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The deeper regularities behind irregularities

Abstract

A major goal of linguistics is to discover regular patterns in language. Irregularities are accordingly often dismissed as uninteresting, primarily annoyances for the analyst and language learner. But irregularity is rarely arbitrary, though we may not always be able to uncover the reasons behind it. It can tell us much about the cognitive capacities behind the language faculty itself. Examples are examined here of what can be learned from some morphological irregularities in Mohawk, a language with particularly elaborate morphological structure. Apparent irregularities in both derivation and inflection can be seen to result from such human cognitive processes as pattern recognition, generalization, extension, and reanalysis, and the routinization of frequently-recurring operations, particularly the lexicalization of complex forms.

1. Irregularity

Irregularity in language is the most noticeable in those areas with the strongest patterning, particularly morphology. The most obvious kinds of morphological irregularity are unpredictable forms, unpredictable meanings, and the non-existence of predicted formations. There are well-established classifications of kinds of deviation from one-to-one correspondences between forms and meanings: suppletion, syncretism, deponency, and defectiveness. The familiar classification is certainly useful for synchronic description. But we can go further, investigating why these phenomena might exist in the first place. Ultimately they can shed light on some of the human linguistic capacity that regularities cannot.

Irregularity can rarely be understood from a synchronic vantage point alone. Speakers happily learn, use, and pass on irregular forms they would never create. But irregularities are not random. They typically result from sequences of events that unfold over time, each of which makes cognitive sense at the moment. When we pull apart the layers of development of the patterns involved, irregularities can point to the operation of such processes as pattern recognition, pattern generalization, pattern extension, pattern reanalysis, and the routinization of recurring tasks.

2. Mohawk

Good observation points for irregularity are provided by languages with complex morphological structures. One such language is Mohawk, a member of the Iroquoian family indigenous to northeastern North America, spoken at present in areas of Quebec, Ontario, and New York State. Relations among the Iroquoian languages are shown schematically in Figure 1.
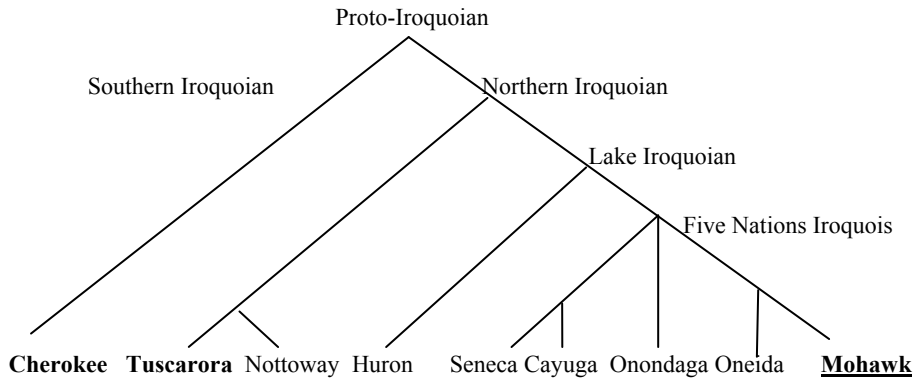

Figure 1: The Iroquoian language family

A sample of the potential morphological complexity of Mohawk can be seen in the verb in (1). (Abbreviations are listed at the end of the article.) This verb is based on the root *-kehront-* 'lay out', combined with a middle voice prefixes 'lay out one's own' = 'peddle, sell'. It contains an incorporated noun stem 'car', based on the verb root *-'ser* 'drag' with its own middle prefix and instrumental nominalizer.

(1)   *Tha'tontahotenenneri'tate'serehtatkehrontakohátie'.*
        tha'-t-onta-ho-ate-nenneri't-ate-'sere-ht-at-kehront-ako-hatie'
        CONTR-DUPLIC-CISLOC-M.SG.PAT-MID-dang-MID-drag-NMZR-MID-lay.out-REV-PROGR
        'He's just on his way back from buying himself another dang car.'

The language contains rich derivational and inflectional morphology, with most complexity concentrated in the verb. Irregularity in both types of morphology is discussed in the sections which follow.

3. Derivation

We know that derivational morphology is patterned: speakers exploit the patterns to understand and create novel formations. But derivation is also notorious for its ranges of predictability of form, meaning, and productivity. This section examines a produc-

tive derivational process in Mohawk: the formation of instrumental applicatives. There are several instrumental applicative suffixes, among them *-hst* and *-hkw*.

(2)   *iera'wistakarháthohs*   'one flips pancakes'
        iera'wistakarhathó-<u>hst</u>-ha'   'one flips pancakes <u>with</u> it'
                                     = 'spatula')

(3)   *iehontanawénhtha'*   'one moistens greens'
        iehontanawenhtá-<u>hkw</u>-ha'   'one moistens greens <u>with it</u>'
                                     = 'teapot'

Instrumental applicatives are pervasive in derived terms for tools, utensils, and other kinds of equipment.

(4)   *iene'konhrék-<u>st</u>-ha'*   'one pounds <u>with</u> it = hammer'
        ienawa'tstarhó-<u>hst</u>-ha'   'one spreads mud <u>with</u> it = trowel'
        iontenaktorók-<u>st</u>-ha'   'one bed-covers <u>with</u> it = bedspread'
        iehwista'ék-<u>st</u>-ha'   'one strikes metal <u>with</u> it = bell'
        iakotà:-st-ha'   'one sleeps <u>with</u> it = pajama'

(5)   *ienon'tawerontá-<u>hkw</u>-ha'*   'one pours milk <u>with</u> it = milk pitcher'
        ienontarotsienhtá-<u>hkw</u>-ha'   'one fetches soup <u>with</u> it = ladle'
        iehnekará-<u>hkw</u>-ha'   'one liquid inserts <u>with</u> it = pail'
        iehnenna'tó-<u>hkw</u>-ha'   'one boils potatoes <u>with</u> it = pot'
        iekontsherihará-<u>hkw</u>-ha'   'one hangs pounds <u>with</u> it = scale'

There is no obvious regularity in the distribution of the two instrumental applicative suffixes. The choice is not phonologically conditioned. It is however, not unmotivated.

    Both of the suffixes are descended from verb roots. The suffix *-hst* originated as a root 'use'; the suffix *-hkw* originated as a root 'pick up'.

(6)   *kát<u>st</u>ha'*
        k-at-<u>hst</u>-ha'
        1SG.AGENT-MIDDLE-<u>use</u>-HABITUAL
        'I use it.'

(7)   *teké<u>hkhw</u>a'*
        te-ke-<u>hkw</u>-ha'
        DUPLICATIVE-1SG.AGENT-<u>pick.up</u>-HABITUAL
        'I pick it up.'

Both roots make sense as sources for instrumental applicative markers. One <u>uses</u> a tool to V. One <u>picks up</u> a tool and Vs. The applicative constructions apparently originated in Verb-Verb compounds. The original alternation between *-hst* and *-hkw* was a matter of lexical choice, a choice governed by concrete semantics. One <u>uses</u> pajamas to sleep (pajamas), and one <u>picks up</u> a hammer to pound.

The development of the earlier compound constructions into modern instrumental applicatives reflects several kinds of processes at work. Speakers extended the two compounding patterns, one containing the root 'use', the other the root 'pick up', to new combinations. With increased frequency, these root-root sequences evolved into root-suffix structures. As the pattern was extended to ever more formations, the meanings of the suffixes became increasingly general and abstract. The original semantic motivations for the choice between *-hst* and *-hkw* were obscured. The functions of the two markers merged, so that now, the choice between them is no longer semantically motivated.

4. Inflection: pronominal prefixes

All Mohawk verbs contain a pronominal prefix identifying the core arguments of the clause, one for intransitives, two for transitives. The pronominal system illustrates a number of types of irregularity.

It is important to keep in mind that sometimes apparent irregularity is not actually a feature of the system, but the result of an imprecise analysis. Consider the prefix *k-* in the verbs in (8). It appears to be a straightforward first person subject pronoun meaning 'I'.

(8)   *k-ká:wehs*   'I paddle'
       k-tákhe'   'I run'
       k-hní:nonhs   'I buy it'
       k-ia'tíhsaks   'I am looking for it'

But there is another prefix *wak-* which is also translated 'I'.

(9)   *wak-í:ta's*   'I'm sleeping'
       wak-é:ka's   'I like it'
       wak-áhton   'I'm full'
       te-wak-henréhtha'   'I yell'

These forms are not exceptions. The pronominal prefix system is built not on subject and object categories, but on grammatical agent and patient categories. Grammatical agent pronouns are used for referents who actively instigate and control situations (*k-*). Grammatical patient pronouns are used for referents who are affected but not in control (*wak-*). These are not simply two subcategories of subjects. The patient pronouns also correspond to English objects.

(10)   *wák-kenhs*   '(It) sees me'
       wak-ia'tíhsaks   '(It) is looking for me'
       wak-atkáhthohs   '(It) is looking at me'
       wake-nòn:we's   '(It) likes me'

Once the nature of the categories is straightened out, the patterns can be seen to be robust. But there are a few exceptions. The verb 'throw' occurs with grammatical patient pronouns.

(11)   *ie-<u>wak</u>-átie's*   '<u>I</u> throw it'

A person who throws would certainly seem to be a semantic agent. There is a reason behind this apparent irregularity. Verbs for throwing are based on the verb stem *-ati* 'lose'. As expected, verbs meaning 'lose' appear with patient pronouns: losing things is generally involuntary. The use of this verb 'lose' in verbs for throwing, with patient pronominal prefixes, is apparently quite old, already present in Proto-Iroquoian. Cognate constructions still persist in the Northern Iroquoian language most distantly related to Mohawk: Tuscarora. They also persist in the Southern branch of the family, Cherokee (Feeling 1975: 159).

(12)   Tuscarora: *<u>wak</u>-á:'nyẹhs*   '<u>I</u> lose it, throw it'
       Cherokee: *<u>agw</u>-adega*   '<u>I</u> throw it'

(Mohawk verbs for 'throw' typically include specification of direction, such as the translocative prefix *ie-* 'away' of *iewakátie's* 'I throw it away'.)

The apparent irregularity in choice of pronominal paradigm for the verb 'throw' is the result of certain cognitive processes. Pronominal paradigm choice is routinized, memorized with each verb stem rather than calculated during speech from judgments about degrees of volition and control. Even if someone 'lost' something intentionally, the event would be described with a patient pronominal prefix. The routinization extends to whole lexical items. When the verb 'lose' was used to mean 'throw', perhaps with a translocative, the memorized pronominal paradigm came along with it, though it was no longer semantically motivated. This apparent irregularity indicates that at least some Mohawk verbs are retrieved as whole, inflected words, not assembled online.

5. Formal irregularity

The basic form of the second person agent pronominal prefix 'you' is *-hs-*, with loss of the *h* word-initially.

(13)   *wa-<u>hs</u>-ká:we'*   '<u>you</u> paddled'
       en-<u>hs</u>-ká:we'   '<u>you</u> will paddle'
       a-<u>hs</u>-ká:we'   '<u>you</u> should paddle'

       <u>s</u>-ká:wehs   '<u>you</u> paddle'
       <u>s</u>-tákhe'   '<u>you</u> run'
       <u>s</u>-hní:nonhs   '<u>you</u> buy it'

Imperatives, like other verbs, contain pronominal prefixes. Agent and patient forms are distinguished, and singular, dual, and plural number.

(14)   <u>s</u>-ká:we   'Paddle!'
       <u>seni</u>-ká:we   'Paddle, you two!'
       <u>sewa</u>-ká:we   'Paddle, everyone!'

The prefixes usually have the same form in statements and commands.

(15)   Singular statements   Singular commands
       serákwahs   'You choose it'   será:ko   'Choose!'
       shní:nonhs   'You buy it'   shí:non   'Buy it!
       satíta's   'You get in'   satíta'   'Get in!'
       sewistóhtha'   'You chill it'   sewístoht   'Chill it!'
       séhsaks   'You look for it'   séhsak   'Look for it!'
       satkáhthohs   'You look at it'   satkáhtho   'Look!'
       senná:kahre'   'You whistle'   senná:kahr   'Whistle!'
       só'kwats   'You dig'   só'kwat   'Dig!'
       sahsé:tahs   'You count'   sáhset'   'Count!'
       skwatákwahs   'You fix it'   skwatá:ko   'Fix it!'
       shrárhohs   'You pull ashore'   shrárho   'Pull ashore!'

In a few commands, however, the form of the pronominal prefix is different. It palatalizes to [tš] (IPA [tʃ]), but only in imperative forms.

(16)   <u>si</u>á:ken's   'You go out'   <u>ts</u>iá:ken'n   'Leave!'
       <u>si</u>a'táta's   'You bury it'   <u>ts</u>ia'táta'   'Bury it!
       <u>si</u>énthohs   'You plant'   <u>ts</u>iéntho   'Plant!
       <u>sí</u>tskote'   'You are seated' <u>ts</u>itskó:tak   'Stay seated!'
       <u>si</u>é:nahs   'You grab it'   <u>ts</u>ié:na   'Grab it!'
       <u>si</u>'terónhnhahs 'You take/lead it' <u>ts</u>i'terónhna'   'Take it!'

Again there is a reason. The original Proto-Northern-Iroquoian pronominal prefixes in statements and commands were different.

(17)   Proto-Northern-Iroquoian
       *hs   2SG AGENT   *θ/tš   2SG IMPERATIVE AGENT

The difference persists in Tuscarora.

(18)   Tuscarora
       <u>s</u>-ačhù:rih   '<u>You</u> eat'   <u>θ</u>-ačhù:rih   'Eat!'
       <u>s</u>-a'rihẹ́:tyẹhs   '<u>You</u> read it'   <u>θ</u>-a'rihẹ́:tyẹh   'Read it!'

The Proto-Northern Iroquoian *θ regularly alternated with *tš before a high front vowel *i or glide *y (both spelled *i* in the standard orthography). This pattern, too, persists

regularly in Tuscarora, throughout the language. The sibilant *s* in statements remains *s* in all contexts, but the *θ* in commands alternates with *tš* before *i* or *y*.

(19)   Tuscarora
       s-yẹ́:thuhs 'You plant'   *tš-yẹ́:thuh*   'Plant!'

Sometime after Tuscarora had separated from the other Northern Iroquoian languages, original *θ merged with *s. None of the other modern languages now contain θ at all. What is interesting is that even though the phonological basis for the *s/tš* alternation is now gone in these languages, the pattern of alternation persists. In Mohawk, the prefix *s-* 'you' alternates with palatal *tš* before *i* or *y* only in commands. The patterning has been reinterpreted as morphological rather than phonological. (In some dialects *tšy* has now shifted to *ts*.)

The reinterpretation can be seen in all of the modern Northern Iroquoian languages. Interestingly, some younger speakers of Seneca, another Northern Iroquoian language, are beginning to remodel the imperative forms, smoothing out what appears to be an unmotivated alternation.

(20)   Seneca
       ts-ihsa:k   'Look for it!'   (older speaker)
       s-ihsa:k   'Look for it!'   (younger speaker)

These apparent irregularities again reflect certain cognitive processes. Speakers have recognized a pattern in which the pronoun 'you' has different forms in statements and commands. They have reanalyzed the alternation as morphological rather than phono-logical. Some younger Seneca speakers are now beginning to remodel the pattern, ge-neralizing the forms used in statements. It may not be irrelevant that imperative forms are used less frequently by Seneca speakers than by Mohawk speakers. Seneca speakers typically use future indicative forms in place of imperative forms for commands.

Second person pronominal prefixes in Mohawk and related languages show another interesting irregularity. The basic form of the transitive prefix 'you/me' is *-hsk-*. The elements of the prefix are still clear: *-hs-* 'you' + *-ak-* 'me' → *-hsk-* 'you/me'.

(21)   Mohawk 'you/me'
       wa-hsk-atkáhtho'   'You looked at me'
       en-hsk-atkátho'   'You'll look at me'

       wa-hsk-i'terónhna'You took me'
       en-hsk-i'terónhna'   'You'll take me'

As seen earlier, the basic form of the second person agent prefix *-hs-* 'you' remains the same in habitual and stative verbs, with loss if *h* word-initially. With the prefix *-hsk-*, however, there is a surprise.

(22)   *tak-atkáhthohs*   'You look at me'
       tak-atkáhtho   'Look at me!'

tak-i'terónhne'	'You've brought me'
tak-i'terónhna	'Take me there!'

The form is quite different: *tak-* in place of *-hsk-*.

Again there is an explanation. The cislocative prefix *ta-* 'hither, this way' occurs immediately before the pronominal prefixes in verbs. (It contrasts with the translocative *ia'-* 'thither, that way, away, there'.)

(23) *ta-sá:ti*   'Throw it here!'
      ia'-sáti   'Throw it over there!'

Apparently at some point, speakers began using the cislocative 'hither' in place of direct reference to their listeners at the beginning of commands, perhaps for politeness. This construction was apparently already in place in Proto-Northern-Iroquoian. It occurs in all of the other Northern Iroquoian languages, including Tuscarora. Interestingly, this usage has been extended in different directions in the different daughter languages. In Tuscarora it has been generalized to all imperatives, even when the pronominal prefix is not word-initial. In Mohawk, it has been generalized to all word-initial contexts, in both commands and statements (Mithun 1996).

Again these apparent irregularities reflect interesting cognitive processes. A construction originally created to show politeness was used with increasing frequency, to the point where it became crystallized in the grammar, the only possible form at the beginning of commands. The form was then extended in different ways in the different languages.

6. Defectiveness in pronominal inflection

As described earlier, all Mohawk verbs contain pronominal prefixes identifying core arguments: one for intransitives and two for transitives.

(24) *rak-*   M.SG/1SG
       rak-hsere's   'he is chasing me'
       rak-hsnié:nonhs   'he helps me'

      iak-   F.SG/1SG
       iák-hsere's   'she is chasing me'
       iak-hsnié:nonhs   'she helps me'

      ri-   1SG/M.SG
       rí-hsere's   'I am chasing him'
       ri-hsnié:nonhs   'I help him'

      khe- 1SG/FSG
       khé-hsere's   'I am chasing her'
       khe-hsnié:nonhs   'I help her'

Kinship terms contain similar prefixes. Basically, the senior member of a kinship relation is identified by an agent form, and the junior member by a patient form. In terms for grandparents for example, the grandparent is identified by an agent form, and the grandchild by a patient form.

(25) <u>*rak-*</u> M.SG/1SG
   <u>*rak*hsótha</u>   '<u>he</u> is grandparent to <u>me</u>' = 'my grandfather'
   <u>*rak*e'níha</u>   '<u>he</u> is father to <u>me</u>' = 'my father'
   <u>*rak*htsì:'a</u>   '<u>he</u> is older sibling to <u>me</u>' = 'my older brother'

   <u>*ak-*</u> F.SG/1SG
   <u>*ak*hsótha</u>   '<u>she</u> is grandparent to <u>me</u>' = 'my grandmother'
   <u>*ak*e'nisténha</u>   '<u>she</u> is father to <u>me</u>' = 'my mother'
   <u>*ak*htsì:'a</u>   '<u>she</u> is older sibling to <u>me</u>' = 'my older sister'

   <u>*ri-*</u> 1SG/M.SG
   <u>*ri*iaterè:'a</u>   '<u>I</u> have <u>him</u> as grandchild' = 'my grandson'
   <u>*ri*ièn:'a</u>   '<u>I</u> have <u>him</u> as child' = 'my son'
   ri'kèn:'a   '<u>I</u> have <u>him</u> as younger sibling = my younger brother'

   <u>*khe-*</u> 1SG/F.SG
   <u>*khe*iaterè:'a</u>   '<u>I</u> have <u>her</u> as grandchild' = my granddaughter'
   <u>*khe*ièn:'a</u>   '<u>I</u> have <u>her</u> as child' = 'my daughter'
   <u>*khe*'kèn:'a</u>   '<u>I</u> have <u>her</u> as younger sibling' = 'my younger sister'

Because there are so many pronominal categories, the potential number of kinship terms is enormous. For a term like 'younger sibling', for example, there could be 35 different forms.

(26) *iakeni'kèn:'a*   'our younger sister'   1EXCL.DU/F.SG
   teni'kèn:'a   'our younger sister'   1INCL.DU/F.SG
   iakwa'kèn:'a   'our younger sister'   1EXCL.PL/F.SG
   tewa'kèn:'a   'our younger sister'   1INCL.PL/F.SG
   konwati'kèn:'a   'their younger sisters'   3DP/F.DP
   shakeni'kèn:'a   'our younger brother'   1EXCL.DU/M.SG
   ehtshiteni'kèn:'a   'our younger brother'   1INCL.DU/M.SG
   shakwa'kèn:'a   'our younger brother'   1EXCL.PL/M.SG
   ehtshitewa'kèn:'a   'our younger brother'   1INCL.PL/M.SG   etc.

But there are surprises. The prefix for 'they/me' in verbs is *ionk-*.

(27) *ionk-* 3PL/1SG
   <u>*iónk*-hsere's</u>   '<u>they</u> are chasing <u>me</u>'
   <u>*ionk*-hsnié:nonhs</u>   '<u>they</u> help <u>me</u>'

We would thus expect the word for 'my older brothers' to be ****ionk-htsì:'a* 'they are older siblings to <u>me</u>' (3PL/1SG). Instead we find singular pronominal prefixes plus a distributive enclitic.

(28) *ra<u>k</u>htsi'<u>shòn:'a</u>*
       rak-htsi'=shon'=a
       <u>M.SG</u>/1SG-be.older.sibling.to=<u>DISTRIBUTIVE</u>=DIMINUTIVE
       'my older brothers'

(29) *a<u>k</u>htsi'<u>shòn:'a</u>*
       ak-htsi'=shon'=a
       <u>F.SG</u>/1SG-be.older.sibling.to=<u>DISTRIBUTIVE</u>=DIMINUTIVE
       'my older sisters'

These terms are irregular against the backdrop of the pronominal paradigms running through the grammar. There is, however, an explanation. Proto-Iroquoian contained a special generic or indefinite third person pronominal category comparable to English *one* or French *on*. It meant 'one' or 'people'. This category persists in all of the modern daughter languages with this meaning.

In some contexts, this category has been extended to use as a referential plural 'they' or 'them'. In some pronominal combinations used with verbs, it has now replaced the original masculine and feminine plural forms.

(30) Combinations with first and second persons
       ionk-   'people/me'   >   'they/me'   <u>INDEF</u>/1SG   >   <u>3DP</u>/1SG
       ionkhi-   'people/us'   >   'they/us'   <u>INDEF</u>/1DP   >   <u>3DP</u>/1DP
       iesa-   'people/you'   >   'they/you'   <u>INDEF</u>/2SG   >   <u>3DP</u>/2SG
       ietshi-   'people/you'   >   'they/you'   <u>INDEF</u>/2DP   >   <u>3DP</u>/2DP

In other combinations, indefinite forms are still competing with the older plural forms. Both can be heard.

(31) *ronwati-*   '<u>people</u>/them M' >   '<u>they</u>/them'   INDEF/<u>M.DP</u> >   <u>3DP</u>/M.DP
       konwati-   '<u>people</u>/them F' >   '<u>they</u>/them   INDEF/<u>F.DP</u> >   <u>3DP</u>/F.DP
       shakoti-   'they M/<u>people</u>' >   'they/<u>them</u>'   M.DP/<u>INDEF</u> >   M.DP/<u>3DP</u>
       iakoti-   'they F/<u>people</u>' >   'they/<u>them</u>'   F.DP/<u>INDEF</u> >   F.DP/<u>3DP</u>

The replacement of the masculine and feminine plural forms by the indefinite is in the process of making its way through the verbal pronominal paradigm, category by category. It is also making its way through the kinship terms, but in this case, lexical ítem by lexical item. Those kinship terms that are learned earliest and used most frequently are most resistant to the remodeling: terms for 'their grandmother', 'their grandfather', 'their mother', 'their father', 'their uncle', 'their older sister', and 'their older brother'. Alternative formations are used in place of those for which there are gaps. (Further examples of defectiveness are discussed in Mithun 2010.)

These irregularities again shed some light on the nature of linguistic knowledge. Even in the case of elaborate inflectional systems, speakers know at least some whole inflected words, and manipulate them as units rather than assembling them online. The more frequent the word, the stronger this knowledge appears to be. At the same time, this example shows that speakers do recognize patterns and extend them, a process observable in the gradual replacement of third person plural forms by indefinite forms in the verbal and kinship paradigms.

7. Semantic irregularity in pronominal inflection

A frequently-cited feature of inflectional morphology is semantic regularity. Inflected forms should have fully predictable meanings. It has sometimes been proposed that particularly in languages with elaborate inflection, speakers could not possibly remember inflected forms. Semantic regularity is thus exactly what would be expected. With around 60 pronominal prefixes, Mohawk should provide a good test case. Here, too there are surprises.

7.1. Holding

A common Mohawk verb stem is *-iena* 'grab, hold'. It appears with the full range of transitive pronominal prefixes.

(32) *tsié:na*   'Catch it!'   2SG
      takié:na   'Hug me! Hold me!   2SG/1SG

      wahiié:na'   'I held him'   1SG/M.SG
      wehtshié:na'   'you held him'   2SG/M.SG
      etc.

The combinations do not always have their predicted meanings, however. With the pronominal prefix 'they/him', the verb cannot mean 'they held him'; it can only mean 'they arrested him' With the pronominal prefix 'he/him', the verb cannot mean 'he arrested him'; it can only mean 'he held him'.

(33) *wahonwaié:na'*   'they arrested him'   3PL/M.SG
                          Not 'they held him'

      wahoié:na'   'he held him'   M.SG/M.SG
                          Not 'he arrested him'

Speakers are taken aback at the suggestion that *wahonwaié:na'* (with prefix *-honwa-* 'they/him') could mean 'they hugged him'. They explain that such a situation is simply

unimaginable. No one would ever say such a thing. They have another explanation for the fact that *wahonwaié:na'* can mean only 'they arrested him', while *wahoié:na'* can never mean 'he arrested him'. Arrests in these Mohawk communities, located in Quebec, were always carried out by Canadian Mounties. Arrests were understood as the act of a group or a generic, unidentified force. Local peacekeepers do things differently.

7.2. Sensing

Another common verb stem shows semantic idiosyncrasy. This is -*attok*- 'sense, feel, perceive, notice'.

(34)   *kattókha'*
       k-at-tok-ha'
       1SG.AGENT-MIDDLE-notice-HABITUAL
       'I am wise'

It appears with the expected pronominal prefixes: <u>k</u>-*attókha'* '<u>I</u> am wise', <u>s</u>-*attókha'* '<u>you</u> are wise', <u>ion</u>-*ttókha'* '<u>she</u> is wise'. But with the masculine singular, there is a surprise.

(35)   *kattókha'*   'I am wise'
       sattókha'   'you are wise'
       ionttókha'   'she is wise'
       <u>*rattókha'* </u>   <u>he is stingy</u>

Negation is expressed in Mohawk by a combination of the negative particle *iáh* plus a prepronominal prefix, either the negative *te-* or the contrastive *th-*.

(36)   *kká:wehs*   'I paddle'
       iáh te-kká:wehs   'I don't paddle'

          ská:wehs   'you paddle'
       iáh te-hská:wehs   'you don't paddle'

          raká:wehs   'he paddles'
       iáh te-haká:wehs   'he doesn't paddle'

          ieká:wehs   'she paddles'
       iáh te-ieká:wehs   'she doesn't paddle'

The forms and meanings of negated verbs are predictable, or rather almost predictable. With the verb -*attok*, speakers report a gap in the first person.

(37)   *kattókha'*   'I am wise'
       ** *iah te-kattókha'*   <u>Does not exist</u>

And with other pronominal prefixes, the meanings are surprising.

(38)   *rattókha'*   'he is stingy'
    iah te-hattókha'   'he didn't use his head, made a foolish mistake'

        ionttókha'   'she is wise'
    iah te-ionttókha'   'she's not all there, loose, a goodtime girl'

These semantic irregularities can all be understood in terms of what speakers choose to express. The irregularities, as well as the gap, also reveal something about inflection. They show that even in a language with elaborate inflectional processes, speakers remember at least some whole inflected forms, complete with their special meanings and usages, even those that are regular in form.

8. Semantic irregularity in tense inflection

Mohawk verbs are also inflected for tense and aspect. There are three aspects: habitual, stative, and perfective, all marked by suffixes. Habituals are used for habitual events and some ongoing activities. Statives are used for states, perfects, and other ongoing activities. Perfectives are further inflected for tense by prefixes: past, future, or optative.

(39)   Habitual aspect
    kká:wehs   'I paddle'

    Stative
    wakká:we   'I am paddling, was paddling'

    Perfective aspect
    wa'-*kká:we'*   'I paddled'   **PAST**
    en-kká:we'   'I'll paddle'   FUTURE
    a:-kká:we'   'I should/might/could/would paddle'   OPTATIVE

The inflection of interest here is the past prefix, which appears as *wa'-, wà:-, wa-,* or *w-*. The phonological alternations are predictable, and the inflection is fully productive. All perfective verbs can be inflected for past tense. But again there are some surprises.

8.1. Go

Verbs based on *-e'* 'go' often appear with a past tense prefix, but are used with present tense meaning. A common exchange is that in (40).

(40)   *Ka' wá-hse'?*   'Where are you going?'
    Tiohtià:ke wà:ke'   'I'm going to Montreal.'

Even speakers are puzzled by the presence of this prefix in these forms (though they rarely notice it until they begin teaching the language). Again, however, there is a reason.

As noted earlier, the Iroquoian languages contain directional prefixes, a cislocative 'hither' indicating motion toward the speaker or other deictic center, and a translocative 'thither, away' indicating motion away or action at a distant location.

(41) *ta-hoká:we*   'He's paddling <u>this way</u>'   CISLOCATIVE
      iah-oká:we   'He's paddling <u>away</u>'   TRANSLOCATIVE

The Mohawk translocative prefix appears in the forms *iah-/ia'-/ie'-/i-*(where orthographic *i* represents a palatal glide [j]). Alternations among these allomorphs are fully predictable.

Comparison with the other Iroquoian languages indicates that the Proto-Iroquoian translocative actually had several basic forms. Tuscarora, the Northern Iroquoian language most distantly related to Mohawk, shows two sets of forms: one set beginning in a palatal glide, cognate with the Mohawk *i-* forms, and another set beginning in a velar glide *w-*. The alternations among the Tuscarora forms are predictable. Those with the palatal glide appear in perfective verbs, and those with the velar glide appear in imperatives, habituals, and statives.

(42) Tuscarora translocative prefixes
      Perfectives   *yah-kwa'kà:yę:t*   'they went <u>there</u>'
                       y-ękà:yę:t   'they will go <u>there</u>'
                       y-aká:yę:t   'they should go <u>there</u>'

                       yah-wahrúha'   'he put it in water'
                       y-ęhrúha'   'he'll put it in water'
                       y-ahrúha'   'he should put it in water'

      Imperatives   *wá'-θe*   'Go!'
                       wa'-θúha   'Put it in water!'

      Habituals   *we-hrúhahs*   'he puts it in water'

      Statives   *we-hraúhę*   'he has put it in water'

Even more remotely related to both Mohawk and Tuscarora is the sole Southern Iroquoian language, Cherokee. Cherokee also contains translocative prefixes beginning in the velar glide *w-*.

(43) Cherokee *wi-* Montgomery-Anderson (2008: 307–312)
      <u>wa</u>àwatéeka
      <u>wi</u>-aki-atéeka
      TRANSLOCATIVE-1SG.PATIENT-throw.PRESENT.CONTINUOUS
      'I'm throwing it <u>there</u>'

The presence of the *w-* translocatives in both Tuscarora and Cherokee would constitute sufficient grounds alone for reconstructing a Proto-Iroquoian translocative prefix beginning in the velar glide *w-*. But there is more. The modern Northern Iroquoian languages all contain traces of an old velar translocative, which still survives in a now-unanalyzable particle: Mohawk <u>*wà:s*</u> 'Go!, Get away! Get out of here!'. (The Tuscarora cognate *wá'θeh!* 'Go!' is still transparent, consisting of the translocative *wa'-*, the second person imperative agent *θ-* 'you', and the verb root *-e* 'go.)

We can now explain the presence of the *w-* prefixes in the present-tense Mohawk verbs for 'go'. They are not past tense markers at all; they are old translocatives. They still contrast with cislocatives.

(44)   Mohawk 'go'
  wà:ke' 'I'm going'   TRANSLOCATIVE
  tá:ke' 'I'm coming'   CISLOCATIVE

The homonymy between this old translocative and the modern past tense prefix is probably no accident. Semantic extensions from space to time are well-documented cross-linguistically. The metaphorical use of a prefix indicating distance in space to indicate distance in time is in keeping with this familiar pathway. The fact that the Cherokee prefix is used only for spatial distance, while the Northern Iroquoian prefixes are used for both spatial and temporal distance, provides additional evidence that the prefix originated as a spatial marker.

Again this seeming irregularity, the use of what appears to be a past tense marker with present tense meaning, has an explanation. It reflects a recurring cognitive process, the routinization of frequent combinations, even when they are discontinuous, like the prefix and verb root here. The *i-* translocative forms have now been generalized to almost all Mohawk verbs, with the exception of the most common combination: the translocative 'thither' and the verb root 'go'. Speakers learn and use these combinations as units.

8.2. Andative 'go and'

The same *w-* prefixes also appear elsewhere without past tense meaning. A set of andative suffixes add the meaning 'go to' to verbs.

(45) *katerò:roks*   'I watch'
  <u>*wa'*</u>-*katerohrók*-<u>*he'*</u> 'I'm going to watch'

Andative verbs can indicate either displacement or intention: I can say *wa'katerohrókhe'* if I meet you on the road and you ask where I'm going, or if I'm sitting in a chair telling you about my plans to watch football on television this evening.

There are several andative suffixes, but all occur with the *w-* prefix in non-past contexts.

(46) *wa'-kahthenno'ókhe'*   'I'm gonna go play ball'
      wa'-ktsinonwahe'tisákhe'   'I'm gonna go look for worms'
      wa'-kenoharéhe'   'I'm gonna go do the laundry'
      wa'-katkehrontakóhe'   'I'm going shopping'
      wa'-katawénhe'   'I'm going swimming'
      wa'-keksoharéhe'   'I'm gonna do the dishes'
      wa'-kahriohkawinéhe'   'I'm going fishing'
      wa'-keniháhshe'   'I'm going to borrow it'
      wa'-kate'nikonhrorià:ne'   'I'm gonna have a good time'
      wa'-tkatska'hòn:ne'   'I'm gonna eat'
      wa'-tkenonniahkwà:ne'   'I'm going dancing'
      wa'-katorishèn:ne'   'I'm going to rest'
      wa'-katerihwaweienhstà:ne'   'I'm going to school'
      wa'-kenatà:re'   'I'm going visiting'
      wa'-ktsienhaiénhsere'   'I'm going to a meeting'

Again there is an explanation. These andative formations all end in the sequence *-e'*: *-h-e'*, *-hn-e'*, *-hr-e'*, *-hser-e'*. (At the end of a stressed syllable and before a resonant, the *h* drags the tone down then disappears.) They are descended from suffix combinations whose second element developed from the verb *-e'* 'go'. The older pattern of the *w*-translocative with the verb 'go' seen in the previous section has remained with this morpheme through its development into a verbal suffix. The use of the *w-* forms with andative verbs in non-past contexts is a robust, productive pattern, which continues to contrast with cislocative forms.

(47) *katerohrókhe'*   'I'm here to watch'
      wa'-katerohrókhe'   'I'm going to watch'
      ta-katerokhrókhe'   'I'm coming to watch'

8.3. Ambulative 'going along'

Mohawk also contains a somewhat less productive verbal formation, based on stative verbs. (Recall that stative verbs are used for both states and certain activities.) It adds the meaning 'going along'.

(48) *roniarèn:ton'*   'his neck is down' = 'he's sad'
      wa-honiaren'tòn :ne'   'he's going along with his neck down'
                                   = 'he's walking along sadly'

      roiéshon   'he's smiling'
      wa-hoieshòn-:ne'   'he's walking along smiling'

      rawékon'   'he likes it, finds it delicious'
      wa-hawekon'òn-:ne'   'he's walking along enjoying eating it'

Again we see verbs containing what appears to be the past tense prefix used in present contexts.

The explanation is similar to that behind the andatives. The ambulative suffix *-hne'* developed from a sequence containing an element descended from the verb *-e'* 'go'. An earlier form of the translocative prefix in *w-*, which has now been replaced in Mohawk with the generalized forms in *i-*, has remained attached to this morpheme through its development into a suffix, even though the prefix and suffix are never contiguous. The prefix still contrasts with the cislocative in ambulative forms.

(49)   *wa-honiara'tòn:ne'*   'he's <u>going</u> along with his neck down'
       ta-honiara'tòn:ne'   'he's <u>coming</u> this way with his neck down'

       wa-hoieshòn:ne'   'he's <u>walking</u> along smiling'
       ta-hoieshòn:ne'   'he's <u>coming</u> this way smiling'

Again the apparent irregularity points to a sequence of cognitive processes. Combinations of the translocative prefix *w-* and the highly frequent verb *-e'* 'go' became routinized, selected as a unit even when the other form of the translocative was generalized in the language. The routinized collocation persisted even with grammaticalization of *e'* from a verb root to the ambulative suffix. The pattern was then extended to new andative and ambulative verbs.

9. Formal irregularity in aspect inflection

As seen in the previous section, Mohawk verbs are inflected for one of three aspects: habitual, stative, or perfective.

(50)   Habitual   *kó'kwat-<u>s</u>*   'I dig, am/was digging'
       Stative   *wako'kwá:t-<u>on</u>*   'I have dug'
       Perfective   *wa'kó'kwat-<u>e'</u>*   'I dug'
                      enkó'kwat-<u>e'</u>   'I will dig'
                      a:kó'kwat-<u>e'</u>   'I should dig'

Habitual forms indicate habitual actions and often progressive activities. The habitual suffixes are based on two main forms: *-ha'* and *-hs* (with conditioned alternants).

(51)   Some *-ha'* habituals
       kónt-<u>ha'</u>   'I attach it, put it over the fire'
       wehnót-<u>ha'</u>   'it floods'
       katirónt-<u>ha'</u>   'I pull it'
       tekiést-<u>ha'</u>   'I mix it'
       khér-<u>ha'</u>   'I set it (on something)'
       kohár-<u>ha'</u>   'I attach it at one end'

kenónn-ha'	'I guard, watch'
tekéhkw-ha'	'I pick it up'
kátst-ha'	'I use it'
tekia'sér-ha'	'I stack them'

(52) Some -hs habituals

ktakwaríhsion-hs	'I straighten it, am straightening it'
kká:we-hs	'I paddle etc.'
kié:na-hs	'I grasp it'
kóser-ahs	'I spray it'
íkket-s	'I grate, scrape, scratch it'
khní:rat-s	'I tighten it'
tekténi-e's	'I change it'
kahténti-e's	'I leave'
iewakáti-e's	'I throw'
iókha-hs	'it leaks'

It is not possible to predict which basic habitual suffix will occur with a particular verb stem. There is no apparent regularity: the appropriate form is simply learned with each verb.

There is, however, a possible explanation for the modern system. It is likely that the Iroquoian language family is remotely related to another language family, Caddoan (Chafe 1976: 75, Melnar 2004: 70–71). The Caddoan language Caddo has two imperfective aspectual categories, a habitual *-h* and a progressive *-s*.

In modern Mohawk, a given verb stem will normally appear with just one habitual form or the other. There is one stem, however, which appears with both, yielding slightly different meanings.

(53) Rare Mohawk pair

kattók-ha'	'I am wise'
kattó:k-ahs	'I feel, notice'

It appears that the Mohawk *-ha'* forms may be descended from an earlier habitual marker, and the *-hs* forms from an earlier progressive marker.

Mohawk terms for tools and professions are typically coined from habitual verbs, very often with the *-ha'* suffix.

(54) Tools and equipment

iehrarhóhst-ha'	'one pulls ashore with it = dock, wharf'
teiehson'karià:kst-ha'	'one cuts boards with it = saw'
ie'tarakarhathóhst-ha'	'one turns over clay with it = plow'
ieksata'áhst-ha'	'one dish inserts with it = china cupboard'
iekontsherarhóhst-ha'	'one spreads paint with it = paintbrush'
ionrahsi'tohrókst-ha'	'one inserts one's foot with it = slipper'
iehwa'ékst-ha'	'one hits with it = bat, racquet'

ionteniatsterénkst-<u>ha'</u>	'one ties one's braid with it = hair ribbon'
iekhwaráhkw-<u>ha'</u>	'one puts food in with it = pantry, larder'
iakenheion'taráhkw-<u>ha'</u>	'one puts the dead in with it = casket'
tsiera'wistáhkw-<u>ha'</u>	'one pierces with it = fork, pitchfork'
iontkahri'táhkw-<u>ha'</u>	'one plays with it = toy'
ionthonwiharáhkw-<u>ha'</u>	'one vessel hangs oneself with it = swing'

(55) Occupations

rakhwahér-<u>ha'</u>	'he sets down food = waiter'
iekhwahér-<u>ha'</u>	'she sets down food, waitress'
ra'swáht-<u>ha'</u>	'he extinguishes = fireman'
raronwarahér-<u>ha'</u>	'he sets down wire = electrician'
tehentstenhrót-<u>ha'</u>	'he stands up stone = mason'
raráhst-<u>ha'</u>	'he draws = artist'
tehatenia'taranónn-<u>ha'</u>	'he guards the flag = goalie'
tehaia'toréht-<u>ha'</u>	'he body splits = judge'
shakoia'tár-<u>ha'</u>	'he body puts in = 'photographer''

But not all terms for tools and professions show the *-ha'* form.

(56) Tools and equipment

teká:ten-<u>hs</u>	'it flies = airplane'
kaié:na-<u>hs</u>	'it holds = scotch tape'
ka'níkhon-<u>hs</u>	'it sews = sewing machine'
tewawénrie-<u>hs</u>	'it mixes = mixer'
tewatotárho-<u>hs</u>	'it hooks over itself = safety pin'
teká:nak-<u>s</u>	'it scratches = rake'
teióia'k-<u>s</u>	'it breaks, flickers = movie'
kahéntia'k-<u>s</u>	'it cuts grass = lawnmower'
tekahtò:rarak-<u>s</u>	'it squeezes = pliers'
teken'tonhkóia'k-<u>s</u>	'it throws a flame = flashlight'

(57) Occupations

raiéntho-<u>hs</u>	'he plants = farmer'
rata'á:ro-<u>hs</u>	'he puts his net in wáter = net fisherman'
rakontsherárho-<u>hs</u>	'he paints = painter'
ion'therón:ni-<u>hs</u>	'she makes baskets = basketmaker'
teietsi'nehtará:ron-<u>hs</u>	'she applies beads = beadworker'
shakonónhkaron-<u>hs</u>	'he cuts hair = barber'
iena'tarón:ni-<u>hs</u>	'she bread bakes = baker'
rató:rat-<u>s</u>	'he hunts = hunter'
ratétsien't-<u>s</u>	'he cures = doctor'
rahson'karaké:t-<u>ahs</u>	'he scrapes boards = carpenter'

We seem to be back where we started, with no regular pattern. In fact the choice of habitual suffix is determined by the last morpheme of the verb stem, not the word as a whole. The term for 'waiter', for example, ends in the habitual suffix *-ha'* because it is based on the verb root is *-her* 'set on a raised surface', which always occurs with the *-ha'* habitual.

(58)   *rakhwahér-ha'*
       ra-khw-a-her-ha'
       M.SG.AGENT-food-LINKER-set.on-HABITUAL
       'he sets down food' = 'waiter'

The term for 'farmer' ends in the habitual *-hs*, because the stem for 'plant' consists of the verb root *-ient-* 'lie' plus an old causative suffix *-ho-/-hw-*. It is this causative that determines the choice of habitual allomorph *-hs*.

(59)   *raiéntho-hs*
       ra-ient-ho-hs
       MSG.AGENT-lie-CAUSATIVE=HABITUAL
       'he causes it (seed) to lie = farmer'

Terms for tools often end in *-ha'* because they are often formed with the instrumental suffixes *-hst, -hkw*, and others. Those suffixes always appear with the *-ha'* habitual.

(60)   *ietsihkwa'ék-st-ha'*
       ie-tsihkw-a-'ek-hst-ha'
       INDEFINITE.AGENT-puck-LINKER-hit-INSTRUMENTAL-HABITUAL
       'one puck hits with it = hockey puck'

(61)   *teie'nhonhsawenrie'tá-hkw-ha'*
       te-ie-'nhonhs-awenrie-'t-a-hkw-ha'
       DUPLICATIVE-INDEFINITE.AGT-egg-stir-CAUSATIVE-LINKER-INSTRUMENTAL-HABITUAL
       'one stirs eggs with it = egg beater'

The origins of the suffixes *-hst* and *-hkw* were seen earlier; they are descended from verb roots meaning 'use' and 'pick up'. The instrumental suffixes still show the habitual forms associated with the verb roots they are descended from.

(62)   *kátst-ha'*   'I use it'
       tekéhkw-ha'   'I pick it up'

The lack of obvious regularity in the distribution of the two basic modern Mohawk habitual aspect markers *-ha'* and *-hs* probably reflects several kinds of cognitive processes. It is likely that certain verb roots occurred more often in the habitual aspect, and others occurred more often in the progressive. At a certain point, individual root-aspect collocations began to be routinized: the choice of aspect marker began to be triggered automatically by the root rather than by the function of the full word. The strength of the

collocations persisted even when certain roots ('use', 'pick up', and others) developed into suffixes (such as instrumental applicatives). Ultimately, the choice between inflectional markers was based on the last morpheme in the stem, rather than on the function of the word as a whole. As a result, the earlier semantic motivation behind choices between the original habitual and progressive markers became blurred. The system was reanalyzed, with a semantic pattern (habitual versus progressive) reinterpreted as a formal, lexical pattern (distribution of allomorphs according to final morpheme).

10. Conclusion

Irregularity can be frustrating to the grammarian seeking regular patterns. But it can also provide glimpses of human cognitive processes at work. Perhaps surprisingly, irregularity can provide evidence of the human propensity for pattern recognition. Speakers perceive patterns, extend them, generalize them, and reinterpret them. They routinize recurring cognitive operations, reducing online choices. All of the irregularities examined here provide evidence of pattern recognition on the part of speakers. Irregularities highlight the tension between the dynamic and the static in language, helping shed light on how speakers perceive and manipulate patterns, and how they store and deploy complex forms.

Abbreviations

AGT	grammatical agent	CISLOC	cislocative	CONTR	contrastive
DP	duoplural	DUPLIC	duplicative	M	masculine
MID	middle	NMZR	nominalizer	PAT	gr patient
PROG	progressive	REV	reversive	SG	singular

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