

# Re(e)volving Complexity: Adding Intonation

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A fruitful methodology for tracing the development of grammatical complexity has been the close examination of centuries of written texts. Unfortunately, such records exist for only a small proportion of languages. Fortunately, an additional methodology is available: the comparison of synchronic structures at various stages of development, either in related languages or within a single language. Such comparisons can do more than compensate for gaps in the philological record. Written documents necessarily remain silent about a crucial feature of the evolving constructions: their prosody. Modern documentation allows us to examine prosodic patterns in spontaneous connected speech, the speech that serves as the basis for language change.

The focus here will be on early stages in the development of complexity. The first section will explore the initial phase. It has on occasion been proposed that some languages have not yet developed syntactic complexity at all. It will be shown that in at least one such case, prosodic patterns reveal complex structures even when segmental markers are absent. The second and third sections will examine some young complex constructions, first complementation then relativization. It will be seen that prosodic patterns can suggest possible pathways of development that might otherwise not come to mind.

## 1. Pre-complexity?

Over the past several years there has been an ongoing discussion about whether recursion is an essential feature of language (Hauser, Chomsky, and Fitch 2002, Everett 2005, 2007, Parker 2006, Mithun 2007, Nevsky, Pesetsky and Rodrigues 2007, and others). The kind of recursion under discussion is hierarchical syntactic structure, in which clauses are embedded in other clauses. The central constructions of this type are complement constructions, in which one clause is embedded inside of another as an argument, and relative constructions, in which one clause is embedded inside of a noun phrase in another as a modifier.

### 1.1. Complementation

Examples of complementation in English abound. Examples (1)a and (1)b both have clausal arguments. The first contains a clausal subject (*you two converse*) and the second a clausal object (*he cried*).

(1) English complementation

- a. *It will be possible for you to converse.*
- b. *And then he started to cry.*

Complement clauses typically have special forms that distinguish them from independent sentences, such as a complementizer like English *that* or *for* (*It will be possible for you to converse*), omission of a coreferential subject (*He started \_\_\_ to cry*), or a special non-finite verb form (*to converse, to cry*).

Such special structures are not as easy to find in some other languages. One such language is Mohawk, an Iroquoian language indigenous to northeastern North America. All of the Mohawk clauses in the examples below can stand alone as complete, grammatical sentences. The examples are all from spontaneous, speech, generally conversation, unless otherwise specified. The free English translations were provided by the speakers themselves or by others involved in the conversations.

(2) Mohawk complementation?

a. Sentential subject: Karihwénhawe' Lazore, speaker p.c.

<i>Enwá:ton'</i>	<i>ensenikaratónnion'</i>
en-w-aton-'	en-seni-kar-aton-nion-'
FUTURE-NEUTER.AGENT-be.possible-PRF	FUTURE-2.DU.AGENT-story-tell-DISTRIBUTIVE-PRF
it will be possible	you two will converse
'It will be possible for you two to carry on a conversation.'	

b. Sentential object: Cecelia Peters, speaker p.c.

<i>Sok</i>	<i>nè:'e</i>	<i>tahatáhsawen'</i>	<i>wa'thahséntho'</i>
sok	nè:'e	ta-ha-at-ahsawen-'	wa'-t-ha-ahsenthó-'
so	it.is	CISLOCATIVE.FACTUAL-M.SG.AGENT-MIDDLE-begin-PRF	FACTUAL-DV-M.SG.AGENT-cry-PRF
so	it is	he started (it)	he cried
'And then he started to cry.'			

Mohawk is polysynthetic: words, particularly verbs, can contain a potentially large number of meaningful parts. All Mohawk verbs contain pronominal prefixes referring to their core arguments. Intransitive pronominals refer to one argument, such as *w-* 'it' in 'it will be impossible' and *seni-* 'you two' in 'you two will converse'. Transitive pronominals refer to two arguments, such as *-honwa-* 'they/him' in *wahonwahón:karon* 'they invited him'. The transitive pronouns are fused forms: it is not usually possible to untangle the agent and patient markers in a transitive prefix. Transitive pronominals with a neuter patient have the same form as intransitives. The prefix *-ha-* means both 'he' and 'he/it': *wa-ha-hní:non* 'he bought it', *wa'-t-ha-hséntho* 'he cried',. For this reason, verbs like *tahatáhsawen* in (2)b above could be translated either 'he started it' or 'he started'.

The only obvious relation between the two clauses in each sentence above is semantic. In each, a core argument of the first clause is coreferential with the entire second clause. In (2)a, the 'it' of 'It will be possible' is coreferential with 'you two will converse'. In (2)b 'He started to cry', the 'it' of 'He started it' is coreferential with 'he cried'. Noonan (2007) provides a list of semantic types of predicates that appear in the matrix clauses of complement constructions cross-linguistically.

(3) Semantic types of matrix predicates: Noonan 2007

Utterance predicates	<i>say, tell, report, promise, ask ...</i>
Propositional attitude	<i>believe, think, suppose, assume, doubt, deny ...</i>
Pretence	<i>imagine, pretend, make believe, fool, trick into ...</i>
Commentative/factive	<i>regret, be sorry, sad, odd, significant, important ...</i>
Knowledge and its acquisition	<i>know, discover, realize, forget, see, hear ...</i>
Fear	<i>fear, worry, be afraid, be anxious ...</i>
Desideratives	<i>want, wish, desire, hope ...</i>
Manipulatives	<i>force, make, persuade, tell, threaten, let, permit, command, order, request, ask, cause, allow ...</i>
Modals	<i>be able, be obliged, can, ought, should, may ...</i>
Achievements	<i>manage, chance, dare, remember to, happen to, get, try, forget to, fail, avoid ...</i>
Phasals	<i>start, begin, continue, keep on, finish, stop, cease...</i>
Immediate perception	<i>see, hear, watch, feel ...</i>

Verbs with all of these meanings appear in Mohawk constructions like those in (2) above, sequences of fully finite clauses. Additional examples of constructions of these types are in Mithun in press (a) and in press (b). The fact that the counterparts of English complement clauses show no special dependent forms is not altogether surprising, given the overall structure of the language. As noted, all clauses contain obligatory reference to their core arguments, in the pronominal prefixes on verbs, so subordinate clauses could not be distinguished by ellipsis of coreferential arguments. All verbs are finite, capable of standing alone, so subordinate clauses could not be distinguished by dependent inflectional forms.

## 1.2. Relativization

Examples of relative clauses are also not difficult to find in English. These are clausal modifiers of an argument of a higher matrix clause. In (3), *the children* is modified by the clause *(they) came here*.

### (3) English relativization

*Maybe the bus brought the children [that came here].*

This English relative clause has a distinctive form. It is introduced by the relative pronoun *that* and is missing a regular pronominal or lexical subject. The sentence in (3) was actually the free translation of the Mohawk sentence in (4), which was part of a conversation. The Mohawk shows none of the structural characteristics of the English: no relative pronoun and no omission of the coreferential argument.

### (4) Mohawk relativization? Charlotte Bush and Josephine Horne, speakers p.c.

<i>Tóka'</i>	<i>ki'</i>	<i>nè:' ne</i>	<i>ki:</i>	<i>iakoia'takarénie's</i>
toka'	ki'	nè:'ne	ki:	iako-ia't-a-kareni-e's
maybe	just	it is	this	INDEFINITE.PATIENT-body-JR-transport-DISTRIBUTIVE
maybe	just	it is	this	it bodily transports one here and there
'Maybe the bus				

<i>thotiia'ténha'</i>	<i>wáhi',</i>
t-hoti-ia't-enha'	wahi'
CISLOCATIVE-M.PL.PATIENT-body-carry	TAG
it bodily carried them here	didn't it
brought them, didn't it,	

[JH Mm.]

<i>ki:</i>	<i>ratiksa'okòn:'a,</i>
ki:	rati-ksa'=okon'a
this	M.PL-be.a.child=DISTRIBUTIVE
these	children
the children	

[JH Mm]

<i>thoné:non</i>	<i>kèn:'en.</i>
t-hon-e-n-on	kèn:'en
CISLOCATIVE-M.PL.PATIENT-go-DIRECTIONAL-STATIVE	here
they have come	here
that came here.'	

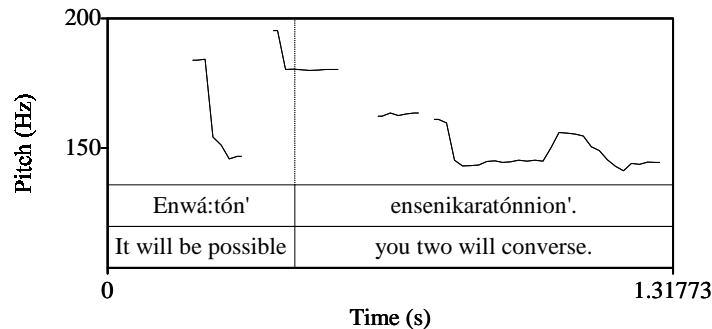
The construction does share some characteristics of relative clauses in other languages. The two clauses 'Maybe the bus brought the children' and 'they came here' share an argument, the children. It is often maintained that subordinate clauses, including relative clauses, represent presuppositions rather than assertions. The last clause 'they came here' represents a presupposition. These two speakers had been standing on the front porch the day before, watching the children.

## 1.3. The prosodic dimension

Sequences like those in (2)a, (2)b, and (4) above are pervasive in Mohawk. One could take them as evidence that the language lacks syntactic complexity. They appear to consist of strings of independent sentences with no special relationship apart from a semantic one, perhaps one that is only inferred. If, however, we move beyond the printed word to a consideration of sound, additional structure emerges. Prosody is generally understood as some combination of pitch, intensity, and timing. In the investigation of complex structures, the most significant of these is pitch movement or intonation.

A pitch trace of the complement-like construction ‘It will be possible for you two to converse’ is below.

(2)a. ‘It will be possible for you two to converse.’

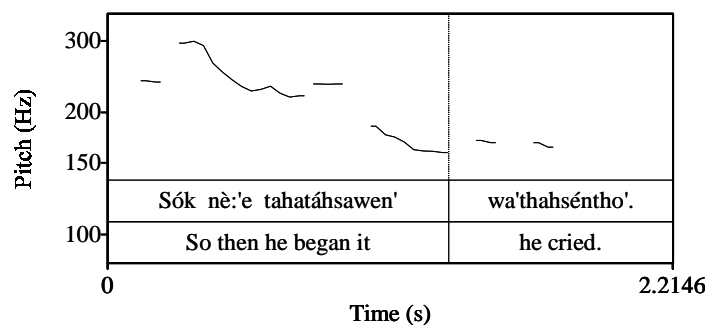


The intonation in (2)a reflects integration of the two clauses into a higher-level structure in several ways. The first is the overall pitch contour. The first clause did not end with the full terminal fall in pitch characteristic of an independent sentence in isolation. The second clause did not begin with the pitch reset characteristic of the beginning of an independent sentence in isolation.

The first clause actually ended with a special continuing intonation contour. Mohawk stress is basically penultimate: it falls on the next-to-the last syllable of the word. (Certain epenthetic vowels, which came into the language after the penultimate stress pattern had become established, do not affect stress placement.) The primary marker of stress is pitch. Stress is accompanied by distinctive tone, basically high or low. (The actual high tone contour is rising on a long syllable. The low tone contour, which occurs only on long syllables, shows a high rise then steep plunge to a point below the baseline.) Open stressed syllables are long. The high pitch of the stress on *enwá:ton* ‘it will be possible’ can be seen in the first peak in the pitch trace above. The stress on *ensenikaratónnion* ‘you two will converse’ can be seen in the last peak in the pitch trace. There is, however, an additional external sandhi phenomenon in Mohawk. When a word with penultimate stress on an open syllable (*enwá:ton*), is followed by another word in the same prosodic phrase, the final syllable of that word is given extra-high pitch (*enwá:tón*). The special extra-high pitch of continuing intonation is easy to see on the pitch trace above near the end of the first clause.

The pitch trace of ‘And then he started to cry’ shows an even clearer picture.

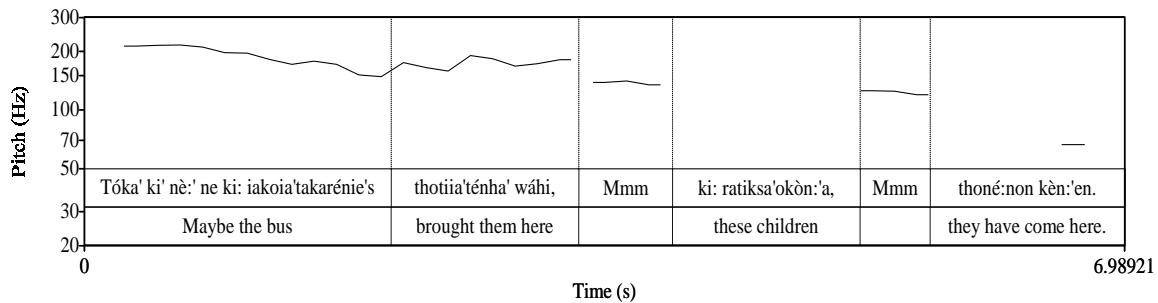
(2)b. ‘And then he started to cry.’



The two clauses were integrated under one overall intonation contour, with no full terminal fall until the end of the last word. (The final syllable *-tho* of ‘he cried’ does not come through well on the pitch trace, due to devoicing, but it is audible.) There was a regular decrease in pitch (declination) from one stressed syllable to the next, that is, from the stressed syllable of *Sók* ‘then’, to the stressed syllable *-táh-* of ‘he started it’ then finally to the stressed syllable *-sént-* of ‘he cried’. (There was no special extra-high pitch at the end of the first verb because stress here was not on an open penultimate syllable.)

The prosody of sentence (4) ‘Maybe the bus brought the children that came here’ also shows an integrated intonation structure, with no final terminal fall until the end. There was some internal structure, represented by the vertical lines on the pitch trace. The second prosodic phrase showed a partial pitch reset. The following prosodic phrases were separated by brief pauses and slight pitch falls, perceived by the other speaker as appropriate places for responses.

(4) ‘Maybe the bus brought the children that came here.’



#### 1.4.Syntactic and prosodic structures

The prosodic integration of constructions like these reflects a kind of cognitive organization similar to that reflected in syntactic integration. The fact that we see prosodic structure without substantive syntactic structure suggests that prosodic structuring may, at least in some cases, precede syntactic structuring. But as Bolinger (1984, 1989) reminded us early on, prosodic and syntactic structure are not necessarily isomorphic.

I start with a claim and a disavowal. The claim is that intonation is autonomous and one can speak of intonational subordination without reference to the segmental side of language. The disavowal is that intonation has any direct connection with subordination in syntax, however this is to be defined. Syntax nevertheless benefits handsomely from the games that intonation plays with it.

I see anything that is tributary to something else as subordinate to it. In syntax this means not only the classical dependent clauses in relation to main clauses, but also their reduced counterparts ... In Gestalt terms, what is superordinate is the figure; what is subordinate is all or part of the ground. (Bolinger 1984:401)

Prosodic and syntactic structure often go hand in hand, but they can also convey different structuring and different aspects of the message. In the complex Mohawk structures seen so far, what is interpreted as the matrix clause always occurs first, followed by what is interpreted as the subordinate clause. This is indeed the normal pattern. Each of these structures has shown a steady fall in pitch as well: each stressed syllable is lower than the preceding one. The matrix clause shows higher pitch than the complement or relative clause.

The highest pitch is not always on the matrix clause, however. Consider the subject complement construction in (5).

(5) Subject complement: Joe Awenhráthen Deer, speaker

‘(If I’m still in good health,) it should be possible for me to make my garden a little bigger.’

ó:nen ki' enwá:tón',  
then just it will be possible  
then I might be able

kwah ostòn:ha enkathehtó:wanahte' nòn:wa.  
quite a little will I field enlarge for myself this time  
to make my garden a little bigger.’



The standard view of complements as subordinate clauses in a grammatical relation with a complement-taking predicate is not supported by the data ... Rather, what has been described under the heading of complementation can be understood in terms of epistemic/evidential/ evaluative formulaic fragments expressing speaker stance toward the content of a clause. (Thompson 2002:125)

Verhagen (2005) comes to a similar conclusion about written Dutch.

Complementation constructions have the primary function of instructing the addressee of an utterance to coordinate cognitively—in a way specified by the matrix clause—with another subject of conceptualization in construing the object of conceptualization (the latter being represented by the complement clause) and not that of representing an object of conceptualization.

Effects of the prosodic structure of examples like those in (5) and (6) can be seen in the further development of grammatical structures in the language. Verbs like ‘it is possible’ and ‘I heard’ are just the kinds of words that tend to be reduced over time into auxiliary verbs, evidential particles, clitics, and affixes. A number of such developments can be seen within Mohawk itself. Mohawk contains, for example, a regular verb *iá:ken*’.

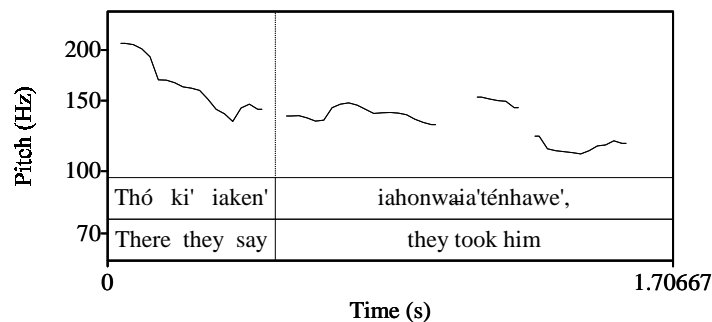
- (7) Verb *-en-* ‘say’  
*iá:ken*’  
*iak-en-*’  
 INDEFINITE-say-STATIVE  
 ‘one says, they say, people say’

This verb can still be used as the matrix clause in a complement construction, but it is used much more often used as a hearsay evidential. In this use it is typically reduced in form and often shows some freedom of movement. Its status as an emerging particle can be seen in (8). It was pronounced with little stress or length. As a matrix verb it would be pronounced *iá:ken*’, but as an evidential, it is more often *iaken*’. In this example it is embedded inside of the clause ‘They just took him up there’, occurring after both ‘there’ and ‘just’. This sentence does not report that ‘one just said it there’, but rather that ‘they just took him there’.

- (8) Hearsay evidential: Josephine Horne, speaker p.c.  

<i>Thó</i>	<i>ki’</i>	<i>iaken’</i>	<i>iahonwaia’ténhawe’</i> ,
tho	ki’	iak-en-’	i-a-honwa-ia’t-enhaw-e’
there	just	INDEFINITE-say-STATIVE	TRANSLOCATIVE-FACTUAL-3.M.PL/3.M.SG-body-carry-PRF
there	just	HEARSAY	they bodily took him

 ‘They apparently just took him up there ...’



## 2. Young marked complement constructions

Givón (2002, 2005, 2006), and Heine and Kuteva (2007) identify two principal paths by which subordination develops. One is referred to as ‘clause chaining’ by Givón and as ‘integration’ by Heine and Kuteva. The other is referred to as ‘embedded verb phrase complementation’ or ‘nominalized V-COMP’ by Givón and as ‘expansion’ by Heine and Kuteva. Heine characterizes the two as follows.

There are cross-linguistically two main ways in which clause subordination arises: either via the integration of two independent sentences within one sentence or via expansion, that is, the reinterpretation of a thing-like (nominal) participant as a propositional (clausal) participant. (Heine 2008ms:1)

He attributes the terms ‘integration’ and ‘expansion’ to Diessel.

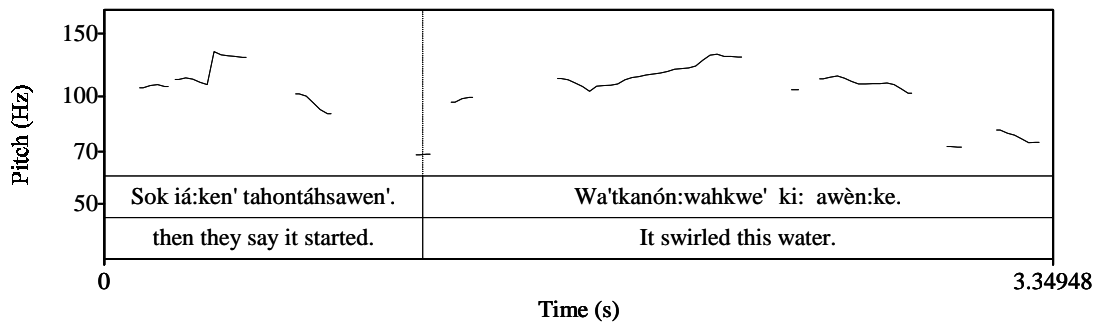
Observing that in first language acquisition complex sentences appear later than simple sentences, he [Diessel] proposes the following generalization: ‘Thus, while complement and relative clauses evolve via *clause expansion*, adverbial and co-ordinate clauses develop through a process of *clause integration*’. (Diessel 2005:4, cited in Heine 2008ms:1)

A consideration of prosody allows us to examine the roles of these two processes and their interaction more closely. The examples of Mohawk complementation seen so far appear to reflect simple integration. In example (2)b we saw two adjacent finite clauses combined under a single overall prosodic contour: ‘he started he cried’ = ‘he started to cry’. Two-sentence sequences involving the same verb ‘start’, without this prosodic integration, still exist in the language as well: ‘It started. The water started swirling around.’

(9) Separate sentences: Sonny Edwards, speaker p.c.

*Sok iaken' tahontáhsawen.*  
so HEARSAY it started  
‘So then, it seems, it started.’

*Wa'tkanón:wáhkwe' ki: awèn:ke.*  
it started swirling this water  
‘The water started swirling around.’



The first sentence ‘So then it started.’ ended with a terminal fall. The second sentence ‘The water started swirling’ began with a full pitch reset then a final fall of its own, comparable to that of the first sentence.

There are, however, indications that there may be more to these constructions than simple integration. Mohawk contains two demonstratives, a proximal *kí:ken* ‘this, this one, these’ and a distal *thí:ken* ‘that, that one, those’. They are often shortened: to *kí:* and *thí:* respectively. They serve to locate a referent in space or time, in the linguistic or extralinguistic context.



- (10) Proximal demonstrative: Margaret Lazore, speaker

*Kthontaiawénhstsi*,

all of a sudden

‘On the spur of the moment,

*wahonterihwahserón:ni’ ahatiia:ken’ne’* *kí:ken* *entáhta’*.  
 they made an agreement they should go out this Saturday  
 they decided to go out this Saturday.’

- (11) Distal demonstrative: Margaret Edwards, speaker

*Thí:ken* *orokwáhsa’ entehsié:na*.  
that chain you will grab it  
 ‘You’ll grab that chain.’

- (12) Demonstratives: Lazarus Jacob, speaker

*É: i:reht* *thí:ken*  
 away may he move that  
 ‘Get that guy out of the way;

*enhahékenhte’* *kí:ken* *ne case*.  
 he will make it bad this the case.  
 he’ll ruin this case.

*Kí:ken* *sò:tsi*  
this too much  
This guy

*rahnekakà:stha’*.  
 he habitually liquid overdoes  
 drinks too much.’

The demonstratives may occur on their own, as in (12) ‘that (guy)’ and ‘this (guy)’, or in combination with a coreferential nominal, as in (10) ‘this Saturday’, (11) ‘that chain’, and (12) ‘this case’. They can appear with possessed nouns and proper names. Interestingly, they can also precede clauses.

- (13) Complement with *kí:ken* ‘this’: Lazarus Jacobs, speaker

*Rérha’ enhoió’ten’* *kí:ken* *enhshakoia’totáhsi’* *ratitshihénhstatsi*  
 he intends he will work this he will expose them priests  
 ‘He intended [to work [to expose the priests]].’

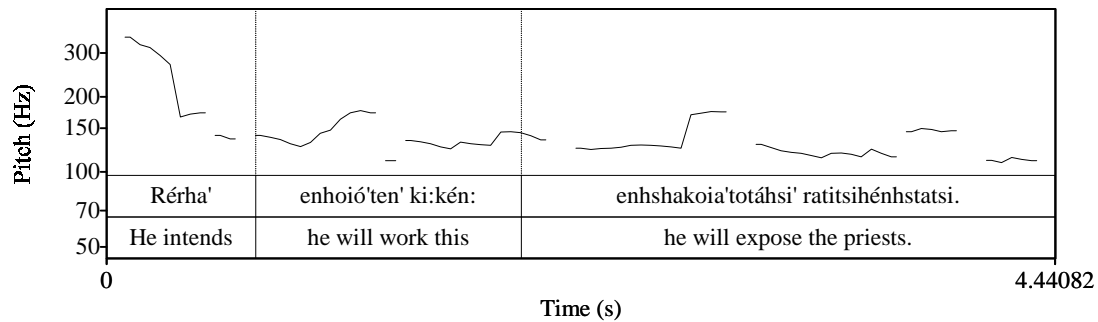
- (14) Complement with *thí:ken* ‘that’: Joe Tiorhakwén:te’ Dove, speaker

*Tóka’ ken enhsehià:rake’* *thí:ken* *wahshakonahskwawíhon* *wahi’*.  
 maybe Q you will remember it that he gave away livestock to various people you know  
 ‘Maybe you remember [that he gave away livestock], right?’

The appearance of demonstratives before complement clauses indicates that these clauses are conceived of as referring expressions rather than predications. One could conceive of the processes by which these constructions might have developed in different ways. They could be viewed as the result of expansion: argument slots which were originally filled by lexical nominals with demonstratives were expanded to allow clauses to fill these slots as well. Alternatively, they could be viewed as the result of the integration of two clauses followed by the later reinterpretation of the second as a referring expression.

The structure in (13) was packaged prosodically as a single sentence with internal structure, the essence of recursion. The second and third clauses each began with a partial pitch reset, but they were not as high as the initial pitch on the matrix verb ‘he intends’. There was no full terminal fall until the end of the third and final clause.

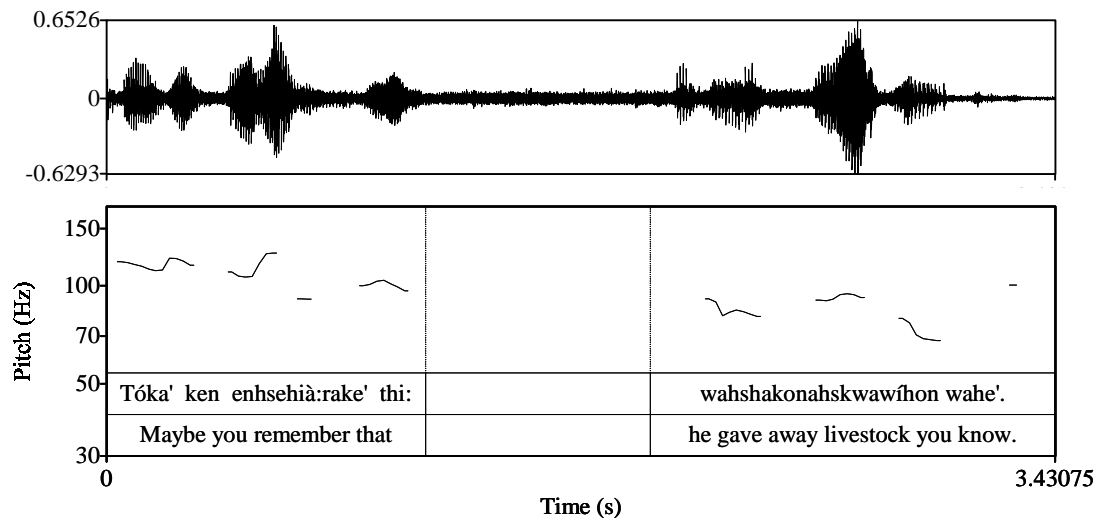
(13) 'He intended [to work [to expose the priests]].': Lazarus Jacob, speaker



Though the entire construction was integrated under a single overall prosodic contour, a break can be heard between the second and third clauses. Interestingly, the break follows the demonstrative *ki:kén* 'this'. In this example it took the form of lengthening on the final syllable of the demonstrative, lengthening that does not normally occur between a demonstrative and following noun. As can be seen, it is not a terminal contour: the rise in pitch on the final syllable of *ki:kén*: indicates that more is to follow.

The break between matrix and complement clauses is often even more pronounced, as in (14). The pause can be seen in both the pitch trace and the waveform above it. Again, it is interesting that the demonstrative was grouped prosodically with the matrix rather than the complement.

(14) 'Maybe you remember [that he gave away livestock], right?'



(These breaks are not pauses for word searches; such structures show different prosodic patterns.)

As has been pointed out by Pawley and Syder (1975), Pawley (2000), and Chafe (1979, 1982, 1987, 1994), spontaneous speech is typically not produced in a continuous stream. Speakers regulate the flow of information such that, in essence, they introduce just one new idea at a time per intonation unit or prosodic phrase. The new idea might be the introduction of a new participant, a new action, a significant time, place, or something else. Chafe describes this structure as follows.

The fact that in the end we are left with few if any cases in which there are two or more separately activated new ideas within the same intonation unit suggests the hypothesis that an intonation unit can express no more than one new idea. In other words thought, or at least language, proceeds in terms of one such activation at a time, and each activation applies to a single referent, event, or state, but not to more than one. (Chafe 1994:109)

Pawley similarly observes that there is a

fundamental limit on cognitive processing, which concerns the number of units of new information that can be manipulated in a single focus of consciousness . . . Two factors place time constraints on speakers' strategies for formulating speech in meetings (face-to-face encounters): first, the social context, which usually places a premium on packaging talk for a fast ride; and second, biological limits on what the mind can do at speed' (Pawley 2000:164, 165).

There is of course variation in the magnitude of prosodic breaks between intonation units, both across speakers and within the speech of single speakers.

The management of information flow can be seen in the passage in (15) below. The passage could be translated 'The late Kahonwinéhtha' always used to go visit her daughter Konwaièn:'a in New York City in the wintertime.' The Mohawk is arranged by intonation unit: each line represents a prosodic phrase.

(15) One new idea at a time: Joe Awenhráthen Deer, speaker

*Ne: ki'*                    *thi:ken* ...  
it is anyway            that

*akokstenhkénha*    *Kahonwinéhtha'*  
late old lady        name (she goes with the boats)

*thó*            *ienienatahré:nawe'*  
there        she used to visit way over there

*(Én:.*  
yes)

*tiótkon's thi*        *n-akohserà:ke*  
always that        the wintertime

*enienatà:ra'.*  
she'll visit.

*Konwaièn:'a* *thí:ken*  
her daughter    that

*Konwahsé:ti*  
name (they count for her)

*tho*        *ses*            *nonkwa(ti)*    *tienákere'*  
there        formerly        over there        there she resides

*Kanón:no.*  
New York City.

'The late Kahonwinéhtha' always used to go visit her daughter Konwaièn:'a in New York City in the wintertime.'

Each prosodic phrase introduced a new idea. The first shifted the topic of conversation. The second identified the new main character by name, old Kahonwinéhtha'. The third introduced her activity 'she used to visit'. (The fourth was the response of another speaker.) The fifth specified the time of the visits. The sixth introduced another character, the daughter. The seventh identified the daughter by name. The eighth brought up her residence. The ninth identified the location by name.

Sequences of separate sentences following this pattern are still common in Mohawk. The sentences are grammatically and prosodically independent. Neither presents presupposed information.

Figure 1 displays the waveform and pitch contour (F0) for two sentences. The top panel shows the waveform, with amplitude ranging from -0.7582 to 0.5591. The bottom panel shows the pitch contour (F0) in Hz, ranging from 100 to 150. The sentences are: 'Eniakwaterohrókha' kí:ken.' (We will watch this.) and 'Tewa'á:raton tahonhthénno'ke'.' (They would play lacrosse.). The time axis for both panels ranges from 0 to 3.91837 seconds.

‘We have to find a lawyer right away.’

The family did locate a lawyer, and the case went to trial. The next mention of the lawyer in this account was the sentence in (18). This time the nominal ‘lawyer’ was preceded by *ne*. The lawyer was identifiable from the previous discussion. The nominal ‘judge’ was also preceded by *ne*, though this was the first mention of him. He was assumed to be identifiable from the general courtroom scenario.

(18) *Ne*: Watshenní:ne’ Sawyer, speaker p.c.

*Ah khare’ ó:nen ki: ia’káhewe’ ne tekari’wakénhahs*  
 ah so then this it arrived there the he argues matters  
 ‘So then this time the lawyer

*tanon’ ne shakorihwénhtha’*  
 and the he decides people’s matters  
 and the judge

*wa’thonwaia’tò:rehte’*  
 they judged him  
 brought him to trial,

*ki: X.*  
 this NAME  
 this Mr. X.’

The particle *ne* can co-occur with demonstratives, as in *kí:ken ne case* ‘this case’ in (12) above and with proper names. It is not, however, obligatory, even when the referent is identifiable. The sentence in (19) occurred sometime after the sentence seen in (11) earlier: ‘You’ll grab that chain.’

(19) No particles: Margaret Edwards, speaker, p.c.

*Tahaié:na’ orokwáhsa’.*  
 he grabbed it chain  
 ‘He grabbed the chain.’

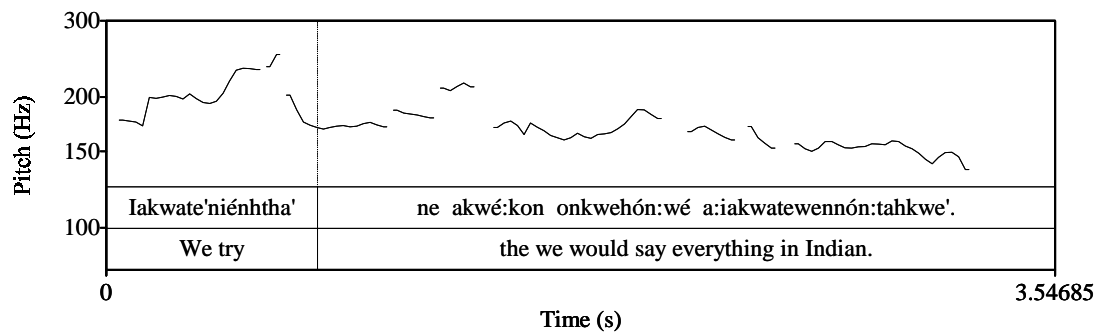
Unlike the demonstratives, the particle *ne* never appears as a referring expression on its own. Interestingly, *ne* can appear before clauses in complement constructions.

(20) Complement with *ne* ‘the’: Cecelia Peters, speaker p.c.

*Iakwate’niénhtha’ ne akwé:kon onkwehón:we a:iakwatewennón:tahkwe’.*  
 we habitually try it the all real person we would our word stand with it  
 ‘We try [to speak only Indian].’

The sentence in (20) was uttered with the same prosodic integration seen in other complement constructions. The complement ‘to speak only Indian’ was embedded prosodically inside of the larger sentence ‘We try to speak only Indian’. There was no full fall in pitch until the end of the second clause. The first matrix clause ‘we try’ ended in only a partial fall, and the second clause, translated as the complement, began with only a partial pitch reset.

(20) ‘We try [to speak only Indian].’: Cecelia Peters, speaker. p.c.



The prosody of complement constructions with *ne* ‘the’ like that in (20) differs from those with demonstratives. The demonstratives are grouped prosodically with the preceding matrix clause. The particle *ne* is grouped with the following complement clause. This particle cannot introduce independent sentences. The sequence *ne* *akwé:kón onkwéhón:wé a:iakwatewennón:tahkwe* ‘the we all speak Indian’ is not a sentence. While it could be argued that the complement constructions with demonstratives could have been formed from a discourse structure of elaboration followed by prosodic integration, complement constructions with *ne* ‘the’ could not have been formed in the same sequence of stages. The development of the *ne* constructions could be conceptualized as simple elaboration, by a scenario in which speakers began inserting clauses into the subject and object slots earlier occupied only by lexical nouns. An alternative scenario might originate in a discourse structure in which an element of one sentence was elaborated on, or expanded on, in the next. Such sequences of sentences then were integrated prosodically. This could be the scenario underlying the clause-clause constructions like ‘It will be possible. We will speak Indian’ → ‘It will be possible for us to speak Indian’ and ‘He started it. He cried’ → ‘He started to cry.’ At some point after the prosodic integration, speakers might have reinterpreted the second clause as a syntactic argument. The reanalysis would become evident only when they then began to precede it with the article *ne* ‘the’.

It might be tempting to assume that the Mohawk demonstratives and definite article have now attained the status of complementizers, much like English *that*. In fact they are not yet at that point. All three still mark the same semantic distinctions with clauses that they mark with lexical nominals. The demonstratives distinguish proximal from distal situations: events or states that are near or remote in space, time, or discourse. In ‘Maybe you remember *thí:ken* (‘that’) he gave away livestock’, the speaker was talking about a remote time, during the Depression in the 1930’s. In ‘He intended *kí:ken* (‘this’) to work to expose the priests’, the speaker was referring to the central topic of the conversation, a lawsuit over land ownership. The particle *ne* ‘the’ still marks exactly the same distinction before clauses that it marks before lexical nominals: identifiability of events and states.

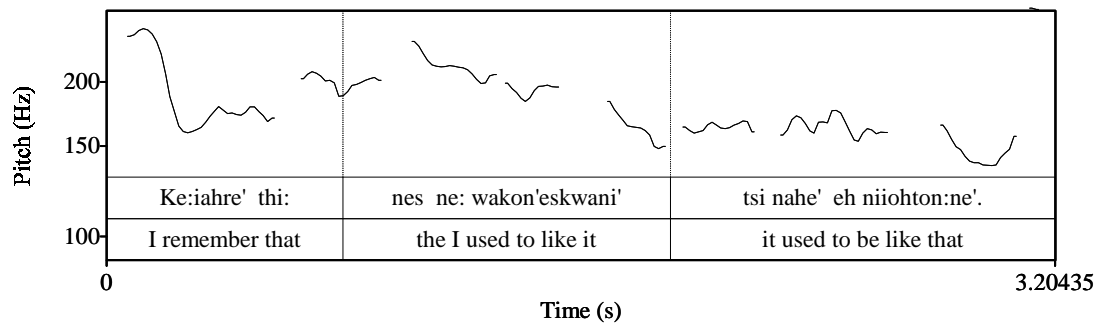
Furthermore, a demonstrative and the article *ne* can co-occur before clauses. As expected, the demonstrative is grouped prosodically with the matrix clause, while the article is grouped prosodically with the complement.

(21) Cooccurrence of demonstrative and article: Cecelia Peters, speaker p.c.

*Kè:iahre’*      *thi:*  
I remember      *that*  
‘I remember that

*ne*    *s*      *ne:*      *wakon’éskwani’*  
*the*    PAST      it is      I like it  
I used to like it

*tsi náhe’*      *eh*      *niihtòn:ne’*.  
long ago      there      so it was remotely  
the way it was long ago.’



### 3. Young marked relativization

Heine and Kuteva (2007) propose that there are only two diachronic sources of relative pronouns cross-linguistically: demonstratives (*the man [that I met]*) and question words (*the man [who came]*). We saw earlier that Mohawk contains constructions that appear on some grounds to be relative clauses but with no overt marking beyond prosodic integration. There are also constructions with markers of exactly the two types predicted by Heine and Kuteva: demonstratives and questions words.

(22) Demonstrative: Joe Tiorhakwén:te' Deer, speaker

Nahò:ten' na' thí:ken wà:kehre' enkehìà:rake' ?  
 what now that I wanted I will remember  
 'What was it now that I meant to remember?'

(23) Question word: Charlotte Bush, speaker

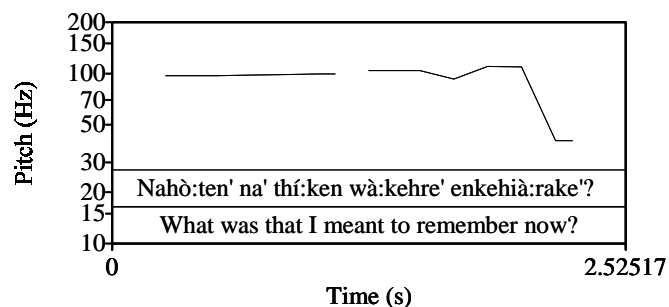
Iakherihonnién:ni ónhka' í:ienhre' aontá:ien wahi.  
 we teach them who one wants one would come TAG  
 'We teach whoever wants to come, don't we.'

It would appear that Mohawk contains prototypical relative clause structures after all.

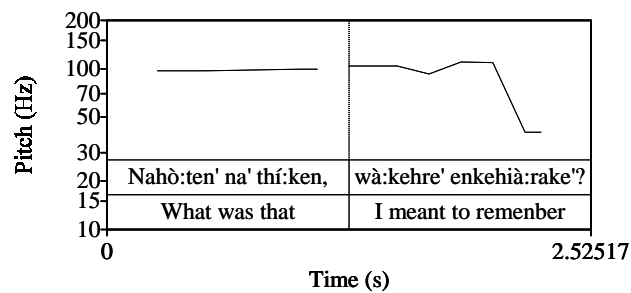
#### 3.1. Relativization with demonstratives

The sentence 'What was it now that I meant to remember?' appears to contain a standard relative clause. The clause 'I meant to remember something' is a presupposition, not an assertion. The full sentence was uttered under a single overall intonational contour. There was no full terminal fall in pitch until the very end. (The slight rise in pitch on the stressed syllable of the final verb 'remember' is due to the tone, written with a grave accent, which consists of a higher rise then very steep fall.)

(22) What was it now that I meant to remember?



The sentence did contain internal prosodic structure. A slight break can be perceived between the two clauses. Interestingly, the demonstrative *thí:ken* ‘that’ was grouped with the first clause.



Similar prosodic structure can be heard in larger constructions, such as that containing *kí:ken* ‘this’ in (23). Again the transcription is arranged so that each line represents a separate prosodic phrase.

(23) Larger demonstrative construction. Joe Awenhráthen Deer, speaker

Nòn:wa *kí:ken*,  
now *this*

òn:wa'k wáhonwaia'táta' thetèn:re',  
just now they buried him yesterday

Eddie,

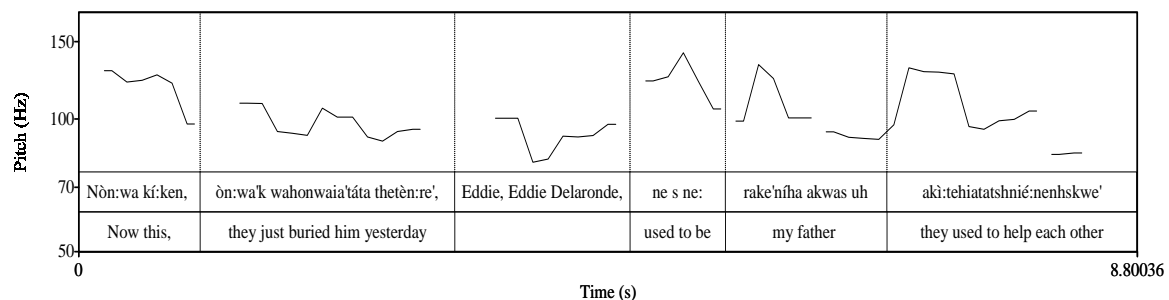
Eddie Delaronde,

ne s ne:  
it is formerly the

rake'níha akwas  
my father really

akì:ron tsi ki' ní: ne: tehiatatshnié:nenhskwe' wáhi.  
I'd say that in fact myself it is they two used to help each other TAG

‘This guy [they just buried yesterday], Eddie, Eddie Delaronde,  
he and my father used to just help each other out, you know.’



The relative clause construction consists of the first two intonation units. A consistent drop in pitch on each successive stressed syllable can be seen over these first two phrases.

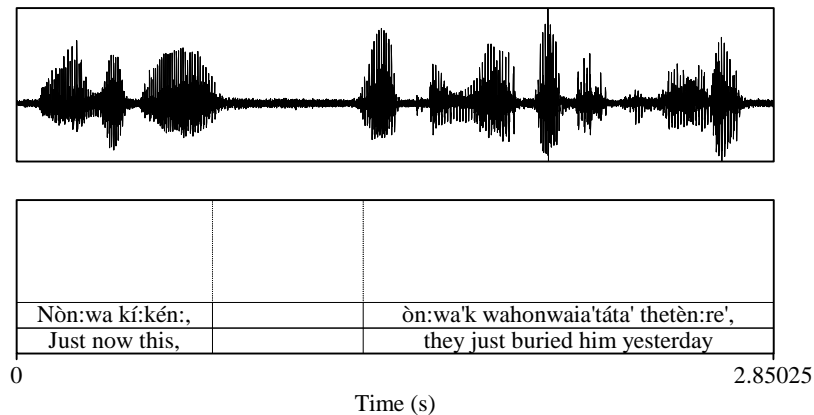


The diachronic pathway generally assumed to underlie relative clauses in languages like English is the following.

*There is the car; that (one) I like* > *There is the car [that I like].*

The prosodic structure of the Mohawk counterparts indicates that this is an unlikely source. There is often a significant prosodic break before the modifying clause in Mohawk, but it comes after the demonstrative. The pause in (23) can be seen both in the break in the pitch trace above and in the waveform below. The demonstrative appears to be in the head position prosodically.

(23) ‘This guy they just buried yesterday ...’



The Mohawk constructions differ from standard relative clauses in another way. Ordinary lexical nouns do not usually occur in this head position.

A different path of development is suggested by the demonstrative structures seen in the previous section, as in example (15) ‘The late Kahonwinéhtha’ always used to go visit her daughter Konwaièn:’a in New York City in the wintertime.’ It is likely that complex constructions like that in (23) sprang from a similar source, in which a demonstrative is used in one intonation unit as place holder promising further elaboration in the next.

The demonstratives here have apparently not developed into full-fledged relative pronouns. Heine and Kuteva note that as demonstratives develop into relative pronouns, ‘desemanticization leads to a loss of the spatial deixis of the demonstrative’. (2007:225) The Mohawk demonstratives here retain their spatial deixis. They distinguish distance in space, time, or discourse. In ‘this guy they just buried yesterday’, the proximal *kí:ken* ‘this’ emphasized the proximity in time, ‘just yesterday’. In ‘What was it that I meant to remember’, the distal *thí:ken* ‘that’ referred to a moment the speaker could no longer remember well. The difference is of course relative, not absolute. The burial had taken place the day before, while the thought of something to remember could have occurred to the speaker earlier the same day.

### 3.2. Relatives with question words

The second path by which relative pronouns can develop is termed by Heine and Kuteva the ‘interrogative channel’ (2007:229). At first glance, Mohawk appears to fall in line with languages like English.

#### Ónhka’ ‘who’

The pronoun *ónhka* ‘who’ is used in questions asking about human beings or referents classified as human.

(24) ‘Who’ question

Ónhka’      *ronáhskwaién*      *akohsá:tens?*  
who      he domestic animal has      it carries one  
‘Who had horses?’

The same form appears in relative-like constructions.

(25) ‘Who’: Joe Tiorhakwén:te’ Dove, speaker

*Ó:nén*    *ki’*      *kè:iahre’*    *ni:’*      *thí:*      *ótia’ke*  
now      in fact    I remember    myself    that      other

*kwah*      *uh*    ...  
just

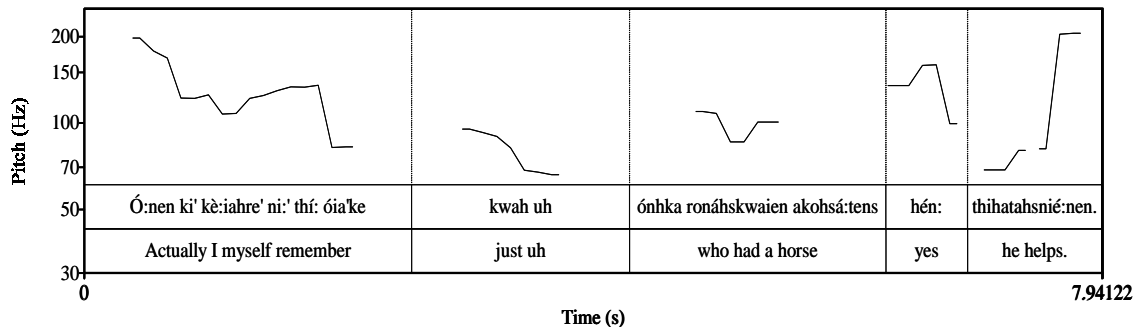
ónhka’    *ronáhskwaién*      *akohsá:tens*  
who      he domestic animal has      it carries one

(*Hén:*).  
(Yes.)

*thihatahsnié:nén.*  
he helps here and there

‘I myself remember that anyone who had horses just helped out without pay.’

The prosodic structure of (25) is different from those of the demonstrative constructions. Here the pronoun is grouped prosodically with the relative clause rather than the matrix. The prosodic phrase ‘who had horses’ is the third in the pitch trace below.



The clause ‘who had horses’ also differs pragmatically from demonstrative constructions like ‘this guy they buried yesterday’. It is not presupposed: the listener knew nothing about anyone having a horse, but he did know about the burial.

**Nahò:ten'** 'what'

The form *nahò:ten'* 'what' appears in questions about non-humans.

(26) *Nahò:ten'* question

**Nahò:ten'** *iakón:ni?*  
**what** she is making (it)  
**'What** is she making?

The same form appears in relative-like constructions.

(27) *Nahò:ten'* 'what': Watshenní:ne Sawyer, speaker Onkwa II 9 WS

*Nia'té:kon* *enhonwà:nonte'*,  
 all sorts of things she will feed him

*nia'té:kon* *toka'* *nòn:wa* *kiken:* ...  
 all sorts of things maybe perhaps this

*tka'wà:ra* *tanon'*  
 meat pie and

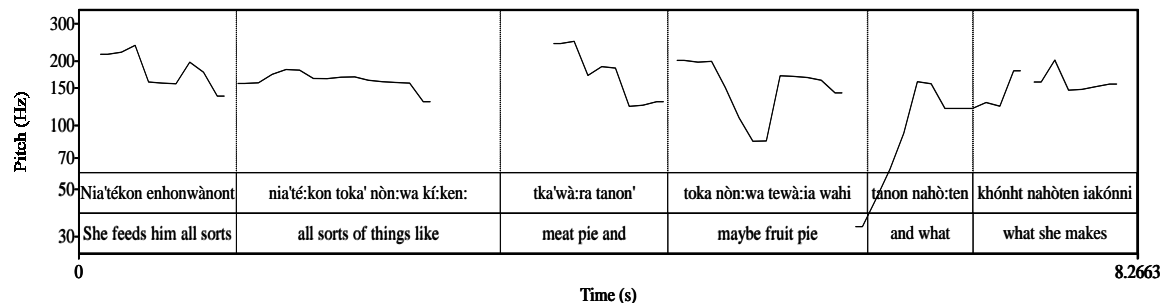
*toka'* *nòn:wa* *tewà:ia* *wahi'*  
 maybe perhaps fruit pie TAG

*tanon'* *nahò:ten'*  
 and what

*khónhte* *nahò:ten'* *iakón:ni* ...  
 and it is possible what she is making

'She feeds him all sorts of things, maybe meat pie, maybe fruit pie,  
 whatever she's cooking.'

As in the previous example, the pronoun *nahò:ten'* 'what' is grouped prosodically with the following clause, visible in the last prosodic phrase on the pitch trace below 'possibly what she is making'.



The construction occurs in negative clauses as well.

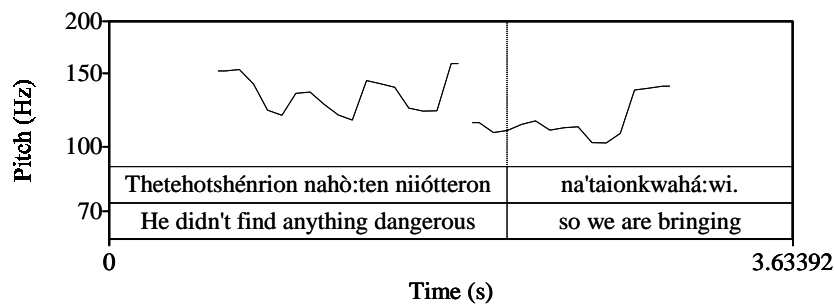
(28) With negation: Watshenní:nen Sawyer, Border WS 5 rec

*Thetehotshénrion* *nahò:ten'* *niióteron*  
 did he find what so it is dangerous  
 'He didn't find anything dangerous'

*na'taionkwahá:wi.*  
 so we are carrying it  
 that we were carrying.'

= 'He didn't find that we were carrying anything dangerous.'

Again, the pronoun 'what' was grouped prosodically with the following clause.



The constructions 'those who had horses, whoever had horses', and 'the things she was making, whatever she was making' can function as free relatives. The free relative meaning can be made more explicit with the addition of an enclitic =*k* 'just, only'.

(29) Explicit free relatives

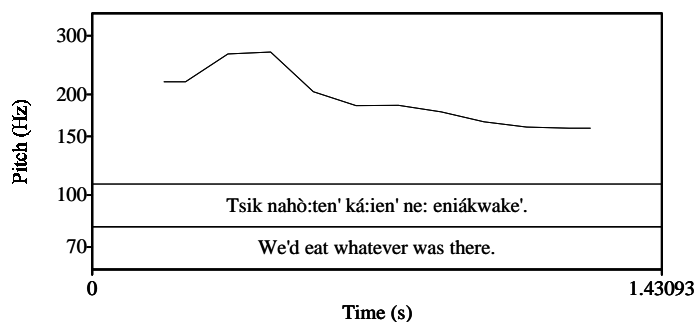
*ónhka'* 'who, someone, anyone'  
*ónhka'k* 'anyone **at all**, who**ever**'

*nahò:ten'* 'what, something, anything, whatever'  
*nahò:ten'k* 'anything **at all**, whate**ver**'  
*tsik nahò:ten'* 'anything **at all**, whate**ver**'

*tsi niká:ien'* 'which'  
*tsik niká:ien'* 'whiche**ver**'

(30) Free relative: Watshenní:ne Sawyer, speaker

***Tsik nahò:ten'*** *ká:ien'* *ne:* *eniákwake'*.  
 as **only** what it lies that we will eat  
 'Whate**ver** was there we would eat.'



Because there is no written record of Mohawk comparable to those of many European languages, we cannot know for certain how this construction evolved. In 1981, Comrie made an interesting observation.

Especially in the less widely spoken Altaic languages of the USSR, and in particular the Tungusic languages, which have developed as written languages under strong Russian influence, there has been a marked tendency to calque subordinate clause types on Russian models, for instance by using interrogative pronouns to introduce relative clauses. (Comrie 1981:85)

More recently, Heine and Kuteva (2006) have discussed the recurring polysemy between interrogative and relative pronouns among a large number of languages in Europe. They propose a process of development along the following lines.

(31) Development of relative pronouns: Heine and Kuteva 2006:209

Stage 1	Questions	<i><u>Who</u> came?</i>
Stage 2	Indefinite complement clauses	<i>I don't know <u>who</u> came.</i>
Stage 3	Definite complement clauses	<i>You also know <u>who</u> came.</i>
Stage 4	Relative pronouns	<i>Do you know the woman <u>who</u> came?</i>

What begin as question words (1) come to be used in embedded questions (2), then are extended to use in definite complements (3) and finally occur juxtaposed to lexical heads as relative pronouns (4).

Heine and Kuteva point out that the distribution across languages of the interrogative-relative pronoun polysemy does not follow strict genealogical lines. Some of the languages which show it are Indo-European (Romance, Slavic, Modern Greek) but others are not (Hungarian, Georgian). They attribute the distribution to language contact, in particular what they term 'replica grammaticalization'. The scenario they propose is as follows. After a series of changes like those outlined above resulted in polysemy between interrogative and relative pronouns in one of their languages, bilingual speakers, noticing the polysemy, might have extend question words in their second language to uses as relative pronouns, on the model of the first. On the basis of historical documents and other studies of them, Heine and Kuteva hypothesize that a development like that outlined in (31) may have occurred in Latin and Slavic, then later spread by contact throughout Europe, developing in Basque on the model of Spanish, and Balkan Turkish on the model of Macedonian. As European languages were spread to the New World with colonization, so too was the polysemy, for example from Brazilian Portuguese into the Amazonian language Tariana, and from Mexican Spanish into the Uto-Aztec language Pipil.

It is possible that these Mohawk relative-like constructions could have developed under similar conditions of contact. Mohawk is still spoken extremely well, but there has also been extensive bilingualism, first in French then more recently in English. The match between the European and Mohawk structures is not perfect. In many cases, Mohawk interrogative pronouns match indefinite pronouns: *ónhka* 'who, someone, anyone'. Where the interrogative and indefinite forms do not match, the relative-clause-like constructions are built on the indefinite forms.

(32) Mohawk question words and indefinite pronouns

- a. Same
 

<i>ónhka</i>	'who?', 'someone, anyone, whoever'
<i>nahò:ten</i>	'what?', 'something, anything, whatever'
- b. Different
 

<i>oh nahò:ten</i>	'what?'
<i>ka' nón:we?</i>	'where?'
<i>tsi nón:we</i>	'the place where'
<i>ka' níká:ien'?</i>	'which one?'
<i>tsi níká:ien'</i>	'the one which'

Examples of the distribution of *ka' níká:ien'* 'which one' and *tsi níká:ien'* 'the one which' are in (33), (34), and (35). The first appears in direct questions and embedded questions.

(33) Question

***Ka' níká:ien'***      *wahshní:non'?*

Q    so it lies      you bought (it)

'**Which one** did you buy?'

(34) Embedded question: Charlotte Kaherakwahs Bush, speaker

('She was showing pictures of her niece's wedding.')

*Iah*      *tewakaterièn:tare'*      *ónhka'*  
not      do I know      who

***ka' níká:ien'***  
**which one**

*ne:*      *wa'kóniake'*      *wáhi'.*  
that one    she got married      TAG

'I don't know which one got married.'

The second is rare in relative clauses, but it does occur. The construction below is also unusual because it contains a lexical head. It was uttered by an excellent Mohawk speaker, but she was engaged in a somewhat unusual task at the time, describing a film she had seen. It could reflect effects of contact.

(35) Rare extension as restrictive relative: Kaia'titáhkhe' Jacobs, speaker

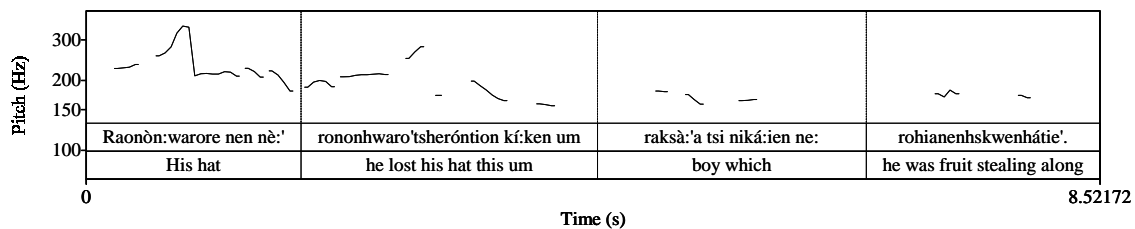
*Raonòn:warore'*    *nen'nè:'e*  
his hat              this it is

*rononhwaro'tsheróntion*    *kí:ken*      *um*  
he hat lost                      this

*raksà:'a* ***tsi níká:ien'***    *ne:*  
boy      **as it lies**      the

*rohianenhskwenhátié'.*  
he is fruit having stolen going along

'The boy who was going along with the stolen fruit lost his hat.'



The use of indefinite pronouns for free relatives seems well motivated semantically. It is easy to imagine that these constructions could have arisen on their own. The fact that where there is a difference between interrogatives and indefinites, the Mohawk constructions show indefinites, does not of course constitute proof that language contact played no role in their development. Bilingual speakers could, for example, have perceived a parallelism between question words and relative pronouns in French or English, developed *ónhka* ‘who’ and perhaps *nahò:ten* ‘what’ constructions by replica grammaticalization, and then later reinterpreted the pattern as one based on indefinites and extending it to other indefinites. The exact sequence of events remains a mystery for now.

In any case, the resulting constructions cover functions well. The relative-like constructions with demonstratives characterize realis referents: they presuppose the existence of a referent (‘This buy they buried yesterday’). Those with indefinite pronouns characterize potentially irrealis referents (‘We ate whatever was there’, ‘He didn’t find anything that we were carrying’).

#### 4. Overall complexity

In the preceding sections, the consideration of the prosodic dimension has allowed us glimpses into possible early stages in the development of two complex constructions: complementation and relativization. It is important to note that this incipient complexity is not characteristic of the language as a whole. There is ample evidence still apparent within the grammar of an old history of syntactic complexity.

One example is provided by traces of what were most likely earlier complex syntactic constructions. Among the verbal suffixes of Mohawk are several instrumental applicatives which derive transitive verbs whose second argument is an instrument. Among them are the suffix *-st* and *-hkw*.

(36) Instrumental applicatives ‘with it’

- |    |                           |  |
|----|---------------------------|--|
| a. | <i>-o’tsirek</i>          | ‘sip’  |
|    | <i>-hnek-o’tsirek</i>     | ‘sip liquid’                                     |
|    | <i>-hnek-o’tsirek-st</i>  | ‘sip liquid with’                                |
|    | <i>iehneko’tsirékha</i>   | ‘she/one sips liquid’                            |
|    | <i>iehneko’tsirékstha</i> | ‘she/one sips liquid <u>with</u> it’ = ‘straw’   |
| b. | <i>-na’ton</i>            | ‘say, call something/someone by name’            |
|    | <i>-na’ton-hkw-</i>       | ‘name someone/something with it, name someone X’ |
|    | <i>wa’khenà:ton</i>       | ‘I mentioned/called her by name’                 |
|    | <i>X wa’khenà:tónhkwe</i> | ‘I named her <u>with</u> it, named her X’        |

The diachronic sources of both suffixes still persist in the language as verb roots. The first is clearly descended from the root *-st* ‘use’ (*i:sats* ‘Use it!’), and the second from the verb root *-hkw-* ‘pick up’ (*té:sekhw* ‘Pick it up!’). A verb meaning ‘use’ is not a surprising source for an instrumental applicative. A verb meaning ‘pick up’ is not so surprising either: prototypically, one picks up an instrument to use it. With grammaticalization the meaning has become more abstract. instrumental applicative verbs no longer necessarily involve a physical act of picking up a concrete object. It is likely that the modern applicative constructions are descended from earlier complex constructions whose constituents became ever more tightly bound over time.

## 5. Conclusion

Adding the dimension of prosody, particularly that characteristic of spontaneous conversation, can enrich our understanding of certain stages in the development of complexity. The prosody of the Mohawk constructions examined here suggests possible pathways of development not obvious from written texts.

Mohawk is a language which might, at first glance, appear to lack syntactic complexity. Counterparts of English complement and relative clause constructions are often expressed in simple strings of syntactically independent sentences. Typical indications of subordination, such as omission of coreferential arguments, and non-finite verbs, do not occur in Mohawk. The core arguments of every clause are overtly identified by pronominal prefixes on the verb, and all verbs are finite. But a look at the prosody of these sequences of clauses reveals integration of another kind and hierarchical structures. The existence of complex prosodic structures in the absence of morphosyntactic markers of subordination suggests that at least in some cases the first might precede the second.

But prosodic structure is not a simple precursor to syntactic structure. Each can show distinctions the other does not. It has sometimes been assumed, for example, that matrix clauses in complex constructions are always asserted, while subordinate clauses are presupposed. Examination of spontaneous speech indicates that subordinate clauses are in fact often not presupposed, though their syntax is identical to those that are. Prosody can mark the difference. Complement clauses conveying new information can be more prominent prosodically, spoken with a wider range of pitches.

Mohawk also contains a construction that at first appears to be equivalent to the English complement construction marked by the complementizer 'that', descended from a demonstrative. The Mohawk construction can indeed contain a demonstrative. Its prosodic pattern suggests an origin in a discourse pattern used to manipulate the flow of information through speech. This development raises interesting issues about the relative contributions of processes of integration and elaboration.

Finally, Mohawk contains some complex constructions that appear at first glance to be prototypical relative clauses. They contain demonstratives and question words, the two kinds of words hypothesized to be the sources of relative pronouns cross-linguistically. A closer look at the prosody of these constructions reveals that differ in internal structure. Further examination reveals additional ways in which they differ from their English counterparts.

We have much to gain by the inclusion of the prosodic dimension in investigations into the development of complex structures in language.



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