the case within its own clause: the scope marker is a nominative object in a clause with Ergative-Nominative alignment, and the embedded *wh*-DP is an accusative object in a Nominative-Accusative clause. In (23) we see that the proleptic object doesn't match the embedded *wh*-phrase in its morphosyntactic appearance either: it will invariably carry the postposition marking *ze* 'on, about'.²

- (22) **ra** ipikra mariam-ma, [rom šota **vis** xedavs]?
what.NOM thought Mariam-ERG COMP Shota.NOM **who.ACC** sees
'Who did Mariam think that Shota sees?'

- (23) **vis-ze** pikrobs mariami, [rom xink'ali **vin** šeč'ama]?
who-on thinks Mariam.NOM COMP khinkali **who.ERG** ate
'Who does Mariam think that ate khinkali?'

Second, the *wh*-expressions in the two clauses do not have to be identical. This is illustrated in (24) and (25) for *wh*-scope marking and prolepsis + *wh*-doubling respectively: we see that the embedded clause contains a complex *wh*-phrase '*which student from this class*', that does not match the *wh*-DP '*what*'/'*who*' in the matrix clause.

- (24) **ras** pikrob,
what.ACC you.think
 [rom [am k'las-i-dan romeli mosc'avle] gaağiziana am sakmem]?
 COMP **this class-from which student.NOM** upset this task
 'Which student from this class do you think that this task upset?'
- (25) **vis-ze** pikrobs mariami,
who-on thinks Mariam.NOM
 [rom [am k'las-i-dan romeli mosc'avle] gaağiziana am sakme-m]?
 COMP **this class-from which student.NOM** upset this task-ERG
 'Which student from this class does Mariam think that this task upset?'

Third, the embedded CP can contain multiple *wh*-phrases, with just a single *wh*-phrase occurring in the matrix clause, (26)-(27). It is unclear how such examples could be analyzed under the direct dependency approach: which embedded *wh* is the matrix one a copy of? One might hypothesize that the matrix *wh*-phrase corresponds to the highest embedded *wh*-phrase, but the problem with this analysis is that Georgian is a language which obligatorily moves all of its *wh*-phrases to the position before the verb (Borise 2023: p. 185).^{3,4}

- (26) **ras** pikrob, [tu **vin vis** šexvda]?
what.ACC you.think Q **who whom** met
 'Who do you think met whom?' (lit. 'What do you think, who met whom?')
- (27) **vis-ze** pikrob, [tu **vin vis** šexvda]?
who.DAT-on you.think Q **who whom** saw
 'Who do you think saw whom?'
 (lit. 'About who all do you think that who saw whom?')

Another piece of evidence against the direct dependency approach comes from the fact that in the *wh*-scope marking construction, the embedded clause can be a polar question:⁵

- (28) givi ra-s pikrobs
 Givi.NOM what-ACC think.PRS.3SG

[č'am-a tu ara mariam-ma xink'ali]?
 eat-AOR.3SG Q NEG Mariam-ERG khinkali.NOM
 'What does Givi think (about) whether Mariam ate khinkali?'

Since in (28) there is no *wh*-phrase in the embedded clause that the matrix *wh*-scope marker would correspond to, a direct dependency analysis of this sentence is not possible.⁶

Finally, in the two constructions involving prolepsis we can alter the properties of the proleptic *wh*-object, and thus test if it originated in the embedded CP. If the proleptic DP originated as a direct object inside the embedded CP, we would expect it to be able to contain pronouns that are bound by the embedded subject. However, such binding is not possible. Examples (29) and (30) illustrate this for anaphor binding for prolepsis + gap and prolepsis + *wh*-doubling constructions respectively.

- (29) [romel tav-is-i tav-is naxat']-ze pikrobs mariami,
 which head-GEN-NOM head-GEN picture-on thinks Mariam.NOM
 rom givi-m __ aamağla?
 COMP Givi-ERG praised

✓ 'Which picture of herself₁ does Mariam₁ think that Givi praised?'

✗ 'Which picture of himself₁ does Mariam think that Givi₁ praised?'

- (30) [romel tav-is-i tav-is naxat']-ze pikrobs mariami,
 which head-GEN-NOM head-GEN picture-on thinks Mariam.NOM
 rom givi-m [romeli naxat'i] šeako?
 COMP Givi-ERG which picture.NOM praised

✓ 'Which picture of herself₁ does Mariam₁ think that Givi praised?'

✗ 'Which picture of himself₁ does Mariam think that Givi₁ praised?'

In both sentences the proleptic DP contains the anaphor *tavisi tavis* which can be bound exclusively by the matrix subject: binding by the embedded subject *Givi* is not possible.⁷

Examples (31)-(32) show that quantificational binding between the embedded subject

and the proleptic object is not possible either: the QP *titoeuli gogo* ‘each girl’ cannot bind the 3rd person pronoun *mis* inside of the proleptic *wh*-object.

- (31) mariami [mis romel masc'avlebel-ze] pikrobs
 Mariam.NOM 3SG.GEN which teacher-on thinks
 [rom titoeuli gogo __ ec'via]?
 COMP each girl visited
 ✓ ‘Which teacher of hers₁ does Mariam₁ think that every girl visited?’
 ✗ ‘Which teacher of hers₁ does Mariam think that every girl₁ visited?’

- (32) mariami [mis romel masc'avlebel-ze] pikrobs
 Mariam.NOM 3SG.GEN which teacher-on thinks
 [rom titoeuli gogo [romel masc'avlebel-s] ec'via]?
 COMP each girl which teacher-DAT visited
 ✓ ‘Which teacher of hers₁ does Mariam₁ think that every girl visited?’
 ✗ ‘Which teacher of hers₁ does Mariam think that every girl₁ visited?’

Another piece of evidence against a direct dependency between the proleptic object and the embedded *wh*/gap comes from the absence of principle C effects. The proleptic object can contain an R-expression that is co-referential with the subject of the embedded clause, (33)-(34). If the proleptic object originated inside the embedded CP, these sentences should be ungrammatical due to a principle C violation, yet we see that they are well-formed.

- (33) mariami [šotas romel natesav-eb-ze] pikrobs
 Mariam.NOM Shota.GEN which relative-PL-on thinks
 [rom man __ šeuracxqopa miaqena]?
 COMP 3SG.ERG offending give.off
 About which Shota₁'s relatives does Mariam think that he₁ offended them?
- (34) mariami [šotas romel natesav-eb-ze] pikrobs
 Mariam.NOM Shota.GEN which relative-PL-on thinks
 [rom man [romel natesav-eb-s] miaqena šeuracxqopa]?
 COMP 3SG.ERG which relative-PL-DAT give.off offending
 About which Shota₁'s relatives does Mariam think that he₁ offended them?

Finally, the proleptic DP cannot form an idiomatic expression together with the predicate of the embedded clause. Georgian has an idiom *misi tma dadga qalqze* ‘his/her hair stood on its back legs, like an animal’ which means that a person got scared. This idiom can in principle be used in questions, as is illustrated in (35).

- (35) visi tma dadga qalq-ze?
 who.GEN hair.NOM stood back.legs-on
 ‘Who got scared?’ (lit. ‘Whose hair stood up on its back legs?’)

While *visi tma* ‘whose hair’ can be part of an idiom in (35), it cannot appear as the proleptic object with the rest of the idiom being part of the embedded clause, (36)-(37).

- (36) mariami [vis tma]-ze pikrobs, [rom __ qalq-ze dadga]?
 Mariam.NOM who.GEN hair-on thinks COMP back.legs-on stood
 ✓ Lit.: ‘About whose hair does Mariam think that it stood on its back legs?’
 ✗ Idiom.: ‘About who does Mariam think that they got scared?’

- (37) mariami [vis tma]-ze pikrobs,
 Mariam.NOM who.GEN hair-on thinks
 [rom [visi tma] dadga qalq-ze]?
 COMP who.GEN hair.NOM stood back.legs-on
 ✓ Lit.: ‘About whose hair does Mariam think that it stood on its back legs?’
 ✗ Idiom.: ‘About who does Mariam think that they got scared?’

Interestingly, with the prolepsis + *wh*-doubling the idiomatic reading becomes available if *visi tma* ‘whose hair’ is present only in the embedded clause, and the matrix clause has the simple proleptic DP *vis* ‘who’, (38). The acceptability of (38) is expected under the indirect approach: the matrix question *Who does Mariam think about?* is restricted by the embedded CP, which contributes that Mariam’s thoughts are of the form ‘*X got scared*’.

- (38) mariami [vis]-ze pikrobs, [rom [visi tma] dadga qalq-ze]?
 Mariam.NOM who-on thinks COMP who.GEN hair.NOM stood back.legs-on

- ✓ Lit.: ‘About who does Mariam think that their hair stood on its back legs?’
- ✓ Idiom.: ‘About who does Mariam think that they got scared?’

To sum up, all the evidence we have seen in this section points to the conclusion that there is no direct dependency between the *wh*-phrase in the matrix clause and the embedded *wh*/gap in the three constructions under consideration. We have seen that there are no connectivity effects between the two *wh*-phrases, that the embedded CP can be a polar question in the *wh*-scope marking construction, and that the proleptic *wh*-objects don’t pass any diagnostics for being generated in the embedded CP—lack of reconstruction for anaphor and variable binding, lack of principle C effects and lack of idiomatic readings all suggest that proleptic DPs are generated in the matrix CP.

If the matrix *wh*-phrase and the embedded *wh*/gap are not part of a movement chain, then we have a question of how the indirect dependency between the two items is established. What is the syntax of these constructions, and how does it allow us to build the meaning of a long-distance question? In the next sections I propose answers to these questions.

4 Syntax of long-distance *wh*-dependencies

Given my claim that *wh*-scope marking, prolepsis + gap and prolepsis + *wh*-doubling do not involve cross-clausal movement one might have expected that these constructions wouldn’t exhibit any locality constraints. This however is not the case. First, in all three constructions the *wh*-phrase in the matrix clause has to immediately precede the verb, (39)-(40).

- (39) *ras mariam-i pikrobs, [rom am sakmem vin gaağiziana]?
 what.ACC Mariam-NOM thinks COMP this task.ERG who.NOM upset
 ‘Who does Mariam think that this task upset?’

- (40) *vis-ze mariam-i pikrobs, [rom am sakmem ___/vin gaağiziana]?
 who-on Mariam-NOM thinks COMP this task.ERG who.NOM upset
 ‘Who does Mariam think that this task upset?’

Second, in *wh*-scope marking and prolepsis + *wh*-doubling constructions, the embedded *wh*-phrase cannot be separated from the verb either, (41)-(42).

- (41) *ras pikrobs mariam-i, [rom vin am sakmem gaağiziana?]
 what.ACC thinks Mariam-NOM COMP who.NOM this task.ERG upset
 ‘Who does Mariam think that this task upset?’
- (42) *vis-ze pikrobs mariam-i, [rom vin am sakmem gaağiziana?]
 who-on thinks Mariam-NOM COMP who.NOM this task.ERG upset
 ‘Who does Mariam think that this task upset?’

Finally, all three constructions exhibit island-sensitivity: the *wh*/gap inside the embedded clause cannot occur inside of an island. In (43)-(44) we see that the embedded *wh*/gap cannot occur inside of a coordinate structure:

- (43) *Wh-scope marking, Coordinate Structure Constraint*
 *mariam-i **ra-s** pikrobs
 Mariam-NOM **what-ACC** think.PRS.3SG
 [rom šota-m [**ra** č’am-a] da [ğvino dalia]]?
 COMP Shota-ERG **what.NOM** eat-AOR.3SG and wine.NOM drink.AOR.3SG
 ‘What is the thing *x* such that Mariam thinks that Shota ate *x* and drank wine?’
- (44) *Prolepsis + Gap/Wh-doubling, Coordinate Structure Constraint*
ra-ze pikrobs mariami
what-on thinks Mariam.NOM
 [rom šotam ___/ra č’ama da ğvino dalia]?
 COMP Shota.ERG /**what.NOM** ate and wine.NOM drank
 ‘What is the thing *x* about which Mariam thinks that Shota ate *x* and drank wine?’

In (45)-(46) we observe relative clause island violations with the embedded *wh*/gap.

(45) *Wh-scope marking, Relative Clause Island*

***mariam-i ra-s** pikrobs [rom natia-m č'am-a
 Mariam-NOM **what-ACC** think.PRS.3SG COMP Natia-ERG eat-AOR.3SG
 xinkali [romelic **vin** gaak'et-a]]?
 khinkali.NOM which **who.ERG** make-AOR.3SG
 'Who is the person *x* such that Mariam thinks that Natia ate khinkali that *x* made?'

(46) *Prolepsis + Gap/Wh-doubling, Relative Clause Island*

***vis-ze** pikrobs mariami,
who-on thinks Mariam.NOM
 [rom natia-m gaak'eta xink'ali, [romelic ___/**vin** č'ama]]?
 COMP Natia-ERG make-AOR.3SG khinkali REL ___/**who.ERG** eat-AOR.3SG
 'Who is the person *x* such that M. thinks about *x* that N. made khinkali that *x* ate?'

(47)-(48) show that the embedded *whs*/gaps are also sensitive to the adjunct island: they cannot occur inside of *because*-clauses.

(47) *Wh-scope marking, Adjunct Island*

***ra-s** pikrobs mariami, [rom bebia-m inerviula
what-ACC thinks Mariam.NOM COMP grandmother-ERG was.worried
 [imitom, rom am sakme-m **vin** gaağiziana]]?
 because COMP this task-ERG **who.NOM** upset
 'Who is the person *x* such that Mariam thinks that the grandmother was
 worried because this task upset *x*?'

(48) *Prolepsis + Gap/Wh-doubling, Adjunct Island*

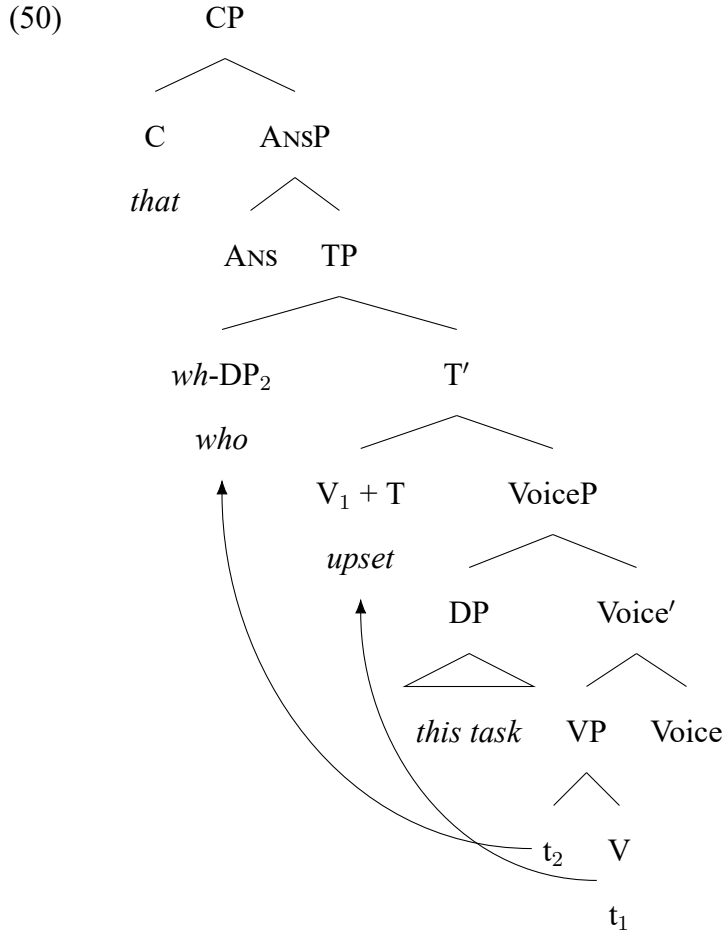
***vis-ze** pikrobs mariami, [rom bebia-m inerviula
who-on thinks Mariam.NOM COMP grandmother-ERG was.worried
 [imitom, rom am sakme-m ___/**vin** gaağiziana]]?
 because COMP this task-ERG **/who.NOM** upset
 'Who is the person *x* such that Mariam thinks about *x* that the grandmother was
 worried because this task upset *x*?'

Thus, in all three constructions we see evidence of movement. The obligatory adjacency of the *wh*-scope marker and proleptic *wh*-DP to the matrix verb suggests that these element undergo *wh*-movement. The embedded *wh*/gap also must be involved in a movement chain: they require adjacency to the embedded verb and cannot occur inside islands.

So we seem to have arrived at a paradox: in section 3 I argued that all three constructions lack long-distance *wh*-movement, yet the *wh*-elements and null elements corresponding to gaps in these structures show evidence of being moved. I suggest that the two conclusions are not in fact in conflict with each other: while there is no movement chain from the embedded clause into the matrix clause, all three constructions involve movement *within* matrix and embedded CPs.

I propose that CPs that contain *wh*-items—i.e., matrix clauses of all three constructions and embedded CPs in *wh*-scope marking and prolepsis + *wh*-doubling—have regular syntax of *wh*-questions in Georgian. *Wh*-phrases in these clauses originate in their usual argument positions, and move to Spec, TP, while the verb raises to T. The embedded CPs of *wh*-scope marking and prolepsis + *wh*-doubling structures, (49), will have LFs like in (50).

- (49) ...[rom am sakmem **vin** gaağiziana]
 COMP this.ERG task.ERG **who.NOM** upset
 ‘...that this task upset who’



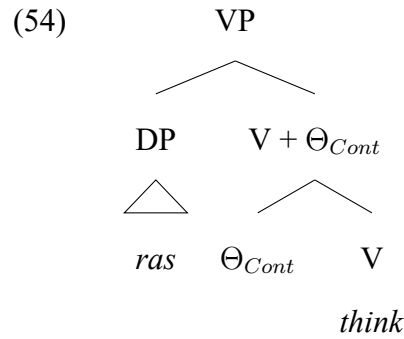
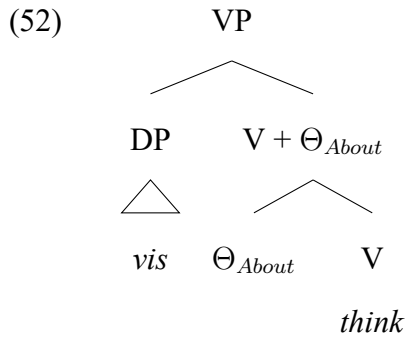
The only difference between the syntax in (50) and a matrix *wh*-question is that there is a null ANS(WERHOOD) operator located between C and T that is inserted in order to make the structure with an embedded question interpretable (see section 5).

I assume a neo-Davidsonian approach to argument structure (Castañeda 1967, a.o.), according to which all arguments are severed from the verb and are introduced by dedicated functional heads: Θ -heads. Two such heads in particular are relevant for the constructions under consideration: Θ_{About} and Θ_{Cont} . I assume that Θ_{About} is the head that we see in structures with prolepsis: it introduces the proleptic object—the individual who the expressed attitude is *about*, and it is responsible for the postpositional marking (*ze* ‘on, about’) that we see attached to the ABOUT-DPs. The second functional head, Θ_{Cont} , is the head that in-

roduces the propositional argument in the *wh*-scope marking constructions: the *wh*-scope marker *ra* ‘what’ will be saturating this argument. With a verb like *pikrobs* ‘think’, these heads can compose with a verb in the absence of an embedded CP, giving rise to sentences like (51) and (53), with VP structures in (52) and (54) respectively.

(51) mariami vis-ze pikrobs?
 Mariam.NOM who-on thinks
 ‘About who does Mariam think?’

(53) mariami ra-s pikrobs?
 Mariam.NOM what-ACC thinks
 ‘What does Mariam think?’



I assume that in all three constructions, the embedded clauses are verbal modifiers (Kratzer 2016, Bogal-Allbritten 2016, Elliott 2020, Özyıldız 2020, Roberts 2020, Bochnak & Hanink 2022, Bondarenko 2022): they are not an argument of the verb (and thus are not introduced by a Θ -head), but combine intersectively, contributing additional information about the eventuality that the verb describes. While verbal modifiers could in principle be merged at different places in the structure, there is evidence that the embedded CPs in all three constructions are merged below the projection that introduces external arguments, which I assume to be VoiceP. In (55)-(56) the external argument of the matrix clause is a quantificational phrase *titoeuli masc* ‘avlebeli’ ‘each student’, and we see that it can bind the embedded subject (reflexive *tviton* ‘self’) in *wh*-scope marking, (55), as well as in the two prolepsis structures, (56). We wouldn’t expect such binding to be possible if the embedded CP was attaching higher than the matrix subject.

- (55) [titoeuli masc'avlebel-i]₁ ra-s pikrobs
 each teacher-NOM what-ACC thinks
 [rom tviton₁ rogor mosc'avle-s asc'avla]?
 COMP self.ERG what student-DAT taught
 'What kind of student does [every teacher]₁ think that (s)he_{1/*2} taught?'
- (56) [titoeuli masc'avlebel-i]₁ vis-ze pikrobs,
 each teacher-NOM what-ACC thinks
 [rom tviton₁ ___/vis asc'avla]?
 COMP self.ERG ___/who.DAT taught
 'About who₃ does [every teacher]₁ think that (s)he_{1/*2} taught them₃?'

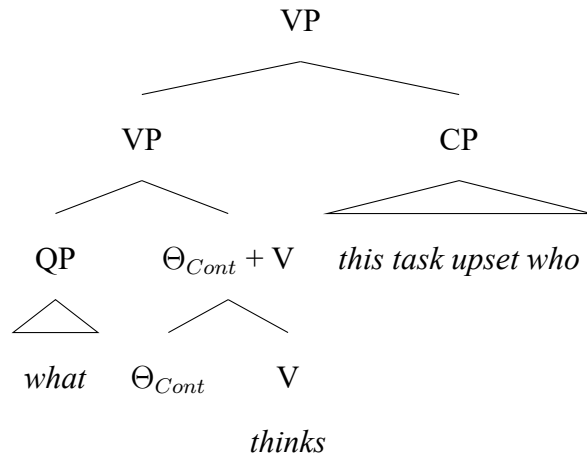
The height of CP attachment has consequences for how the indirect *wh*-dependency can be established. The proposal for *wh*-scope marking in (Dayal 1993) assumes that the embedded CP is attached directly to the matrix CP in order to act as its restrictor—an option that is untenable for Georgian given the data in (55). Dayal (2000) suggests that there are in fact several syntactic configurations that can instantiate an indirect dependency, and argues that there is a structure in which the embedded CP is the complement of the verb. The *wh*-scope marker in this structure is not in an argument position, but is base-generated in a Spec,CP position and has a null restrictor co-indexed with the embedded CP. In order for the structure to be interpreted, the embedded CP then moves into the restrictor of the *wh*-scope marker at LF. One disadvantage of this syntactic proposal is that the required CP-movement at LF violates the Extension Condition. It also loses the parallel between the *wh*-scope marking construction and the *what*-questions without embedded clauses as in (53), assuming that *ra* 'what' is generated in two different positions in these sentences.

Treating embedded CPs as modifiers of *the verb* rather than modifiers of the *wh*-scope marker avoids these drawbacks, and also allows us to extend the proposal to indirect dependencies involving prolepsis. Let us first consider the syntax of the *wh*-scope marking. I propose that the VP of sentences like (57) has the structure in (58).

(57) *Wh-scope Marking*

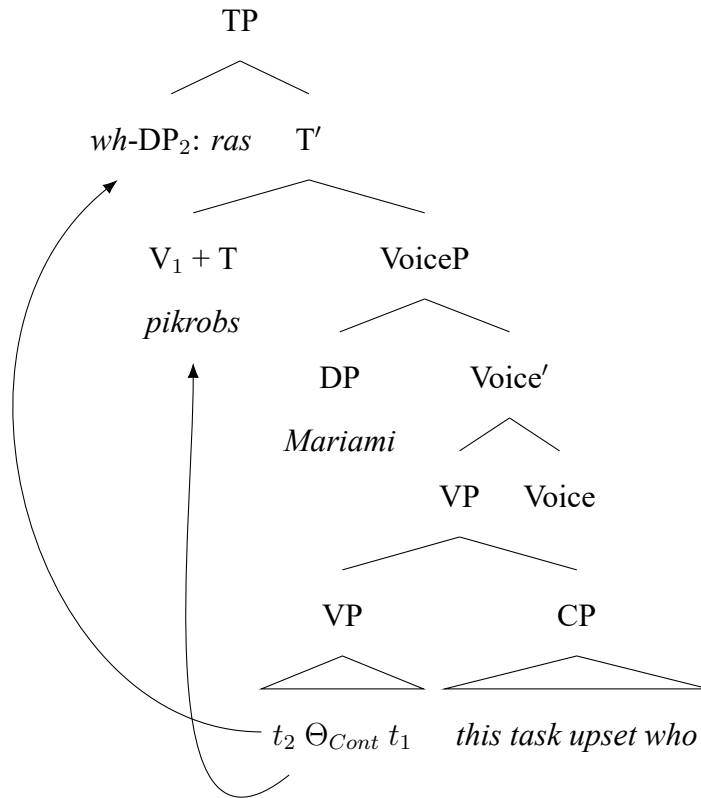
mariami **ra-s** pikrobs, [rom am sakmem **vin** gaağiziana]?
 Mariam.NOM **what-ACC** thinks COMP this.ERG task.ERG **who.NOM** upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘What does Mariam think that this task upset who?’)

(58) *Wh-Scope Marking: VP*



The verb combines with the functional head introducing the propositional argument, Θ_{Cont} , and then *ra* ‘what’, which in this case is an existential quantifier over propositions, merges with the complex head $\Theta_{Cont} + V$. CP modifies the resulting VP. After the external argument is introduced by Voice and T is merged into the structure, the verb will move to T, and the *wh*-scope marker will move to Spec,TP position, (59).

(59) *Wh-Scope Marking: TP*



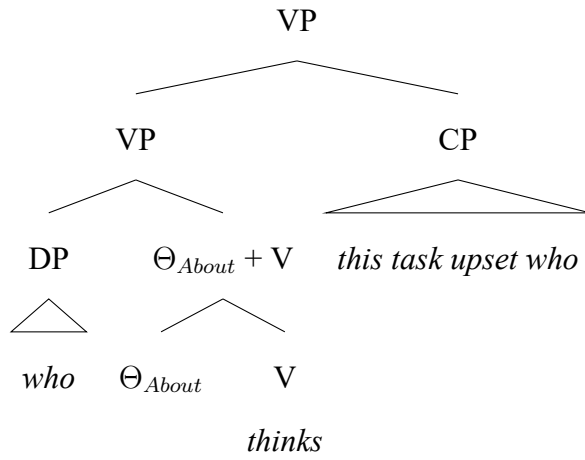
The matrix clause is thus identical to the one in (53), and forms the question *What does Mariam think?* The embedded CP will restrict the thinking events we are asking about to those whose propositional content is a proposition of the form “*This task upset X*”.

I propose that the structure of prolepsis + *wh*-doubling is very similar to that of the *wh*-scope marking construction. A sentence like (60) will have the VP in (61) and the TP in (62).

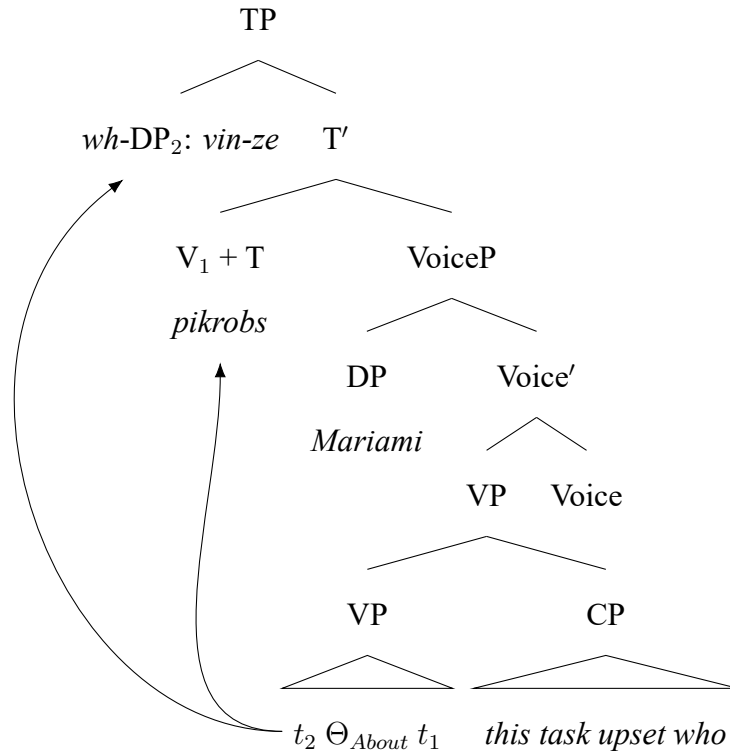
(60) *Prolepsis + Wh-doubling*

mariami **vis-ze** pikrobs, [rom am sakmem **vin** gaağiziana]?
 Mariam.NOM **who-on** thinks COMP this.ERG task.ERG **who.NOM** upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘About who_i does Mariam think that this task upset who_i?’)

- (61) *Prolepsis+Wh-doubling: VP*



- (62) *Prolepsis+Wh-doubling: TP*



The matrix clause is identical to the simple *wh*-prolepsis question in (51): *Who does Mariam think about?* The embedded clause attaches to the VP, and again restricts the set of thinking eventualities to those whose content is of the form “*This task upset X*”.

Finally, let us consider the prolepsis + gap configuration, (63). In these cases the em-

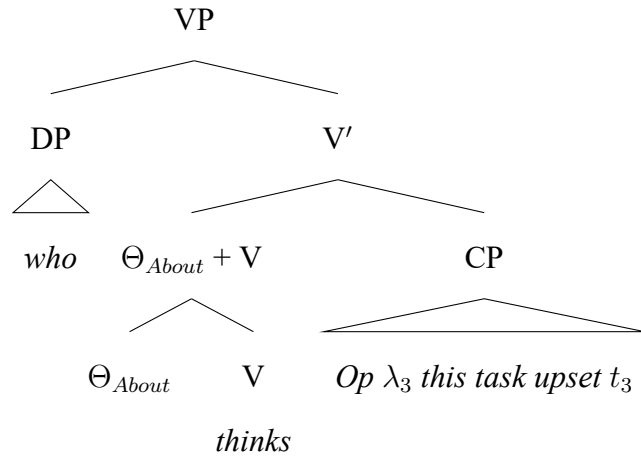
bedded clause is not interrogative. I suggest that the gap in this CP corresponds to a semantically vacuous null operator (Op) which originates in an argument position and undergoes movement to the edge of the clause, contributing λ -abstraction over that argument.

(63) *Prolepsis + Gap*

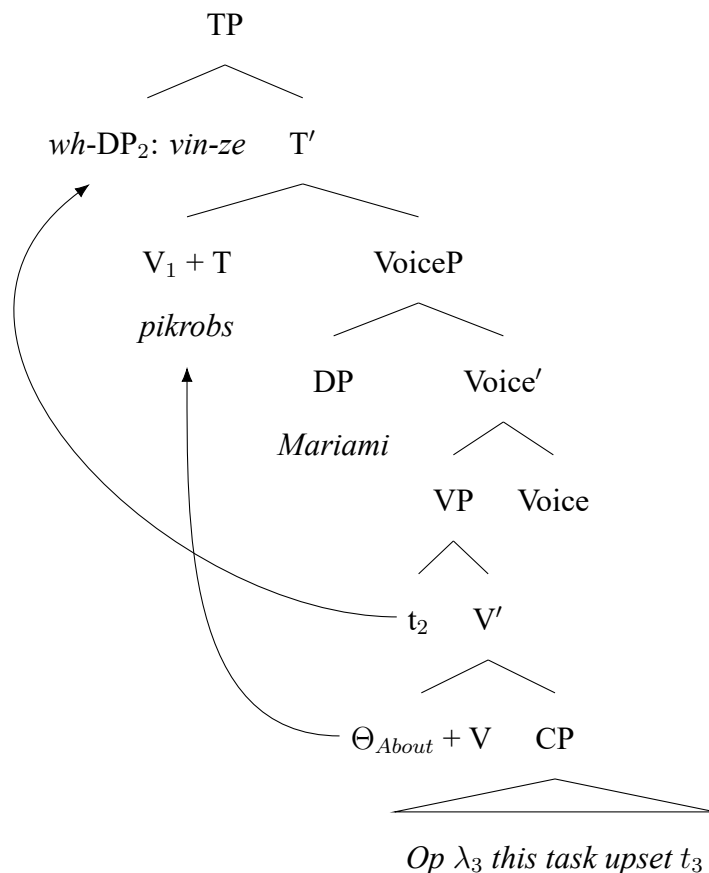
mariami **vis-ze** pikrobs, [rom am sakmem ____ gaağiziana]?
 Mariam.NOM **who-on** thinks COMP this.ERG task.ERG upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘About who_i does Mariam think that this task upset _____i?’)

I propose that the CP with the abstracted argument combines not with the VP, but with the complex head $\Theta_{About} + V$ before it merges with the proleptic object.⁸ The proleptic *wh*-DP then will saturate both the ABOUT-argument of the matrix verb as well as the argument inside of the embedded CP, and then move to Spec,TP, followed by V-to-T movement, (65).

(64) *Prolepsis+Gap: VP*



(65) *Prolepsis+Gap: TP*



Just like in the previous case, the matrix clause in (65) is identical to the one in (51), and constitutes the question: *Who does Mariam think about?* The embedded CP again restricts the content of thinking: we will only consider the thinking events where Mariam thinks “*This task upset X*” about the individual *X* she is thinking about.

Let us now see how the proposed structures capture the syntactic properties that the three constructions exhibit. First, note that both the *wh*-scope marker and the proleptic *wh*-DP on my proposal originate as arguments of the matrix verb—they have not been inside the embedded CP at any stage of derivation. This explains their properties that we saw in section 3: the lack of connectivity effects, the possibility of polar questions in the *wh*-scope marking construction, the lack of anaphor and variable binding, the lack of principle C effects

and the lack of idiomatic readings in the two constructions involving prolepsis. Second, the requirement of adjacency of the *wh*-scope marker and the proleptic *wh*-object to the verb on my proposal follows from the fact that the matrix clauses in these constructions have regular Georgian *wh*-syntax: *wh*-scope markers and the proleptic *wh*-DPs move from their argument positions to Spec,TP while the verb undergoes movement to T, which prevents other material intervening between the verb and *wh*-phrases. Finally, the adjacency requirement observed in embedded clauses and the fact that the embedded *wh*/gap cannot occur inside of islands is explained by the fact in all three constructions there is clause-internal movement in the embedded CP. In *wh*-scope marking and prolepsis + *wh*-doubling constructions, the embedded CP exhibits regular *wh*-movement: *wh*-phrases undergo movement to the embedded Spec,TP, and the embedded verb moves to T. This makes the *wh*-phrases always appear adjacent to the verb. In the prolepsis + gap construction, I proposed that there is a null operator moving to the edge of the embedded CP. Thus, this structure will also exhibit island-sensitivity, even though it does not have *wh*-movement.

Prolepsis in Georgian is not limited to the two constructions with indirect *wh*-dependency that we have been discussing. In (66) we see that a non-*wh* proleptic object can co-occur with a co-referential gap inside of the embedded clause. My account of the island-sensitivity of the prolepsis + gap construction makes a prediction that we should see island effects with prolepsis even when the proleptic object is not a *wh*-item. This is borne out: in (67) we see that placing the gap inside a relative clause leads to an island violation. This supports the view that island-sensitivity in the prolepsis + gap construction is due to the syntax of prolepsis and not due to cross-clausal *wh*-movement.^{9,10}

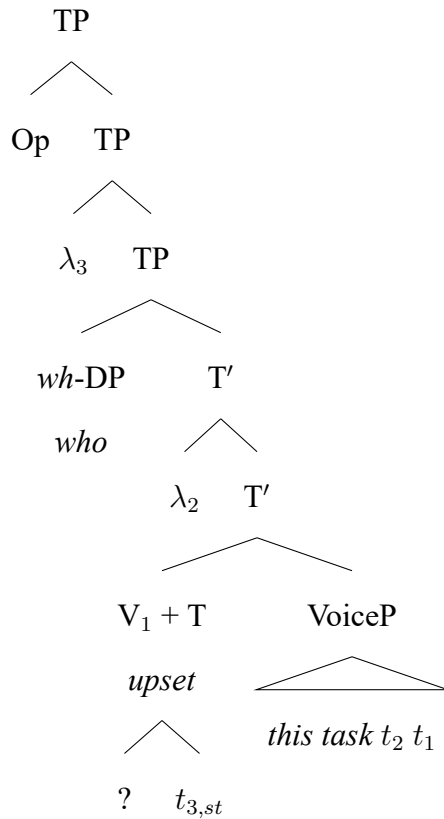
- (66) mariami **givi-ze** pikrobs, rom am sakmem ____ gaağiziana.
 Mariam.NOM **Givi-on** thinks COMP this task.ERG upset
 ‘Mariam thinks about Givi₁, that this task upset him₁.

- (67) *mariami šota-ze pikrobs, rom natia-m gaak’eta xink’ali,
 Mariam.NOM **Shota-on** thinks COMP Natia-ERG made khinkali
 [romelic ____ č’ama].
 REL ate
 ‘Mariam thinks of Shota₁ that Natia made khinkali that he₁ ate.’

5 Semantics of long-distance *wh*-dependencies

Let us now turn to how the three kinds of indirect *wh*-dependencies are interpreted—how the syntactic structures proposed in the previous section lead to a meaning similar to that of a long-distance *wh*-question. I assume that matrix *wh*-questions have LFs like in (68).

- (68) *LF of a Matrix Wh-Question*



The T head of a *wh*-clause hosts a question operator with the semantics in (69): it’s a func-

tion that takes two proposition and equates them.

$$(69) \quad \llbracket ? \rrbracket = \lambda p_{st}. \lambda q_{st}. p = q$$

This question operator combines with a null $\langle s, t \rangle$ -type operator that moves and contributes abstraction at the top of the tree, resulting in the overall meaning being a set of propositions. *Wh*-phrase *vin* ‘who’ is an existential quantifier over individuals, (70), and the T' node it combines with after undergoing movement has the denotation in (71): it’s a function that takes an individual and returns “true” if the proposition $g(3, st)$ is “*This task upset x*”. Once we abstract over $g(3, st)$, we will get the set of proposition in (72) as the meaning of the question: it’s a set of propositions of the form “*This task upset X*”.

$$(70) \quad \llbracket vin \rrbracket^{w,g} = \lambda f_{et}. \exists x_e [\text{human}_w(x) \wedge f(x)]$$

$$(71) \quad \llbracket T' \rrbracket^{w,g} = \lambda x_e. g(3, st) = \lambda w'. \text{this task upset}_{w'} x.$$

$$(72) \quad \llbracket TP \rrbracket^{w,g} = \lambda p_{st}. \exists x_e [\text{human}_w(x) \wedge p = \lambda w'. \text{this task upset}_{w'} x]$$

Now let us consider how *wh*-questions with CONTENT and ABOUT arguments are interpreted. Since I am assuming neo-Davidsonian approach to argument structure (Castañeda 1967, a.o.), the verb ‘think’ will be a simple predicate of thinking events, (73). The functional heads introducing CONTENT and ABOUT arguments will have denotations in (74) and (75) respectively: Θ_{Cont} introduces an argument of the propositional type $\langle s, t \rangle$ that is the content of the attitudinal eventuality, and (75) introduces an individual-type argument that the eventuality is about. Finally, I assume that the *wh*-scope marker *ra* ‘what’ has the semantics in (76): it is an existential quantifier over propositions.

$$(73) \quad \llbracket \text{think} \rrbracket^{w,g} = \lambda e_v. \text{think}_w(e)$$

$$(74) \quad \llbracket \Theta_{Cont} \rrbracket^{w,g} = \lambda V_{vt}. \lambda p_{st}. \lambda e_v. V(e) \wedge \text{CONT}(e) = p$$

$$(75) \quad \llbracket \Theta_{About} \rrbracket^{w,g} = \lambda V_{vt}. \lambda x_e. \lambda e_v. V(e) \wedge \text{ABOUT}(e) = x$$

$$(76) \quad \llbracket ras \rrbracket^{w,g} = \lambda Q_{st,t}. \exists q_{st} [Q(q) = 1]$$

In questions in (77) and (78) the *wh*-DPs will undergo movement, and after the abstraction contributed by the null $\langle s, t \rangle$ -type operator, we will get the meanings in (79) and (80).

- | | |
|---|--|
| <p>(77) mariami ra-s pikrobs?
 Mariam.NOM what-ACC thinks
 ‘What does Mariam think?’</p> | <p>(78) mariami vis-ze pikrobs?
 Mariam.NOM who-on thinks
 ‘About who does Mariam think?’</p> |
|---|--|

$$(79) \quad \llbracket \text{What does Mariam think?} \rrbracket^{w,g} =$$

$$\lambda p_{st}. \exists q_{st} [p = \lambda w'. \exists e [think_{w'}(e) \wedge Exp(e) = M. \wedge Cont(e) = q]]$$

(Mariam thinks p, Mariam thinks q,...)

$$(80) \quad \llbracket \text{About who does Mariam think?} \rrbracket^{w,g} =$$

$$\lambda p_{st}. \exists x_e [\text{human}_w(x) \wedge p = \lambda w'. \exists e [think_{w'}(e) \wedge Exp(e) = M. \wedge About(e) = x]]$$

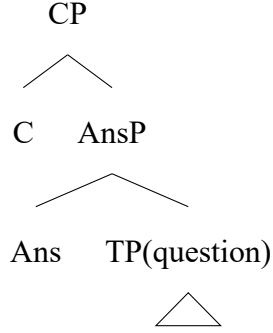
(Mariam thinks about x, Mariam thinks about y,...)

The meaning of (77) is a set of propositions of the form “*Mariam thinks P*”, where *P* is some proposition, and the meaning of (78) is a set of propositions of the form “*Mariam thinks about X*”, where *X* is some individual. I will assume that (79) and (80) are exactly the meanings that we have in matrix clauses in the *wh*-scope marking construction and the two indirect *wh*-dependencies involving prolepsis.

Now let us consider the semantics of embedded *wh*-questions in the *wh*-scope marking and prolepsis + *wh*-doubling constructions. The interrogative embedded clauses in these constructions do not have meanings of questions, i.e., the attitude holder is not engaged in a wondering eventuality—the content of their mental state is propositional. Thus, I suggest

that an Ans(werhood) operator is inserted into the structures of these embedded CPs, (81).

(81) *Embedded CP in Wh-scope marking and Prolepsis + Wh-doubling*



I assume that embedded CPs in these constructions are verbal modifiers (Kratzer 2016, Bogal-Allbritten 2016, Elliott 2020, Özyıldız 2020, Roberts 2020, Bochnak & Hanink 2022, Bondarenko 2022): they specify what the propositional content associated with the thinking eventuality is. Following (Moulton 2009, Elliott 2020, Bassi & Bondarenko 2021, Bondarenko 2022), I assume *equality semantics* of displacement: the complementizer requires that the propositional content of the event *equals* the embedded proposition.¹¹

$$(82) \quad \llbracket C \rrbracket^{w,g} = \lambda p_{st}. \lambda e. Cont(e) = p$$

I propose that the Ans operator has the meaning in (83): it takes the meaning of the embedded TP (a question, Q) and the meaning of the complementizer (F) as its arguments, and returns a predicate of events e such that there is a proposition among the members of Q such that the meaning of the complementizer returns “true” when applied to it and to e .

$$(83) \quad \llbracket Ans \rrbracket^{w,g} = \lambda Q_{st,t}. \lambda F_{st,vt}. \lambda e. \exists q [q \in Q \wedge F(q)(e) = 1]$$

Thus, the embedded clause like (84) will have the meaning in (85).

- (84) ...[rom am sakmem **vin** gaağiziana]
 COMP this.ERG task.ERG **who.NOM** upset
 ‘...that this task upset who’

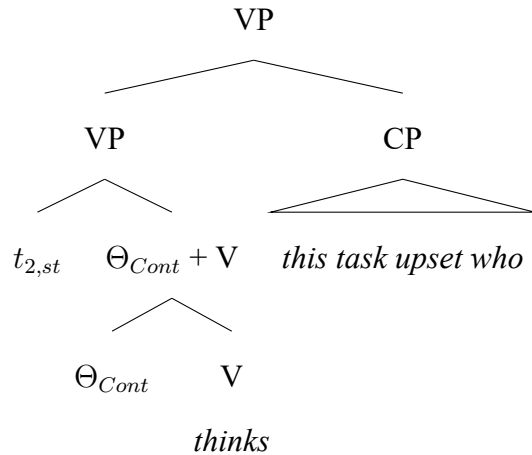
- (85) $\llbracket (84) \rrbracket^{w,g} = \lambda e. \exists q [q \in Q \wedge Cont(e) = q]$,
 where $Q = \{p : \exists x_e [\text{human}_w(x) \wedge p = \lambda w'. \text{this task upset}_{w'} x]\}$

This CP is a predicate of events with propositional content, but, unlike a declarative clause, (86), it does not explicitly state what the propositional content associated with the event *is*. What it does is it *restricts* what the propositional content associated with the event is: it must be a proposition of the form “*This task upset X*”, where *X* is some individual.

- (86) $\llbracket \text{that this task upset Shota} \rrbracket^{w,g} = \lambda e. Cont(e) = \lambda w'. \text{this task upset}_{w'} \text{Shota}$

Now let us see how an embedded clause with this meaning allows us to establish an indirect *wh*-dependency in *wh*-scope marking and prolepsis + *wh*-doubling constructions. The VP in the *wh*-scope marking construction, (88), will have the meaning in (87).

- (87) $\llbracket \text{VP} \rrbracket^{w,g} = \lambda e_v. \text{think}_w(e) \wedge Cont(e) = g(2, st) \wedge \exists q \in Q [Cont(e) = q]$
 where $Q = \{p : \exists x_e [\text{human}_w(x) \wedge p = \lambda w. \text{this task upset}_w x]\}$
- (88) *Wh-scope Marking VP*



VP and CP combined by Predicate Modification, and the resulting predicate is true of thinking events whose content is $g(2, st)$ and whose content is of the form “*This task upset X*”. Since CONT is a function and can’t return two distinct propositions when applied to the same event, it follows that $g(2, st)$ must be a proposition of the form “*This task upset X*”.

The meaning of the whole sentence like (89) then will be in (90).

(89) *Wh-scope Marking*

mariami **ra-s** pikrobs, [rom am sakmem **vin** gaağiziana]?
 Mariam.NOM **what-ACC** thinks COMP this.ERG task.ERG **who.NOM** upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘What does Mariam think that this task upset who?’)

(90) $\llbracket (89) \rrbracket^{w,g} = \lambda p_{st}. \exists q_{st} [p = \lambda w'. \exists e [think_{w'}(e) \wedge Exp(e) = \text{Mariam}$
 $\wedge Cont(e) = q \wedge \exists q' \in Q [Cont(e) = q']]]$

where $Q = \{p : \exists x_e [\text{human}_w(x) \wedge p = \lambda w'. \text{this task upset}_{w'} x]\}$

Paraphrase: *Which proposition does Mariam think,*
such that her thinking is of the form “This task upset X”?

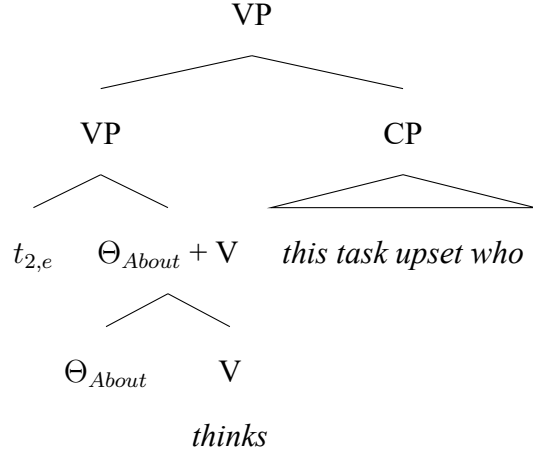
The set in (90) is the same set of propositions that we would get for a long-distance *wh*-question: it contains propositions like “*Mariam thinks that this task upset Shota*”, “*Mariam thinks that this task upset Natia*”, etc. The way we arrived at this set is however different from long-distance *wh*-questions: our main question just asks *What does Mariam think?* But because the embedded CP restricts Mariam’s thinking eventuality by saying that the content of Mariam’s thoughts is of the form “*This task upset X*”, possible answers to the main question would have to have the form “*Mariam thinks that this task upset X*”.

Let us now turn to the prolepsis + *wh*-doubling construction. The VP, which has the structure in (92), will receive the meaning in (91).

$$(91) \quad \llbracket \text{VP} \rrbracket^{w,g} = \lambda e_v. \text{think}_w(e) \wedge \text{About}(e) = g(2, e) \wedge \exists q \in Q[\text{Cont}(e) = q]$$

where $Q = \{p : \exists x_e[\text{human}_w(x) \wedge p = \lambda w'. \text{this task upset}_{w'} x]\}$

(92) *Prolepsis + Wh-doubling VP*



The CP again combined as a verbal modifier, restricting the content of thinking to propositions of the form “*This task upset X*”. What is different in this case though is that the argument introduced into the structure by the functional head is an individual who the thinking is about. The meaning of the full sentence like in (93) then will have the denotation in (94).

(93) *Prolepsis + Wh-doubling*

mariami **vis-ze** pikrobs, [rom am sakmem **vin** gaağiziana]?
 Mariam.NOM **who-on** thinks COMP this.ERG task.ERG **who.NOM** upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘About who_i does Mariam think that this task upset who_i?’)

$$(94) \quad \llbracket (93) \rrbracket^{w,g} = \lambda p_{st}. \exists x_e[p = \lambda w'. \exists e[\text{think}_{w'}(e) \wedge \text{Exp}(e) = \text{Mariam} \wedge \text{About}(e) = x \wedge \exists q' \in Q[\text{Cont}(e) = q']]]]$$

where $Q = \{p : \exists x_e[\text{human}_w(x) \wedge p = \lambda w'. \text{this task upset}_{w'} x]\}$

Paraphrase: *About who does Mariam think, such that her thinking is of the form “This task upset X”?*

Note that the meaning in (94) is slightly different from the meaning of a long-distance *wh*-question: it assumes that there is some particular individual who is the topic of Mariam’s thoughts. The ABOUT-argument is not connected to the internal argument of the embedded clause directly: note that the variables corresponding to these arguments are bound by two distinct existential quantifiers, and so the set of propositions that we are getting has propositions of the form “*Mariam thinks about $\underline{Y}$ and the content of her thoughts is “This task upset $\underline{X}$ ”*”, where Y and X do not necessarily co-refer. The way native speakers however seem to interpret this question is that Y and X pick out the same individual. Why is this the case? I suggest that this restriction comes from what it means to be an ABOUT-argument: the propositional content of the event can’t be unrelated to the individual described by the ABOUT-DP. The proposal by Rawlins (2013) could be one way to make this intuition more precise. Rawlins proposes semantics of *aboutness* which says that the propositional content of an event must not be orthogonal to the resolution of some property associated with the *about*-DP: truth or falsity of the embedded proposition should move us towards answering some question about the *about*-argument. If the individual X in the propositional content “*This task upset X* ” is the ABOUT-argument, such a requirement would be easily met. But if X is some unrelated individual, the content of the event would be orthogonal to the resolution of any salient property associated with the ABOUT-argument. Thus, I assume that restrictions on what it means to be an ABOUT-argument lead us to restricting the set in (94) to the set in which the internal argument of the embedded CP and the ABOUT-argument refer to the same individual. So, e.g., proposition like “*Mariam thinks about Shota and the content of her thoughts is “This task upset Natia”*” will not be maintained in the resulting set, only propositions of the form “*Mariam thinks about $\underline{X}$ and the content of her thoughts is “This task upset $\underline{X}$ ”*” will be maintained due to the semantics of aboutness. I leave the formal implementation of how this restriction is incorporated into the meaning of Θ_{About} for the future.

Finally, let us consider the semantics of the prolepsis + gap construction. In this case the

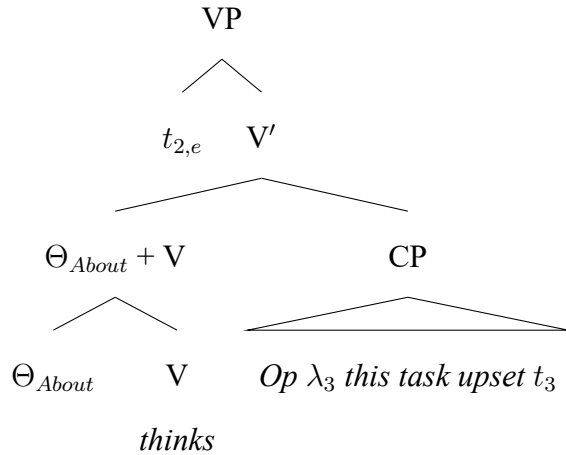
embedded clause is declarative, and the null operator that moves to its edge contributes a λ -abstraction, so that the meaning of the CP is in (95): it is an $\langle e, \langle v, t \rangle \rangle$ -type function where the individual argument corresponds to the internal argument of the embedded proposition. The complex head that the CP combines with, $\Theta_{About} + V$, is of the same semantic type, (96), and so it combines with the CP by Predicate Modification, resulting in the meaning in (97).

$$(95) \quad \llbracket CP \rrbracket^{w,g} = \lambda x_e. \lambda e_v. Cont(e) = \lambda w'. This \text{ task upset}_{w'} x$$

$$(96) \quad \llbracket \Theta_{About} + V \rrbracket^{w,g} = \lambda x_e. \lambda e_v. think_w(e) \wedge About(e) = x$$

$$(97) \quad \llbracket V' \rrbracket^{w,g} = \lambda \mathbf{x}_e. \lambda e_v. think_w(e) \wedge About(e) = \mathbf{x} \wedge Cont(e) = \lambda w'. This \text{ task upset}_{w'} \mathbf{x}$$

$$(98) \quad \textit{Prolepsis} + \textit{Gap VP}$$



Note that the individual that will saturate the argument x in (97) will “fill in” both the ABOUT-argument of the verb and the internal argument of the embedded verb at the same time. This is how the indirect dependency between the two arguments is created.

The whole sentence in (99) will then receive the denotation in (100). It is a set of propositions of the form “*Mariam thinks about $\underline{X}$ that this task upset $\underline{X}$* ”: in this case, unlike in prolepsis + *wh*-doubling, there is a single quantifier binding the two variables, and so they have to co-refer. This is a consequence of how the CP combined with the verb:

the internal argument of the embedded verb has been identified with the proleptic argument when $\Theta_{About} + V$ and the CP composed by Predicate Modification.

(99) *Prolepsis + Gap*

mariami **vis-ze** pikrobs, [rom am sakmem ____ gaağiziana]?
 Mariam.NOM **who-on** thinks COMP this.ERG task.ERG upset
 ‘Who does Mariam think that this task upset?’
 (lit. ‘About who_i does Mariam think that this task upset _____i?’)

(100) $\llbracket (99) \rrbracket^{w,g} = \lambda p_{st}. \exists x_e [p = \lambda w'. \exists e [think_{w'}(e) \wedge Exp(e) = \text{Mariam} \wedge About(e) = x \wedge Cont(e) = \lambda w''. \text{This task upset}_{w''} x]]$

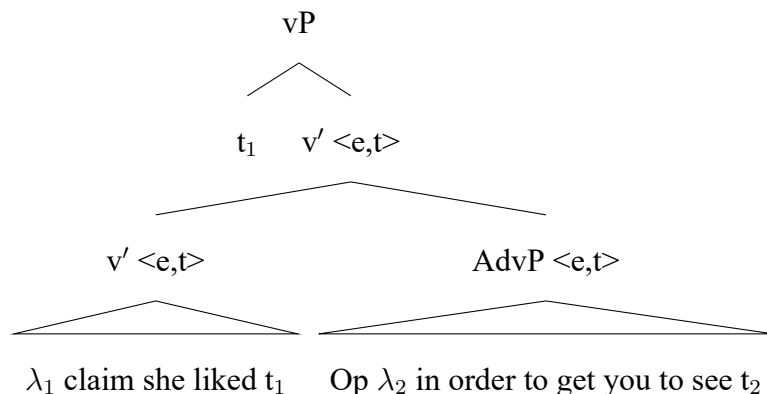
Paraphrase: *About which individual x does Mariam think that this task upset x?*

Thus, in the prolepsis + gap construction we are building a meaning similar to that of a long-distance question by using the syntax of prolepsis—the fact that it allows us to establish an indirect dependency between two individuals without cross-clausal movement.

This analysis of Georgian prolepsis is quite similar to Nissenbaum’s (2000) proposal about semantics of parasitic gaps. Nissenbaum (2000) claims that sentences like (101) involve the structure in (102): the adverbial clause (AdvP) modifies a v' constituent, which includes the λ -abstraction over the argument undergoing successive-cyclic *wh*-movement, but not the trace saturating the argument that is abstracted over. Inside the adverbial clause, there is a semantically vacuous null operator that undergoes movement, abstracting over an argument inside the AdvP. This makes v' and AdvP be of the same semantic type, and they can compose intersectively by Predicate Modification, identifying the argument of the matrix clause with the argument inside AdvP.¹² The newly created function will then be saturated by the trace of the *wh*-phrase, and it will “fill in” both arguments at the same time.

(101) [What movies]₁ did Mary [claim she liked t_1 [in order to get you to see PG₁]]?
 (Nissenbaum 2000: p. 30)

(102) *vP in structure with a PG*



Thus, viewing embedded clauses as verbal modifiers allows us to unify such phenomena as prolepsis in languages like Georgian and structures with parasitic gaps.

To sum up, I argued that the three structures of building indirect *wh*-dependencies in Georgian involve embedded CPs that are verbal modifiers—they modify the matrix question (*What did Mariam think?* or *About who did Mariam think?*) by restricting the propositional content associated with the attitudinal eventuality. There are two ways how such content can be restricted, (103). First, the embedded CP could restrict the content to some answer to a *wh*-question. This strategy is compatible both with *wh*-scope marking and with prolepsis. Second, the embedded CP could restrict the content if it is a declarative clause that contains a null operator forming an $\langle e, \langle v, t \rangle \rangle$ -type predicate that can combine with a complex verbal head. This strategy is compatible with prolepsis, but not with *wh*-scope marking, (104): since the argument in the *wh*-scope marking construction is propositional, an $\langle e, \langle v, t \rangle \rangle$ -type CP couldn't compose with $\Theta_{Cont} + V$ due to a type mismatch.

- (103) a. **Content is an Answer to Q:** [COMP [ANS [TP-_Q *this task upset who*]]]
 ✓ *wh* scope marking, ✓ *prolepsis*
- b. **An $\langle e, \langle v, t \rangle \rangle$ -type CP via Op:** [Op λ₃ [COMP [TP-_{Decl} *this task upset t₃*]]]
 ✗ *wh* scope marking, ✓ *prolepsis*

- (104) *mariami **ra-s** pikrobs, [rom am sakmem ____ gaağiziana]?
 Mariam.NOM **what-ACC** thinks COMP this.ERG task.ERG upset
 Intended: ‘Who does Mariam think that this task upset?’
 (lit. ‘What does Mariam think that this task upset ____?’)

6 Impossibility of movement

I have argued that none of the alternative structures for long-distance *wh*-dependencies in Georgian involve cross-clausal movement. The conclusion then is that while Georgian has *wh*-movement within a single clause, cross-clausal movement across a full finite CP in this language is impossible. This raises the question of why this would be the case: how is Georgian different from languages like English, where such movement is permitted?

In this section I would like to propose that impossibility of cross-clausal *wh*-movement in Georgian is a consequence of the fact that *wh*-phrases target a lower position in the clausal spine in this language. While the landing site of *wh*-phrases in languages like English is Spec,CP, Borise (2023) has argued that the landing site in Georgian is lower than that—in this paper I’ve been assuming that it is Spec,TP. It has been claimed in the literature that there is a general syntactic constraint that connects the height of the projection that the movement targets to its locality (Williams 2003, 2011, Meadows 2023, Poole 2023)—this proposal is known as the *Williams Cycle*. I would like to argue that *wh*-movement out finite CPs in Georgian violates this syntactic constraint due to its lower landing site, leading to ungrammaticality of cross-clausal movement. Consider the formulation of this constraint in (105): *Generalized Ban on Improper Movement* (based on Williams 2003).

(105) **Generalized Ban on Improper Movement**

Movement to [Spec, XP] can't proceed from [Spec, YP] or across YP, where Y is higher than X in the functional sequence.

C is higher than T in the functional sequence, so according to the constraint in (105), movement to Spec,TP cannot proceed across a CP. If *wh*-movement in Georgian targets Spec,TP, then (105) predicts that such movement would not be able to cross a finite CP boundary. Thus, as soon as we adopt the constraint in (105), we have an explanation for the lack of cross-clausal *wh*-movement in Georgian.

Why would a constraint like in (105) hold? The answer proposed in the literature (Williams 2003, 2011, Meadows 2023) is that this constraint is a consequence of how the syntactic structure is built, and the timing of the derivation. In what follows I briefly introduce the key concepts of the implementation of this idea in (Meadows 2023), and discuss how it can be applied to derive the lack of cross-clausal *wh*-movement in Georgian.

There are three key principles of structure-building that we will need to create a William's Cycle effect: *Parallel Derivation*, (106), *Substitution and placeholders*, (107), and the *Strict Cycle Condition*, (108). According to *Parallel Derivation*, all clauses in a sentence are built in parallel: going from the lowest functional projections to the highest, at each step we merge the next functional head into all clauses that we are building in parallel workspaces.

(106) *Parallel Derivation*

- a. Main and embedded clauses are built in separate workspaces.
- b. The Merge of a component of clausal functional sequence applies in parallel across all workspaces.
- c. Syntactic dependencies involving Merge/Agree cannot be established across workspaces.

We can think of each step in structure-building as a *cycle*: a unit of syntactic time, measured by the clausal functional sequence. The merger of a new category in the clausal functional sequence is the start of a cycle. Within the cycle, operations Merge and Agree apply. The next cycle begins once the next category in the functional sequence is merged.

The idea of *substitution and placeholders* in this system is needed to achieve clausal embedding. For example, if a verb combines with a CP, it cannot do so directly: due to parallel derivation, CP is not yet built at the V-cycle. So instead of the CP, V will combine with a placeholder $C\downarrow$, which will be substituted for a CP at the C-cycle.

(107) *Substitution and placeholders*

A placeholder functional category $F\downarrow$ must be rewritten (i.e. substituted) for a matching non-placeholder category F and its constituents at the cycle in which F is introduced.

The final crucial concept that we need is the *Strict Cycle Condition*:¹³ a principle that requires that all syntactic operations (Merge, Agree) pertaining to a certain category of the clausal functional sequence happen during the cycle at which this category is merged.

(108) *Strict Cycle Condition* (Meadows 2023: p. 144)

- a. If a syntactic operation O affects a component F of a clausal extended projection at a cycle C_j , then F must be merged as part of the clausal extension at C_j .
- b. A syntactic operation O affects a component F of a clausal extended projection if it causes the projection of F, or if it alters the featural content of F (by e.g. supplying copied feature values).

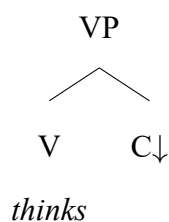
Now let us see how these principle will apply to create the William's Cycle effect in Georgian. The concepts introduced above are in principle compatible with different ideas

about phases (see discussion in Meadows 2023), but here I will for simplicity assume that CPs are phases but VoicePs are not.¹⁴ I will furthermore assume that *wh*-phrases in Georgian embedded clauses are in the best possible position to escape: they move to embedded Spec,CP (perhaps, driven by edge features). Let us now see why even in these favorable conditions, cross-clausal movement will not be possible in a sentence like (109).

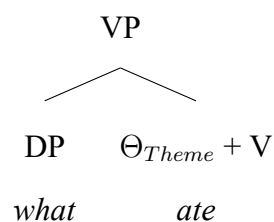
- (109) *<mariam-i> **ra-s₁** pikrob-s <mariam-i>
 <Mariam-NOM> **what-ACC** think-PRS.3SG <Mariam-NOM>
 [rom šota t₁ č'am-s]?
 COMP Shota.NOM eat-PRS.3SG
 'What does Mariam think that Shota is eating?'

First, we build two VPs in parallel: the matrix one and the embedded one, (110)-(111). In the matrix clause, the verb combines with a placeholder category C↓, as the CP it will combine with has not yet been built.¹⁵ In the embedded clause, the verb combines with a *wh*-object. No other syntactic operations happen in the V-cycle.

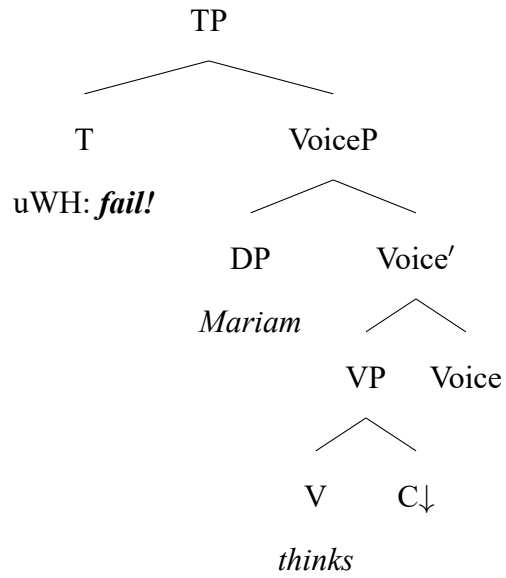
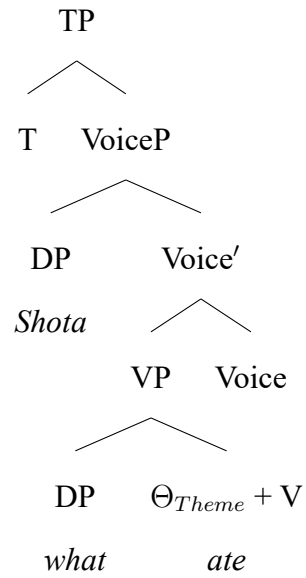
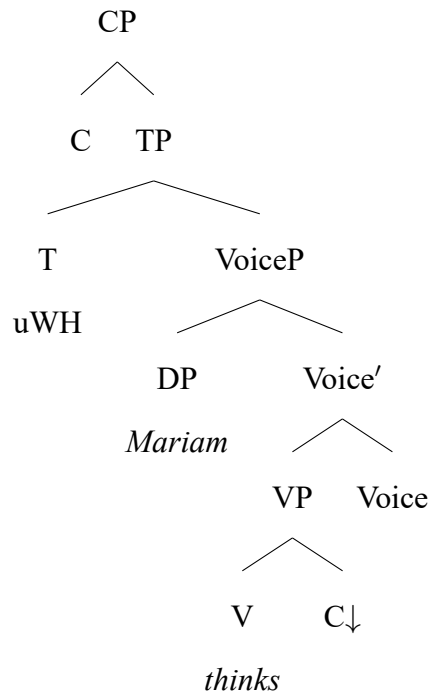
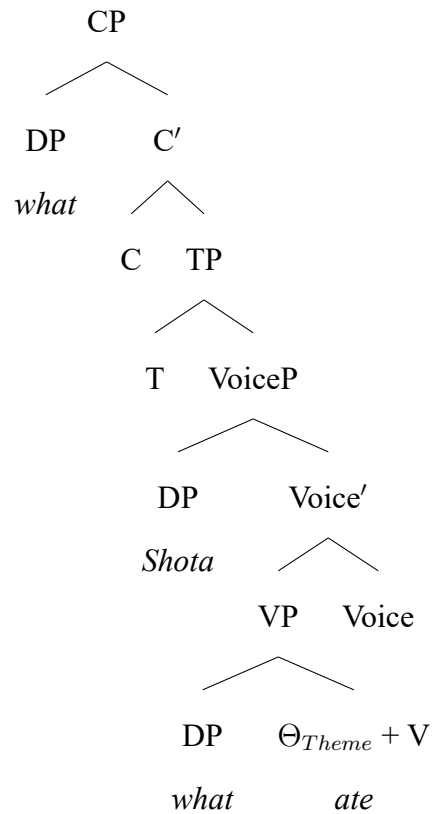
- (110) *V-Cycle: matrix clause*



- (111) *V-Cycle: embedded clause*

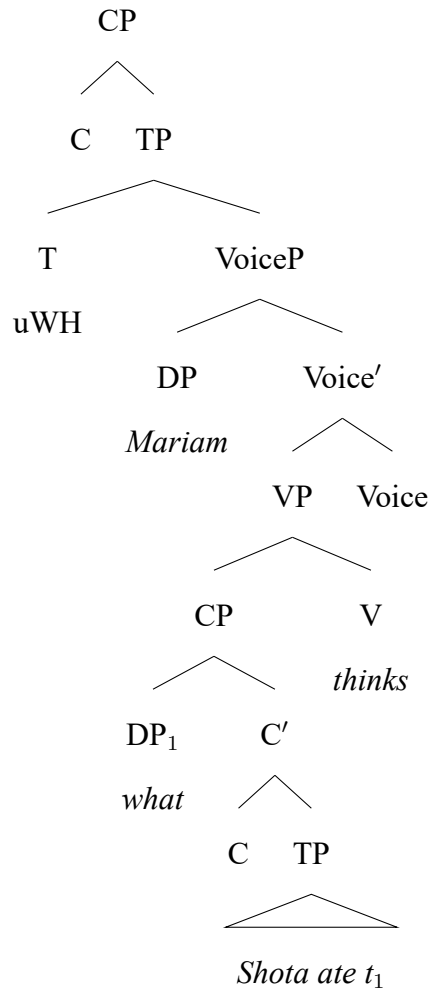


In the Voice-cycle, Voice projections are merged into both clauses, and external arguments (*Mariam* and *Shota*) are introduced. Next, T-heads are merged into the two clauses. The T merged into the matrix clause contains an uWH feature: this head wants to Agree and attract *wh*-phrases. However, at the T-cycle, (112)-(113), the search of this probe fails: *Parallel Derivation* does not allow Agree and Merge to be established across workspaces, and so the matrix T cannot find the *wh*-phrase located in the embedded clause.

(112) *T-Cycle: matrix clause*(113) *T-Cycle: embedded clause*(114) *C-Cycle: matrix clause*(115) *C-Cycle: embedded clause*

At the C-cycle, (114)-(115), C heads are merged into both clauses. The *wh*-DP moves to the left periphery of the embedded clause. Then the embedded CP undergoes substitution: it is incorporated into the matrix tree, taking place of the C↓ placeholder, (116).

(116) *C-Cycle: substitution*



Now the *wh*-phrase and the T with the uWH are in the same tree. But interaction between them is not possible: according to the *Strict Cycle Condition*, any operations of Agree and Merge that T is involved in must happen at the T cycle and cannot happen later in the derivation. Thus, at the C-cycle the connection between T and the *wh*-phrase cannot be

established. I propose that this is what leads to the ungrammaticality of sentences like (109). Note that if the landing site of the *wh*-movement in Georgian was higher, i.e. if *wh*-phrases moved to Spec,CP, cross-clausal movement would be predicted to be possible: after the embedded CP merges into the main tree, matrix C could probe and find *wh*-phrases in the embedded clause and move them to itself. Thus, the principles in (107)-(108) derive the connection between the height of the landing site and the locality of movement: the higher the position that movement targets, the bigger the structure that movement can vacate.

This proposal makes the following prediction. If Georgian has clauses that are not full CPs, then *wh*-movement out of them should be possible. I suggest that this prediction is borne out. Predicates like ‘want’ and ‘need’ cross-linguistically are known to combine with clauses that are smaller than full CPs: e.g. in (Wurmbrand & Lohninger 2023) they are considered verbs that take *Situation*-type complements (and not the full-size *Proposition*-type complements). Complements of these verbs often receive optative/irrealis marking, and describe situations which are future-oriented relative to the matrix eventuality. Interestingly, these are the verbs that allow cross-clausal *wh*-movement in Georgian:

- (117) šota-s ra₁ unda /sč’irdeba, [rom keti-m t₁ moigos]
 Shota-DAT **what.NOM** wants /needs COMP Ket_i-ERG win.OPT.3SG
 ‘What does Shota want/need Ket_i to win?’

Examples like (117) suggest that it is probably wrong to associate the presence of the complementizer *rom* with the C head. We can think of *rom* as a subordinator that can appear on top of clauses of different sizes, including CPs and TPs (cf. discussion of left periphery of embedded clauses in Bondarenko 2022). Then a plausible hypothesis about (117) is that the optative clause in this case is TP-sized. This size of the clause allows *wh*-movement to move from the embedded clause into the matrix one: the landing site of *wh*-movement will now not cross any projection higher than it in the functional sequence, avoiding the

violation of the Strict Cycle Condition.

7 Conclusions

In this paper I argued that while Georgian moves its *wh*-phrases within a clause, it truly lacks long-distance *wh*-movement. I proposed that this lack of long-distance *wh*-movement is due to the height of the landing site and the timing of structure-building: *wh*-phrases move to Spec,TP (Borise 2023), and thus extracting them out of CPs violates the Williams’s Cycle (Williams 2003, 2011, Poole 2023, Meadows 2023).

I investigated three constructions that carry meaning similar to that of a long-distance *wh*-question: *wh*-scope marking, prolepsis + *wh*-doubling, prolepsis + gap, and argued that none of these structures involve a direct dependency between the matrix *wh*-phrase and the embedded *wh*/gap. I proposed that matrix clauses in all three constructions have regular syntax and semantics of a *wh*-question: either a question about propositional content (*What does Mariam think?*) or about the topic of thoughts (*About who does Mariam think?*). I suggested that in all three constructions the embedded clause is a verbal modifier that restricts the propositional content of the matrix event. In *wh*-scope marking and prolepsis + *wh*-doubling, the embedded clause modifies the VP, and restricts the content of the matrix eventuality to some answer to the embedded question (“...so that her thoughts are an answer to the question “Who did this task upset?””). In the prolepsis + gap construction, I argued that there is a null operator movement inside of the embedded CP, and the clause modifies the $\Theta_{About} + V$ head, providing the content of the matrix event while identifying the proleptic argument of the matrix verb with the individual corresponding to the gap in the embedded clause (“...so that her thoughts are “This task upset *X*””, where *X* is the topic of her thoughts). Thus, CPs restricting the propositional content of the matrix event is what allows to build the meaning of a long-distance question indirectly in all three constructions.

If this proposal is on the right track, it raises many questions. Explaining the lack of long-distance *wh*-movement by appealing to the William's Cycle makes cross-linguistic predictions. We expect the height of the landing site of *wh*-movement in a language to correlate with whether or not the language allows cross-clausal *wh*-movement out of finite CPs. Is this prediction cross-linguistically borne out? Languages that have been argued to have *wh*-movement within a clause but not across a finite clausal boundary involve some dialects of German (Salzmann 2017) and Russian (Dyakonova 2009, Antonenko 2010, Bailyn 2020), Svan (Erschler 2015), Kinande (Schneider-Zioga 2009). Can the account in terms of the William's Cycle be extended to these languages? Do we find languages where *wh*-movement targets a low position but is nevertheless capable of escaping a full-sized CP?

Another question that arises is why not all languages have the indirect *wh*-dependencies that Georgian has: e.g., why can't English use *about*-PPs to build the meaning of a long-distance question (118)? Do English CPs have different syntax and semantics? Are *about*-PPs introduced differently into the structure compared to Georgian proleptic objects? Does English disallow inserting modifiers between the Θ -head and the argument that it introduces (and if so, why)? What are the general constraints that govern whether *wh*-scope marking, prolepsis + *wh*-doubling and prolepsis + gap would be available in a given language?

(118) *About who does Mariam think that this task upset ___/who?

One of the predictions that my proposal makes is that only CPs that can function as verbal modifiers should be able to be used for building indirect *wh*-dependencies: e.g., if a CP has been nominalized and became a true argument of the verb introduced by a Θ -head, none of the three constructions should be possible with it. Investigating this and other predictions that arise from my proposal about Georgian should help us understand the parameters of variation in how languages build indirect A-bar dependencies.

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Notes

¹Accusative and Dative cases are syncretic in Georgian, but I will distinguish them in glosses.

²Some speakers allow to drop the postposition in proleptic constructions, in which case the proleptic DP will appear to be marked with the ACC/DAT case. They report that it is a more colloquial variant of the “more correct” version with *ze*. I leave investigation of this alternative marking for the future.

³One might note that in (26)–(27) we suddenly see an interrogative complementizer *tu* instead of the default complementizer *rom*. The reason for this change is that the speakers I worked with found the complementizer *rom* in these sentences degraded (though some still found it acceptable), and wanted to see either no complementizer or *tu*. The factors influencing the choice of complementizer require further research—while it seems clear that declarative embedded clauses are incompatible with *tu*, interrogative clauses seem to vary in whether they have no complementizer, *tu* or *rom*—and what affects this variation is unclear to me at this point.

⁴Some speakers also allow the *wh*-proleptic object to be plural, (119). These kinds of examples are even harder to account for under the direct dependency approach: note that the proleptic object in this case mis-

matches in number features with both of the embedded *wh*-DPs.

- (119) **vin-eb-ze** pikrob, [**vin vis** šexvda]?
who-PL-on you.think **who whom** saw
 ‘Who do you think saw whom?’
 (lit. ‘About who all do you think that who saw whom?’)

⁵Embedded polar questions are incompatible with prolepsis, which is perhaps not surprising: if the matrix clause raises a question like *About who do you think?*, the content of thoughts needs to contain some reference to the individual described by the proleptic object, which will be impossible with a polar question.

⁶The sentence in (28) cannot be analyzed as a sequence of two questions, because the question particle *tu* cannot occur in matrix polar questions, (120). Furthermore, it is not possible to switch the order of the two clauses, (121). This supports the view that (28) involves clausal embedding.

- (120) (*tu) vin aris sauk’eteso k’andidat’i?
 (Q) who.NOM be.PRS.3SG best candidate
 ‘Who is the best candidate?’

- (121) *[č’am-a tu ara mariam-ma xink’ali], givi ra-s pikrobs?
 eat-AOR.3SG Q NEG Mariam-ERG khinkali.NOM Givi.NOM what-ACC think.PRS.3SG
 Intended: ‘What does Givi think (about) whether Mariam ate khinkali?’

⁷Note that in the prolepsis + *wh*-doubling construction the anaphor is present only in the matrix *wh*-phrase: as we have seen before, the two phrases in this construction do not have to be identical, which allows us to specifically test the properties of the proleptic phrase.

⁸Both CP and $\Theta_{About} + V$ in this case are $\langle e, \langle v, t \rangle \rangle$ -type functions and thus can compose intersectively; see section 5 for discussion.

⁹The fact that Georgian prolepsis is island-sensitive is surprising given that cross-linguistically prolepsis usually doesn’t exhibit locality constraints (Lohninger, Kovač & Wurmbrand 2022, Salzmann 2017). However Salzmann (2017: p. 314) notes that island-sensitive prolepsis should in principle be possible: “*One...in principle expects instances of prolepsis that occur with a gap and display island-sensitivity. However, such cases are not attested...Whether this points towards a fundamental property of the construction in need of explanation or just an accidental lexical gap is unclear because sufficient information about prolepsis is currently only available for rather few languages.*” I suggest that Georgian indeed fills this lexical gap, having a

construction where a null operator undergoing movement co-occurs with the proleptic DP in the matrix clause.

¹⁰It is also possible to have a pronoun in the construction involving prolepsis, (122). Properties of the structure with the pronoun need further research. Interestingly, the pronoun is not available if the proleptic object is a *wh*-phrase—a gap must be used, (123).

- (122) mariami **givi-ze** pikrobs, rom am sakmem **is** gaağiziana.
 Mariam.NOM **Givi-on** thinks COMP this task.ERG **3SG.NOM** upset
 ‘Mariam thinks about Givi₁, that this task upset him₁.’

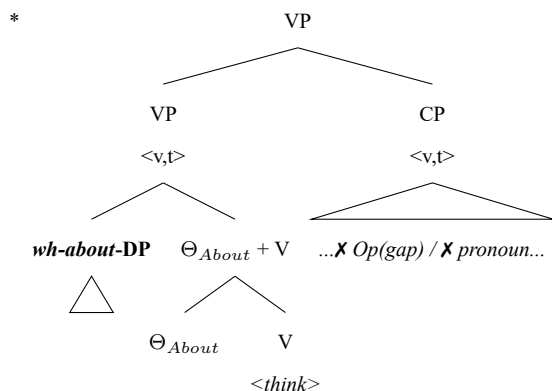
- (123) mariami **vis-ze_i** pikrobs, rom am sakmem _i/***is_i** gaağiziana?
 Mariam.NOM **who-on** thinks COMP this task.ERG /**3SG.NOM** upset
 ‘About who_i does Mariam think that this task upset them_i?’

If the structure with the pronoun does not involve null operator movement that creates an abstraction, then the clause with the pronoun in (123) would be of the wrong type to combine with the $\Theta_{About} + V$ head: $\langle v, t \rangle$ instead of the needed $\langle e, \langle v, t \rangle \rangle$. If we on the other hand tried to combine such a clause with the VP after the proleptic DP is introduced, there wouldn’t be a type mismatch (as the VP is of type $\langle v, t \rangle$), but we might expect ungrammaticality due to the Weak Crossover violation (WCO): WCO states that when a quantifier binds both a pronoun and a trace, the trace must c-command the pronoun, (124). Note that in a structure where CP combines with VP, (125), the trace of the proleptic object won’t c-command the pronoun in the embedded CP.

- (124) *Weak Crossover (descriptive generalization)*

In a configuration where a pronoun P and a trace T are both bound by a quantifier Q,
 T must c-command P. (Lasnik & Stowell 1991: p. 690)

- (125) *CP modifies VP with wh proleptic object*



¹¹Attributing the semantics in (82) to the complementizer is a simplification. It is likely that the displacement is introduced not by the complementizer *rom* in Georgian, but by a null head below it (see Bondarenko

2022 for discussion of the left periphery of CPs cross-linguistically). The exact head contributing the meaning in (82) will not be important for the present discussion.

¹²Nissenbaum does not use event semantics, so v' and AdvP for him are of type $\langle e, t \rangle$, but his analysis could be maintained if we introduce events as well: then both constituents would be of the type $\langle e, \langle v, t \rangle \rangle$.

¹³In (Meadows 2023: p. 144) it is called “Modified Strict Cycle Condition”.

¹⁴Existence of clause-medial phases is problematic for the William’s Cycle: it shouldn’t be possible to move from Spec,CP to Spec,VoiceP, since this violates the Strict Cycle Condition. Movement to Voice should be only possible in the Voice-cycle, but at this point the CP has not been built yet. See chapter 6 of (Meadows 2023) for discussion of how the William’s Cycle can be weakened to allow for the phasehood of VoiceP/vP.

¹⁵The literature on William’s Cycle assumes that embedded clauses are arguments to verbs, but according to my proposal in sections 4-5, Georgian CPs are verbal modifiers (at least in some cases). As far as I can see, it is not crucial for the William’s Cycle proposal that CPs would be interpreted as semantic arguments of verbs, so I think the two ideas will not be in conflict as long as we assume that placeholder categories do not have to be limited to argument positions. I.e., the CP in (110) can be combining with the verb as a modifier.