Causality of Passive and Paradigmatic Gaps[*]

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1   The puzzle

This paper is about passive in Barguzin dialect of Buryat (Mongolic).

The received wisdom about passives is that they can attach to agentive transitive verbs, as is schematized in (1). In this case they existentially bind the Agent and leave the event structure (the semantics of the verb) intact. The Patient becomes the subject. If a morpheme does that to the argument structure of transitive verbs, we label it 'passive'.

		'Jane ate the soup.' →	*'The soup was eaten.'*
(1)	arguments:	1_{NOM} 2_{ACC}	2_{NOM} (1)
	subevents:	+ causation event	+ causation event
	θ-role types:	+ Agent	+ Agent (implicit, $\exists$-bound)

What is also known since Perlmutter (1978) is that morphemes that do that to transitives (passive morphemes), do not attach to unaccusatives.

What is less known is that this generalization does have counterexamples. In certain languages there are morphemes that, apart from forming standard passives, like in (1), (so we would call them 'passives'), also attach to unaccusatives. In the latter case they form what has been called *causal passive*[1], schematized in (2). They *introduce* a new existentially bound Agent and a corresponding causation event into the argument structure of the base verb:

		'The boy slept.' →	*'The boy was slept.'*
(2)	arguments:	2_{NOM}	2_{NOM} (1)
	subevents:	− causation event	+ causation event
	θ-role types:	− Agent	+ Agent (implicit, $\exists$-bound)

Causal passives were, probably, firstly discovered in Karachay-Balkar (Turkic) by Lyutikova et al. (2006). They are also present in Barguzin Buryat. The fact that we find counterexamples to Perlmutter's generalization in different languages with possibly unrelated passive morphemes tells us that we should probably rethink what we have been assuming about passives in general.

The focus of this paper is going to be the novel data from Buryat. In section 2 I will go through the Standard Passive use and the Causal Passive use of the Buryat *-gda* morpheme. In section 3 I will propose a unifying analysis, based on event decomposition

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[1]The term is from Lyutikova and Bonch-Osmolovskaya (2006).

and neo-Davidsonian approaches to the argument structure. In section 4 I will try to explore what a possible analysis that seems to work for Buryat would predict, if extended to other languages, which may lack causal passives altogether.

2 The case for Barguzin Buryat

The focus here is a morpheme *-gda*, glossed as PASS and called 'the passive' and a sample of 48 verb roots. The passive attaches[2] to two major classes of verbs: transitives (or A-only for Agent-only, 22 out of 48) and unaccusatives (P-only for Patient only, 18 out of 48).

2.1 A-only verbs: Standard Passive

Underived verbs The 22 A-only verbs (notation V_{ag}) that we have worked with: *ala* 'kill', *bəʃə* 'write', *bədər* 'look.for', *du:la* 'sing', *əd'i* 'eat', *əl'gə:* 'send', *n'ə:* 'open', *olo* 'find', *soxi* 'beat', *ʃədə* 'throw', *ʃərdə* 'paint', *ʃagna* 'listen', *ʃara* 'fry', *tʉrə* 'give.birth', *ta:la* 'kiss', *uga:* 'wash', *unʃa* 'read', *ʉgə* 'give', *ʉldə* 'drive.away', *xara* 'watch', *xaxal* 'rip', *zolgo* 'meet/greet'.

No A-only verb can be used in an unaccusative clause, as in (3a) or (4a). All A-only verbs can be used in a transitive clause, as in (3b) or (4b). With respect to their diathesis, A-only verbs are obligatory transitive.

(3) a. *ʉ:dən   n'ə:-gə: b. dugar   ʉdə   n'ə:-gə:
        door.NOM open-PST   Dugar.NOM door.ACC open-PST
     The door opened.   *Dugar opened the door.*

(4) a. *ʃʉlən   əd'-ə: b. səsəg   ʃʉlə   əd'-ə:
        soup.NOM eat-PST   Seseg.NOM soup.ACC eat-PST
     The soup ate.   *Seseg ate the soup.*

With respect to their event and argument structure, all A-only verbs involve agentive causation. They are all compatible with agent-oriented adverbials:

(5) səsəg   **zor'u:ta**   (/ **məndə-ʒə** / **mədə:-gʉj**)   ojo:r-o: uga:-ba
     Seseg.NOM deliberately (/ hurry-CONV / intention-NEG) floor-REFL wash-PST2

     Seseg deliberately (/ in a hurry / unintentionally) washed her floor.

The nominative argument of A-only verbs has all the semantic properties, usually associated with Agents. It controls the situation, it is volitionally involved etc. – see Dowty (1991).

Their *-gda* derivatives: Standard Passive The suffix *-gda* can attach to all A-only verbs. In this case it forms what we would normally call 'standard passive'.

The former subject is suppressed, the former object becomes the subject:

(6) a. [dugar]₁   [ʉdə]₂   n'ə:-bə   b. [ʉdən]₂   n'ə:-gd-ə:
        Dugar.NOM door.ACC open-PST2   door.NOM open-PASS-PST
     Dugar opened the door.   *The door was opened.*

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[2]Modulo certain exceptions.

The -*gda* derivatives of A-only verbs have the argument and event structure of a standard passive. They can be modified by agent-oriented adverbials:

(7) ənə ojo:r **zor'u:ta**   (/ **məndə-ʒə** / **mədə:-gʉj**)   uga:-gd-a:
     this floor deliberately (/ hurry-CONV / intention-NEG) wash-PASS-PST

     This floor was deliberately (/ in a hurry / unintentionally) washed by someone.

They have an implicit Agent argument, which can control PRO in purpose clauses. Purpose clauses with -*xa-ja* 'FUT-REFL' cannot be associated with an understood Agent (8a), but can be associated with an implicit Agent in standard passive (8b).

(8) a. Ungrammatical, if associated with an understood Agent[3]
         *hʉn   **PRO$_i$ tvorog   bəldə-xə-jə:**   gaʃal-a:
         milk.NOM PRO cottage.cheese make-FUT-REFL sour-PST

         The milk soured to prepare some cottage cheese.

     b. Grammatical, if associated with a covert Agent
         PRO$_i$ ailʃa-nu:d-i:-jə du:d-xa-ja: ənə ojor u:g-**agd$_i$-a:**
         PRO   guest-PL-GA-ACC host-FUT-REFL this floor wash-PASS-PST

         This floor was washed by someone in order to host guests.

For some speakers the implicit Agent in passive can bind subject-oriented reflexives:

(9) $^{\%}$ojo:r **ө:r-i:n-gө:$_i$**   **gər-tə**   uga:-**gd$_i$-a:**
     floor self-GEN-REFL house-DAT wash-PASS-PST

     Someone washed the floor in their own house.

Importantly, the implicit Agent is neither pronominal, nor high scope indefinite. It must be ∃-bound at the VP level. In particular, unlike pronouns, it cannot be bound by a c-commanding quantifier. (10) only has the stronger meaning (nobody even admits that the meat was eaten).

(10) CONTEXT: Seseg cooked some meat. Somebody ate it, but nobody admits to the crime.
      xənʃjə$_i$ səsəg-əi   m'axan   əd'i-**gd**$_{*i/j}$-ə: gə-ʒə xələ-nə-gʉj
      nobody Seseg-GEN meat.NOM eat-**PASS**-PST that say-PRS-NEG

      *Nobody$_i$ says that Seseg's meat was eaten (*by them$_i$).*

Unlike pronouns, it cannot be discourse-anaphoric:

(11) Nam-da **axa$_i$**   bi:. $^{\#/?}$Enə nom bəʃ-**əgd$_i$**-ə:.
      I-DAT   brother there.is   this book write-PASS-PST

      *I have a brother$_i$. This book was written (*by him$_i$).*

Unlike high scope indefinites, the Agent cannot create a discourse antecedent that would be referred back to by a pronoun:

(12) Ojo:r uga:-**gd$_i$**-a:. $^{\#/?}$**Tərə$_i$** mini: axa   bai-ga:.
      floor wash-PASS-PST   3SG   my   brother be-PST

      Intended: *The floor was washed by someone$_i$. They$_i$ were my brother.*

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[3]The judgments about (8a) vary, meanwhile (8b) is ok by all the speakers.

Summary Buryat has a class of verbs that cannot be used in an unaccusative clause, but can be used in a transitive clause and can be passivized by -gda. The result has all the signature properties of a standard passive:

(13) a.*[ʉdən]₂ n'ə:-gə: b.[dugar]₁ [ʉdə]₂ n'ə:-bə   c.[ʉdən]₂ n'ə:-gd-ə:
       dr.NOM open-PST   D.NOM dr.ACC open-PST2   dr.NOM open-PASS-PST
     → The door opened.   → The door opened.   → The door opened.
                           → Dugar opened the door.   → Someone opened the door.

2.2   P-only verbs: Causal Passive

Underived verbs The 18 P-only verbs (notation V_{un}) that we have worked with: *dəbxərə* 'jump', *durla* 'fall.in.love', *ən'ə:* 'laugh', *gʉj* 'run', *gaʃal* 'sour', *go:ʒo* 'drop', *jərə* 'come', *jaba* 'go', *n'i:də* 'fly', *oro* 'enter', *sai* 'whiten', *ʃunga* 'swim', *tamar* 'float', *unta* 'sleep', *ʉxə* 'die', *xʉrə* 'cool.down', *xarai* 'skip', *xurxir* 'snore'. This includes unaccusatives like 'sour' and motion verbs with non-agentively interpreted subjects.[4]

All P-only verbs can be used in an unaccusative clause, as in (14a) or (15a). No P-only verb can be used in a transitive clause, as in (14b) or (15b).

(14) a. hʉn   gaʃal-a: b. *badma   hʉ   gaʃal-a:
         milk.NOM sour-PST   Badma.NOM milk.ACC sour-PST
      The milk soured.   *Badma soured the milk.*
(15) a. ʉxibʉ:n   unt-a: b. *badma   ʉxibʉ: unt-a:
         child.NOM sleep-PST   Badma.NOM child.ACC sleep-PST
      The child slept.   *Badma slept the child.*

Buryat has a productive causative morpheme -*u:l*, which can attach to V_{un}. But it does *not* form a direct causative, aka a transitive clause ('put to bed'). It always entails indirect causation ('make/let someone sleep'). For direct vs. indirect causatives see Miyagawa (1984, 1998, 1999) and Harley (1997, 2008, 2010). In other words, there is no way to transitivize P-only verbs.

P-only verbs do not involve any agentive causation. They are incompatible with agent-oriented adverbials:

(16) *hʉn   **zor'u:ta**   (/ **məndə-ʒə**   / **mədən-gʉj**) gaʃal-a:
       milk.NOM deliberately (/ hurry-CONV / intention-NEG) sour-PST
      The milk soured deliberately (/ in a hurry / unintentionally).

The nominative argument of P-only verbs has all the semantic properties, usually associated with Patients. It does not control the situation, is not volitionally involved – see Dowty (1991).

Their *-gda* derivatives: Causal Passive *For most speakers* of Barguzin Buryat -*gda* can attach to *most* P-only verbs and form a causal passive.[5] The subject stays nominative:

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[4]Motion verbs, like *jere*, take either an animate subject ('Badma swam') or an inanimate one ('log swam'). In the former case they behave like unergatives. In the latter case they behave like P-only verbs.

[5]Though there is variation, on the whole causal passives are allowed. For some speakers the less agentive is the base verb, the better is its passive derivative.

(17) a. [hʉn]₂ gaʃal-a:
milk.NOM sour-PST
The milk soured.

b. [hʉn]₂ gaʃal-agd-a:
milk.NOM sour-PASS-PST
The milk was soured.

(18) a. [ʃubun]₂ ni:d-ə:
bird.NOM fly-PST
The bird flew.

b. [ʃubun]₂ ni:d-əgd-ə:
bird.NOM fly-PASS-PST
Lit: *The bird was flown.*
(Meaning: Someone let the bird fly.)

The -*gda* derivatives of P-only verbs have *the same* argument and event structure as a standard passive. Like standard passives, they can be modified by agent-oriented adverbials, even though P-only verbs cannot, compare (16) and (19).

(19) hʉn **zor'u:ta** (/ **məndə-ʒə** / **mədə:-gʉj**) gaʃal-adg-a:
milk.NOM deliberately (/ hurry-CONV / intention-NEG) sour-PASS-PST
The milk was soured deliberately (/ in a hurry / unintentionally).

Like in a standard passive, causal passives involve an implicit Agent argument, which can control PRO in purpose clauses:

(20) a. *hʉn **PRO$_i$ tvorog bəldə-xə-jə:** gaʃal-a:
milk.NOM PRO cottage.cheese make-FUT-REFL sour-PST
The milk soured to prepare some cottage cheese.

b. hʉn **PRO$_i$ tvorog bəldə-xə-jə:** gaʃal-**agd$_i$**-a:
milk.NOM PRO cottage.cheese make-FUT-REFL sour-PASS-PST
The milk was soured to prepare some cottage cheese.

For some speakers the Agent can bind subject-oriented reflexives:

(21) $^{\%}$hʉn **ө:r-i:n-gө:$_i$ gər-tə** gaʃal-**agd$_i$**-a:
milk.NOM self-GEN-REFL house-DAT sour-PASS-PST
The milk was soured by someone in their own house.

Unlike pronouns, the implicit Agent cannot be bound by a c-commanding quantifier:

(22) CONTEXT: Seseg warmed water. Somebody cooled it, but nobody admits to the crime.
xənʃjə$_i$ səsəg-əi uhan xʉr-**əgd**$_{*i/j}$-ə: gə-ʒə xələ-nə-gʉj
nobody Seseg-GEN water.NOM cool-**PASS$_i$**-PST that say-PRS-NEG
1. *Nobody$_i$ says that Seseg's water was cooled by them$_i$.*
2. *Nobody says that Seseg's water was cooled.*

Unlike pronouns, it cannot be discourse anaphoric:

(23) Nam-da **axa$_i$** bi:. $^{\#/?}$Enə ʉxibʉ:n unt-**agd$_i$**-a:.
I-DAT brother there.is this child sleep-PASS-PST
*I have a brother$_i$. This child was put to sleep (*by him$_i$).*

Unlike high scope indefinites, the Agent cannot create discourse antecedents:

(24) ʉxibʉ:n unt-**agd$_i$**-a:. $^{\#/?}$**Tərə$_i$** mini: axa bai-ga:.
child sleep-PASS-PST 3SG my brother be-PST
Intended: *The child was put to bed by someone$_i$. They$_i$ were my brother.*

In other words, the Agent must be ∃-bound at the VP level.

Summary Buryat has a class of verbs that can be used in an unaccusative clause, cannot be used in a transitive clause, but can be passivized by *-gda*. The result has the same argument structure, as a standard passive:

(25) a. [hʉn]₂ gaʃal-a:
       m.NOM sour-PST
    → The milk soured.

    b. *[b.]₁ [hʉ]₂ gaʃal-a:
       B.NOM m.ACC sour-PST
    → The milk soured.
    → Badma soured the milk.

    c. [hʉn]₂ gaʃal-agd-a:
       m.NOM sour-PASS-PST
    → The milk soured.
    → Someone soured the door.

2.3 Generalizations

(26) a. [badma]₁ [ʃʉlə]₂ əd'-ə:
       Badma.NOM soup.ACC eat-PST
    → The soup was eaten.
    → Badma ate the soup.

    b. [ʃʉlən]₂ əd'i- gd -ə:
       soup.NOM eat-PASS-PST
    → The soup was eaten.
    → Someone ate the soup.

(27) a. [ʉxibʉ:n]₂ unt-a:
       child.NOM sleep-PST
    → The child slept.

    b. [ʉxibʉ:n]₂ unt- agd -a:
       child.NOM sleep-PASS-PST
    → The child slept.
    → Someone put the child to bed.

The standard passive with *-gda* (26b) and the causal passive with *-gda* (27b) have basically the same argument and event structure. In particular they share the same semantic component: the causation event and the implicit existentially bound Agent (the boxed entailments).

This is the semantic component shared by (26b) and (27b). The shared morphological component is the passive morpheme *-gda*. It is natural to assume that the semantic contribution of *-gda* in *both* cases is indeed the causation event + the ∃-bound Agent.

If the semantic contribution of *-gda* in (26b) is the causation + the Agent, then, under the simplest assumptions, the semantic contribution of the verb *əd'i* 'eat' itself is the remaining part: the non-agentive soup-being-eaten. If it is the contribution of *əd'i* in (26b), it is the contribution of *əd'i* in (26a) as well (again, under the simplest assumptions). Hence the overt Agent and the causation event in (26a), aka the dash-boxed entailment, should come from something else. This something else must be familiar to the reader by the name of the little *v*.

3 Analysis: unifying passives

3.1 The *v*-hypothesis

The proposed analysis is built on the neo-Davidsonian theory of the argument structure. The assumption is that at least some arguments of the verbs (in particular, Agents) are introduced by separate functional heads. In addition I am assuming an event decomposition approach, according to which those functional heads also bear event semantics. A sample of such theories includes Dowty (1979), Hale and Keyser (1993), Kratzer (1996), Harley (1997), Baker (1997), Miyagawa (1998), Pylkkänen (2002), Folli and Harley (2007), Ramchand (2008), Harley (2008, 2010) and Paducheva (2001, 2009).

Step 1 Assume non-agentive semantics for both P-only and A-only verbs:

(28) a. [['sour']] = λx. λe. sour(e) & Patient(x)(e). V_{un}
          [['sleep']] = λx. λe. sleep(e) & Patient(x)(e).

       b. [['open']] = λx. λe. open(e) & Patient(x)(e). V_{ag}
          [['eat']] = λx. λe. eat(e) & Patient(x)(e).

(29) [[$[_{V_{un}P}$ 'child' 'sleep']]] = λe. child-sleeping(e).
      [[$[_{V_{ag}P}$ 'soup' 'eat']]] = λe. soup-being-eaten(e).

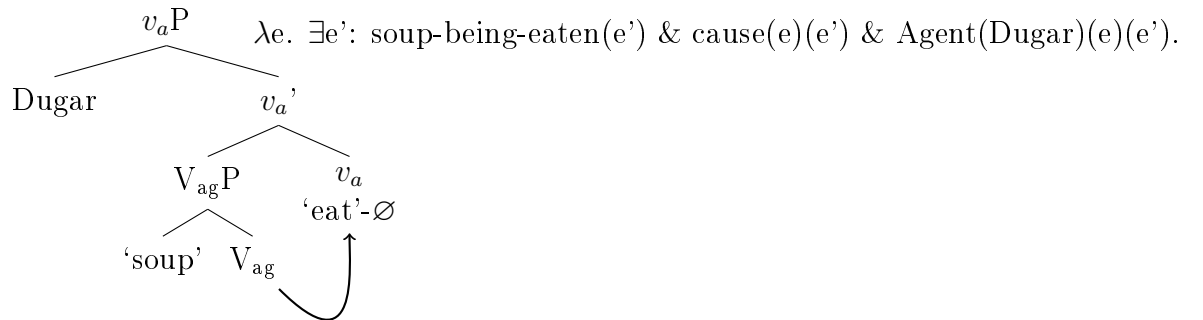**Step 2** Assume two extra morphemes: v_a and v_p. *Both* introduce a causation event and an (∃-bound) Agent. The former may be decomposed into v and Voice, following the proposal in Pylkkänen (2002), further developed in e.g. Lyutikova et al. (2006) or Harley (2013). Here I am not taking up this assumption for simplicity. The lexical entries for v_a and v_p:

(30) a. [[$\frac{v_a}{-\varnothing}$]] = λP$_{vt}$. λy. λe. ∃e': P(e') & cause(e)(e') & Agent(y)(e)(e').

       b. [[$\frac{v_p}{-gda}$]] = λP$_{vt}$. λe. ∃e',y: P(e') & cause(e)(e') & Agent(y)(e)(e').
          1. **v** is the type for events; 2. **cause**(e$_1$)(e$_2$): e$_2$ only occurs in all and only the worlds where e$_1$ does; 3. **Agent**(y)(e$_1$)(e$_2$) iff cause(e$_1$)(e$_2$) and (a) Causer(y)(e$_1$)(e$_2$) := e$_1$ causes e$_2$ by y; (b) Control(y)(e$_1$)(e$_2$) := y has the ability to prevent e$_1$ from causing e$_2$.[6]
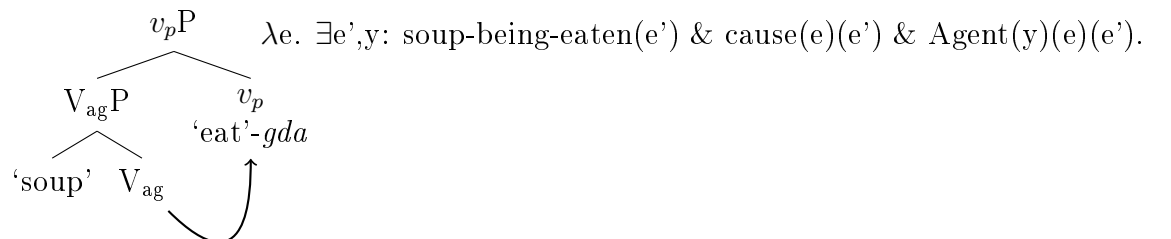
Nothing prevents v_a and v_p from combining with the VP of either of the classes of verbs. This successfully derives passivized A-only verbs, aka Standard Passives, and passivized P-only verbs, aka Causal Passives. Note that *-gda* in *both* cases has exactly the same meaning.

(31) A-only verbs: v_aP (transitive) and v_pP (standard passive).
       a. v_aP:

v_aP   λe. ∃e': soup-being-eaten(e') & cause(e)(e') & Agent(Dugar)(e)(e').

Dugar v_a'

          V_{ag}P v_a
                            'eat'-∅

       'soup' V_{ag}

       b. v_pP:

v_pP   λe. ∃e',y: soup-being-eaten(e') & cause(e)(e') & Agent(y)(e)(e').

V_{ag}P v_p
                 'eat'-*gda*

'soup' V_{ag}

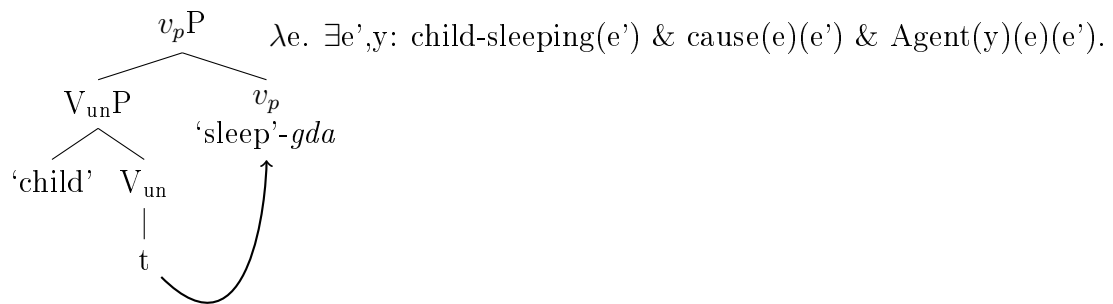[6]Based on Davidson (1967), Dowty (1979, 1991), Baker (1997), Kratzer (2007), Ramchand (2008).

(32) P-only verbs: $V_{un}P$ (unaccusative, see above) and v_pP (causal passive).

v_pP $\lambda e.\ \exists e',y$: child-sleeping(e') & cause(e)(e') & Agent(y)(e)(e').

$V_{un}P$ v_p

'child' V_{un} 'sleep'-*gda*

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The v_a given the A-only VP 'soup eat' returns a predicate of causation events by e.g. Dugar for each of which there is an soup-being-eaten event that they caused (31a). The v_p given the P-only VP 'soup eat' returns a predicate of causation events by someone for each of which there is a soup-being-eaten event that they caused (Standard Passive) (31b). The v_p given the P-only VP 'child sleep' returns a predicate of causation events by someone for each of which there is a child-sleeping event that they caused (Causal Passive) (32).

3.2 A combinatoric problem

Obviously, this cannot be the whole story. We inevitably run into a serious combinatoric problem. The same kind of problem, as the one noticed in Ramchand (2008:81). Namely, not all the combinations of [verb class]×[flavor of v] are acceptable, remember (13) and (25). So far we predict 6 possibilities (V_{ag}/V_{un} can be on its own, with v_a or with v_p):

(33) Paradigmatic gaps:

$V_{ag} = n$'ə: 'open', ʃərdə 'paint', əd'ə 'eat', bəʃə 'write' etc.

*!	[$V_{ag}P$]	unaccusative A-only	(13a)
ok	[$V_{ag}P$ v_a]	transitivized A-only	(13b)
ok	[$V_{ag}P$ v_p]	passivized A-only	(13c)

$V_{un} = ga\int al$ 'sour', *unta* 'sleep', *jaba* 'go' etc.

ok	[$V_{un}P$]	unaccusative P-only	(25a)
*!	[$V_{un}P$ v_a]	transitivized P-only	(25b)
ok	[$V_{un}P$ v_p]	passivized P-only	(25c)

If the above analysis is on the right track, there are two kinds of unacceptability:

(34)   a. **Obligatoriness** A certain class of verbs cannot surface without some flavor of v.

     b. **Incompatibility** A certain v cannot take a certain class of verbs as its complement.

Between these two problems the obligatoriness case seems to be the more important and the more universal one. Tentatively expanding this analysis, it seems that in all languages there is a class of verbs that cannot surface without some or another v. However, whether a language can regularly transitivize or passivize all of its unaccusatives seems to depend on the language. In particular, a language may have or lack a productive passive (the one which forms both causal and standard passives). A language may also have or lack a productive lexical causative (transitivizer), see Miyagawa (1998) or Harley (1997).

3.3   A solution for obligatoriness

Step 1   Assume that P-only verbs are predicates of events; *but* A-only verbs are predicates of *caused* events. That is, any event of milk-souring or child-sleeping can be in the extension of *gafal* and *unta*, caused or not. Only *caused* events of door-opening or soup-eating can be in the extension of *n'ə:* and *əd'ə*:

(35)   a. P-only. $[[V_{un}]] = \lambda x. \ \lambda e. \ V_{unacc}(e) \ \& \ Patient(x)(e).$

　　 b. A-only. $[[V_{ag}]] = \lambda x. \ \lambda e. \ V_{ag}(e) \ \& \ Patient(x)(e).$

$$\forall e: V_{ag}(e) \rightarrow \exists e_0, y: \mathbf{cause(e_0)(e) \ \& \ Agent(y)(e_0)(e)}.$$

The result of this assumption is that the truth-conditions of $V_{ag}P$ are the same as of $[\ v_p \ [\ V_{ag}P \ ] \ ]$. Namely, the truth-conditions of a standard passive of an A-only verb ('soup was eaten') are the same as the truth-conditions of the base VP of an A-only verb ('soup ate').

Then the obligatoriness problem is restated as follows. Given that V_{ag} ('soup ate') and V_{ag}-v_p ('soup was eaten') have the same truth-conditions, the speaker prefers the latter.

Why? Maybe, for the same reason as in the case of *weight of our tent vs. **the** weight of our tent. Because the latter *presupposes* more. In other words, *V_{ag} is a Maximize Presupposition effect. The principle of Maximize Presupposition was established in Heim (1991) and is used elsewhere in the grammar. For it to work here we need one more step.

Step 2   Assume presuppositional semantics for *v*:

(36)   a. $[[v_a]] = \lambda P_{vt}. \ \lambda y. \ \lambda e: \underline{\exists e': P(e')}. \ cause(e)(e') \ \& \ Agent(y)(e)(e').$

　　 b. $[[v_p]] = \lambda P_{vt}. \qquad \lambda e: \underline{\exists e': P(e')}. \ cause(e)(e') \ \& \ \exists y: Agent(y)(e)(e').$

(37)   Take VP to be *ɥde n'e:* 'door open'

　　 a. $[[v_a(VP)(Dugar)]] = \lambda e: \underline{\exists e': door\text{-}opening(e')}. \ cause(e)(e') \ \& \ Agent(Dugar)(e)(e').$

　　 b. $[[v_p(VP)]] = \qquad \lambda e: \underline{\exists e': door\text{-}opening(e')}. \ cause(e)(e') \ \& \ \exists y: Agent(y)(e)(e').$

The *v*P is a predicate of such causation events for each of which there is *presupposed* to be a caused VP-event.

If *v* is a presupposition trigger, it would have to be a soft one. It seems to behave in the same way as soft presuppositions, like in the case of possessive pronouns, see Abusch (2002).[7] The predicted presupposition (that the caused event happened) can, but does not have to project from under negation.

Step 3   The final step is the Maximize Presupposition principle (henceforth MP): "Präsupponiere in deinem Beitrag so viel wie möglich!" (Presuppose in your utterance as much as possible!), Heim (1991:515). In a more formal way it could be stated as follows:

(38)   Maximize Presupposition P (based on Katzir (2007) and Schlenker (2012))
　　 * on sentence U in a context C, if there is a sentence S such that
　　　　a. U is a structural alternative to S;[8]
　　　　b. S is contextually equivalent to U (S $\leftrightarrow_C$ U);
　　　　c. the presuppositions of both S and U are met in C;
　　　　d. S carries stronger presuppositions than U.[9]

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[7] Soft triggers also cause Maximize Presupposition effects, see Heim (1991).

This principle accounts for the obligatory use of the definite article in cases like *(the) weight of our tent* and for the obligatory usage of the presuppositional trigger *too* in *Ann read this book. And Bill did so *(too)*.

Assume that, if there is a v, V moves to it and forms a single lexical item V-v. In this case V and V-v_p will be lexical alternatives, as defined in Katzir (2007). Hence $V_{ag}P$ and $[v_p\ V_{ag}P]$ will also be structural alternatives.

V_{ag} and V_{ag}-v_p are structural alternatives. V_{ag} and V_{ag}-v_p have the same truth-conditions. V_{ag}-v_p has stronger presuppositions: V_{ag} presupposes nothing, while V_{ag}-v_p presupposes the caused event. Hence by MP $^{ok}V_{ag}$-v_p and $*V_{ag}$.

3.4 A solution for incompatibility

If the above analysis is correct, in Barguzin Buryat v_p is compatible with any VP, while v_a is only compatible with $V_{ag}P$. Other languages may have a productive transitivizer v_a, compatible with any verb (e.g. most Turkic languages). In addition their v_p may be more restricted: it would only take $V_{ag}P$. This will result in a language without a causal passive. In the view of this typological prediction, I will stipulate that Buryat v_a has a selectional restriction: it *only* takes predicates of *caused* events.

3.5 Summary

The paper proposes two lexical entries for basic classes of verbs and two functional heads:

(39) a. P-only. $[[\ V_{un}\ ]] = \lambda x.\ \lambda e.\ V_{un}(e)\ \&\ Patient(x)(e)$.
   b. A-only. $[[\ V_{ag}\ ]] = \lambda x.\ \lambda e.\ V_{ag}(e)\ \&\ Patient(x)(e)$.
$$\forall e: V_{ag}(e) \rightarrow \exists e_0, y: \mathbf{cause}(e_0)(e)\ \&\ \mathbf{Agent}(y)(e_0)(e).$$

(40) a. $[[\ v_a\ ]] = \lambda P_{vt}: \underline{\forall e_1: P(e_1) \rightarrow \exists e_0: cause(e_0)(e_1)}.$ (the selectional restriction)
$$\lambda y.\ \lambda e: \underline{\exists e': P(e')}.\ cause(e)(e')\ \&\ Agent(y)(e)(e').$$
   b. $[[\ v_p\ ]] = \lambda P_{vt}.$ $\lambda e: \underline{\exists e': P(e')}.\ cause(e)(e')\ \&\ \exists y: Agent(y)(e)(e').$

4 Conclusion: a typological prediction

What part of this picture could be parametrized cross-linguistically? There seem to be two potential points of variation. Firstly, the exact lexical members of the verb classes (e.g. Buryat *n'ə:* and Russian *otrky* is V_{ag}, but English *open* is V_{un}). Secondly, whether v_a or v_p or both have a selectional restriction:

(41) a. $[[\ v_a\ ]] = \lambda P_{vt}: \left(\underline{\forall e_1: P(e_1) \rightarrow \exists e_0: cause(e_0)(e_1)}. \right)$
$$\lambda y.\ \lambda e: \underline{\exists e': P(e')}.\ cause(e)(e')\ \&\ Agent(y)(e)(e').$$
   b. $[[\ v_p\ ]] = \lambda P_{vt}: \left(\underline{\forall e_1: P(e_1) \rightarrow \exists e_0: cause(e_0)(e_1)}. \right)$
$$\lambda e: \underline{\exists e': P(e')}.\ cause(e)(e')\ \&\ \exists y: Agent(y)(e)(e').$$

If that is correct, every language with v_a and v_p will have two basic classes of verbs.

(A) Verbs that cannot be used in an unaccusative clause (V_{ag}). All of them will be able to be both transitive and passivized. (B) Verbs that can be used in an unaccusative clause

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[8]As defined in Katzir (2007).
[9]As defined in Schlenker (2012).

(V_{un}). These are predicted to be homogeneous (modulo potential idiosyncratic cases). All of them will be able to be, depending on the language, (a) neither passivized nor transitive; or (b) passivized, but not transitivized; or (c) transitivized, but not passivized; or (d) both.

(42) That is, $*V_{ag}$; $^{ok}V_{ag}\text{-}v_a$; $^{ok}V_{ag}\text{-}v_p$. $*$unaccusative, ^{ok}transitive, ^{ok}passivized
And, as for V_{un}:

   a. v_a and v_p have a selectional restriction;
    $^{ok}V_{un}$; $*V_{un}\text{-}v_a$; $*V_{un}\text{-}v_p$. ^{ok}unaccusative, $*$transitive, $*$passivized

   b. v_p has a selectional restriction;
    $^{ok}V_{un}$; $^{ok}V_{un}\text{-}v_a$; $*V_{un}\text{-}v_p$. ^{ok}unaccusative, ^{ok}transitive, $*$passivized

   c. v_a has a selectional restriction;
    $^{ok}V_{un}$; $*V_{un}\text{-}v_a$; $^{ok}V_{un}\text{-}v_p$. ^{ok}unaccusative, $*$transitive, ^{ok}passivized

   d. neither v has a selectional restriction.
    $^{ok}V_{un}$; $^{ok}V_{un}\text{-}v_a$; $^{ok}V_{un}\text{-}v_p$. ^{ok}unaccusative, ^{ok}transitive, ^{ok}passivized

(42c) is Barguzin Buryat. (42a) may be Karachay-Balkar and certain dialects of Tatar (Turkic), building on Lyutikova et al. (2006) and Tatevosov et al. (2017). Karachay-Balkar and Tatar have a causative morpheme -*tyr* 'CAUS' which can form lexical causatives (transitives). They also have a passive morpheme *l/n*. Assume Karachay-Balkar and Tatar -*tyr* is a v_a and assume Karachay-Balkar and Tatar -*l/-n* is a v_p. Then, Karachay-Balkar and Tatar (at least its certain dialects, see Tatevosov et al. (2017)) exemplify (42a). (42d) may be Russian (assuming Russian *s'a* is v_p and v_a is null). Finally, if English *be -en* passive is v_p, English exemplifies (42b). Although there are reasons to believe that *be -en* is not v_p. In particular, all the passives discussed so far, *regardless* of the base verb, *allow for* agentive causation readings. It is not true for the English *be -en* passive: *be seen/owned/liked/hated* does not allow for agentive causation readings.

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