From transitive to intransitive and voiceless to voiced in Proto-Sino-Tibetan

New evidence from Stau, Geshiza, and Khroskyabs

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This paper offers new evidence from Stau, Geshiza, and Khroskyabs to address the question of directionality in valency-changing derivations in Sino-Tibetan. Examining Stau, Geshiza, and Khroskyabs causative and anticausative verb stem pairs adds to the evidence that in Proto-Sino-Tibetan, a number of intransitive stems are derived from transitive stems, in some cases as the result of *N- prefixation, and in other cases from voicing alternation independent of *N- prefixation. In addition, the proto-sigmatic prefix (*s-) does not cause devoicing in Stau, Geshiza, and Khroskyabs, but rather often undergoes voicing assimilation, and has more than just a causativization function. Furthermore, by looking at Gyalrong, Minyag, Tangut, Middle Chinese, and Old Chinese we emphasize that there is no synchronic evidence to support devoicing induced by *s-, nor is there historical evidence to support the claim that *s- caused devoicing in Proto-Gyalrongic, or even at genetically deeper stages.

Keywords: transitive and intransitive verb stems, sigmatic causative, anticausative, voicing assimilation, West Gyalrongic

1. Introduction

There has been some debate about the directionality of valence-changing derivations in Sino-Tibetan historical linguistics. Some scholars claim that the direction is simply one of transitivizing; and this valence-increasing derivation is accomplished through the sigmatic causative *s-, resulting in the devoicing of the onset (e.g. Gerner 2007; Mei 2012). Other scholars claim that the direction is one of detransitivizing; and this valence-decreasing derivation is accomplished through the *N- prefix, which changes the onset from voiceless to voiced (Sagart & Baxter

2012; Jacques 2012a, 2015). Handel (2012) provides an excellent overview of the debate, but does not offer an alternative solution for Proto-Sino-Tibetan. Through evidence by way of causative and anticausative verb stem pairs, the West Gyalrongic languages Stau, Geshiza, and Khroskyabs add weight to the argument that in Proto-Sino-Tibetan a number of intransitive stems are derived from transitive stems through a nasal prefix *N-. Moreover, it is shown that an opposite derivational path with a sigmatic prefix, namely from intransitive to transitive, cannot be established for this set of verb pairs. In addition, we shall show how adding the sigmatic prefix never results in devoicing for Stau, Geshiza, and Khroskyabs, but rather the *s- prefix often undergoes voicing assimilation.

We shall not be discussing analytic causatives and anticausatives nor lexical causatives and anticausatives in Stau, Geshiza, and Khroskyabs, but rather we shall focus on morphological causatives derived from *s- and anticausatives derived by voicing alternation since such structures have important diachronic implications for these languages. We shall also not be discussing the causative prefix wV/vV/γV- that is widely attested in Gyalrongic languages, as it does not have direct relevance to the argumentation used in this paper.

Unless otherwise mentioned, all Stau, Geshiza, and Khroskyabs data presented herein originates from the authors' fieldwork. It should be mentioned that the tabular data will not include inverse prefixes on the verb stems.

1.1   Goal and structure of the paper

Section 1.2 serves as an introduction to the Stau, Geshiza, and Khroskyabs languages and their classification. Section 2 discusses how anticausativization is derived by voicing alternation in Stau, Geshiza, and Khroskyabs: § 2.1 focusing on Stau, § 2.2 on Geshiza, and § 2.3 on Khroskyabs. Section 3 addresses causativization by the sigmatic prefix and discusses how the reflexes of *s- appear in Stau and Geshiza (§ 3.1), and Khroskyabs (§ 3.2). There are also non-causative functions of *s-. These are discussed in § 4. The last major section, § 5, concerns the diachronic implications of our study. We give a brief summary of the controversy (§ 5.1) and discuss the evidence for unvoiced/transitive → voiced/intransitive directionality in § 5.2. The evidence lies in aspiration contrast neutralization (§ 5.2.1), and how *s- does not induce voicing on initial consonants (§ 5.2.2). In § 5.3 we look at evidence from other languages, e.g. Japhug Gyalrong (§ 5.3.1), Minyag (§ 5.3.2), Middle and Old Chinese (§ 5.3.3), and Tangut (§ 5.3.4). Section 6 brings a conclusion to the paper.

1.2   A brief introduction to Stau, Geshiza, and Khroskyabs

Stau, Geshiza, and Khroskyabs are West Gyalrongic languages. West Gyalrongic and East Gyalrongic make up the two daughter nodes under Gyalrongic. Geshiza and Stau belong to a branch described as Horpa in previous research (see Tunzhi et al. 2019 for problems inherent in the term Horpa). Horpa languages in turn are closely related to Khroskyabs, another major branch within West Gyalrongic. The genetic relationships are illustrated in Figure 1, which offers a simplified *Stammbaum* of Gyalrongic languages.
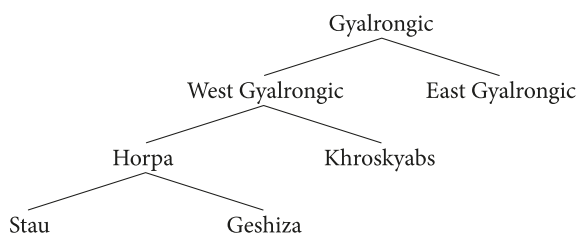

Figure 1. *Stammbaum* of Gyalrongic

1.2.1   *Introduction to Stau*

Stau is a major Horpa lect spoken primarily in Daofu County (Tibetan: *rta'u rdzong*; Chinese: 道孚縣) of Ganzi Prefecture (Tibetan: *dkar mdzes khul*; Chinese: 甘孜州), Sichuan Province, China. Moving northwest, the language forms a dialect continuum with Horpa lects spoken in Luhuo County (Tibetan: *brag 'go*; Chinese: 爐霍). A dialect continuum with Geshiza also possibly exists via the hinge dialect spoken in Dangling (Chinese: 黨嶺). Stau is relatively well-known among the Horpa lects, most of which still remain under-documented (see, inter alia, Vanderveen 2015 for a description of Mazur phonology and Gates 2017 for an analysis of triplication in Mazur Stau). Gates (2021) is an extensive descriptive grammar that covers all prominent grammatical phenomena identified in the language. The vitality of the language has been recently analyzed, being described as threatened and its use being in decline (see Genxia & Suzuki 2008; Tunzhi 2017). See Jacques et al. (2017); Honkasalo (2017); Gates & Kim (2018); Gates et al. (2019) for other works on Stau.

1.2.2   *Introduction to Geshiza*

Similar to Stau, Geshiza is a major Horpa lect spoken in Geshiza valley of Danba County (Tibetan: *rong.brag rdzong*; Chinese: 丹巴縣) west of Daofu County. On the basis of Chinese census data, the dialects of Geshiza have altogether approximately 8,000 speakers, many of whom also speak Sichuanese Mandarin

fluently. The language, with at least two main dialects, is rapidly becoming endangered and most children now prefer Chinese, at least in the proximity of Danba County Town. While Geshiza and Stau are not fully mutually intelligible without extended exposure, the lects share many features in their phonology and grammar, such as similar phoneme inventories, complex two- and three-member consonant clusters, similar directional prefix systems for the verbs, and similar argument indexation systems. In addition, Geshiza and Stau enjoy a highly similar lexicon. Until recently, the only major publication on Geshiza was Duo'erji (1998), a grammatical sketch in Chinese. It is now accompanied by Honkasalo (2019), a descriptive grammar that attempts to fill in the gaps with a culturally anchored documentation of Geshiza. Finally, it should be noted that the term Geshiza in this paper is used as shorthand for the Geshiza dialect spoken around Balang Village (Geshiza: *bəra groŋ*; Chinese: 巴郎村). Other dialects of Geshiza do not necessarily show identical behavior regarding the phenomena discussed.

1.2.3   *Introduction to Khroskyabs*

Khroskyabs is a cluster of lects that forms the other main branch of West Gyalrongic.[1] Khroskyabs is primarily spoken in Jinchuan County (Tibetan: *chu chen rdzong*; Chinese: 金川縣) north and northeast from the Stau and Geshiza homelands. Huang (2007:1–2) estimates that the language has less than ten thousand speakers. Khroskyabs is in contact with Amdo Tibetan, Horpa, and Sichuanese Mandarin; bilingualism between Khroskyabs and Sichuanese Mandarin being common. Despite extensive bilingualism, the language is still being used by all generations. At the same time, its future vitality is uncertain, like Stau and Geshiza. Khroskyabs has been recognized as a separate Gyalrongic language only relatively recently. Lai (2017) is a comprehensive descriptive grammar of Wobzi Khroskyabs. Khroskyabs grammar shows archaic Gyalrongic features shared with East Gyalrongic. At the same time, Jacques et al. (2017:610) propose a set of lexical innovations that connect Khroskyabs with Horpa. In all, Khroskyabs can be seen as a 'bridge' that connects East Gyalrongic and the Horpa lects.

2.   Anticausativization derived by voicing alternation

Since the goal of this paper is to demonstrate the overwhelming evidence that the historical directionality of derivation for the verb stem pairs presented in this

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1. Khroskyabs was formerly known as Lavrung and sometimes Guanyinqiao, the latter deriving from a Chinese toponym. In Lai (2017), the term Guanyinqiao is referred to as the Khroskyabs variety spoken in Thugs Chen.

paper is from transitive to intransitive, derived by alternating the initial consonant from voiceless to voiced, it is important that we set the stage by discussing the form and function of the pairs of morphological causatives (which are transitive by definition) and anticausatives (which are intransitive by definition) in Stau, Geshiza, and Khroskyabs.

In order to commence our discussion, some definitions of causativity and anticausativity are in order. Causativisation is an operation that increases valence by which a verb takes an additional argument, becoming ditransitive, as the result of a new agent who is considered the "causer" (Comrie 1974: 2). When an additional agent argument is introduced to a transitive clause (which is called "causer-related causation;" see Kittilä 2013 for the terms "causer-" and "agent-related"), the causer instigates the causee to carry out an action or to undergo a change of state (Song 2013). For intransitive clauses (agent-related causation), an agent argument is introduced, with the causee becoming a patient. The intransitive scenario could also be described as follows: the single argument (S) of an intransitive clause in active voice becomes the transitive object (O) of a transitive clause, or S→O, (Dixon 2000; 2010: 165).

An anticausative is a valence decreasing derivation in which the transitive object (O) of a transitive clause becomes the single argument (S) of an intransitive clause (O→S). In terms of detransitivizing, an anticausative looks the same as a passive; both are O→S, except that in a passive construction the A can be reintroduced as a peripheral argument, whereas in an anticausative the A cannot be reintroduced as a peripheral argument. In addition, in an anticausative there is a sense of spontaneity, and self-causing or self-benefiting (or self-harming), which is absent in passive and antipassive constructions (Haspelmath 2016).

Anticausative verb pairs exist in all three language under survey here. As noted in Honkasalo (2019), most of the attested verb pairs express the notions of breaking, separation, or removal in various ways, which cannot be considered a coincidence. Data from other related languages, such as Japhug Gyalrong (Jacques 2021) and Minyag (Gao 2015: 337–339) further shows that voicing alternation in causative and anticausative verb pairs can be traced back even further than Proto-Gyalrongic.

2.1   Anticausativization in Stau

Stau's set of causative and anticausative verb stem pairs was first pointed out by Jacques et al. (2017: 602). Table 1, reproduced from Jacques et al., gives a set of causative and anticausative verb stems from the Khang.gsar dialect of Stau.

Table 1. Anticausative verbs in Stau (Jacques et al. 2017: 602)

Base verb	Meaning	Anticausative verb	Meaning
səla	cause to fall	*zəla*	fall
pʰre	break (TR)	*bre*	break (INTR)
fkʰe	cut down	*vge*	break away, off
ftʂə	wake (TR)	*brə*	wake up
ftɕə	melt (TR)	*dzə*	melt (INTR)

In Mazur Stau, causative stems have voiceless (and mostly aspirated) initials; anticausative stems, having derived from causative stems (Jacques 2012b; Jacques et al. 2017: 602), have voiced initials. This set of causative and anticausative verb stem pairs can be observed in Tables 2 and 3 (with verb stems in third person non-finite forms). When it is allowed phonotactically, the causative verbs appear with an inverse prefix (*v-*), like all other transitive verbs in the language. In terms of form, the set of causative and anticausative verb stem pairs in Mazur Stau can be divided into two groups. The first group, with the most members, has voiceless aspirated causative stems and voiced unaspirated anticausative stems, as in Table 2. The second group takes the *s-* prefix as can be seen in Table 3.

Table 2. Anticausative derivation by onset voicing in Stau

Transitive	Gloss	Intransitive	Gloss
kʰfɛ	cause to cut/fall down	*gvɛ*	fall down
qʰre	cause to collapse	*ɢre*	collapse
pʰɛv	cause to come down	*bɛv*	come down
sili	cause to fall over	*zili*	fall over
tɕʰoqæ	disassemble	*dzoqæ*	fall apart
pʰrɛ	cause to break	*brɛ*	break (long things)
xcʰi	make a hole	*ɣɟi*	create a hole
mtɕʰə	cause to melt	*dzə*	melt
χtɕər	squeeze out	*dzər*	be squeezed out
qo	peel (cause to be peeled)	*ɢo*	be peeled

Note that *pʰɛv* 'cause to come down' and *bɛv* 'come down' are Tibetan loanwords: <'bebs/phag> and <'bab>, respectively. *ɣɟi* 'create a hole' is when a hole is created through the action of the patient.

Table 3. Anticausative derivation in Stau (with *s-* causatives)

s- + Causative verb	Gloss	Anticausative	Gloss
s-qə	extinguish	*qə*	go out (e.g. a fire)
s-pjæ	cause to burst	*bjæ*	burst
s-pədzo	rend	*bədzo*	tear apart
s-pʰrə	wake somebody	*brə*	wake (INTR)
s-pʰɛ	cause to fall back	*bɛ*	fall back
s-pərjɛ	cause to burn up	*bərjɛ*	burn up

The causative stems in Table 2 cannot take the *s-* prefix, and the causative stems in Table 3 cannot occur without the *s-* prefix.

2.2 Anticausativization in Geshiza

Geshiza retains a small number of causative and anticausative verb pairs that rely on voicing and aspiration contrast. Our data includes 11 causative and anti-causative verb pairs in the language (Table 4).

Table 4. Anticausative derivation by onset voicing in Geshiza

Transitive	Gloss	Intransitive	Gloss
ɑɕə	cause to break (sticks)	*ɑzə*	break (sticks)
tɕʰævsʰə	cause to roll	*dzævzə*	roll
kʰuæ	cut (general)	*guæ*	collapse, drop (e.g. antlers)
mtɕʰə	cause to melt	*dzə*	melt
pja	cut (wood)	*bja*	crack
præ	cause to break (strings)	*bræ*	break (strings)
prə	cause to break (fabric)	*brə*	break (fabric)
pʰæ v-tɕʰo	cause to separate	*bæ-dzo*	to get separated, divorce
sʰæle	cause to rotate	*zæle*	rotate
tsa	drop	*dza*	fall
tɕʰi	make a hole	*wdzi*	have a hole

Like Stau, the causative verbs appear with an inverse prefix when it is allowed phonotactically. Without exception, the causative stems have voiceless initials and the anticausatives have voiced initials. Geshiza nevertheless noticeably differs from Stau by not having subgroups of different causative and anticausative verb pairs. In other words, the prefix *s/sʰ/z-* never appears with causative verbs in the

pairs that rely on voicing and aspiration contrast. The syntax of anticausativiza-
tion in Geshiza is almost identical to that of Stau.

2.3   Anticausativization in Khroskyabs

Lai (2016) describes anticausativization in Khroskyabs. The data closely resem-
bles Horpa languages, as can be seen in Table 5 (for Wobzi Khroskyabs) and
Table 6 (for Siyuewu Khroskyabs). However, all but one of the causative verbs
have aspirated initials, whereas there is a greater variety of aspirated and unaspi-
rated initial consonants among causative verb stems in Stau and Geshiza.

Table 5. Anticausative derivation by onset voicing in Wobzi Khroskyabs

Transitive	Gloss	Intransitive	Gloss
cʰô	cause to open	*ʁɟô*	open
ftɕʰ�â	cause to melt	*dzâ*	melt
ftɕʰôm	cause to gather	*ʁdzôm*	gather
kʰlǽ	perish	*glǽ*	die out
ntɕʰətɕʰáv	trip	*ndzədzáv*	tumble
ftsʰôr	uprear	*dzôr*	stand
tsʰây	attach	*dzây*	be there (attached)
pʰayláy	cause to lay down	*bayláy*	be laid down
pʰjá	destroy (financially)	*bjá*	go bankrupt
pʰráy	tie	*bráy*	be tied
pʰrâ	loosen	*brâ*	become loose
tɕʰâlay	scatter	*dzâlay*	be scattered
tɕʰǽv	cause to break	*dzǽv*	break
tɕârə	tear	*dzârə*	be torn

Table 6. Anticausative derivation by onset voicing in Siyuewu Khroskyabs

Transitive	Gloss	Intransitive	Gloss
pʰlód	take away	*blód*	disappear
pʰǽv	show (magical power)	*bǽv*	show up (deity)
pʰǽv	dampen	*bǽv*	become wet
tɕʰâd	cause to secrete	*dzâd*	secrete
tɕʰáv	cause to roll down	*dzáv*	roll down

pʰǽv 'to show (magical power)' and *bǽv* 'show up (deity)' are from Tibetan <'bebs/phag> and <'bab>, respectively, and correspond with Mazur Stau *pʰɛv* 'cause to come down' and *bɛv* 'come down'.

In Khroskyabs, verb pairs with a voiced anticausative and an *s-* prefixed causative are rare. Only one example in Wobzi Khroskyabs is attested: *spʰlǽ* 'cause to disappear, cause to go over a mountain' vs *blǽ* 'disappear, go over a mountain'. However, the causative cognate in Siyuewu Khroskyabs is without an *s-* prefix: *pʰlód* vs *blód* (with the same meanings as in Wobzi Khroskyabs).

3.   The *s-* prefix in Stau, Geshiza, and Khroskyabs

This section discusses causative derivation with the sigmatic prefix in Stau, Geshiza, and Khroskyabs along with related morphophonemic processes.

3.1   *s-* prefix: Stau and Geshiza

In Stau (Tables 3 and 7) and Geshiza (Table 8), a select number of causatives verbs can be derived morphologically with reflexes of Proto-Sino-Tibetan *⋆s-*, as with all Gyalrongic languages and most contemporary Sino-Tibetan languages. For both Stau and Geshiza the prefix attaches both to intransitive and transitive verbs and the form of the prefix is phonologically determined (whether *s-* or *z-*). The voicing of the initial consonant largely determines the voicing of the causative prefix; nasals and the initial *j* being exceptions. The allomorph *s-* is used with unvoiced initial consonants and nasals, and the allomorph *z-* is used with voiced initial consonants (thus, a process of voicing assimilation).

In both Stau and Geshiza, the morphophonology of prefixal causativization on verbs with preinitials can be explained with the following steps.[2] A preinitial is removed and the causative prefix is placed in its stead. The value of the causative prefix allomorph is then determined by the voicing of the initial consonant. To illustrate, in both Stau and Geshiza, the verb *rgə* 'to sleep' has the preinitial *r-* removed. Since the initial consonant *g* is voiced, the voiced allomorph *z-* is added to the causativized verb: *z-gə* 'to put to sleep'.

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2. Studies of Gyalrongic phonology frequently employ the notions of preinitial, initial, and medial. The terminology is followed here, since it helps in understanding the conditioning factors that determine the form of the causative prefix. For example, in Geshiza, any full consonant phoneme may serve as an initial (C_i). This consonant may be preceded by a preinitial (C_p) *m-, n-, N-, v-, s/z-, x/ɣ-, r-, l-, w-*. It may also be followed by a medial (C_m) *-r-, -l-, -j-*. In all, this gives the consonant cluster structure of $(C_p)C_i(C_m)$ with maximally three members.

The Stau *gra* 'famous' is a Tibetan loanword from <grags> 'renowned, famous', as is the causative counterpart *z-gra* 'cause to be famous' from <bsgrags> 'to proclaim, make renowned'. *nkʰərvæ* 'turn' and *s-kərvæ* 'cause to turn' are also Tibetan loanwords (from <'khorba> and <skorba>, respectively).

Table 7. Causative derivation with the prefix *s/z-* in Stau

Base verb	Gloss	Causative	Gloss
rjɛ	stand	*s-jɛ*	cause to stand
rgə	lie down	*z-gə*	cause to lie down
gə	wear	*z-gə*	cause to wear (=get dressed)
gra	famous	*z-gra*	cause to be famous
lə	boil	*z-ʐə*	cause to boil
cʰu	hot	*s-cʰu*	cause to be hot (=burn)
nkʰərvæ	turn	*s-kərvæ*	cause to turn
tʰi	drink	*s-tʰi*	cause to drink
nə	start to burn	*s-nə*	light (a fire)
tʰoʐə	swirl	*s-tʰo-z-ʐə*	cause to swirl (=mix)
cʰi	ride (a horse)	*s-cʰi*	cause somebody to ride (a horse)
ʁo	help	*z-ʁo*	ask for help (recruit)
cʰə	lift up	*s-cʰə*	place on the back
pʰji	flee	*z-bji*	send off
bɛv	soak	*z-bɛv*	cause to soak
xi	wear shoes	*s-xi*	put shoes on somebody
ngəngæ	pick up	*z-gə*	gather
ntʰvæ	step	*s-tʰvæ*	push down

In our database, Geshiza has 31 verbs that undergo causativization by the prefix *s/sʰ/z-* (Table 8), while Stau has 24 (combining Tables 3 and 7). Since Geshiza phonotactics does not permit the nasal clusters **zm, *zn, *zɲ, *zŋ*, the voiceless allomorph must be used in this context: *mæmu* 'to move (INTR)' → *s-mæmu* 'to move (TR)'. This is different from Stau where the causative *s-* does not become voiced before nasals, but the verbalizer *s/z-* does become voiced before nasals. In addition, in Geshiza the allomorph *sʰ-* adjoins the initial *j* and also appears in *wele* 'to hang (INTR)' → *sʰ-uele* 'to hang (TR)'.[3]

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3. For *sʰ-uele* 'to hang (TR)' the initial *u* is historically the semivowel *w*.

Table 8. Causative derivation with the prefix *s/sʰ/z-* in Geshiza

Base verb	Gloss	Causative	Gloss
ạ-le	fall	*s-le*	fell, cause to fall
ạ-tɕʰi	move	*s-tɕʰi*	cause to move
bəla	turbid	*z-bəla*	cause to be turbid
v-gə	wear	*z-gə*	dress somebody
ŋgræl	line up	*z-ŋgræl*	lay out (things)
ɣo	help	*z-ɣo*	ask for help (recruit)
kə	be conserved	*s-kə*	conserve (e.g. food)
lə	boil (INTR)	*z-lə*	boil (TR)
lmæmæ	cry	*s-mæmæ*	cause to cry
mæmu	move	*s-mæmu*	cause to move
mbəva	ride piggyback	*s-mbəva*	to cause somebody to ride piggyback
mə	cook (INTR)	*s-mə*	cook (TR)
ndə	get wet	*z-də*	irrigate
nə	be lit	*s-nə*	light
ŋgæde	call, shout	*z-gæde*	knock
ŋkʰær	return	*s-kʰær*	cause to return
pʰrəu	leash, fasten	*s-pʰrəu*	tie
qʰæqʰæ	laugh	*s-qʰæqʰæ*	cause to laugh
rbə	pile up	*z-bə*	pile
rgə	sleep	*z-gə*	tell somebody to sleep
ri	be remaining	*z-ri*	to leave, e.g. food
rkʰo	be cold	*s-ko*	cool down, e.g. tea
rŋi	borrow	*s-ŋi*	lend
rji	stand, wake	*sʰ-ji*	cause to wake up
sko	have in possession	*s-kʰo*	cause somebody to have something
tʰi	drink	*s-tʰi*	cause to drink
*tʰoʑə	[not used]	*s-tʰoʑə*	mix
tɕi	ride (a horse)	*s-tɕi*	cause somebody to ride (a horse)
tɕutɕu	gather (INTR)	*s-tɕutɕu*	gather (TR)
wele	hang (INTR)	*sʰ-uele*	hang (TR)
xuə	wear shoes	*s-xuə*	put shoes on somebody

Note that the Geshiza intransitive verb **tʰoʑə* 'to mix' is not used in Balang, the primary fieldwork location. The verb *tʰoʑə* is nevertheless reported in Duo'erji (1998: 73–76), thus it is likely being used in some parts of the Geshiza valley. For Geshiza *rkʰo* 'be cold' → *s-ko* 'cool down, e.g. tea' and *sko* 'have in possession' → *s-kʰo* 'cause somebody to have something' we have an irregular difference in aspiration between the pairs.

In (2) we can see an example in Stau of the prefix *s-* deriving a causative from the intransitive verb stem *rjɛ* 'stand.3' as found in (1).

(1) *tɕʰəgɛ tʰi smi=ji pʰæŋe pəŋæ=ʁe   tə-rjɛ-sə*
     then DEM girl=GEN beside man=CLF.PERSON PFV-stand.3-IFR
     ji-rə
     EXIST.ANIM-SENS
     'Then a man was standing next to that girl.'

(2) *rdzə ʁdurtæ rə-s-jɛ-sə*
     post beam   UP-CAUS-stand.3-IFR
     'They made the posts and beams to stand.'

Note the loss of the preinitial *r-* in the causative derivation *s-jɛ* 'CAUS-stand.3', as there is a phonotactic constraint that disallows **sr*.

3.2   *s-* prefix: Khroskyabs

In Wobzi Khroskyabs, the prefixation of causative *s-* involves various complex morphophonological processes (Lai 2016). Apart from voicing assimilation as seen in Stau and Geshizha, the prefix *s-* may also undergo affrication, two types of metatheses, lateralization, lateral assimilation, and tone alternation.

Table 9. Voicing assimilation, lateralization, and tonal alternation of *s-* in Wobzi Khroskyabs

Base verb	Gloss	Causative	Gloss	Type
qʰrá	be big	*s-qʰrá*	cause to be big	voicing assimilation
gí	wear	*z-gí*	cause to wear	voicing assimilation
tɕʰə̂ra	stand up	*ɬ-tɕʰə̂ra*	cause to stand up	lateralization
dzǽv	bark	*l-dzǽv*	cause to bark	lateralization
tʰê	drink	*s-tʰé*	cause to drink	tonal alternation
nâr	burn (INTR)	*s-nár*	cause to burn	tonal alternation

In Table 9, examples of voicing assimilation, lateralization, and tonal alternation are listed. Lateralization occurs with coronal fricative or affricate initials, causing the prefix *s-* to lateralize into *l-* or *ɬ-*. Affrication is only found in one example, *rzə̂* 'wash' → *l-dzə̂* 'cause to wash', in which the fricative initial *z-* becomes *dz-*. Tonal alternation, which is attested in a handful of examples, involves a fossilized change from a falling-toned base to a high-toned causative verb when *s-* is applied.

The causative prefix *s-* undergoes two types of metathesis. The first type involves the predetermined ordering of preinitials in Wobzi Khroskyabs (Lai 2017: 73–76), in which the more sonorant preinitials precede less sonorant ones. Since *s-* is among the less sonorant preinitials, it has to be inserted between more sonorant preinitials and the initial consonant, as in (3).

(3)   a.   *s-* + *ʁbáɣ* 'explode' → *ʁ<z>báɣ* 'cause to explode'
      b.   *s-* + *jdâ* 'buy' → *j<z>dâ* 'cause to buy'

The second type of metathesis is termed *v*CV*r* metathesis. It metathesizes the preinitial and the coda of verbs with a *v*CV*r* structure, before applying the causative prefix. A five-step transformation is illustrated in (4).

(4)   1.   *s-vzár* (CAUS-be.spicy)
      2.   → *s-rzáv* (*v*CV*r* metathesis)
      3.   → *r-s-záv* (preinitial ordering metathesis)
      4.   → *s-záv* (cluster reduction)
      5.   → *l-záv* (lateralization, voicing assimilation) 'cause to be spicy'

The prefix *s-* in Wobzi Khroskyabs enjoys fairly high productivity, as it is attested in Tibetan loanwords, such as *l-dzǽn* 'cause to recall', from Tibetan <dran> 'recall', and *s-kʰæ̀* 'cause to be expert', from Tibetan <mkhas> 'be expert'.

4.   Non-causative functions of the *ˣs-* prefix

In Stau, Geshiza, and Khroskyabs, the use of the *ˣs-* prefix is not limited to causativization, a category-internal derivational device. In all of the three languages, the prefix also functions as a verbalizer. The prefix derives transitive verbs, as in Stau *ɣmɛ* 'wound' → *s-me* 'to hurt'.[4] The functional overlap and formal similarity of the *ˣs-* causative and *ˣs-* verbalizer point to a close historical connection (Jacques 2015).

Table 10. *s/z-* as a verbalizer in Stau

Base noun	Gloss	Denominal verb	Gloss
bəcæ	rod	*z-bəcæ*	hit
ɣmɛ	wound	*s-me*	hurt
rmə	name	*z-mə*	give a name
ɣmə	fire	*z-mə*	bake
kiŋoq	hook	*z-ŋo*	hang

It should be noted for Stau that while the causative *s/z-* does not become voiced before nasals, the verbalizer usually does become voiced (with the exception of *s-me* 'hurt'). Thus, this is evidence that the causativizer and verbalizer had different formal behavior in the proto-language. Note also that *kiŋoq* 'hook' is an Amdo loanword, demonstrating that the verbalizer was productive at some relatively recent period in the history of the language.

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4. The vowel alternation (*ɛ→e*) is due to *status constructus* (Gates & Kim 2018: 287), also described as bound state and compound stem in Gyalrongic studies.

The prefix *s/z-* appears as a verbalizer in four attested denominal verbs in Geshiza: *bəthа* 'stick'→ *z-bəthа* 'to hit with a stick'; *bi* 'stick' → *z-bi* 'to hit with a stick'; *kærkær* 'circle' → *s-kærkær* 'to go around, take a roundabout way'; *məu* 'eyes' → *s-məu* 'to close the eyes'.[5] While the first three are unquestionably transitive verbs, the verbalization *s-məu* is semi-transitive. It conjugates like other Geshiza intransitive verbs, but shows the syntactic behavior of transitive verbs by taking two arguments.

Additionally, a subset of reduplicated adjectives may be verbalized with *s/z-*. In each case, the verbalization is a transitive verb, in contrast to verbalizations with *N-* that result in intransitive verbs. It should be noted that since reduplicated adjectives in Geshiza derive from verbs, verbalization returns them to this original word class, albeit without the feature of stativity. To illustrate, *pær* (v.) 'to be flat' → *pær~pær* (adj.) 'flat' → *s-pær~pær* (v.) 'to crush, make flat'.

There is also a set of other derivations from the prefix *s/z-* in Stau, as seen in Table 11. For example, there is the applicative *s-qʰæ* 'laugh at' derived from *qʰæ* 'laugh' (also pointed out in Khang.gsar Stau by Jacques et al. 2017: 603).

Table 11. Other derivations with the prefix *s/z-* in Stau

Base stem	Gloss	Derived stem	Gloss
qʰæ	laugh	*s-qʰæ*	laugh at
bi	vclf.hit	*z-bi*	beat somebody
*kʰə-dziᵒ**	NW direction	*s-kʰə-dzi*	towards NW
ɣə-dziᵒ	SE direction	*z-ɣə-dzi*	towards SE

* The upper index zero ᵒ indicates that these forms are unattested as unbound stems.

In Khroskyabs, the prefix *s-* as a verbalizer is also attested. The verbalizer *s-* undergoes the same morphophonological processes as the causative prefix *s-*. Table 12 shows several examples of *s-* verbalization in Wobzi Khroskyabs (cited from Lai 2017: 526).

Table 12. *s-* as a verbalizer in Wobzi Khroskyabs

Base noun	Gloss	Denominal verb	Gloss
ʁ𝑗ô	hole	*ʁ<z>𝑗ó*	bury
tɕʰî	road	*ɬ-tɕʰî*	guide
grí	salary	*z-grí*	reward
váɣ	alcohol	*s-váɣ*	inebriate
mkʰɔ́	smoke	*s-kʰɔ́*	fumigate

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5. The noun *məu* 'eye' appears as the O argument when such an argument is overtly present with the verb.

5. Diachronic implications

This section discusses the diachronic implications of our findings from Stau, Geshiza, and Khroskyabs. After briefly introducing the question of directionality in valency changing derivations of Sino-Tibetan languages and offering our contributions from Stau, Geshiza, and Khroskyabs, we show that other related languages, such as Japhug, Minyag, Old Chinese, and Tangut, give further evidence that corroborate the conclusions of this paper.

5.1 Introduction to the question of directionality of valency-changing derivations in Sino-Tibetan studies

The directionality of valence changing derivations in Sino-Tibetan has been debated for some time now. As mentioned in the introduction to this paper, some scholars claim that the direction of valence changing derivations in the Sino-Tibetan proto-language is simply one of transitivizing; and this valence-increasing derivation is accomplished through the sigmatic causative *s-, resulting in the devoicing of the onset (e.g. Gerner 2007; Mei 2012). Other scholars claim that the direction is one of detransitivizing; and this valence-decreasing derivation is accomplished through the *N- prefix, which changes the onset from voiceless to voiced (Sagart & Baxter 2012; Jacques 2012a, 2015). We shall demonstrate in this section that Stau, Geshiza, and Khroskyabs add to the evidence that in Proto-Sino-Tibetan a number of intransitive stems are derived from transitive stems, and the sigmatic causative did not affect the voicing of the onset.

It is important to note that we are not claiming that for all verbs the derivation is from transitive to intransitive, but that this directionality is the case for at least a set of verbs. In addition, we want to strongly argue against the proposal that the *s- prefix is linked to devoicing.

5.2 Evidence in favor of transitive to intransitive derivation from Stau, Geshiza, and Khroskyabs

There are two primary pieces of evidence for arguing that there is a transitive → intransitive directionality of valence change in Stau, Geshiza, and Khroskyabs. Both pieces of evidence are pointed out by Jacques (2021) in reference to Japhug Gyalrong, but we have found both pieces of evidence to also be true for Stau, Geshiza, and Khroskyabs. Jacques also discusses a third piece of evidence for Japhug Gyalrong, namely intransitivization of loanwords, which will be discussed in §5.3.1. The two pieces of evidence in Stau, Geshiza, and Khroskyabs are aspiration contrast neutralization by voicing (§5.2.1) and the fact that the sigmatic

prefix does not cause devoicing, but rather mostly undergoes voicing assimilation (§ 5.2.2).

5.2.1 *Aspiration contrast neutralization by voicing*

As was demonstrated in Tables 1–5 and will be shown in Table 13, in all three languages (Stau, Geshiza, and Khroskyabs) we find that the initials for causative/transitive verbs can be aspirated or unaspirated, but the initials for anticausative/intransitive verbs are always unaspirated, and all anticausative/intransitive verbs, except one (*qə* 'go out'), are voiced. The most obvious conclusion from this data is that there is aspiration contrast neutralization brought about by voicing the initial consonant.

Table 13. Horpa-Khr aspirated and unaspirated initials for transitive verbs

Transitive	Gloss	Intransitive	Gloss
Khang.gsar Stau			
fkʰe	cut down	*vge*	break away, off
ftʂə	wake	*brə*	wake up
ftɕə	melt	*dzə*	melt
Mazur Stau			
qʰre	cause to collapse	*ɢre*	collapse
s-pjæ	cause to burst	*bjæ*	burst
s-pʰrə	wake somebody	*brə*	wake
Geshiza			
prə	cause to break (fabric)	*brə*	break (fabric)
pʰæ v-tɕʰo	cause to separate	*bæ-dzo*	to get separated, divorce
tsa	drop	*dza*	fall
tɕʰi	make a hole	*wdzi*	have a hole
Wobzi Khroskyabs			
pʰrâ	loosen	*brâ*	become loose
tɕʰâlaɣ	scatter	*dzâlaɣ*	be scattered
tɕʰǽv	cause to break	*dzǽv*	break
tɕârə	tear	*dzârə*	be torn

Getting a bit deeper into the data, we find that this aspiration contrast neutralization is exhibited in near minimal pairs. In Stau the initials *p* and *pʰ* in causative/transitive verbs both correspond to *b* for anticausative/intransitive verbs, as seen in (5).

(5)   *pʰɛv* 'cause to come down' ⇒ *bɛv* 'come down'
       s-pədʐo 'rend' ⇒ *bədʐo* 'tear apart'
       s-pʰɛ 'cause to fall back' ⇒ *bɛ* 'fall back'
       s-pərjɛ 'cause to burn up' ⇒ *bərjɛ* 'burn up'

Likewise, in both Stau and Khroskyabs the initials *tɕ* and *tɕʰ* in causative/transitive verbs both correspond to *dʐ* for anticausative/intransitive verbs, as in (6).

(6)   Mazur Stau *mtɕʰə* 'cause to melt' ⇒ *dʐə* 'melt'
       Mazur Stau *χtɕar* 'squeeze out' ⇒ *dʐar* 'be squeezed out'
       Khroskyabs *tɕʰǽv* 'to break (TR)' ⇒ *dʐǽv* 'to break'
       Khroskyabs *tɕârə* 'to tear' ⇒ *dʐârə* 'to be torn'

Thus, we observe aspiration contrast neutralization by voicing, shown in Table 14, as Jacques does with prenasalization and aspiration neutralization in Japhug Gyalrong.

Table 14. Aspiration neutralization by voicing

p-, pʰ- → b-
tɕ-, tɕʰ- → dʐ-

This systematic aspiration contrast neutralization points to a transitive → intransitive directionality. If the direction were from intransitive to transitive, as the result of the adding **s-*, we would not be able to predict whether we would get an aspirated or unaspirated initial after applying **s-*, and as a result we would need to come up with many more explanations than if we consider that the origin is from transitive verbs (Jacques 2021). It is more reasonable and simpler to suggest that a prefix, most likely **N-*, is causing voicing to aspirated initials and to unaspirated initials as a detransitivizing derivation.

5.2.2   *The sigmatic prefix does not cause devoicing*

Our second piece of evidence comes from the fact **s-* does not cause devoicing of the initial consonant of its host verb, but on the contrary, in most instances assimilates to the voicing value of the initial. The voiced initials of all base verbs in Tables 7, 8, and 9 from which a representative sample can be observed in Table 15, stay voiced after **s-* prefixation. Not only do the initials of the base verbs maintain their voicing after the application of **s-*, they often cause **s-* to become voiced (voicing assimilation i.e. *s-* → *z-*).[6] **s-* never devoices initial consonants.

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6. While the assimilation process is almost regular, exceptions exist. For instance, while *nə* 'to rest', *z-nə* 'to make rest' shows assimilation in Stau, the causativizing prefix does not assimilate

Table 15. Maintanence of voicing with **s-*

Base verb	Gloss	Causative	Gloss
Stau			
rgə	lie down	*z-gə*	cause to lie down
gə	wear	*z-gə*	cause to wear (=get dressed)
gra	famous	*z-gra*	cause to be famous
lə	boil	*z-ʐə*	cause to boil
nə	start to burn	*s-nə*	light (a fire)
tʰoʐə	swirl	*s-tʰo-z-ʐə*	cause to swirl (=mix)
ʁo	help	*z-ʁo*	ask for help (recruit)
ngəngæ	pick up	*z-gə*	gather
Geshiza			
a̠-le	fall	*s-le*	fell, cause to fall
bəla	turbid	*z-bəla*	cause to be turbid
gə	wear	*z-gə*	dress somebody
ŋgræl	line up	*z-ŋgræl*	lay out (things)
ɣo	help	*z-ɣo*	ask for help (recruit)
lə	boil (INTR)	*z-lə*	boil (TR)
mə	cook (INTR)	*s-mə*	cook (TR)
ndə	get wet	*z-də*	irrigate

In all cases when **s-* is a verbalizer in Stau the initial of the derived verb maintains its voicing after applying **s-* as seen in Table 10 reproduced in Table 16. Often **s-* assimilates the voicing of the initial, e.g. *z-bəcæ* 'hit', *z-mə* 'give a name', *z-mə* 'bake', and *z-ŋo* 'hang'.

Table 16. **s-* as a verbalizer in Stau

Base noun	Gloss	Denominal verb	Gloss
bəcæ	rod	*z-bəcæ*	hit
ɣmɛ	wound	*s-me*	hurt
rmə	name	*z-mə*	give a name
ɣmə	fire	*z-mə*	bake
kiŋok̚	hook	*z-ŋo*	hang

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in *nə* 'to be lit', *s-nə* 'to light'. At the current stage of research, the exact reasons for this irregularity remain unclear.

Strong evidence that *s- does not cause devoicing can be seen in Table 17, which shows the pathway of two transitive unbound verbs ($c^h\partial$ 'lift' and $p^h\varepsilon$ 'drop'), which can be used productively and in many constructions, becoming unproductive bound morphemes ($z\jmath\partial^o$ 'backwards motion' and $b\varepsilon$ 'fall back') used in only one construction (7).

Table 17. Unbound morpheme → bound morpheme

Pathway:	Transitive unbound morpheme → s- Causative → Bound morpheme
Morpheme	$c^h\partial → s\text{-}c^h\partial → z\jmath\partial^o$
Gloss	lift → lift and put on the back of something/somebody → backwards motion
Morpheme	$p^h\varepsilon → s\text{-}p^h\varepsilon → b\varepsilon$
Gloss	drop → cause to fall back → fall back (ANTIC)

(7) $t^h\varepsilon$ $z\jmath\partial\jmath\partial$ $t\partial\text{-}b\varepsilon\text{-}s\partial$
  3   backwards PFV-fall.back.ANTIC.3-IFR
  'He fell backwards.'

While $c^h\partial$ 'lift' is monotransitive, $s\text{-}c^h\partial$ 'lift and put on the back of something or somebody' can be either monotransitive or ditransitive depending on the number of core arguments in the clause. $z\jmath\partial^o$, which is clearly derived from $s\text{-}c^h\partial$ 'lift and put on the back of something or somebody', has become a bound adverb that conveys backwards motion. In contemporary Stau, $z\jmath\partial^o$ only occurs reduplicated ($z\jmath\partial\jmath\partial$) and only occurs with the anticausative verb $b\varepsilon$ 'fall back' in a construction seen in (7).[7] The monotransitive verb $p^h\varepsilon$ 'drop' also follows this pathway to becoming a bound intransitive verb $b\varepsilon$ 'fall back'; bound in the sense that it only can occur in a construction with $z\jmath\partial\jmath\partial$. The pathyway in Table 17 clearly shows that the palatal stop in $z\jmath\partial\jmath\partial$ became voiced after the s- prefix was added.

For verb pairs as found in Table 18 and for verb pairs, e.g. Mazur Stau $nt^hv\ae$ 'step' and $s\text{-}t^hv\ae$ 'push down' there are two plausible hypotheses to explore.

Table 18. Anticausative derivation in Stau (with s- causatives)

s- + Causative verb	Gloss	Anticausative	Gloss
$s\text{-}pj\ae$	cause to burst	$bj\ae$	burst
$s\text{-}p\partial dzo$	rend	$b\partial dzo$	tear apart
$s\text{-}p^hr\partial$	wake somebody	$br\partial$	wake (INTR)
$s\text{-}p^h\varepsilon$	cause to fall back	$b\varepsilon$	fall back
$s\text{-}p\partial rj\varepsilon$	cause to burn up	$b\partial rj\varepsilon$	burn up

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7. An alternative pronunciation is $z\jmath\dot{\imath}\dot{\imath}$ (Gates & Kim 2018: 269).

The first hypothesis is that both *nt^hvæ* 'step (INTR)' and *s-t^hvæ* 'push down (TR)' are derived from a root with an unvoiced initial, e.g. **t^hvæ*. In this scenario, **s-* transitivizes resulting in *s-t^hvæ* and *n-*, related to the Proto-Sino-Tibetan **N-*, creates the intransitive verb *nt^hvæ* 'step (INTR)'. The second hypothesis is that the causative has replaced the nasal preinitial (*s-nt^hvæ → s-t^hvæ*). In either hypothesis, devoicing is an untenable proposal. In the second hypothesis, however, (*s-* ousting the nasal) we could claim intransitive to transitive derivation, but not linked to devoicing by any means. These two hypotheses provide explanations for all of the verbs in Table 18.

The first hypothesis for Mazur Stau *nt^hvæ* 'step (INTR)' and *s-t^hvæ* 'push down (TR)' (both derived from **t^hvæ*) find a parallel in Tibetan, see in (8). (Data from Jacques 2015: 192.)

(8) *grib(-ma)* 'shade, shadow' ⇒ N-*grib* 'fail, be obscured'
  grib(-ma) 'shade, shadow' ⇒ *s-grib* 'cover'

The voicing of the initial consonant in Stau, Geshiza, and Khroskyabs anticausative verbs is indicative of prenasalization present in Proto-Gyalrongic (descending from **N-* in Proto-Sino-Tibetan). A simple explanation is that while the nasal was lost, the voicing was maintained in the initial consonant.

5.2.3   *Preinitial **N-* probably existed in Khroskyabs*

Although it cannot be stated with absolute certainty at this stage, there are two pieces of evidence that could show that voiced initials in Khroskyabs came from prenasalized consonants. The first piece concerns the word for horse, which is *bró* in Siyuewu and Wobzi Khroskyabs, corresponding to Japhug Gyalrong *mbro* and Bragbar Situ Gyalrong *mbró*. According to Jacques (2004: 278), the Proto-Gyalrong form of this word is reconstructed as **mraŋ*, which means that the voiced stop *-b-* is epenthetic. The Khroskyabs case preserves the epenthetic voiced stop *-b-*, which would not exist without a prenasal, suggesting that Khroskyabs *bró* comes from an earlier **mbró*. Whether this example is a cognate or a loanword from Gyalrong is irrelevant, and this evidence implies that at least a part of the voiced stops originated from prenasalized stops in Khroskyabs.[8]

The second piece of evidence has to do with the plural marker *=ɟə* in Khroskyabs. It is comparable to Geshiza *=ɲə*, Stau *=ɲi* and Cogtse Situ Gyalrong *=ɲê* (Lin 2016: 17). The prenasal is preserved in pronouns, such as *ŋəɲɟậ* '1PL' and

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8. One of the reviewers disagrees with the reconstruction of Jacques (2004) by insisting that the proto-form should be simply **mbro*. This alternative reconstruction however does not affect our analysis, as Khroskyabs *bró* originates anyway from an earlier **mbro*, validating our hypothesis that prenasalized initials did exist in Khroskyabs.

njêŋjə '2PL'. We can postulate the following sound change in Khroskyabs: **=ɲə >*
*=ɲjə > =jə.

5.3   Corroborating evidence from other languages

In this section we offer evidence from other languages that corroborate with the
internal evidence from Stau, Geshiza, and Khroskyabs.

5.3.1   *Japhug Gyalrong*

In Japhug Gyalrong, we also find voicing alternation in causative (transitive) →
anticausative (intransitive) pairs that parallels the process in Stau, Geshiza, and
Khroskyabs, as seen in Tables 19 and 20 (Japhug data is from Jacques 2021).
It is important to note that all of the anticausative verbs are prenasalized and
have voiced initials. Jacques demonstrates, with an even larger data set than we
have found in Horpa-Khroskyabs, that the same two pieces of evidence given in
§ 5.2.1 (aspiration neutralization) and § 5.2.2 (no devoicing of the initial conso-
nant after **s-* prefixation) can be observed in Japhug and speak of a transitive to
intransitive and voiceless to voiced directionality. Aspiration neutralization can
be clearly observed by comparing data in Table 19, in which the transitive stems
have unaspirated initials and Table 20, in which the transitive stems have aspi-
rated initials.

Jacques adds a third piece of evidence, which can be observed in Table 19.
The Tibetan loanword *χtɤr* 'scatter (TR)' (from <gtor>) has a counterpart *ʁndɤr*
'be scattered (INTR)', in which the consonant cluster *ʁnd* is phonotactically not
permitted in any Tibetic variety. This points to the derivational process for *ʁndɤr*
'be scattered (INTR)' starts with Japhug (or Proto-Gyalrong) borrowing in the
unvoiced and transitive *χtɤr* 'scatter', followed by voicing the onset via the nasal
prefix *n-*, which then was followed by the nasal and the uvular fricative undergo-
ing metathesis.

Table 19. Anticausative derivation by prenasalization and onset voicing in Japhug (Jacques 2021)

Transitive verb	Intransitive verb
plut 'destroy'	*mblut* 'be destroyed'
prɤt 'break' (of thread)	*mbrɤt* 'break'
pri 'tear'	*mbri* 'be torn'
pyaʁ 'turn over'	*mbyaʁ* 'turn over'
χtɤr 'scatter'	*ʁndɤr* 'be scattered'
tɕɤβ 'burn'	*ndzɤβ* 'be burned'
tɕyaʁ 'squeeze out'	*ndzyaʁ* 'be squeezed out'
tʂaβ 'cause to fall/roll'	*ndzaβ* 'fall/roll'
ftʂi 'melt'	*ndzi* 'melt'
cu 'open'	*ɲɟu* 'open'
krɣ 'bend'	*ŋgrɣ* 'be bent'
kio 'cause to glide'	*ŋgio* 'slip'
kra 'cause to fall'	*ŋgra* 'fall'
qaʁ 'peel off'	*ɴɢaʁ* 'peel off'
qɤt 'separate'	*nuɴɢɤt* 'part ways'
qia 'tear down'	*ɴɢia* 'get loose'
qlut 'break' (of long objects)	*ɴɢlut* 'break'
qraʁ 'tear'	*ɴɢraʁ* 'be torn'
qrɤz 'shave'	*ɴɢrɤz* 'break' (of hair, dry leaves etc.)
qru 'break' (of hard objects)	*ɴɢru* 'break'

Table 20. Anticausative derivation by prenasalization and onset voicing in Japhug (Jacques 2021)

Transitive verb	Intransitive verb
pʰaʁ 'split'	*mbaʁ* 'split, break'
u-ʁo+pʰi 'be disappointed by'	*u-ʁo+mbi* 'be discouraged'
sɤpʰɤr 'wipe off'	*mbɤr* 'be wiped off'
tʰu 'built' (road, bridge)	*ndu* 'be spread' (road, bridge)
xtʰom 'put horizontally'	*ndom* 'lie horizontally'
tsʰoʁ 'attach'	*ndzoʁ* 'be attached'
cʰɤβ 'flatten, crush'	*ɲɟɤβ* 'be crushed, flattened'
qʰrut 'completely scratch'	*ɴɢrut* 'be completely scratched'

5.3.2   Minyag

The paper has hitherto discussed closely related languages. Taking a wider perspective, however, shows that the arguments concerning the directionality of valence-changing derivations apply to other Sichuan Ethnic Corridor (Qiangic) languages as well. Gao (2015: 339) identifies four verb pairs in Minyag that behave identically to Stau, Geshiza, and Khroskyabs: e.g. *ˡtʰʌkʌ* 'to break (thread) (TR)' → *ˡtʰʌŋɡʌ* 'to break (thread) (INTR)'; *ˡnɑpʰa* 'to break, puncture (ball) (TR)' → *ˡnɑmba* 'to break, puncture (ball) (INTR)'. The existence of both aspirated and unaspirated consonants in the transitive, but not in the intransitive forms shows that the latter are derived from the former. In the examples, the first syllables stand for orientational prefixes.

5.3.3   Middle and Old Chinese

Extensive scholarship in Chinese historical linguistics exists concerning voicing alternation and valency change. Voicing alternation between transitive and intransitive verbs in Middle Chinese has long been recognized, illustrated in Table 21:

Table 21. Voicing alternation and valence change in Middle Chinese (adapted from Jacques 2015: 193)

Transitive	Meaning	Intransitive	Meaning
見 *ken³*	see	現 *ɣen³*	appear
敗 *pæj³*	defeat	敗 *bæj³*	be defeated
別 *pjet*	separate	別 *bjet*	be different, leave
折 *tɕet*	break, bend (TR)	折 *dʑet*	break, bend (INTR)

While the phenomenon is the most universally recognized reflection of a morphological process proposed for historical stages of Chinese, its historical origins remain under debate. Considering the possibility that a sigmatic prefix was present in at least a part of the alternating verb pairs, examples in Table 22 show that the sigmatic prefix did not result in devoicing the derived causative stems in Old Chinese. On the contrary, the prefix is seen to become voiced with voiced obstruents, like in Stau, Geshiza, and Khroskyabs.

Table 22. The causative **s-* in Old Chinese (adapted from Jacques 2015: 194 citing Sagart & Baxter 2012)

Old Chinese	Middle Chinese	Meaning
*gijʔ	→ 視 *dzij²*	see
*s-gijʔ-s	→ 示 *zij³*	show
*mə-lək	→ 食 *zik*	eat
*s-m-lək-s	→ 飼 *zi³*	feed

Additionally, like in Stau, Geshiza, and Khroskyabs, a sigmatic prefix with a verbalizing function existed in Old Chinese, examples given in Table 23. However, the few existing uncontroversial examples impede a detailed analysis.

Table 23. Examples of the verbalizer **s-* in Old Chinese (adapted from Jacques 2015: 195)

Old Chinese	Middle Chinese	Meaning
*rəʔ-s	→ 吏 *li³*	officer
*s-rəʔ	→ 使 *ṣi²*	send
*rut	→ 率 *lwit*	norm, standard
*s-rut	→ 率 *ṣwit*	follow, go along

5.3.4 *Tangut*

As shown in Table 24, Tangut includes anticausative verbs with similar semantics to Stau, Geshiza, and Khroskyabs discussed in this paper. Moreover, some of the verb pairs are clear cognates. As can be seen, the transitive verbs appear with voiceless aspirated initials corresponding to voiced initials in the intransitive verbs.

Table 24. Anticausative verbs in Tangut (adapted from Jacques 2014: 247)

Transitive verb		Gloss	Intransitive verb		Gloss
敎[5390]	*phie*	untie, release	絥[2162]	*bie*	be untied
燬[3929]	*tɕhjwi*	cause to melt	髍[3956]	*dzj(w)i*	melt
襐[4807]	*khji*	cause to fall	豧[4930]	*gji*	fall
緂[2475]	*phia*	break	糷[4314]	*bia*	break
緂[3708]	*phja*	cut	拨[4459]	*bja*	cut
羿[1527]	*phjaa*	disallow/ban	衕[2350]	*bjaa*	be finished
毛[0390]	*khjwɨ*	cut	燊[5746]	*gjwɨ*	be cut
髒[2827]	*phej*	fasten	髍[5979]	*bej*	be fastened
緂[2478]	*khjij*	stretch, dry	禄[0471]	*gjij*	be stretched, be opened
羆[4592]	*phjo*	distinguish	纇[3923]	*bjo*	be clear

The exact position of Tangut among Trans-Himalayan languages has received increasing attention in recent times. Many striking similarities between Tangut and Horpa languages exist (for instance, see Honkasalo 2019: 646 for similar distribution of "basic" and "modal" negators in Tangut and Geshiza, and see Lai et al. 2020 for extensive evidence pointing to Tangut as a West Gyalrongic language). Since most of the research is still ongoing with few finished publications, we have remained conservative by treating Tangut separately from West Gyalrongic languages here.

6.   Conclusion

This paper offers new data from Stau, Geshiza, Khroskyabs, and Tangut for addressing the question of directionality in valency changing derivations. In the set of causative and anticausative verb pairs in Stau, Geshiza, and Khroskyabs, the anticausative stems can irrefutably be shown to derive from the causative stems. To explain the direction of derivation in these verb pairs, we postulate a nasal prefix *N- that has eroded from Stau, Geshiza, and Khroskyabs, yet has been retained in some other related languages, e.g. Japhug. Furthermore, the sigmatic causative prefix present in Stau, Geshiza, and Khroskyabs never results in devoicing in Stau, Geshiza, and Khroskyabs. On the contrary, it is shown to undergo voicing in phonologically determined contexts. Consequently, data from Stau, Geshiza, and Khroskyabs provides a strong argument against a universal devoicing function for the sigmatic prefix in Sino-Tibetan. At this point of research, the conclusion regarding valence directionality that we offer in this paper cannot yet be universally applied to all Sino-Tibetan languages, but is limited to Proto-Gyalrongic, and more widely, to Qiangic. Further analysis of Ngwi and other branches of Sino-Tibetan may nevertheless reveal that the presented conclusions have a wider applicability, possibly even to the Sino-Tibetan proto-language.

Acknowledgements

Abbreviations

ANIM	animate	INTR	intransitive
ANTIC	anticausative	INV	inverse
CAUS	causative	PFV	perfective
CLF	classifier	SENS	sensory evidential
EXIST	existential verb	TR	transitive
EXIST.ANIM	animate existential verb	UP	orientaltional prefix 'up'
GEN	genitive	VCLF	verbal classifier
IFR	inferential evidential		

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