Seneca Kinship: solution

http://gawron.sdsu.edu/semantics

Jean Mark Gawron

San Diego State University, Department of Linguistics

February 17, 2020

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

GEN^{-1}

haʔnih	father	F, FB, FMSs, FFBs, FMBs, FFSs, FFFBss, etc.
hakhnóʔsẽh	uncle	MB, MMSs, MFBs, MMBs, MFSs, MMMSds, etc.
noʔyẽh	mother	M, MS, MMSd, MFBd, MMBd, MFSd, MMMSdd, etc.
akeːhak	aunt	FS, FMSd, FFBd, FMBd, FFSd, FFFBsd, etc.

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

A new feature

Consider a NEW feature SIDE with values MOTHERS and FATHERS.

MOTHERS	Kinship types whose first kinship link is M
FATHERS	Kinship types whose first kinship link is F

$\left[\text{SIDE} \quad \text{MOTHERS}\right]$	M, MF, MFd, MFFds, etc.
$\left[\text{SIDE} \quad \text{FATHERS}\right]$	F, FM, FMd, FMFds, etc.

The subtle problem

The feature SIDE can be used to correctly describe GEN^{-1} relatives in Seneca!

All ha?nih ("father") are male GEN^{-1} relatives on the father's side. All no?yẽh ("mother") are female GEN^{-1} relatives on the mother's side. All "uncles" are male GEN^{-1} relatives on the mother's side. All "aunts" are female GEN^{-1} relatives on the father's side. So for example:

$$[\![\text{ha?nih}]\!] = [\![\text{FATHERS}]\!] \cap [\![\text{MALE}]\!] \cap \left[\left[\text{GEN}^{-1}\right]\right]$$

This is an insight. But the feature SIDE does not offer much help when it comes to GEN^{0} relatives. A hatsi? ("elder brother") is a mixture of father's side and mother's side relatives. **Can we do better?**

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

GEN^0 v. GEN^{-1}

haʔnih	my father	F, FB, FMSs, FFBs, FMBs, FFSs, FFFBss, etc.
hakhnóʔsẽh	my uncle	MB, MMSs, MFBs, MMBs, MFSs, MMMSds, etc.
noʔyẽh	my mother	M, MS, MMSd, MFBd, MMBd, MFSd, MMMSdd, etc.
akeːhak	my aunt	FS, FMSd, FFBd, FMBd, FFSd, FFFBsd, etc.
hatsiʔ	my elder brother	B, MSs, FBs, MMSds, FFBss, MFBds, FMSss, MMBds, etc. (older)
akyã́ːʔseːʔ	my cousin	MB(s/d), FS(s/d), MMSs(s/d), FFBd(s/d), MFBs(s/d), FMSd(s/d), MMBs(s/d)

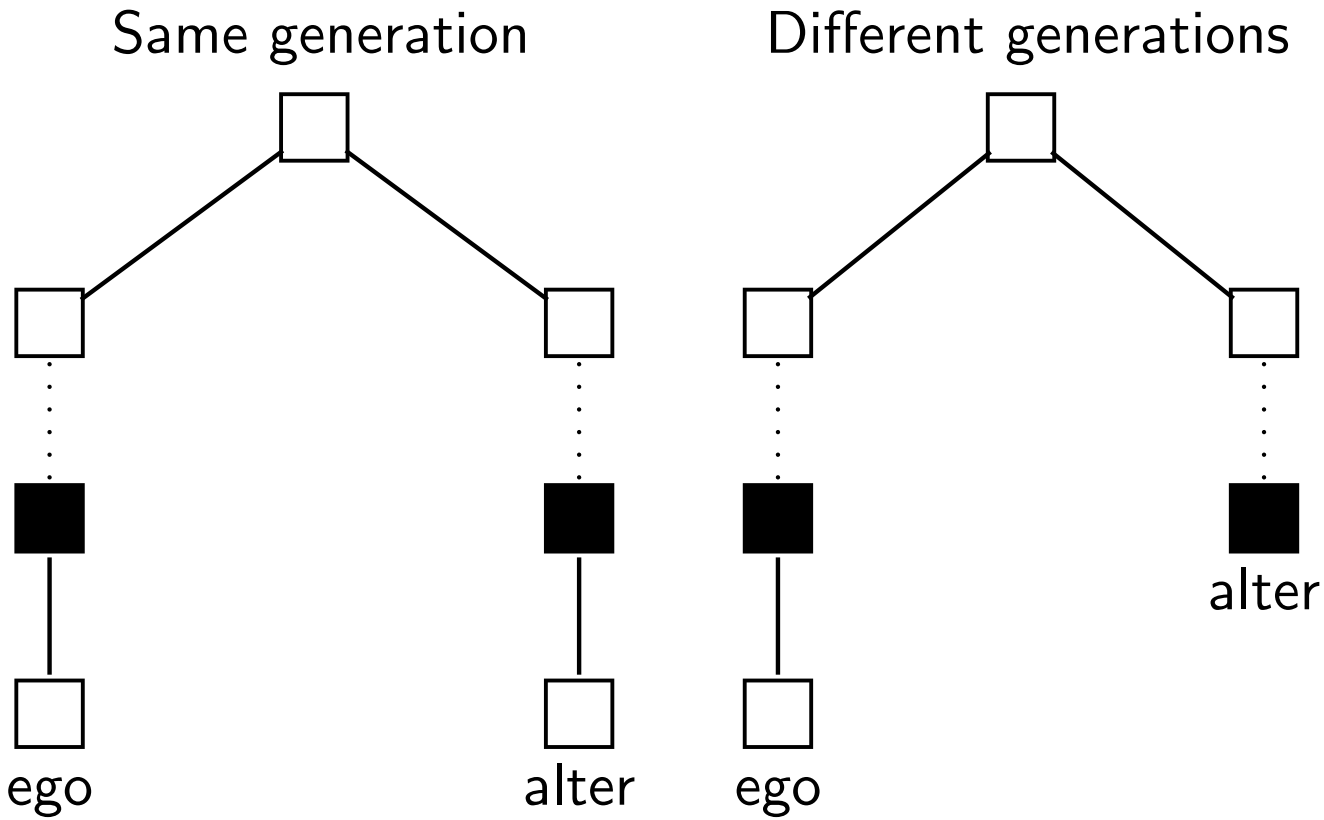
Key observation:

GEN^0 v. GEN^{-1}

haʔnih	my father	F, FB, FMSs, FFBs, FMBs, FFSs, FFFBss, etc.
hakhnóʔsẽh	my uncle	MB, MMSs, MFBs, MMBs, MFSs, MMMSds, etc.
noʔyẽh	my mother	M, MS, MMSd, MFBd, MMBd, MFSd, MMMSdd, etc.
akeːhak	my aunt	FS, FMSd, FFBd, FMBd, FFSd, FFFBsd, etc.
hatsiʔ	my elder brother	B, MSs, FBs, MMSds, FFBss, MFBds, FMSss, MMBds, etc. (older)
akyáːʔseːʔ	my cousin	MB(s/d), FS(s/d), MMSs(s/d), FFBd(s/d), MFBs(s/d), FMSd(s/d), MMBs(s/d)

Key observation: A "brother" is the child of a "father" or "mother". A "cousin" is the child of a "uncle" or "aunt".

Iroquoian cross/parallel: parenthood



Parallel	sister/brother, father/mother: filled squares are same sex
Cross	cousin, uncle/aunt: filled squares are opposite sex

Min Pairs

hatsiʔ	my elder brother	B, MSs, FBs, MMSds, FFBss, MFBds, FMSss, MMBds, etc. (older)
akyáːʔseːʔ	my cousin	MB(s/d), FS(s/d), MMSs(s/d), FFBd(s/d), MFBs(s/d), FMSd(s/d), MMBs(s/d)

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

GEN^{-1} relatives

noʔyẽh
mother

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & -1 \end{bmatrix}$$

haʔnih
father

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & -1 \end{bmatrix}$$

akeːhak
aunt

$$\begin{bmatrix} \text{CP} & \text{CROSS} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & -1 \end{bmatrix}$$

hakhnóʔsẽh
uncle

$$\begin{bmatrix} \text{CP} & \text{CROSS} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & -1 \end{bmatrix}$$

GEN^0 Relatives

ahtsi?
eld. sister

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & 0 \\ \text{AGE} & + \end{bmatrix}$$

hatsi?
eld. brother

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & 0 \\ \text{AGE} & + \end{bmatrix}$$

akyá:?se:?
cousin

$$\begin{bmatrix} \text{CP} & \text{CROSS} \\ \text{GEN} & 0 \end{bmatrix}$$

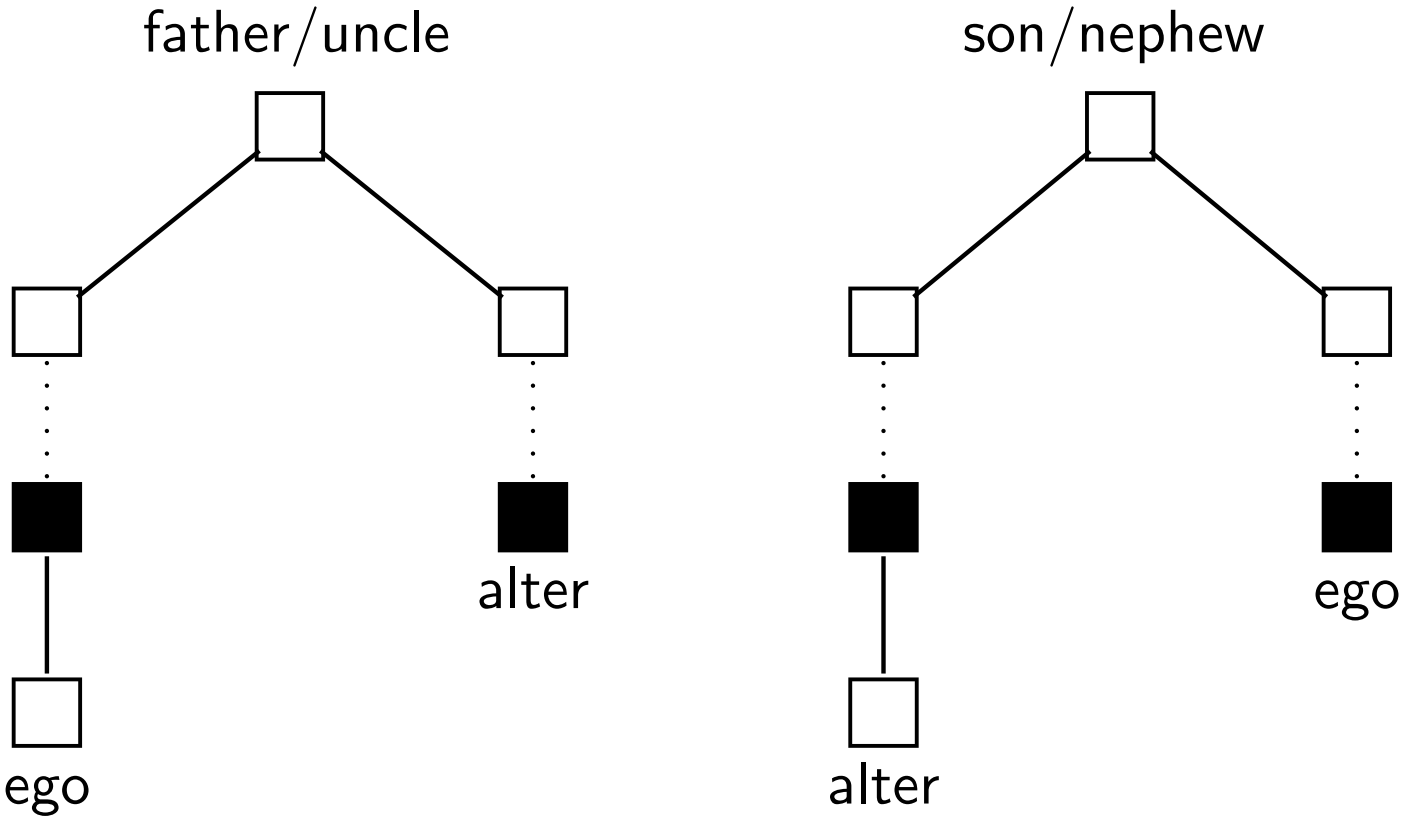
GEN^{-1}, GEN^{0} Feature definitions

CP	CROSS : GEN^{-1} relative links in the kinship type are of the opposite sex; otherwise PAR
SEX	Alter is Male/Female
GEN	Number of generations up or down from Ego
AGE	+ means alter is older than ego; - means younger.

GEN[1] relatives: CP in other GENs

- For male ego, "uncle" and "nephew" are converses

$$\text{uncle}(x, y) \longleftrightarrow \text{nephew}(y, x)$$

- 

$\textsc{gen}^1$: New features

- In the case of *nephew* and *niece* the relatives that count for establishing an Iroquoian cross relationship are NOT in $\textsc{gen}^{-1}$, but in $\textsc{gen}^0$
- Sex of ego matters

Crossed $\textsc{gen}^1$ relatives

heyéːwõːtěʔ
nephew
(♂ego)

$$\begin{bmatrix} \textsc{cp0} & \textsc{cross} \\ \textsc{sex} & \textsc{male} \\ \textsc{esex} & \textsc{male} \\ \textsc{gen} & 1 \end{bmatrix}$$

hehsőʔneh
nephew
(♀ego)

$$\begin{bmatrix} \textsc{cp0} & \textsc{cross} \\ \textsc{sex} & \textsc{male} \\ \textsc{esex} & \textsc{female} \\ \textsc{gen} & 1 \end{bmatrix}$$

kheyéːwõːtěʔ
niece
(♂ego)

$$\begin{bmatrix} \textsc{cp0} & \textsc{cross} \\ \textsc{sex} & \textsc{female} \\ \textsc{esex} & \textsc{male} \\ \textsc{gen} & 1 \end{bmatrix}$$

khehsőʔneh
niece
(♀ego)

$$\begin{bmatrix} \textsc{cp0} & \textsc{cross} \\ \textsc{sex} & \textsc{female} \\ \textsc{esex} & \textsc{female} \\ \textsc{gen} & 1 \end{bmatrix}$$

Parallel GEN^1 relatives

khe:hawak
daughter

$$\begin{bmatrix} \text{CP0} & \text{PAR} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & 1 \end{bmatrix}$$

he:hawak
son

$$\begin{bmatrix} \text{CP0} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & 1 \end{bmatrix}$$

GEN^{-1} Relatives: A second CP feat

no?yẽh
mother

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & -1 \end{bmatrix}$$

ha?nih
father

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & -1 \end{bmatrix}$$

ake:hak
aunt

$$\begin{bmatrix} \text{CP} & \text{CROSS} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & -1 \end{bmatrix}$$

hakhnó?sẽh
uncle

$$\begin{bmatrix} \text{CP} & \text{CROSS} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & -1 \end{bmatrix}$$

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

A key notational problem

Feature notation not ideal for relational facts

We need more than 1 feature representing the same underlying relationship. CP and CP0 check for identity of sex among relatives in the same generation, but because ego and alter are swapped, we need different features to do that.

GEN^{-1} and GEN^{1}

That these relations are converses is uncaptured.

no?yẽh
mother

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & -1 \end{bmatrix}$$

ha?nih
father

$$\begin{bmatrix} \text{CP} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & -1 \end{bmatrix}$$

khe:hawak
daughter

$$\begin{bmatrix} \text{CP0} & \text{PAR} \\ \text{SEX} & \text{FEMALE} \\ \text{GEN} & 1 \end{bmatrix}$$

he:hawak
son

$$\begin{bmatrix} \text{CP0} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & 1 \end{bmatrix}$$

Entailments

$\text{female}(x)\,\&\,\text{mother}(y,x) \longrightarrow \text{daughter}(x,y)$
$\text{male}(x)\,\&\,\text{mother}(y,x) \longrightarrow \text{son}(x,y)$
$\text{female}(x)\,\&\,\text{father}(y,x) \longrightarrow \text{daughter}(x,y)\text{male}(x)\,\&\,\text{father}(y,x) \longrightarrow \text{son}(x$

Another view: Two distinct relations unnecessary

y is x's mother	$\text{parent}(y, x)$ & $\text{female}(y)$
x is y's daughter	$\text{parent}(y, x)$ & $\text{female}(x)$
y is x's father	$\text{parent}(y, x)$ & $\text{male}(y)$
x is y's son	$\text{parent}(y, x)$ & $\text{male}(x)$

Unifying the account

- **iparent** x and y stand in an **iparent** relation if they are consanguineal relatives who are exactly one generation apart.
- **iparent parent** x is the **iparent parent** of y if x and y stand in an iparent relation and x is in the older generation.
- **iparent child** x is the **iparent child** of y if x and y stand in an iparent relation and x is in the younger generation.
- **parallel iparent** x and y stand in a **parallel iparent** relation if x and y stand in an iparent relation and the parent of the iparent child is the same sex as the iparent parent.

The last step

x and y stand in a parallel iparent relation only if one is a parallel iparent of the other (one gen apart), so this handles both GEN^{-1} and GEN^{1} cases, but it doesn't yet handle the GEN^{0} case, where x and y are in the same generation.

Generalized parallel iparent

ego and *alter* stand in a **generalized parallel iparent** (GPP) relation if either x and y stand in a parallel iparent relation; or the parent of *ego* is the iparent parent in a parallel iparent relation to *alter*.

he:hawak
son

$$\begin{bmatrix} \text{CP0} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & 1 \end{bmatrix} \Longrightarrow \begin{bmatrix} \text{GPP} & \text{PAR} \\ \text{SEX} & \text{MALE} \\ \text{GEN} & 1 \end{bmatrix}$$

Structural differences

True in Seneca and English

If A is B's "brother", then A is the "son" of B's "father" or "mother".

True only in English

If A is B's "nephew", then A is the son of B's "sibling" (Seneca elder brother or younger brother or elder sister or younger sister).

heyẽ:wõ:tĕ? includes FSds (FSd is a cousin)
nephew
(♂ego)

Logical relationships

Logical relationships are not being captured.

Symmetry	$\text{cousin}(x, y) \longleftrightarrow \text{cousin}(y, x)$
Converses	$\text{male}(x)\ \&\ \text{father}(y, x) \longleftrightarrow \text{son}(x, y)\ \&\ \text{male}(y)$
	$\text{female}(x)\ \&\ \text{mother}(y, x) \longleftrightarrow \text{daughter}(x, y)\ \&\ \text{female}(y)$
	$\text{male}(x)\ \&\ \text{uncle}(y, x) \longleftrightarrow \text{nephewm}(x, y)\ \&\ \text{male}(y)$
	$\text{female}(x)\ \&\ \text{aunt}(y, x) \longleftrightarrow \text{niecef}(x, y)\ \&\ \text{female}(y)$
Entailment	$\text{female}(x)\ \&\ \text{father}(y, x) \longleftrightarrow \text{daughter}(x, y)\ \&\ \text{male}(y)$
	$\text{male}(x)\ \&\ \text{mother}(y, x) \longleftrightarrow \text{son}(x, y)\ \&\ \text{female}(y)$
	$\text{father}(z, x)\ \&\ \text{uncle}(z, y) \longrightarrow \text{cousin}(x, y)$

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

Logical predicates

iparent(x, y)	is true of x and y when either x is y's parent or x is a consanguineal relative of y's parent, p, in the same generation as p, and has the same sex as p.
inuncle(x, y)	is true of x and y when x is a consanguineal relative of y's parent, p, in the same generation as p, and has the opposite sex from p.

---

haʔnih father	x is my haʔnih if and only if iparent(x, me) and x is male.
heːhawak son	x is my heːhawak if and only if iparent(me, x) and x is male.
hatsiʔ eld. brother	x is my hatsiʔ if and only if I have a parent p such that iparent(p, x) and male(x) and older-than(x, me).

Iparent/Ichild Axioms

	iparent
(a)	$\text{parent}(p, c) \rightarrow \text{iparent}(p, c)$
(b)	$\text{iparent}(p, c) \,\&\, \text{sgr}(p, z) \,\&\, \text{ss}(p, z) \rightarrow \text{iparent}(p, z)$
	inuncle
(c)	$\text{iparent}(p, c) \,\&\, \text{sgr}(p, z) \,\&\, \sim \text{ss}(p, z) \rightarrow \text{inuncle}(p, z)$
	isybling
(d)	$\text{iparent}(p, c_1) \,\&\, \text{parent}(p, c_2) \rightarrow \text{isybling}(c_1, c_2)$
	icousin
(e)	$\text{inuncle}(p, c_1) \,\&\, \text{parent}(p, c_2) \rightarrow \text{icousin}(c_1, c_2)$

Same generation relative Axioms

same-generation-relation: a consanguineal relation in the same generation as ego

$$(a) \quad \text{sybling}(x, y) \rightarrow \text{sgr}(x, y)$$
$$(b) \quad \text{parent}(p_1, c_1) \,\&\, \text{parent}(p_2, c_2) \rightarrow [\, \text{sgr}(p_1, p_2) \leftrightarrow \text{sgr}(c_1, c_2) \,]$$

Outline

1. Iroquoian kinship concepts
2. A solution with a subtle problem
3. The key idea
4. A solution
5. Problems with the solution
6. A logic-based solution
7. Summary of logic-based solution

No word for a key concept

The iparent relation is a parenting relation that holds between consanguineal relatives separated by one generation.

Notice that Seneca has no word for a **same-sex-same-generation-relative**, the crucial relation we used in our **iparent** axiom. Call this a member of ego's **cohort**. A member of ego's cohort might be either a cousin or a sibling. A sybling does not need to be of the same sex, but a member of one's cohort does. It is interesting that the cohort soncept seems to be crucial but there's no word for it.

Maybe that's because that concept plays no role in Seneca. It may be that when you or a member of your cohort has a child, a significant relation springs into existence, defining rights and obligations. It's an iparenting relation.