Conveying content questions without *wh*-words: evidence from Abaza

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The use of a special kind of clause (*wh-* interrogative clause) characterized by the presence of at least one element from a restricted closed class (*wh*-words) in order to convey the meaning of a content question (a set of propositions) may seem a good candidate for a universal feature across natural languages. Although rare, languages have been found that do not allow *wh-* interrogative clauses in embedded contexts and use a different embedded construction (relative clauses) to convey the same meaning (Hewitt 1979a, 1979b; Caponigro & Polinsky 2011; Lander 2012). On the other hand, no language has been reported without matrix *wh-* interrogative clauses in the theoretical or typological literature. In this paper, we show that the polysynthetic language Abaza (Northwest Caucasian) is such a language by building on the recent descriptive and typologically oriented discussion in Arkadiev (2020) and providing a compositional formal account for this uncommon syntax-semantics mapping. In particular, we argue that Abaza can convey content-question meaning by means of headless relative clauses at both the matrix and the embedded level. Our basic idea is that Abaza exploits and expands an option that is attested across languages: conveying question meaning by means of certain kinds of DPs, which are usually called 'Concealed Questions' (CQs). The bracketed DP in (1)a occurs in the complement position of a predicate that usually selects an interrogative clause as its complement and is interpreted as the bracketed *wh-* interrogative clause in (1)b.

(1)   a.   Sam asked me [CQ the outcome of the election].[1]
      b.   Sam asked me [*wh*-INTERROGATIVE what the outcome of the election was].[2]

We'll argue that Abaza generalizes this strategy to all cases in which question meaning is conveyed, both in matrix and embedded contexts. The bracketed embedded *wh-* interrogative clause (CP) in (2)a shows a typical way to convey an indirect content question in English.[3]

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[1]Frana, forthcoming: (1d)
[2]Frana, forthcoming: (2d)
[3] Throughout the paper, we use the labels 'matrix clauses' and 'embedded clauses' to refer to clauses (syntactic objects) occurring on their own and within other clauses, respectively. We use the label 'question' to refer to the

Abaza conveys the same meaning with a headless relative clause, which we roughly rendered with the bracketed complex DP in (2)b. Similarly, the direct content question in (3) is conveyed by a matrix *wh-* interrogative clause in English (3)a and by a headless relative clause resembling a complex DP in Abaza, as roughly rendered in English in (3)b.

(2) a. Sam asked me [CP who was at the party].   *English*
     b. Sam asked me [DP those that were at the party]. *Rough English rendering of Abaza*

(3) a. What did you eat?   *English*
     b. {That which}/{the things} you ate?   *Rough English rendering of Abaza*

We suggest that the reason why this aspect of Abaza syntax-semantics mapping is so rare across languages is because it requires a series of morphosyntactic features that are all attested in Abaza but rarely occur all together in a single language.

The remainder of the paper is structured as follows. Section 1 introduces the general features of Abaza that will be relevant for our discussion: verbal morphology (§ 1.1) and relative clauses (§ 1.2). Section 2 discusses the construction that Abaza uses to convey question meaning. Section 3 provides a formal account of the syntax-semantics mapping between this construction and its meaning. Section 4 concludes.

1. Background on relevant features of Abaza

Abaza (ISO 639-3 abq) belongs to the Abkhaz-Abaza branch of the Northwest Caucasian language family and is spoken by an estimated fifty-thousand people in the Russian republic Karachay-Cherkessia as well as in Turkey. The data for the current paper has been obtained by Peter Arkadiev during fieldwork on the Tapanta dialect of Abaza spoken in the village Inzhich-Chukun in the Abazinsky district of Karachay-Cherkessia in 2017-2019 as well as through online elicitation sessions in 2019-2020.[4]

Published descriptions of Abaza include the grammars by Genko (1955) and Tabulova (1976) (in Russian), a short sketch by Lomtatidze et al. (1989) and a generative account of certain aspects of morphosyntax by O'Herin (2002) (in English). It is worth mentioning that most of what we say below on Abaza applies, *mutatis mutandis*, to its closest relative Abkhaz (see e.g. Hewitt 1979c).

In the remainder of this section we introduce two core features of Abaza that will play a crucial role in our investigation of how content questions are conveyed in the language: the complex

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semantic object that is associated with an interrogative clause (or a concealed question DP) in a language like English. We use the label 'content question' for the question that is typically conveyed by a *wh-* interrogative clause in a language like English (although concealed question DPs can convey content questions as well). Finally, we use the labels 'direct question' to refer to a question that is conveyed on its own (by an independent syntactic object) and the label 'indirect question' to refer to a question that is part of a larger meaning (and is conveyed by a syntactic object embedded in a larger one).

verbal morphology in Abaza, which we sketch in §1.1, and the way the language forms headed and headless relative clauses, which we sketch in §1.2.

1.1. Verbal morphology in Abaza

Similar to the other Northwest Caucasian languages (see Arkadiev & Lander 2020 for a general overview), Abaza is characterized by polysynthesis, consistent head-marking, and morphological ergativity. The polysynthetic nature of Abaza is manifested primarily in its complex verbal morphology, which includes affixal expression of person, number and gender of up to four participants, valency increase (the causative and a large number of applicatives often with fairly specific semantics, see O'Herin 2001), spatial, evaluative, aspectual, modal and temporal meanings, as well as negation and an elaborate system of marking of the independent vs. dependent status of predication. Examples (4) and (5), taken from a short corpus of oral narratives collected in Inzhich-Chukun, show particularly complex verbal forms, while Table 1 presents the general verbal template of Abaza.

(4) *s-z-a-la-nəq́ʷa-wa–ӡə-j-š'a-ṭ*
     1SG.ABS-POT-3SG.N.IO-LOC-pass-IPF–LOC-3SG.M.IO-seem(AOR)-DCL
     'It seemed to him that I would be able to pass there.'

(5) *j-ŝə-z-j-a-s-hʷ-ṗ*
     3SG.N.ABS-2PL.IO-BEN-3SG.M.IO-DAT-1SG.ERG-say-NPST.DCL
     'I'll tell this to him for your sake.'

Table 1. Abaza verbal template

−12	−11	−10	−9	−8	−7	−6	−5	−4	−3	−2	−1	**0**	+1	+2	+3	+4	+5	+6	+7
absolutive	subordinators, negation	repetitive	potential	applicatives	directional preverbs	locative preverbs	indirect object	ergative	negation	causative	sociative	**ROOT**	directional suffixes	event operators	plural	aspect	negation	tense, mood	subordinators, force

Abaza does not have morphological case marking on argument nominals, and full noun phrases and especially pronouns are optional if retrievable from context ("pro-drop"). The primary means of argument expression in Abaza is the cross-referencing prefixes on verbs, which come in two series, the absolutive and the oblique, shown in Table 2. Examples are provided in (6).

Table 2. Person cross-referencing prefixes

	ABSOLUTIVE	OBLIQUE
1SG	*s(ə)-*	*s(ə)-/z-*
2SG.M	*w(ə)-*	*w(ə)-*
2SG.F	*b(ə)-*	*b(ə)-/p-*
3SG.	*d(ə)-*	*j(ə)-*
3SG.F		*l(ə)-*
3SG.N	*j(ə)-*	*a-/na-*
1PL	*h(ə)-*	*h(ə)-/ʕ-*
2PL	*ŝ(ə)-*	*ŝ(ə)-/ẑ-*
3PL	*j(ə)-*	*r(ə)-/d(ə)-*
REL	*j(ə)-*	*z(ə)-*

(6)   a.   ***wə**-nχ-əj-ṭ*   [txt]
           2SG.M.ABS-work-PRS-DCL
           'You (man) are working.'

      b.   *haram-ta*   ***wə**-**s**-č'pa-ṗ*   [txt]
           banned-ADV   2SG.M.ABS-1SG.ERG-do-NPST.DCL
           'I'll ban you (man).'

      c.   *j-ʕa-**wə**-**r**-t-ṭ*   [txt]
           3SG.N.ABS-CSL-2SG.M.IO-3PL.ERG-give(AOR)-DCL
           'They gave it to you (man).'

      d.   *s-na-**wə**-ça-pš-əj-ṭ*   [txt]
           1SG.ABS-TRL-2SG.M.IO-LOC.upon-look-PRS-DCL
           'I look upon you (man).'

      e.   ***wə**-naṗə*   [txt]
           2SG.M.IO-hand
           'your hand'

The prefixes of the absolutive series occur in slot –12 and index the subject of intransitive verbs, as shown in (6)a, and the direct object (patient) of transitive verbs, as shown in (6)b. The prefixes of the oblique series, instead, mark the subject (agent) of transitive verbs in slot –4 (ergative), as shown in (6)b–c, the indirect object in slot –5, as shown in (6)c, applied objects in slots –6 and –8, as shown in (6)d, and adnominal possessors, as shown in (6)e.

Abaza applicatives introduce indirect objects cross-referenced by prefixes immediately preceding the relevant applicative prefix; their presence does not in any way affect the expression of other verbal arguments. The cross-referencing prefixes are obligatory and overt with the following exception: the absolutive 3rd person singular non-human and 3rd person plural

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prefixes, both looking as *jə-*, are normally omitted if the corresponding full noun phrase immediately precedes the verb, compare (6)c above and (7)d below.

Abaza has a complex system of morphological marking of clause type on the predicate. One part of this system is the relativization marking discussed in the next subsection. Here we focus on clause-typing suffixes, which usually close the verbal word occurring in slot +7. One of these is the declarative suffix *-ṭ* shown in most of the examples given so far and occurring in most of the finite tense-aspect forms. A similar suffix with a more restricted distribution is the non-past declarative *-ṗ* in (5) and (6)b, which occurs in one of the future forms of dynamic verbs and in the present tense of stative verbs. Both these suffixes unequivocally mark the clause as indicative and independent/matrix. In the same word-final position occur such suffixes as the polar interrogative *-ma* in (7)a, the optative *-nda* in (7)b, also marking the clause as independent, and many of the subordination markers, such as the conditional *-rəkʷən* in (7)c and numerous converbs, e.g., the converb of simultaneity *-mca* in (7)d, both of which, in addition to expressing their own particular meanings, mark the clause as dependent. The absence of any clause-typing suffix in the verb-final slot signals that the clause is either dependent/embedded or non-declarative (e.g., imperative).

(7)   a.   *wə-ʕa-**ma***   [txt]
                2SG.M.ABS-hear(AOR)-**Q**
                'Have you heard?'

       b.   *s-na-šəl-χə-**nda***   [txt]
                1SG.ABS-TRL-go.in-RE-**OPT**
                'I wish I could enter (this place) again.'

       c.   *w-a-pš-**rəkʷən***   [txt]
                2SG.M.ABS-3SG.N.IO-look-**COND**
                'if you look at it'

       d.   *awat   s-č'pa-wa-**mca***   [txt]
                DIST.PL   1SG.ERG-do-IPF-**CVB**
                'while making them'

One should also note that certain tense-aspect suffixes have different allomorphs for finite and non-finite forms (the latter are also used in all negative forms), e.g., the past tense suffix looks as *-n* in finite forms, as shown by the matrix clause in (8)a, and as *-z* in non-finite forms, as shown by the headless relative clause in (8)b.

(8)   a.   *d-ʕa-l-q-aštələ-**n***   [txt]
                3SG.H.ABS-CSL-3SG.F.IO-LOC-forget-**PST.DCL**
                'She forgot about him.'
       b.   *jə-z-də́r-kʷ-əw-**z***   [txt]
                3SG.ABS-REL.ERG-know-PL-IPF-**PST.NFIN**
                'those who knew it'

1.2. Headed and headless relative clauses in Abaza

Abaza relative clauses are formed on the basis of relative verbal forms containing markers of relativization which belong to the pronominal prefix system and occupy the same slots in the verbal template as the genuine cross-referencing prefixes, as shown in the last row in Table 2 above. This system is shared by Abaza with the other Northwest Caucasian languages.[5] The Abaza relative prefixes *jə-* (absolutive) and *zə-* (oblique, i.e. ergative and indirect object) can be analyzed as markers of "wh-agreement" or, alternatively, a specific type of resumptive elements.[6] The verbal forms in relative clauses normally do not feature any clause-typing suffixes apart from specific constructions not discussed here, and the non-finite past tense suffix *-z*.

Examples of headed relative clauses are shown in (9). The nominal head follows the relative clause and is cross-indexed in the verb of the relative clause by the relative prefix, absolutive in (9)b corresponding to the direct object, indirect object in (9)c and ergative in (9)d.[7]

(9)   a.   *a-phʷəspa   ĉa   j-lə-s-t-ṭ*
              DEF-girl   apple   3SG.N.ABS-3SG.F.IO-1SG.ERG-give(AOR)-DCL
              'I gave an apple to the girl.'

        b.   [*a-phʷəspa   jᵢ-lə-s-tə-z*]   *a-ĉaᵢ*
              DEF-girl   **REL.ABS**-3SG.F.IO-1SG.ERG-give-PST.NFIN   DEF-apple
              'the apple I gave to the girl'

        c.   [*ĉa   zᵢ-s-tə-z*]   *a-phʷəspaᵢ*
              apple   **REL.IO**-1SG.ERG-give-PST.NFIN   DEF-girl
              'the girl whom I gave an apple'

        d.   [*a-phʷəspa   ĉa   lə-zᵢ-tə-z*]   *a-č'ḳʷənᵢ*
              DEF-girl   apple   3SG.F.IO-**REL.ERG**-give-PST.NFIN   DEF-boy
              'the boy who gave an apple to the girl'

Headless relative clauses are productive as well and used extensively. They make use of the very same morpho-syntactic strategy as headed relative clauses and occur as referential/generic DPs, as shown in (10)a with the relativization of the absolutive argument (10)b with the relativization of the ergative argument, and (10)c with the relativization of the indirect object.

(10)   a.   [*awaʔa   j-ʕa-ta-χa-kʷa-z*]   *abaza-kʷa   r-aḳʷa-ṗ*   [txt]
              there   **REL.ABS**-CSL-LOC-remain-PL-PST.NFIN   Abaza-PL   3PL.IO-COP-NPST.DCL
              'Those who remained there are the Abaza.'

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[5] See Hewitt (1979a) and Kibrik (1992) on Abkhaz, and Caponigro & Polinsky (2011) and Lander (2012) on West Circassian, among others.

[6] See the preliminary analysis in O'Herin (2002: Ch. 8) for the former approach and Lander & Daniel (2019) for the latter approach

[7] The head may precede the verb and other material in the relative clause. It can be shown that in this case the head is located inside the relative clause and the whole construction is an internally headed relative clause, which won't be discussed here.

b. g'-s-akʷə-m   [kʷərməš   z-zə-r-č'pa-wa]   [txt]
NEG-1SG.IO-COP-NEG   bow   REL.IO-BEN-3PL.ERG-do-IPF
'I am not the one who they bow to.'

c. [s-**zə**-r-pχ'a-z]   j-tagʷẑa   [txt]
1SG.ABS-**REL.ERG**-CAUS-spend.night-PST.NFIN   3SG.M.IO-wife
'the wife of the one who let me spend night at his place'

Abaza makes use of specialized markers for the relativization of adjuncts such as place, time and manner. They occur in slot –11 of the verbal template and are used to form both headed and headless relative clauses, as shown in (11)a–d.

(11) a. [a-karbəʒ'-kʷa   **ʔa**-də-r-baχ-wa-z]   a-baq̇   [txt]
DEF-brick-PL   **REL.LOC**-3PL.ERG-CAUS-dry-IPF-PST.NFIN   DEF-shed
'the shed where bricks are made'

b. [l-an   d-**an**-ʕa-j-χ]   asqan   [txt]
3SG.F.IO-mother   3SG.H.ABS-**REL.TMP**-CSL-go-RE   DEF.time
'at the time when her mother came back'

c. [apχ'arta   s-**an**-ʕa-lga]   a-institut   s-ca-ṭ   [txt]
DEF.school   1SG.ABS-**REL.TMP**-CSL-finish   DEF-college   1SG.ABS-go(AOR)-DCL
'I went to college when I had finished school.'

d. [d-**š**-š'ṭa-z]   a-pš-ta   d-š'ṭal-χə-n[8]   [txt]
3SG.H.ABS-**REL.MNR**-lie-PST.NFIN 3SG.N.IO-be.like-ADV 3SG.H.ABS-lie.down-RE-PST.FIN
'He lay down like he lay before.'

To sum up, we have shown that Abaza uses its rich verbal morphology to form headed and headless relative clauses by marking which argument or adjunct is relativized by means of a set of specialized prefixes.

2. The construction conveying question meaning in Abaza

In this section, we describe the construction that conveys the meaning of a content question in Abaza and argue that it is a headless relative clause (§2.1) and lacks any *wh*-word (§2.2).

2.1 Question meaning via headless relative clauses

Let's start with an example to set the stage. As we saw in §1.2, the same embedded clause in Abaza can be used as a headed or a headless relative clause. For instance, the bracketed string in (12)a syntactically and semantically behaves like a modifier of the underlined external nominal head 'milk', like the headed relative clause 'that Zarina buys' in English. The very same string can occur on its own without a nominal head with the distribution and the interpretation of a definite DP like 'the food Zarina buys' in English or a maximal free relative clause like 'what

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[8] From Xagba (2015: 69).

Zarina buys' in English, as shown in (12)b. Crucially, the very same string can occur as the object of a predicate that selects for a question-denoting complement like 'ask' and be interpreted as the indirect content question 'what Zarina buys' in English, as shown by the bracketed string in (12)c, and finally it can occur on its own and convey the meaning of a direct content question like 'What does Zarina buy?' in English, as shown in (12)d.

(12) a. [*zarina   jə-l-χʷʕa-wa*]   *a-χš   sə-ẑ-əj-ṭ*
          Zarina   **REL.ABS**-3SG.F.ERG-buy-IPF DEF-milk 1SG.ERG-drink-PRS-DCL
          'I drink the milk that Zarina buys.'

      b. [*zarina**jə**-l-χʷʕa-wa*]   *s-f-əj-ṭ*
          Zarina   **REL.ABS**-3SG.F.ERG-buy-IPF 1SG.ERG-eat-PRS-DCL
          'I eat {what}/{the stuff} Zarina buys.'

      c. *s-a-z-çʕa-ṭ*   [*zarina   jə-l-χʷʕa-wa*]
          1SG.ABS-3SG.N.IO-BEN-ask(AOR)-DCL   Zarina   **REL.ABS**-3SG.F.ERG-buy-IPF
          'I asked what Zarina buys.'

      d. *zarina   jə-l-χʷʕa-wa-**ja***
          Zarina   **REL.ABS**-3SG.F.ERG-buy-IPF-**Q.N**
          'What does Zarina buy?'

The only difference between the matrix clause in (12)d and the embedded clauses in (12)a–c has to do with the obligatory presence of a verb-final suffix (Q) in (12)d: the boldfaced suffix *-ja* indicates that the question is about non-humans (N). The general way of conveying direct questions about arguments is by enriching a headless relative clause with one of the two interrogative suffixes: the abovementioned *-ja* for non-humans or *-da* for humans (H). The relative prefix indicates the syntactic role of the argument that is questioned. Neither suffix is allowed when the headless relative clause is embedded, and an indirect question is conveyed: (12)c with *-ja* (or *-da*) would be completely unacceptable (unless interpreted as a direct quotation).

In what follows, we provide examples of how Abaza conveys different kinds of direct content questions that in English are conveyed by *wh-* interrogative clauses introduced by different *wh-*words.[9] The examples in (13) and (14) illustrate questions about absolutive arguments of intransitive and transitive verbs, respectively.

(13) a. *wəẑə   jə-ĉ-wa-**da**?*
          now   **REL.ABS**-sleep-IPF-**Q.H**
          'Who is sleeping now?'

      b. *j-ḳa-ŝa-**ja**?*
          REL.ABS-LOC.down-fall(AOR)-**Q.N**
          'What fell?'

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[9] For more details and more types of question-conveying headless relative clauses, see Arkadiev (2020).

(14) a. ***j-b-ba-wa-da****?*
      REL.ABS-2SG.F.ERG-see-IPF-**Q.H**
      'Whom do you see?'

   b. ***j-ʕa-w-gə-z-ja****?*
      REL.ABS-CSL-2SG.ERG-carry-PST.NFIN-**Q.N**
      'What did you bring?'

The examples in (15) illustrate questions about the ergative agent of transitive verbs.

(15) a. *ž'ə*   *zə-m-f-əw-š-**da**?*
      meat   **REL.ERG**-NEG-eat-IPF-FUT-**Q.H**
      'Who won't eat meat?'

   b. *wə-zə-r-ŝa-**ja**?*
      2SG.M.ABS-**REL.ERG**-CAUS-be.afraid(AOR)-**Q.N**
      'What frightened you?'

The examples in (16) and (17) illustrate questions about indirect and applied objects, respectively.

(16) a. *b-zə-m-pχ'a-**ja**?*
      2SG.F.ABS-**REL.IO**-NEG-read(AOR)-**Q.N**
      'What haven't you read?'

   b. *a-hʷrapšʒa-kʷa*   *zə-w-t-wa-š-**da***
      DEF-flower-PL   **REL.IO**-2SG.F.ERG-give-IPF-FUT-**Q.H**
      'Whom will you give the flowers?'

(17) a. *jə-z-zə-b-χʷʕa-**da**?*
      3SG.N.ABS-**REL.IO**-BEN-2SG.F.ERG-buy(AOR)-**Q.H**
      'Whom did you buy it for?'

   b. *ʒca*   *z-la-r-fa-wa-**ja**?*
      soup   **REL.IO**-INS-3PL.ERG-eat-IPF-**Q.N**
      'What do people (lit. they) eat soup with?'

The same strategy is used to convey direct content questions about goals or purposes, for which English could use a *wh-* interrogative clause introduced by *why*: the oblique relative prefix occurs in slot –11 of the verbal template (see Table 1) and the verb has the non-human interrogative suffix *-ja*, as shown in (18).

(18) *qaça*   *də-z-lə-ma-χ-**ja**?*   [txt]
      man   3SG.H.ABS-**REL.RSN**-3SG.F.IO-have-RE(PRS)-**Q.N**
      'Why does she need a man then?'

A different strategy is used to convey direct content questions about place, time, or manner—those questions that in English are conveyed by *wh-* interrogative clauses introduced by *where*, *when*, and *how*. This strategy is shown in (19) and closely resembles the one we saw in § 1.2 for the relativization of locative, temporal, and manner adjuncts: one of three different dedicated relative prefixes has to occur in slot –11 of the verbal template. The only difference is that the relative prefix has to be immediately followed by the adverbial interrogative prefix *-ba-* (or *-pa-*, depending on phonological conditions) in order to convey a question. Notice that no clause-typing suffix can occur in these clauses, which raises the issue whether the adverbial interrogative prefix *-ba-* belongs to the same class as the argument interrogative suffixes *-da* and *-ja*, despite their occurring in distinct slots.

(19) a.   *h-**an**-**ba**-ta-də-r-č'a-χ-wa-š?*
            1PL.ABS-**REL.TMP-Q.ADV**-REP-3PL.ERG-CAUS-eat.ITR-RE-IPF-FUT
            'When will they feed us again?'

      b.   *a-k'tap   (ʔ)a-**ba**-š'ța-b-ça?*
            DEF-book   **REL.LOC-Q.ADV**-LOC.down-2SG.F.ERG-put(AOR)
            'Where did you put the book?'

      c.   *a-kʷțəw   **š-pa**-b-ẑ-wa?*
            DEF-chicken   **REL.MNR-Q.ADV**-2SG.F.ERG-cook-IPF
            'How do you cook chicken?'

As has already been pointed out above and exemplified in (12), indirect content questions are conveyed by means of the very same morphosyntactic structure as direct content questions, i.e., headless relative clauses. The only difference is the ban on any clause-typing affixes, including the interrogative affixes *-ja*, *-da*, or *-ba-*. The examples in (20)a–e show bracketed headless relative clauses conveying indirect questions about arguments, while the bracketed headless relative clauses in the examples in (21)a–c convey the indirect question counterparts to the direct questions about adjuncts in (19)a–c. In (20)a, we show that the interrogative argument suffix *-ja* is unacceptable; the same holds for all the other examples regardless of the chosen suffix.

(20) a.   [***j**-ķa-ŝa-z(*-**ja**)*]   *də-w-ba-ma?*
            REL.ABS-LOC.down-fall-PST.NFIN(*-**Q.N**)   3SG.H.ABS-2SG.M.ERG-see(AOR)-Q
            'Did you see what fell?'

      b.   *d-ʕa-s-a-hʷ*   [***j**-b-ba-wa*]
            3SG.H.ABS-CSL-1SG.IO-DAT-say(IMP)   **REL.ABS**-2SG.F.ERG-see-IPF
            'Tell me whom you see!'

      c.   *j-hʷa*   [*wə-**zə**-r-ŝa-z*]
            3SG.N.ABS-say(IMP)   2SG.M.ABS-**REL.ERG**-CAUS-be.afraid-PST.NFIN
            'Say what frightened you!'

     d.   *wəẑəg'əj   də-g'-sə-z-dəra-m*
                 yet   3SG.H.ABS-NEG-1SG.IO-POT-know-NEG
             [*a-hʷrapšʒa-kʷa   z-s-t-wa-š*]
             DEF-flower-PL   **REL.IO**-1SG.ERG-give-IPF-FUT
             'I don't know yet whom I shall give the flowers.'

     e.   *d-hʷa*   [*jə-z-zə-b-χʷʕa-z*]
             3SG.H.ABS-say(IMP)   3SG.N.ABS-**REL.IO**-BEN-2SG.F.ERG-buy-PST.NFIN
             'Say whom you bought it for!'

(21) a.   *j'ə-w-dər-əw-ma*   [*h-**an**-ata-də-r-č'a-χ-wa-š*]?
             3SG.N.ABS-2SG.M.ERG-know-IPF-Q   1PL.ABS-**REL.TMP**-REP-3PL.ERG-CAUS-eat.ITR-RE-IPF-FUT
             'Do you know when they will feed us again?'

     b.   *jə-b-dərχ-əw-ma*   [*a-k'tap **ʔa**-š'ṭa-b-ça-z*]?
             3SG.N.ABS-2SG.F.ERG-remember-IPF-Q   DEF-book **REL.LOC**-LOC.down-2SG.F.ERG-put-PST.NFIN
             'Do you remember where you put the book?'

     c.   *j-hʷa*   [*a-kʷṭəw   š-bə-ẑ-wa*]
             3SG.N.ABS-say(IMP)   DEF-chicken   **REL.MNR**-2SG.F.ERG-cook-IPF
             'Say how you cook chicken.'

To sum up, we have argued that Abaza conveys direct and indirect content questions without making use of *wh*-words nor *wh*- clauses, but by means of headless relative clauses without *wh*-words.

2.2. No wh-words in Abaza

One may wonder whether what we labelled interrogative markers (-*da*, -*ja* -*ba*-/-*pa*-) could be analyzed as *wh*-words, instead. In this section, we present a series of arguments that go against this hypothesis and, therefore, bring further support to our conclusions in the previous section that question meaning is conveyed by headless relative clauses without *wh*-words in Abaza.
(i) No interrogative marker can occur in embedded clauses. Therefore, if interrogative markers were assumed to be *wh*-words, a dual analysis would be needed, according to which headless clauses would still be conveying question meaning, although in embedded contexts only.[10]
(ii) The interrogative markers -*da* and -*ja* are undoubtedly verbal suffixes belonging to the same formal paradigm (i.e., slot +7 in verbal template in Table 1) as the other clause-typing suffixes shown in (7) above (e.g., the polar interrogative suffix -*ma*).
(iii) While the argument interrogative markers -*ja* and -*da* can be at least analogized to 'what' and 'who' because of the shared distinction between humans and non-humans that is commonly attested in *wh*-word inventories across languages (Idiatov 2007), such an analogy would be more problematic with the adverbial interrogative marker -*ba*-: languages with an indeterminate interrogative word ambiguous between 'when', 'where' and 'how' are very rare.[11]

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[10] This is the situation in Adyghe according to Caponigro & Polinsky (2011). On the other hand, Adyghe provides clear evidence of a full set of *wh*-words as separate lexical items rather than affixes in matrix clauses.
[11] See e.g. Cysouw (2007) on Pichis Ashéninca and Wojtylak (2017: 166–173) on Murui.

(iv) Even if the argument interrogative suffixes -*da* and -*ja* can probably historically be traced to encliticezed independent *wh*-words,[12] nothing of this kind can be said about the adverbial interrogative -*ba*-, which occurs in the middle of the prefixal string. Considering it an obligatorily incorporated semantically indeterminate interrogative word whose interpretation is determined by the immediately preceding relative marker would be merely restating the facts in a more convoluted jargon, rather than providing an explanation.

(v) The closest Abaza comes to independent *wh*-words is a number of expressions usually translated with 'what' or 'who' and occurring as predicates in pseudocleft structures, as shown in (22) (we glossed them with WHO and WHAT in small capitals to highlight that we are not assuming they are the actual equivalents of *who* and *what* in English).

(22) a. [*wəẑə jə-ĉ-wa*]   ***dəzda?***
          now   REL.ABS-sleep-IPF   WHO
          'Who is sleeping now?'

      b. [*j-ḳa-ŝa-z*]   ***aĉəja?***
          REL.ABS-LOC.down-fall-PST.NFIN   WHAT
          'What fell?'

On closer inspection, however, these and similar forms turn out to belong to the same class of expressions as the genuine interrogative verbal forms. Thus, *aĉəja* in (22b) is nothing but a reduced variant of the non-human interrogative form built on the basis of the root 'belong' and also employed as a sui generis interrogative word, as shown by the full form in bold in (23).

(23) ***d-z-aĉə-ja***   [*awat   rə-wa   bzəj   jə-b-ba-wa*]*?*
      3SG.H.ABS-REL.IO-belong-Q.N   those   3PL.IO-from good   REL.ABS-2SG.F.ERG-see-IPF
      'Who of them do you love?' (Lit., 'The thing (identity) the one of them who you love belong to?')

Likewise, *dəzda* 'WHO' in (22)a can be synchronically analyzed as consisting of the human absolutive prefix, the relative indirect object prefix, and the human interrogative suffix, and is a phonologically reduced variant of *d-a-z-əw-da* 'whose part is s/he? ' (Lit. 'the one s/he is part of?') (Pazov 2016). That these alleged interrogative words are still verbal forms, albeit semantically impoverished and formally reduced, is confirmed by the following facts. First, all such expressions never behave like plain verbal arguments but can only be used as predicates in a pseudocleft structure like (22) and (23). In other words, they always serve as main predicates of matrix interrogative clauses bearing the regular interrogative suffixes -*ja* and -*da*, just like the ordinary interrogative verbal forms discussed above. Second, such interrogative words can take tense suffixes like normal verbs, as shown in (24) with the alleged 'WHAT' carrying the non-finite past tense suffix -*z*. For these reasons, we prefer to gloss them as just predicates (PRED).

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[12] See Arkadiev (2020) for a discussion of such a diachronic analysis together with its problems.

(24) [*jə-h-č'p-wə-šə-z*]   *aĉə-z-ja*   *š'ta?*   [txt]
      REL.ABS-1PL.ERG-do-IPF-FUT-PST.NFIN   **PRED**-PST.NFIN-Q.N   PTCL
      'What would we have done?' (Lit., 'What was it that we would have done?')

Needless to say, these independent interrogative expressions are categorically excluded from embedded positions, even if the matrix interrogative suffix is removed, as shown in (25).

(25) *j-g'ə-w-dəra-m*   [*jə-w-ma-m*   (**aĉə(-ja)*)]
      3SG.N.ABS-NEG-2SG.M.ERG-know-NEG   REL.ABS-2SG.M.IO-have-NEG   PRED(-Q.N)
      'You don't know what you lack.' (Lit. 'You don't know what you don't have.')

Finally, Abaza completely lacks any independent word that can be taken as counterparts to or just translated as 'where', 'when' or 'how'.

The last possible alternative approach we consider is the one that flips our approach and assume that the constructions that we have been labelling headless relative clauses are actually interrogative clauses in Abaza and what we have assumed to be their relative marker prefixes are actually *wh*-marker prefixes. We raise three main points regarding this possible approach. First, it agrees with our conclusion that Abaza lacks true *wh*-words, since the *wh*-markers are assumed to be prefixes under this approach as well.

Second, comparative evidence from other Northwest Caucasian languages clearly shows that the cognates of the Abaza prefixes *jə-* and *zə-* have relativization as their original function, their use in purely interrogative constructions being clearly secondary and related to the tendency observed in these languages to use pseudo-cleft constructions for expressing focus and content questions (Sumbatova 2009; Arkadiev 2020). Moreover, if the prefixes that are commonly assumed to be relative markers in Abaza are in fact *wh*-markers, then the dedicated interrogative elements *-ja*, *-da* and *-ba-* still remain unaccounted for.

Third, Abaza lacks any construction conveying the same meaning as multiple *wh*- interrogative clauses of the type *Who married whom?* or *Who came when?* in English. This naturally follows from our proposal according to which the only possible question-denoting clausal construction in Abaza is headless relative clauses. In fact, no more than one position at a time can be relativized in relative clauses across languages. The same restriction is clearly stated for the related language Abkhaz by Hewitt (1979c: 21). On the other hand, an approach according to which this construction is primarily an interrogative clause would need some further stipulation to account for the ban on multiple *wh*-affixes[13].

In conclusion, it is not so crucial for our analysis whether the construction we are investigating started with one use and then was extended to other uses historically. What really matters for us is that it's just one and the same construction in Abaza nowadays, it can convey three different meanings that in other languages are associated with three distinct constructions (i.e., interrogative clauses, headless relative clauses, and headed relative clauses), and contains no *wh*-words because the language has none.

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[13] In fact, as shown in Arkadiev (2020: 240–241), Abaza allows and even requires multiple relative prefixes in relative clauses and questions, but only when all such prefixes are bound by the same operator (e.g. *the person*i [*who*i *is afraid of his*i *own shadow*]). We do not discuss such cases here.

2.3. Summary

We have examined the constructions that Abaza makes use of to convey content questions and have concluded that they are headless relative clauses without *wh*-words. Interrogative markers are added as suffixes or prefixes to the relative clause or to a small class of matrix predicates in order to convey direct content questions, while no extra marking nor extra predicate is used to convey indirect content questions. We have argued that neither those interrogative markers nor matrix predicates can be analyzed as *wh*-words.

3. A compositional analysis

In the previous section, we have shown that Abaza conveys direct and indirect-question meaning by means of headless relative clauses. In this section, we show how this uncommon syntax-semantics mapping can be accounted for compositionally. We start with headless relative clauses conveying indirect-question meaning. (26) repeats the example in (20)c. We will argue that the bracketed headless relative clause in (26) ends up conveying the same kind of question meaning, i.e., the same kind of semantic object, as the one that has been proposed for the bracketed concealed question DP in (27)—an individual concept, i.e., a function from possible worlds to individuals.[14]
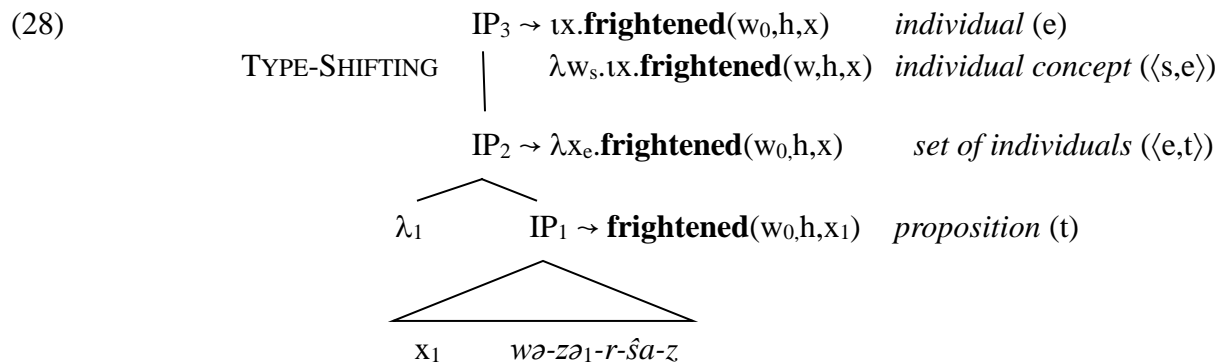
(26)   *j-hʷa*   [*wə-ẓə-r-ŝa-z*]
        3SG.N.ABS-say(IMP)   2SG.M.ABS-**REL.ERG**-CAUS-be.afraid-PST.NFIN
        'Say what frightened you!'

(27)   *j-hʷa*   [*a-χš*   *a-χʷ*]
        3SG.N.ABS-say(IMP)   DEF-milk   3SG.N.IO-price
        'Say the price of the milk!'

Within the Montagovian semantic framework we are adopting, the fact that a definite DP can convey the meaning of an individual concept is not surprising: it is just the standard intensional component of its meaning whose extension is an individual. But how does a headless relative clause end up doing the same? The semantic derivation of the bracketed headless relative clause in (26) is schematized in (28). We have assumed its full syntactic category to be an IP rather than a CP for lack of evidence for the latter (e.g. no clause-typing suffix can occur in relative clauses in general).

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[14] See Frana (forthcoming) for a thorough survey of semantic analyses of concealed question DPs.

(28) $IP_3 \rightarrow \iota x.\textbf{frightened}(w_0,h,x)$ *individual* (e)

TYPE-SHIFTING $\lambda w_s.\iota x.\textbf{frightened}(w,h,x)$ *individual concept* ($\langle s,e \rangle$)

$IP_2 \rightarrow \lambda x_e.\textbf{frightened}(w_0,h,x)$ *set of individuals* ($\langle e,t \rangle$)

λ_1 $IP_1 \rightarrow \textbf{frightened}(w_0,h,x_1)$ *proposition* (t)

x_1 *wə-zə$_1$-r-ŝa-z*

First, we assume that the relative marker *zə-* licenses the argument variable x_1, similarly to the standard assumption that is made for relative clauses in languages with relative markers occurring as independent words (or no relative markers at all). The combination of the variable with the remainder of the relative clause, which acts as a one-place predicate, produces an open proposition—the denotation of IP_1.[15] Lambda abstraction over x_1 turns the open proposition into a set of individuals: the set of all and only the individuals that frightened the hearer (h). This is the denotation of IP_2. Both the set denotation and the way to achieve it via lambda abstraction over a free variable follows the standard semantic analysis for relative clauses (Quine 1960, Montague 1970).

The next step from IP_2 to IP_3 assumes a type-shifting operation that turns a set into its maximal individual. In (28), this means the shift from the set of all the individuals that frightened the hearer to the unique maximal individual that frightened the hearer—the individual resulting from the sum of all the individuals in the set. If there's only one atomic thing that frightened the hearer, let's say a snake, then IP_2 denotes the singleton set containing that snake {snake}, while IP_3 denotes the snake itself. If there's more than one thing that frightened the hearer, let's say a snake and a tarantula, then IP_2 denotes the set {snake, tarantula} containing both frightening creatures. IP_3, instead, denotes the maximal plural individual snake⊕tarantula resulting from the sum of the two frightening creatures in the set. This is a straightforward application of the analysis of maximal free relative clauses like *what frightened you* in *I took care of what frightened you* that is argued for in Jacobson (1995), Dayal (1996), and Caponigro (2003, 2004), who in turn build on the analysis of definite DPs in Sharvy (1980) and Link (1984).

In the Montagovian semantic framework we are adopting, the Fregean distinction between denotation (*Bedeutung*) and sense (*Sinn*) of any expression E is rendered through the notions of the extension and the intension of E, with the latter being a function from possible worlds (or a broader set of indices) to extensions of E. If the extension of E is of semantic type *n*, then its intension is of type $\langle s,n \rangle$. It follows that the meaning of IP_3 consists of both an extension, i.e., the thing(s) that frightened the hearer in the world of evaluation *w$_0$*, and an intension, i.e., the function from possible worlds *w* to the thing(s) that frightened the hearer in *w*. For instance, if the hearer was frightened by a snake in *w$_0$*, then the extension of IP_3 is the snake in (29)a, while its intension will be a function like the one in (29)b.

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[15] As common practice, the semantic derivation in (28) provides the logical translation of IP_1 and IP_2, rather than their actual meanings, although their meanings are straightforwardly inferable from those logical forms.

(29) a. $[\![IP_3]\!]^{w0} = $ snake

b. $[\![IP_3]\!] = $ $\begin{pmatrix} w_0 & \to & \text{snake} \\ w_1 & \to & \text{snake} \oplus \text{tarantula} \\ w_2 & \to & \text{tarantula} \\ \ldots \end{pmatrix}$

But how does an individual concept combine with the meaning of the matrix interrogative predicate? We adopt the analysis of concealed question DPs developed in Heim (1979), Romero (2005), and Frana (2017). They assume that a predicate like *say* in English, which allows for either an interrogative clause or a concealed question DP as its complement, is semantically ambiguous: it can combine with either the propositional object denoted by an interrogative clause, as shown in (30)a,[16] or the individual concept denoted by a concealed question DP, as shown in (30)b.

(30) a. *say₁* → $\lambda y_{\langle s,t \rangle} \lambda x \lambda w.\mathbf{say}(w,x,y)$

b. *say₂* → $\lambda y_{\langle s,e \rangle} \lambda x \lambda w.\mathbf{say}(w,x,y)$

We assume that only option (30)b is available in Abaza, i.e., interrogative predicates in Abaza only combine with a complement denoting an individual concept. We remain non-committal whether this restriction is semantic or syntactic in nature. It may be due to interrogative predicates not being semantically ambiguous in Abaza or to the lack of syntactic objects like embedded interrogative clauses that can denote a set of propositions.

Let's now consider headless relative clauses conveying direct content questions like (15)b, repeated below as (31). It looks the same as the bracketed headless relative clause in (26) that we just discussed, except for having the interrogative suffix *-ja* marked in bold.

(31) *wə-zə-r-ŝa-**ja**?*
2SG.M.ABS-REL.ERG-CAUS-be.afraid(AOR)-**Q.N**
'What frightened you?'

A straightforward application of our previous analysis would return the very same semantic object as the semantic contribution of (31): the individual concept mapping worlds to maximal individuals that frightened the speakers in those worlds. This is not a welcomed result for at least two reasons. First, the literature on direct questions we mentioned earlier has convincingly

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[16] See Hamblin (1974) and Karttunen (1977) for the beginning of the approach to the meaning of an interrogative clause according to which they denote sets of propositions. Also, see Dayal (2016) for a recent extensive survey. We set aside a further semantic issue about a predicate like *say*, which can take either an interrogative or a declarative clause as its complement: whether *say* encodes further ambiguity by combining with either a set of propositions (interrogative clause denotation) or a single proposition (declarative clause denotation) or whether it combines with just a proposition and an answerhood operator applies to the set of propositions denoted by an interrogative clause to return a proposition.

argued that they are propositional in nature. Second, Abaza speakers can produce a proposition-denoting full clause as an answer to (31), as shown in (32).

(32) *s-zə-r-ŝa-z*   *sə-χʷaga*   *aḵʷ-ṗ*
      1sg.abs-REL.ERG-CAUS-be.afraid-PST.NFIN   1SG.IO-shadow   3SG.N+COP-NPST.DCL
      'My shadow frightened me.' (lit. It is my shadow that frightened me.)

We propose that the interrogative marker *-ja* semantically acts as an operator triggering the shift from an individual concept to a set of propositions—the set of all the possible answers to the questions. In other words, the interrogative marker denotes the function in (33): it applies to an individual concept x and returns the set of propositions p of the kind 'y is identical to the value of the individual concept x' with y a nonhuman individual.

(33) *-ja* → $\lambda z_{\langle s,e\rangle}\lambda p_{\langle s,t\rangle}\exists y_e[\mathbf{N}(y) \wedge p = \lambda w[y = z(w)]]$ (**N: nonhuman**)

When applied to the headless relative clause in (31) and its individual-concept intension, *-ja* returns a set of propositions, as shown by the logical translation of the CP in (34). IP_3 in (34) and its logical translation are the same and the result from the same syntactic and semantic composition as in (28).

(34)   CP → $\lambda z\lambda p\exists y[\mathbf{N}(y) \wedge p = \lambda w[y = z(w)]] (\lambda w.\iota x.\mathbf{frightened}(w,h,x))$
                               $\lambda p\exists y[\mathbf{N}(y) \wedge p = \lambda w[y = \iota x.\mathbf{frightened}(w,h,x)]]$

      IP_3 → $\lambda w.\iota x.\mathbf{frightened}(w,h,x)$ C

      x_1 *wə-zə₁-r-ŝa(-z)*   *-ja* → $\lambda z\lambda p\exists y[\mathbf{N(y)}\wedge p = \lambda w[y = z(w)]$

For instance, if a snake and a tarantula are the only nonhuman individuals in the domain, then the denotation of the CP in (34) would be the set of propositions {'the tarantula is the thing that frightened the hearer', 'the snake is the thing that frightened the hearer', 'the tarantula and the snake are the things that frightened the hearer'}.

The same approach can be extended to the other two interrogative markers *-da* and *-ba-*, as shown in (35) and (36), respectively.

(35) *-da*   ~> $\lambda z_{\langle s,e\rangle}\lambda p\exists y[\mathbf{human(y)}\wedge p = \lambda w[y = z(w)]]$

(36) *-ba-* ~> $\lambda z_{\langle s,e\rangle}\lambda p_<\exists y[p = \lambda w[y = z(w)]]$

The only difference between *-da* and *-ba-* with respect to each other and to *-ja* is that *-da* restricts the individuals to humans, while *-ba-* imposes no restriction. On the other hand, the relative

marker that always immediately precedes *-ba-* already imposes restrictions on the relevant individuals: locations, time units, or manners.[17]

4. Conclusion

We have shown that there is at least one language—Abaza—that can convey direct and indirect content-question meaning without making use of *wh-*words or *wh-* interrogative clauses. Headless relative clauses are used, instead. Relying on independently motivated logical tools and assumptions, we have provided a compositional semantic analysis that assigns a headless relative clause an individual concept as its meaning. This is the same semantic object that has been argued for as the meaning of concealed question DPs, which are DPs that can convey content question meaning. We have adopted the same solutions that have been developed for concealed question DPs to explain how headless relative clauses that are interpreted as individual concepts can combine with the matrix interrogative predicates that they are arguments of. Finally, we have proposed a semantics for the interrogative clause-type markers that Abaza requires in matrix headless relative clauses conveying question meaning: they semantically behave like logical operators that apply to an individual concept and return a set of propositions built around that individual concept (a function from worlds to individuals) and its values.

This strategy that Abaza employs to convey question meaning is extremely rare across languages. Although some other Northwest Caucasian languages have been shown to make exclusive use of headless relative clauses to convey indirect questions (Hewitt 1979a, 1979b; Caponigro & Polinsky 2011; Lander 2012), Abaza (and, *mutatis mutandis*, its closest kin Abkhaz) is the only one that employs the same basic strategy at the matrix level to convey direct questions. Why is this option so rare, despite being accountable for by independently needed logical tools and assumptions, as we just showed? We speculate that its rarity may be due to the need for several morphosyntactic features to occur together in the same language in order for the mapping onto question meaning to be able to occur without making use of more common and more specialized devices like *wh-* interrogative clauses with their *wh-*words. First, a language needs to have a highly articulated and productive system of headless relative clauses that allows for the relativization of any argument or adjunct. Second, it needs to have a rich verbal morphology that marks every argument and adjunct and, at the same time, marks which of those is relativized. Third, it needs clause-type markers at the matrix level licensing logical operators that can turn an individual concept into a set of propositions—the appropriate kind of direct question meaning.

Abaza has all these features combined. The Northwest Caucasian languages we have referred to above share most of these features, but they may lack the crucial set of clause-type markers licensing the logical operators in a matrix clause. Therefore, they only employ the headless strategy at the embedded level. Most languages lack a few if not all these features and, therefore, are precluded from pursuing this route to convey question meaning and are pushed towards the

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[17] "Individual" here should be understood as any entity that is included in the domain of the Model and can be referred to. There is no doubt that we can talk about and refer to places (*that place*), time units (*those minutes*), and manners (*this way*).

more common path of having specialized markers like *wh*-words and specialized clauses like *wh-* interrogative clauses.

Acknowledgements

List of abbreviations

1 — 1ˢᵗ person; 2 — 2ⁿᵈ person; 3 — 3ʳᵈ person; ABS — absolutive; ADV — adverbial; AOR — aorist; BEN — benefactive; CAUS — causative; COP — copula; CSL — cislocative; DAT — dative applicative; DCL — declarative; DEF — definite; DIST — distal demonstrative; ERG — ergative; F — feminine; FIN — finite; FUT — future; H — human; IMP — imperative; INS — instrumental; IO — indirect object; IPF — imperfective; ITR — intransitive; LOC — locative preverb; M — masculine; N — non-human; NEG — negation; NFIN — non-finite; NPST — nonpast; PL — plural; POT — potential; PRED — predicate; PRS — present; PST — past; PTCL — particle; Q — interrogative affix; RE — refactive; REL — relativizer; REP — repetitive; SG — singular; TRL — translocative; txt — textual example

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