

0. Introduction

- Most Yuman languages feature a medio-passive –*v* morpheme
- In many Yuman languages, –*v* is losing productivity (Munro, 1976; Gordon, 1986; Miller, 2001)
- While in one branch (Pai), –*v* has extended to reflexives and lost its passive use (Powell, 2020)
- Three Yuman languages have an innovative and productive passive –*č* /tʃ/ morpheme:
 - Mohave –*č* (Munro, 1976)
 - Tolkapaya Yavapai –*ch* (Hardy, 1979)
 - Hualapai –*j* (Watahomigie et al., 2001)
- Mohave (River branch) is not directly related to Tolkapaya and Hualapai (Pai branch, *Figure 1*, p. 2)
- Curiously, –*č* has not been found in:
 - Piipaash or Quechan, the other River languages
 - Verde Valley Yavapai, a sister dialect of Tolkapaya
 - Havasupai, a sister dialect of Hualapai
- Why is it that only these three languages share this innovative morpheme?
- When considering geographic proximity and other linguistic features shared among Mohave, Tolkapaya, and Hualapai, borrowing through language contact explains the spread of passive –*č*
- We propose that a chain shift in voice morphology led to innovation and diffusion of passive –*č*
- To our knowledge, this is the first example of morphological borrowing in (Northern) Yuman
- Thus, we show that the outcomes of language contact in Yuman extend to shared morphology

0.1 Research Questions

- (A) What are the passives for all the Yuman languages?
- Virtually all Yuman languages have a medio-passive –*v* morpheme, undergoing either loss in Mohave or semantic shift in Tolkapaya and Hualapai
- (B) Is the source of the passive –*č* in these three languages genetic or borrowed?
- Borrowing explains the diffusion of –*č* across the three languages
- (C) What linguistic features led to the innovation and diffusion of the passive –*č*?
- A shift of semantics in voice morphology led to the innovation and spread of passive –*č*
- (D) Why is it that only these three languages, which cross sub-groupings within the Yuman family, and no other closely related languages feature this morpheme?
- These three languages have borrowed from one another in the areas of phonology and the lexicon, and this paper provides an example of morpho-syntactic borrowing as well

0.2 Yuman Languages

- Yuman is a family of Indigenous languages in Arizona, California, Baja California, and Sonora
- For this study, we are assuming the classification of Yuman languages by Miller (2018), see *Figure 1*
- All Yuman classifications assign (1) Tolkapaya & Hualapai and (2) Mohave to different branches

- In many languages, –v is unproductive, falling out of use (Munro, 1976; Gordon, 1986; Miller, 2001)

1.2 Survey of Yuman Passive and Stative Morphology

- We surveyed published grammars of 12 Yuman languages
 - Represent every branch of the family and the vast majority of the Yuman languages
- We documented the passive and stative morphemes for each language, see *Table 1*

Table 1. Survey of passive, medio-passive, and stative morphemes in Yuman languages

Branch	Language	(Medio-)Passive	Stative
Pai	<i>Hualapai</i> (Watahomigie et al., 2001)	–j /tʃ/ (passive)	–v (p. 557)
	<i>Havasupai</i> (Kozłowski, 1972; Seiden, 1963)	–v (K., p. 114)	–v (S., p. 229)
	<i>Tolkapaya</i> (Hardy, 1979)	–ch /tʃ/ (passive)	–v (p. 29, p. 311)
	<i>Verde Valley Yavapai</i> (Kendall, 1976)	–v (p. 127, 246)	–v (p. 127, 246)
	<i>Paipai</i> (Joel, 1966)	?	?
River	<i>Piipaash</i> (Gordon, 1986)	–v (p. 82-85)	–v (p. 83-85)
	<i>Mohave</i> (Munro, 1976)	–č /tʃ/ –v (~p) (p. 240)	–v (p. 241)
	<i>Quechan</i> (Halpern, 1947)	–v (~p) (p. 274)	?
Delta	<i>’iipay</i> (Langdon, 1966)	–p (p. 123-124, 145-147)	–p (p. 123-124, 145-147)
	<i>Jamul Tiipay</i> (Miller, 2001)	mat– (p. 167) (middle)	–p (p. 71)
	<i>Cocopah</i> (Crawford, 1966; 1989)	?	–p (1989: p. 203)
Kiliwa	<i>Kiliwa</i> (Mixco, 1971; 2000)	p–, –p (258, 161)	?

- The vast majority of Yuman languages feature a passive –v (or cognate –p) morpheme
 - Reconstructable to Proto-Yuman (Powell, 2020)
- A distinct –č /tʃ/ passive is also found in Hualapai (spelled –j), Tolkapaya (–ch), and Mohave (–č)
- They are represented differently in the practical orthographies, but are phonemically the same
- Yet, even in the passive –č languages, there is also a –v morpheme which has:
 - Undergone significant attrition in Mohave
 - Semantically narrowed to only stative interpretations in Tolkapaya and Hualapai
- Note the stative interpretation of –v is available in all Yuman languages, even in those with –č
- The distribution of –č is indicative of innovation, but with no obvious genetic source
- The three languages do not represent an individual branch but rather belong to separate branches
- Importantly, –č is shared at the exclusion of more closely related languages

2. Passive –č in Mohave, Tolkapaya and Hualapai

- Passive –č /tʃ/ exhibits similar characteristics in Mohave, Tolkapaya, and Hualapai

² Question marks indicate that information was not found within the published grammars for a given morpheme.

2.1 Passive –č in Mohave

- In Mohave, patients in passive –č constructions are in accusative case (unmarked)
 - This is true for Tolkapaya and Hualapai too
- Examples (4-5) exemplify the typical use of passive –č in Mohave:

(4) *masahay-nʸ-Ø* *əta:v-č-m* (Mohave)
 girl-DEM-ACC hit-PASS-TNS
 ‘The girl got hit.’

(5) *nʸ-tapi?ipay-č-m*
 3/1-save-PASS-TNS
 ‘I was saved.’ (Munro, 1976: 241)

- Note the pronominal agreement prefix in (5) also indicates the patient is treated as a syntactic object
- Munro (1976) remarks that no agent may be expressed through means of a by-phrase or otherwise
- Mohave also has medio-passive –v, but it is becoming unproductive (Munro, 1976: p. 242)
- Passive sentences with –v marked verbs have subjects marked in nominative case

(6) *hova-č* *uumar-v-k* (Mohave)
 DEM-NOM bring-MP-TNS (Langacker & Munro, 1975: p. 812)
 ‘He wins at cards.’ (He gets brought a desirable substance [money].)

2.2 Passive –ch in Tolkapaya

- Tolkapaya also has both –v and –č (spelled –ch), but with different semantic and syntactic properties
- In sentences with –v, patient subjects are marked in nominative case
 - The lexical verb also often selects the stative auxiliary *yu* ‘be’

(7) *ma-che* *m-chqam-v-k* *m-yu-ny* (Tolkapaya)
 2-NOM 2-hit-STA-SS 2-be-PERF
 ‘You were hit.’ (Hardy, 1979: p. 30)

- Hardy (1979) describes the semantics of –v when attached to an active verb, like in (7): “–v derives a verb which describes the quality of being in a state resulting from a previous action” (p. 30-31)
- However, when –v is affixed to a stative verb, it “describes the subject noun as being in a state as a (potential) goal of another verb” (p. 31), which she argues is not a canonical passive, see (9)

(8) *m-chita* *nya* *ny-’uu-k* *yu-m* (Tolkapaya)
 2-mother 1.ACC 3/1-see-SS be-IMPF
 ‘Your mother saw me.’

(9) *nya-che* *’-’uu-v-k* *’-yu-ny*
 1-NOM 1-see-STA-SS 1-be-PERF
 ‘I was visible.’ (i.e. has the potential to be seen) (Hardy, 1979: p. 31)

- In –ch /tʃ/ constructions, the semantic patient is marked in accusative case
 - The lexical verb typically selects for the active auxiliary *wu* ‘do’

- Consider (10-11), which contrasts $-ch$ (passive) and $-v$ (stative)

(10) Bonnie-Ø 'uu-**ch**-k **wi**-ny (Tolkapaya)
 Bonnie-ACC see-PASS-SS **do**-PERF
 'Bonnie was **seen**.'

(11) Bonnie-**ch** 'uu-**v**-k **yu**-ny
 Bonnie-NOM see-STA-SS **be**-PERF
 'Bonnie was **visible**.' (Hardy, 1979: p. 33-34)

- Hardy (1979) remarks that: "sentences with the $-ch$ construction appear to focus attention on the whole situation (i.e. action, state, or process) itself, rather than on the state or quality attributable to some noun in the sentence. The sense is actually closer to that of the English passive than is the $-v$ construction" (p. 33)
- She summarizes the difference between $-v$ and $-ch$: " $-v$ suffixation reflects the state of an object resulting from a situation whereas $-ch$ suffixation refers more closely to the activity itself" (p. 34)

2.3 Passive $-j$ in Hualapai

- Watahomigie et al. (2001) describe a similar passive morpheme, written as $-j$ but phonemically /tʃ/:

(12) ba:-h-ch nya nyi-đ'gyo:-k-wi-ny (Hualapai)
 man-DEM-NOM 1.ACC 3/1-pinch-SS-AUX-PAST
 'The man pinched me.'

(13) nya nyi-đ'gyo:-**j**-k-wi-ny
 1.ACC 3/1-pinch-PASS-SS-AUX-PAST
 'I was pinched (by many/them).' (Watahomigie et al., 2001: p. 346)

- The patient is marked in accusative and the unpronounced semantic agent has a plural interpretation
- As far as we know, Hualapai is the only language with this plural impersonal passive interpretation
- Otherwise, much of what has been described for Mohave and Tolkapaya applies to Hualapai too
- Like in Tolkapaya, the auxiliaries *wi* and *yu* co-occur with $-j$ and $-v$, respectively
- For active verbs, there is awkwardness for $-v$ marked stems, whereas $-j$ marked stems are felicitous:

(14) ba:-h đagwi:v-**j**-o-k-wi-ny (Hualapai)
 woman-DEM chase-PASS-EVID-SS-AUX-PAST
 'The man was chased.'

(15) ? ba:-h-ch đagwi:v-**v**-k-yu-ny
 woman-DEM-NOM chase-STA-EVID-SS-AUX-PAST
 Intended: 'The man was chased.' (Watahomigie et al., 2001: p. 349-350)

- For these reasons, Watahomigie et al. (2001) and Sohn (1995) argue that $-v$ is not passive in Hualapai
- $-j$ took on the role of (impersonal) passive, while $-v$ became restricted to stative verbs
- We have found no evidence of passive $-č$ in either Havasupai or Verde Valley Yavapai
 - This is curious considering their close relation to Hualapai and Tolkapaya, respectively
 - Both languages instead utilize the typical medio-passive $-v$ (Kozlowski, 1972; Kendall, 1976)
- This suggests that genetic inheritance of $-č$ among the Upland Pai languages is unlikely

2.4 Reflexives in Pai Languages

- Passive –č coincides with the innovative use of –v for reflexives in most Pai languages, but not used outside of the Pai branch
- Powell (2020) argued that when Upland Pai lost the Proto-Yuman *mat*- reflexive clitic, there was an innovative extension of the medio-passive –v to reflexives
 - Moreover, the development of a new reflexive pronoun *ye(:v')m* renewed reflexives in Pai
- Table 2 summarizes his findings on the reflexives found in the Yuman languages

Table 2. Survey of reflexives in Yuman languages (adapted from Powell, 2020)

Branch	Language	Reflexive
Pai	<i>Hualapai</i> (Watahomigie et al., 2001)	<i>ye:v'm ...-v</i> (p. 332-341)
	<i>Havasupai</i> (Kozłowski, 1972)	<i>yevm ...-v</i> (p. 111-114)
	<i>Tolkapaya</i> (Hardy, 1979)	<i>yem ...-v</i> (p. 29-33)
	<i>Yavapai</i> (Kendall, 1976)	<i>yem ...-v</i> (p. 127-137)
	<i>Paipai</i> (Joel, 1966)	<i>mat-</i> (p. 39)
River	<i>Piipaash</i> (Gordon, 1986)	<i>mat-</i> (p. 65)
	<i>Mohave</i> (Munro, 1976)	<i>mat</i> (p. 45-47)
	<i>Quechan</i> (Halpern, 1947)	<i>mat-</i> (p. 283)
Delta	<i>'Iipay</i> (Langdon, 1966)	<i>mat</i> (p. 233)
	<i>Jamul Tiipay</i> (Miller, 2001)	<i>naynaa</i> (p. 166)
	<i>Cocopah</i> (Crawford, 1966)	<i>mc-</i> (p. 69)
Kiliwa	<i>Kiliwa</i> (Mixco, 1971; 2001)	<i>ma:t</i> (p. 230)

- The reflexive use of –v is limited to most Pai languages, whereas *mat*- is found in every other branch
 - In the non-Pai languages, reflexive constructions do not feature –v
 - The only Pai language with *mat*- is Paipai, which is spoken far away in Sonora³
- (16-17) exemplify the contrast between stative and reflexive uses of –v in Hualapai

(16) John-ch nahmid-vi-k-yu (Hualapai)
 John-NOM 3.hurt-STA?/REFL?⁴-SS-AUX
 'John was hurt.'

(17) John-ch ye:v'm nahmid-vi-k-yu
 John-NOM self 3.hurt-STA?/REFL?-SS-AUX
 'John hurt himself.' (Watahomigie, et al., 2001: p. 343)

- The cognate *yem* in Tolkapaya has a similar meaning and use. Note the stative –v on the verbal stem

(18) yem m-ktoh-v-k m-yu-m (Tolkapaya)
 self 2-kick-STA-SS 2-be-IMPF
 'You kicked yourself.' (Hardy, 1979: p. 33)

- Hardy (1979) remarks on the use of –v: "It is my impression that sentences without *yem* simply do not refer to any agency at all – they may in fact be used in a reflexive sense as well as any other" (p. 33)

³ Paipai is the only Pai language to retain the *mat*- reflexive. Paipai is divergent from other Pai languages in many respects. Unlike the other Pai communities, the Paipai remained in Baja California and in close contact with other Yuman languages outside of the Pai branch (Langdon & Munro, 1980; Laylander, 2015; Hinton, 1984). This may explain why Pai shows reflexes of the Proto-Yuman *mat*- construction.

⁴ The ambiguity seen in these glosses is reproduced from Watahomigie et al. (2001).

2.5 Background on –č

- Munro (1976) considers three sources for the passive –č morpheme, as the form and distribution of the –č passive is similar to that of (A) plural, (B) nominalizer, and (C) perfective suffixes in Mohave

A. **Plural –č:** Munro rejects the possibility that passive –č is related to plural morphology:

- Plural implicit arguments never surface as explicit
- When clear in dialogue or context, implicit arguments are often singular⁵
- Plural and passive forms for the same verb often differ, such as in (19-20):

(19) ɔta:v-č hit-PASS (Mohave)
 (20) u:ta:v hit.PL (Munro, 1976: p. 244)

- Passive –č occurs alone and is always segmentable, whereas Mohave uses as many as 25 different combinations of morphological markers (e.g. prefixes, ablaut) to express plurality
 - Co-occurrence with other morphology would have impeded reanalysis of plural –č
 - Passive –č alone restricts the type of realis and switch-reference markers that a verb can take
 - However, the plural impersonal use of –č passives in Hualapai suggests a connection to pluralization
- B. **Nominalizer –č:** Munro suggests that –č is etymologically related to the –č nominalizer:
- She suggests that –č marked passives are nominalized clauses which are the subject of an unpronounced copula ‘be’ verb construction, a common process in Yuman
 - However, like pluralization, nominalization morphology has numerous patterns beyond –č in isolation

C. **Perfective –č:** A third productive and segmentable –č is the perfective suffix, exemplified in (21):

(21) ʔinʷeč kʷəloyaw tapuy-p ʔ-iyu:č (Mohave)
 1.NOM chicken kill-p 1-see-PERF
 ‘I saw him kill the chicken’ (Munro, 1976: p. 141-142)

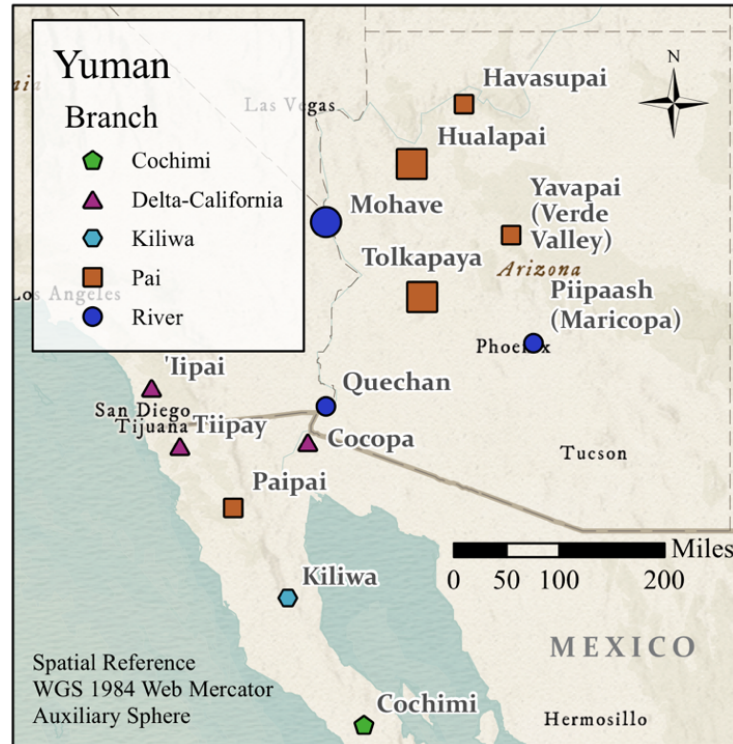
- A –p suffix co-occurs with –č in the so-called –p ... –č perfective in Mohave: If the –č perfective is the origin of the passive –č, it is unclear why the –p does not surface in any of the passive examples
- The source of passive –č goes beyond the scope of this paper and, for now, remains unresolved

3. Innovation and Borrowing of Passive –č in Yuman Languages

- The passive –č of Mohave, Tolkapaya, and Hualapai was not inherited from a common ancestor
 - Passive –č occurs in three languages from two different branches of Yuman: River and Pai
 - Passive –č does not occur in River languages closely related to Mohave
 - Passive –č does not occur in Pai dialects closely related to Tolkapaya and Hualapai
- Rather, the innovative –č construction must have been borrowed from one language into the others
- *Map 1* shows the locations of Yuman languages, with symbols enlarged for the passive –č languages
 - Mohave, Tolkapaya, and Hualapai have long been spoken in close geographic proximity

⁵ For example, Munro (1976) remarks that a singular ‘fierce bear’ was used for context when eliciting sentence (A):

(A) John tapuy-č-m (Mohave)
 John kill-PASS-TNS
 ‘John got killed.’ (Munro, 1976: p. 244)



Map 1. Yuman geography. Enlarged symbols indicate passive $-č$ languages. This map was produced with ArcGIS Pro (ESRI, 2020). Geo-coordinates were obtained from Glottolog (Hammarström et al., 2020).⁶

- The speakers of these languages have exhibited close ties historically (Kroeber, 1925), facilitating:
 - The diffusion of a variety of linguistic items (e.g. Hinton, 1984)
 - The exchange of cultural elements such as song cycles (Hinton, 1979)
 - The exchange of material goods through trade (Davis, 1961)
- In fact, Hinton (1984) identified a “Northern Yuman” language area which has facilitated linguistic diffusion among Mohave and the Upland Pai languages since the 19th century and at least into the 20th
- We argue that the passive $-č$ was borrowed among the three languages via this same network
 - To our knowledge, this represents the first example of morphological borrowing

3.1 Examples of Borrowing between Mohave and Upland Pai

- **Lexicon:** A range of lexical borrowings have entered Mohave through Upland Pai and vice versa:
 - Mohave and Upland Pai share a unique set of numerals (Langdon & Munro, 1980)
 - Spanish loans entered Hualapai (then other Upland Pai languages) via Mohave (Winter 1990)
 - Mohave borrowed its word for ‘coyote’ from Upland Pai languages (Geary, 2019)
- **Phonology:** Mohave and Upland Pai share at least two innovative sound shifts:
 - Proto-Yuman $/*x/ \rightarrow /h/$ (Wares, 1968)
 - Proto-Yuman $/*s/ \rightarrow /s/$ and $/*s/ \rightarrow <th> /θ/$ (Hinton, 1979, 1981, 1984;)
 - Hinton (1979, 1981) demonstrated that the latter shift began in Mohave before spreading to Hualapai when the two communities were jointly incarcerated in the 1870s
- **Morphology:** We suggest that borrowing extends to the passive $-č$ construction
 - This is the first case of morphological borrowing in Northern Yuman or the Yuman family

⁶ An additional point for Tolkapaya was estimated from other language maps, such as in Miller (2018).

3.2 Background on Morphological and Passive Borrowing

- Morphological borrowing is well-attested in other contact situations (e.g. Gardani, 2008; Gardani, Arkadiev, & Amiridze, 2015; Heine & Kuteva, 2003, 2005; Matras & Sakel, 2007; Sakel, 2007)
- Matras & Sakel (2007) and Sakel (2007) identify two broad types of morphological borrowing:
 1. “Matter replication”, where one language borrows the actual morpheme(s) that express some function
 - This is exemplified among the Quechuan languages, which have borrowed plural $-s$ (22-23) and agentive $-dor$ (24-25) from Andean Spanish (Muysken, 2012):

Spanish $-s$ ‘PL’ > Bolivian Quechua $-s$ ‘PL’ (cf. native $-kuna$ ‘PL’)

(22)	warmi- s	cf. warmi- kuna	(23)	atuq- kuna-s
	woman-PL	woman-PL		fox-PL-PL
	‘women’	‘women’		‘foxes’

Spanish $-dor$ ‘AG’ > Cajamarca Quechua $-dur$ ‘AG’ (cf. native $-q$ ‘AG’)

(24)	michi- dur	cf. michi- q	(25)	upya- dur	cf. upya- q
	herd-AG	herd-AG		drink-AG	drink-AG
	‘shepherd’	‘shepherd’		‘drinker’	‘drinker’

(adapted from Muysken, 2012)

2. “Pattern replication”, where one language adopts a new grammatical function from another language but repurposes native material to express that function
 - This is exemplified in Hup (Nadahup), which has acquired evidentiality from neighboring Tucanoan languages but repurposed native sensory verbs (Epps, 2005, 2006), see (26):

Hup $h\delta h-$ ‘produce sound, make noise’ > Hup $=h\delta$ ‘non-visual evidential’

(26)	nasia	pæ-sĩw-ĩy= h\delta
	boat	go.upriver-COMPL-IMP=NONVIS
	‘The boat already went upriver.’ (heard but did not see it)	

(adapted from Epps, 2005)

- Passive morphology is independently known to be borrowable
 - Maltese (Semitic) replicated an Italian passive morpho-syntactic structure while repurposing the native verbs *kien* ‘it was’ and *gie* ‘it came’ for use as copular verbs (Borg & Azzopardi-Alexander, 1997: p. 214; Gardani, 2008)
- Thus, it is plausible that the passive $-č$ construction developed first in one of Mohave, Hualapai, or Tolkapaya before spreading to the other languages through borrowing
- Two factors likely facilitated the diffusion of $-č$ among the languages of the Northern Yuman area:
 - Inflectional morphology is more likely to be borrowed when source and donor languages are related: Similar structural/sociolinguistic features facilitate borrowing (Thomason, 2015)
 - Mohave and the Upland Pai languages diverged from a common Proto-Pai-River ancestor (Miller, 2018) and have become more similar over time through their participation in the Northern Yuman language area (Hinton, 1984)
 - What Booij (1996) calls “inherent inflection” (i.e. determined by speakers’ communicative goals; e.g. plurality, voice) is easier to separate from original contexts and so borrow than is “contextual inflection” (i.e. determined by syntax; e.g. case, agreement) (Gardani, 2008)
 - Passive $-č$ is a type of inherent inflection so would have been easily borrowable

3.3 The Original Donor Language

- At present, it is not immediately clear in which language the innovative passive –č first developed
 - If it originated from the –č perfective found only in Mohave, then Mohave is the donor
- However, the syntactico-semantic reanalysis of other morphemes may have triggered the innovation
 - Medio-passive –v became restricted to statives in Tolkapaya and Hualapai and then extended to reflexives, perhaps creating a void in voice morphology which passive –č developed to fill
 - On the other hand, passive –č may have triggered a semantic chain shift in voice morphology

Table 3. Semantics of Voice Morphology in Pai Languages

Language	Canonical Passive	Stative	Reflexive
<i>Hualapai</i> (Watahomigie et al., 2001)	–j	–v	<i>ye:v'm ... –v</i>
<i>Tolkapaya</i> (Hardy, 1979)	–ch	–v	<i>yem ... –v</i>
<i>Havasupai</i> (Kozlowski, 1972)	–v		<i>yevm ... –v</i>
<i>Yavapai</i> (Kendall, 1976)	–v		<i>yem ... –v</i>
<i>Paipai</i> (Joel, 1966)	?	?	<i>mat</i>

- The loss of medio-passive –v in Mohave may have triggered the development of passive –č
- On the other hand, the introduction of –č may have triggered the loss of medio-passive –v

Table 4. Semantics of Voice Morphology in River Languages

Language	Canonical Passive	Stative	Reflexive
<i>Mohave</i> (Munro, 1976)	–č	–v	<i>mat</i>
<i>Piipaash</i> (Gordon, 1986)	–v		<i>mat–</i>
<i>Quechan</i> (Halpern, 1946)	–v	?	<i>mat–</i>

- The results illustrate the role that borrowing can play in grammaticalization cycles:
 - Borrowing can accelerate on-going cycles, as in the case of Dutch losing reflexive objects and Pennsylvania Dutch increasing its usage of progressives (van Gelderen, pc)

4. Conclusion

- We have argued that passive –č spread throughout Mohave, Hualapai, and Tolkapaya via borrowing
 - Hence, it spread at the exclusion of River languages related to Mohave (Piipaash, Quechan) and Pai dialects related to Hualapai and Tolkapaya (Havasupai, Verde Valley Yavapai)
 - The most plausible explanation is that the –č passive developed in one of Mohave, Hualapai, or Tolkapaya, which are geographically proximate and exhibit a long history of exchanging linguistic structures, before spreading to the others via morphological borrowing
- What triggered the original development of passive –č in one of the three languages remains unclear
- However, language-internal developments may have facilitated the development of –č and its spread
 - A semantic chain shift involving medio-passive –v in Hualapai and Tolkapaya may have facilitated the spread of the new passive –č to fulfill functions voided by –v
 - The near loss of the medio-passive –v in Mohave may have created a similar functional opening for the spread of the innovative passive –č
 - Alternatively, the spread of passive –č may have helped to displace –v in any of the languages
- Our findings illuminate the shared linguistic history of the Northern Yuman language area
 - Language convergence among Mohave and Upland Pai extends to innovative morphology
 - To our knowledge, this is the first case of morphological borrowing in (Northern) Yuman

Acknowledgements

We would like to thank Elly van Gelderen, Heidi Harley, and three anonymous abstract reviewers for SSILA for their helpful feedback and contributions to this paper.

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