Directionals and argument structure in Mam

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1 Introduction

- Mayan languages make use of **directionals** to indicate the direction of movement described by a verbal event (see e.g., England 1976; Haviland 1993; Mateo Toledo 2008, 2012; Henderson 2016).

(1) Directionals in Mam

    a. Ma   ∅   **pon**   t-ii-n   Noé kiẍ
        PROX B2/3SG DIR:arrive.there A2/3SG-bring-DS Noé fish
        'Noé took the fish there.'   (TS Mam)

    b. Ma   tz=**ul**   t-ii-n   Noé kiẍ
        PROX B2/3SG=DIR:arrive.here A2/3SG-bring-DS Noé fish
        'Noé brought the fish here.'   (TS Mam)

- Here, we argue that they also have implications for **argument structure** (as proposed by Mateo Toledo (2008; 2023) for Q'anjob'al).

- We argue that directionals in Mam introduce **theme** arguments, showing that:

    1. All (but one) transitive verbs require a directional;
    2. Unaccusative verbs require a directional;
    3. Unergatives never require a directional.

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Goals of this talk:

1. Identify and disentangle the two uses of directionals.

    → **lexical:** contribute the direction of event

    → **functional:** introduce THEME arguments

2. Present an analysis of Mam verbal syntax & semantics that can derive directionals' functional contribution.

    → **Argumentless verbs:** severing both arguments from the transitive verb (extending Kratzer 1996)

       – verbs are simply properties of events: $[\![feed]\!] = \lambda e.$ FEED(e)

       – v introduces AGENTS

       – DIR introduces THEMES

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2 Basics of Mam syntax

- Mam (iso 639: mam) is a Mamean-branch Mayan language spoken predominantly in Guatemala by over 500,000 speakers (Richards and Macario 2003).

- Data in this talk come from several varieties:

    → San Juan Atitan (SJA) Mam   (Tessa Scott)

    → Todos Santos (TS) Mam   (Noah Elkins)

    → San Ildefonso Ixtahuacán (Ixt) Mam   (Nora England)

- Baseline word order is VSO:

(2)   V   S   O
    [Ma   tz'=ok   ky-ke'y-an   ] [qa xjal   ] [ja   ]
    [PROX B2/3SG=DIR:in A2/3PL-see-DS] [PL person] [house]
    'The people saw the house.'   (SJA Mam)

- Mam is an ergative-absolutive language, seen through verbal agreement

  - Ergative (**Set A**) cross-references transitive subjects

  - Absolutive (**Set B**) cross-references objects and intransitive subjects

(3) a. Transitive verb template:
    NEG/ASP – **Set B** (ABS) – <u>DIR</u> – **Set A** (ERG) – <u>ROOT</u> – SUFFIXES

  b. Ma **chin** ok **t**-tzeeq'a-n=a.
    PROX B1SG DIR A2/3SG-hit-DS=1SG
    'You hit me'   (Ixt Mam; England 1983:2)

  c. Ma **chin** b'eet=a.
    PROX B1SG walk=1SG
    'I walked'   (Ixt Mam; England 1983:2)

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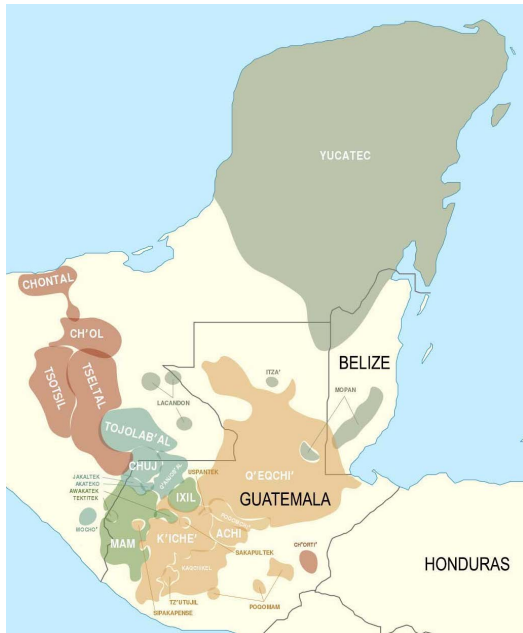

Figure 1: Current-day Mayan-speaking area (Law 2014, p. 25)

3 Two contributions for directionals in Mam

- Mam features a set of 12 directionals:

Table 1: Directionals in San Juan Atitán Mam; Scott 2023: 66

Directional	Meaning	Directional	Meaning
xi'	go, away from speaker	*el*	out; to the west
tzaj	come, towards speaker	*ok*	in; to the east
ul	arrive here	*kyaj*	remain
pon	arrive there	*aj*	return
jaw	up; to the north	*iky'*	pass
kub'	down; to the south	*b'aj*	complete

- All of the verbs in this table can be used as basic intransitive verbs, as in (4); note that some have long vowels when used as such.

(4) Ma tz**=uul**   Noé.
    PROX B2/3SG=arrive.here Noé
    'Noé arrived here.'   (TS Mam)

- Directionals can also combine with main verbs, preceding that main verb and appearing between **Set B** and **Set A** morphology.

(5) Ma **tz=ul**   **t**-ii-n   Noé kiẍ.
    PROX B2/3SG=DIR:arrive.here A2/3SG-bring-DS Noé fish
    'Noé brought the fish here.'   (TS Mam)

- Directionals may be stacked in Mam, with predetermined combinations of stacked elements (England 1976; Scott 2023: table 2.26).

(6) a. Ma ∅   **ku'=x** n-awa-'n   kjo'n
      PROX B2/3SG DIR=DIR A1SG-plant-DS corn
      'I planted the corn'   {*kub' + xi'*}

  b. Ma ∅   **ja=tz** n-baq'o-'n   jun mata is
      PROX B2/3SG DIR=DIR A1SG-harvest-DS INDF MW potato
      'I harvested some potatoes'   {*jaw + tzaj*}

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3.1 The "lexical" contribution of directionals

- For some verbs, directionals seem to only add "directional", "locative" or "aspectual" content to the verbal event:

  (7) a. Ma   chn=   ajqeln=i.
           PROX B1SG= run=1SG
           'I ran.'   (SJA Mam)

       b. Ma   chn=   **el**   ajqeln=i.
           PROX B1SG= DIR:out   run=1SG
           'I ran out.'   (SJA Mam)

       c. Ma   chn=   **ok=x**   ajqeln=i.
           PROX B1SG= DIR:in=DIR:go run=1SG
           'I ran in.'   (SJA Mam)

  → The verb 'run' in (7) doesn't require a directional; i.e., (7a) is good.

  → Insertion of directionals in (7) has a transparent semantic contribution.

3.2 The "functional" contribution of directionals

- For other verbs, directionals *are required*:

  (8) Ma   tz=***(ok)**   q-ke'y-n=i   a=y.
       PROX B2/3SG=DIR:in A1PL-see-DS=2SG   DET=2SG
       'We saw you.'   (Scott 2023: 67)

  → The verb *ke'yn* 'see' requires a directional.

  → The directional *ok* has a less transparent semantic contribution

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Goals for the rest of the talk:

- Analyze the **functional contribution** of directionals.

- We'll show that only transitives and unaccusatives require directionals.

  ➤ We propose that directionals are needed to introduce THEME arguments.

4 Directionals and argument structure

- Three predictions if directionals introduce THEME arguments:

  1. Transitive verbs should require directionals: → 99% true; §4.1.
  2. Unaccusative verbs should require directionals   → true; §4.2.1.
  3. Unergative verbs should never require directionals   → true; §4.2.2.

4.1 All but one transitive verbs require a directional

- It has long been known that directionals are needed with transitive verbs:

  Most transitive verbs in Mam almost always require directionals. While theoretically possible to use these verbs without a directional, the native speaker much prefers to use one, and even has difficulty accepting forms without directionals for most transitive verbs. Therefore in eliciting a finite transitive verb, the form given almost always includes a directional. If the form is requested without a directional, the native speaker invariably responds with an intransitive rather than transitive form. (England 1976: 204)

- (8) was an example, here are two more:

  (9) a. Ma   tz'=***(el)**   t-laq'o-'n   Xwan tx'otx'.
           PROX B2/3SG=DIR:out   A2/3SG-buy-DS Xwan land
           'Xwan bought land.'

       b. Ma   ∅   ***(tzaj)**   t-laq'o-'n   Xwan jun xkoy.
           PROX B2/3SG DIR:come   A2/3SG-buy-DS Xwan one tomato
           'Xwan bought a tomato.'   (Scott 2023: 76)

  → **Important:** while the choice of a directional might sometimes "make sense lexically" (e.g., 'run out' in 7b), its core lexical content is often opaque when required by the verb, as above.

- Table 2 on the next page provides a sample of transitive verbs: all but one require a directional.

Table 2: Sample of transitive verbs in Mam

Directional	Meaning	Translation
(ku'x) + awa'n	down.go + plant	plant
(tzaj) + laq'o'n	come + buy	buy
(ok) + b'yo'n	in + hit	hit
(ok) + ke'yan	in + see	see
(tzaj) + q'i'n	come + take	bring
(jaw) + xk'lo'xan	up + wrap	wrap
(kub') + qesa'n	down + cut	cut
(xi) + chmo'n	go + weave	weave
(xi) + yek'an	go + show	show
(*DIR) + il	(*DIR) + see	see

- The only clear exception is one of the verbs meaning 'to see', *il*, which in fact seems to never allow a directional (see also Scott 2023):

(10) Ma   ∅   **{*xi',*tzaj,*kub'...}**   w-i<u>l</u>   xuuj.
      PROX B2/3SG DIR:go;DIR:come;DIR:down A1SG-see woman
      'I saw the woman.'   (TS Mam)

4.2   Intransitives: unergatives vs. unaccusatives

- In Mam, a clear morphological distinction arises within intransitives.

  1. **Unergatives**: denote agentive events and end with 'antipassive' *-n*.

     (11) Ma   qo   scha-**n**=i.
           PROX 1PL play-AP=1PL
           'We played.'   (SJA Mam)

     → Similar to other Mayan languages, such as Chuj, where unergatives are derived with *-w* (AP) but not unaccusatives (Coon 2019).

  2. **Unaccusatives:** denote non-agentive events and don't end with *-n*.

     (12) Ma   ∅   ***(kub')**   pax   xk'utz'ib'il.
           PROX B2/3SG DIR:down break computer
           'The computer broke.'   (SJA Mam)

➤ These two classes of verbs show different behavior with *directionals*.

  → Unaccusatives require a directional   §4.2.1.
  → Unergative verbs never require a directional   §4.2.2.

4.2.1   Unaccusative verbs require a directional

- Underived unaccusative verbs in Mam also require directionals:

(13) **Underived unaccusative**
      Ma   tz'=***(e=tz)**   tz'aq k'ab'il twi' mes.
      PROX B2/3SG=DIR:out=DIR:come <u>fall</u> cup   top table

      'The cup fell off the table.'   (SJA Mam)

Table 3: Underived unaccusative verbs

Directional + verb	Meaning	Translation
(jaw) + tolj	up + fall	fall (animate)
(etz) + tz'aq	out.come + fall	fall (inanimate)
(kub') + pax	down + break	break
(el) + neq't	out + melt	melt
(txi) + tzaq	go + rip	rip

- Here we are contrasting underived unaccusatives with unaccusatives derived from passives, as in (14).

(14) **Derived (from passive) unaccusative**
      Ma   ∅   **(kub')**   b'uch-**j**   lamet.
      PROX B2/3SG DIR:down shatter-PASS glass

      'The glass shattered.'   (SJA Mam)

  → Directionals are mostly optional with unnacusatives derived from passive morphology, as above.

  → We're assuming that this is because the passive voice in (14) introduces THEMES (see Appendix A.2 and A.3 for more details)

- Lastly, note that when used as main verbs, directional verbs themselves never seem require *another* directional:

(15) Ma   ∅   pon=i
      PROX B2/3SG arrive.there=2SG
      'You arrived there.'   (see Table 1 for full list)

4.2.2 Unergative verbs never require a directional

- Unergative verbs *never* require a directional (see also (7a) and (11) above).

  (16) Ma   qo   xnaq'tza-n.
        PROX B1PL listen-AP
        'We studied.'   SJA Mam

- A sample of unergative verbs is provided in Table 4

Table 4: Sample of unergative verbs

Verb	Translation	Directional	Translation
b'et(an)	walk	*sch'in*	read/shout
ajqelan	run	*tz'ib'an*	write
b'ixan	dance	*schan*	play
b'itzan	sing	*aq'nan*	work
yolan	talk	*xnaq'tzan*	study
b'in	listen	*wan*	eat₁
tan	sleep	*lon*	eat₂
na'n	pray	*kxun*	eat₃
lipan	fly	*chyon*	eat₄
yon	wait	*k'an*	drink

→ Unergative verbs are never offered with a directional in translation tasks.

→ Because of the *lexical contribution* of directionals, many of these verbs *can* nonetheless appear with one.

  (17) Ma   chn= **el**   ajqeln=i.
        PROX B1SG= DIR:out run=1SG
        'I ran out.'   (SJA Mam)

Summary of empirical observations:

Table 5: Directionals and argument structure

	Arguments	DIR required?
Transitive	Agent **Theme**	99%
Unaccusative	**Theme**	yes
Unergative	Agent	no

- Transitives and unaccusatives share the property that they both combine with *internal arguments*.

- **Next:** we propose that this makes sense if Mam directionals are needed to introduce THEMES, explaining their **functional contribution**.

  → In other words, Mam verbs in general do not introduce *any* arguments, they are predicates of events.

  → Directionals are the only exception: they introduce internal arguments

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5   Analysis: severing the "internal" argument from Mam verbs

- Kratzer (1996) (building e.g., on Williams 1981, Marantz 1984, Hale and Keyser 1993) influentially proposed that external arguments should be severed from verbs.

- So instead of taking both direct objects and transitive subjects as arguments, as in other classical approaches (e.g., Davidson 1967)...

  (18) $\llbracket feed \rrbracket = \lambda x.\lambda y.\lambda e.$ FEED$(x)(y)(e)$

- ...transitive verbs only take an internal argument:

  (19) $\llbracket feed \rrbracket = \lambda x.\lambda e.$ FEED$(x)(e)$
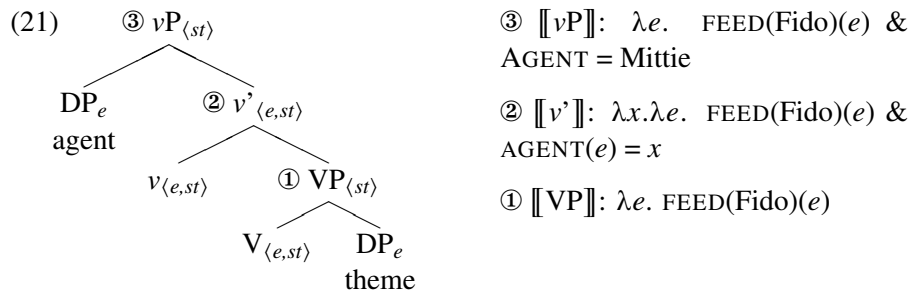
- The external argument is instead delegated to v (or Voice):

  (20) $\llbracket v \rrbracket = \lambda y.\lambda e.$ AGENT$(e) = y$

- This theory is couched in Event Semantics (Davidson 1967); see extra λe.

  ▶ We assume existential closure of event argument higher in the structure.

- Kratzer's theory also requires the compositional rule of **Event Identification**, which allows $\langle e,st \rangle$ functions to combine with $\langle s,t \rangle$ functions.

- Event Identification allows for the VP and v to compose in structures like (21); see step ② of composition.

(19) $[\![feed]\!] = \lambda x.\lambda e.$ FEED$(x)(e)$ (repeated for illustration)

(20) $[\![v]\!] = \lambda y.\lambda e.$ AGENT$(e) = y$ (repeated for illustration)

(21)   ③ $vP_{\langle st \rangle}$

        DP$_e$ ② $v'_{\langle e,st \rangle}$
        agent

            $v_{\langle e,st \rangle}$ ① VP$_{\langle st \rangle}$

                    V$_{\langle e,st \rangle}$ DP$_e$
                            theme

③ $[\![vP]\!]$: $\lambda e.$ FEED(Fido)(e) & AGENT = Mittie

② $[\![v']\!]$: $\lambda x.\lambda e.$ FEED(Fido)(e) & AGENT$(e) = x$

① $[\![VP]\!]$: $\lambda e.$ FEED(Fido)(e)

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- With this background in place, we need to address two points about Mam:

  1. What is the lexical semantics of Mam verbal roots such that the internal argument can be severed from them?

  2. How does the composition of the verbal domain unfold (i.e., the syntax of directional + main verb + arguments)?

- We address both of these points in turn below.

5.1 Mam verbal roots and argument structure

- Since most verbs in Mam cannot themselves introduce internal arguments, we propose that internal arguments are also severed from the verbal roots (see Parsons 1990, Levinson 2010 and Elliott 2017 for this theory even in English):

(22) a. $[\![feed]\!] = \lambda e.$ FEED(e) (Mam transitive verb)
       b. $[\![melt]\!] = \lambda e.$ MELT(e) (Mam unaccusative verb)

  ▶ Transitive and unaccusative verbs have the same basic argument structure (this is the same result as Kratzer 1996, Davis 1997, Elliott 2017, etc. on English and even Coon 2019 on Chuj, another Mayan language).

  ▶ As discussed in Coon 2019, we assume that transitive/unaccusative roots can be distinguished with regards to whether or not they are compatible with external causation (see also Levin and Rappaport-Hovav 1995).

  ▶ However, Mam verbs differ from languages like English and Chuj in that they essentially have *no* argument structure; they denote properties of events (compare (22a) with (19)).

- Finally, we propose that the introduction of internal arguments is instead delegated to directional auxiliary verbs:

(23) $[\![$DIR$]\!] = \lambda x.\lambda e.$ DIR(e) & THEME$(e) = x$ (Mam directional)
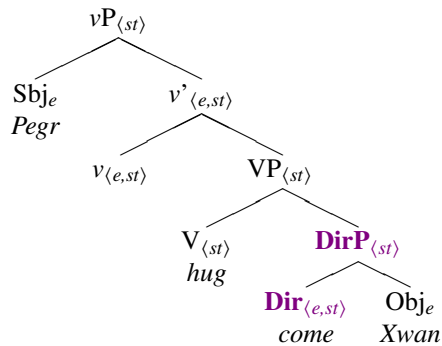
5.2 Composing the Mam VP domain

- We provide an example of a transitive verb, using a (24) as an example.

(24) Ma   ∅   ***(tzaj)**   t-xhq'e-'n   Pegr Xwan.
      PROX B2/3SG   DIR:come   A2/3SG-hug-DS   Pegr Xwan
      'Pegr hugged Xwan.'   TS Mam

- Building on Elkins 2023, we propose the following minimal syntax for the extended VP domain (ignoring tense-aspect morphology).

(25)   Tree for (24) (*Pegr hugged Xwan*)

```
                vP⟨st⟩
            /          \
        Sbj_e           v'⟨e,st⟩
        Pegr          /        \
                 v⟨e,st⟩       VP⟨st⟩
                            /         \
                        V⟨st⟩        DirP⟨st⟩
                        hug         /        \
                                Dir⟨e,st⟩    Obj_e
                                 come        Xwan
```

- **Some key observations**:

  → Directionals are merged low in comp,VP and introduce the object (we note another viable option in the appendix, where the directional is merged high).

  → We assume that verb-initiality is derived via head raising to a position above *v*P (following Clemens and Coon 2018 and Elkins 2023).

    ▶ Directionals are also part of this head-movement chain, deriving the mirror DIR−VERB−VOICE morphological order.

  → We also assume consistent object raising in Mam (Coon et al. 2014, Coon et al. 2021, Scott 2023), which we ignore in the trees for space.

    ▶ We crucially assume, however, that the object is interpreted in its base position for purposes of semantic interpretation.

- With the entries in (26), we can go through crucial composition steps in (25).

  (26)   a. $[\![xhq'e_{HUG}]\!]$ = $\lambda e.$ HUG(e)
         b. $[\![tzaj_{COME}]\!]$ = $\lambda x. \lambda e.$ TOWARD.SPKR(e) & THEME(e) = x
         c. $[\![v]\!]$ = $\lambda x. \lambda e.$ AGENT(e) = x

- From bottom-up:

(27) $[\![\textbf{DirP}]\!]$: $\lambda e.$ TWRD.SPKR(e) & TH(e) = Xwan
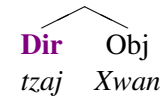
```
        Dir      Obj
        tzaj     Xwan
```
                                         (through Function Application)

(28) $[\![VP]\!]$: $\lambda e.$ **Hug(*e*)** & TWRD.SPKR(e) & TH(e) = Xwan
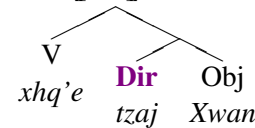
```
        V          /    \
       xhq'e     Dir     Obj
                 tzaj    Xwan
```
                                         (through Predicate Modification)

(29) $[\![v']\!]$: $\lambda y.\lambda e.$ HUG(e) & TWRD.SPKR(e) & TH(e) = Xwan & **Ag = y**
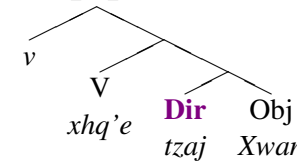
```
     v
         /    \
        V      /   \
       xhq'e  Dir   Obj
              tzaj  Xwan
```
                                         (through Event Identification)

(30) $[\![vP]\!]$: $\lambda e.$ HUG(e) & TWRD.SPKR(e) & TH(e) = Xwan & **Ag = Pegr**
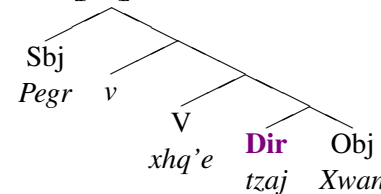
```
      Sbj         /    \
      Pegr   v       /   \
                    V     /   \
                   xhq'e Dir   Obj
                         tzaj  Xwan
```
                                         (through Function Application)

- Crucially, both the AGENT and THEME are severed from the verbal root (V).

- As a final note, this analysis allows to capture exceptions mentioned above:

  → The one transitive verb that doesn't require a directional simply needs a different lexical entry:

    (31) $[\![il_{see}]\!]$ = $\lambda x \lambda e.$ SEE(x)(e)

6   Conclusion

- Empirically, we showed that directional verbs in Mam, in addition to indicating direction (→ their "lexical" use), are almost always needed with transitive and unaccusative verbs (→ their "functional" use).

- Conceptually, we argued that this is because directionals introduce themes: transitive/unaccusative roots are severed from their internal argument.

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Abbreviations used for Mam: 2/3 = 2nd or 3rd person; A = Set A (ergative/ possessive); AP = antipassive; B = Set B (absolutive); CLF = classifier; COM = completive aspect; DEM = demonstrative; DEP = dependent clause aspect; DIR = directional auxiliary; DS = directional suffix; INC = incompletive aspect; MW = measure word; NEG = negator; PASS = passive; PAT = patientive; PL = plural; PROX = proximate aspect; PURP = purposive complementizer; RN = relational noun; TV = transitive voice

A Evidence from voice alternations

- We provide some additional evidence that directionals are tied to internal argument introduction:

  → Different flavors of *v* bleed the need for a directional.

  → **Antipassives** and **passives**, two voice operations, result in the directional becoming optional.

A.1 Antipassives

- In the antipassive, the object is demoted to an oblique; this is often done to facilitate A-bar extraction of the transitive subject.

(32) a. E   ∅   **kub'** t-b'iyo-'n   xin xjaal jel b'alam
     COM B2/3SG DIR A2/3SG-kill-DS CLF man CLF jaguar
     'The man killed the jaguar'   (TS Mam)

   b. Ja   xin xjaal e-∅-b'iyoo-**n**   [OBL t-e   jel
     DEM CLF man COM-B2/3SG-kill-AP   A2/3SG-RN CLF
     b'alam]
     jaguar
   'It was the man who hit the jaguar'   (TS Mam)

- For the active/antipassive alternation, we propose that antipassive verbs are simply unergatives: both are agentive intransitives which lack THEMES.

  → Unergatives in Mam never require directionals (since they lack themes), and so the antipassive not requiring a directional is expected.

  → Unergatives and antipassive verbs also both take the *-n* suffix; (we hypothesize that the *-n* suffix is the realization of active *v*, which introduces AGENTS; see Appendix C for more details).

A.2 Passives

- In the passive, the subject is demoted to a *by*-phrase and the verb bears passive morphology (usually *-(e)et*, *-t*, or *-j*) that is in complementary distribution with antipassive *-n* in (32b).

(33) a. E   tz'=**ok**   t-pju-'n   xin xjaal q'a Miguel
     COM B2/3SG=DIR A2/3SG-hit-DS CLF man CLF Miguel
     'The man hit Miguel'   TS Mam

   b. E   ∅   pj-**eet**   q'a Miguel [OBL t-u'n   xin xjaal]
     COM B2/3SG hit-PASS CLF Miguel   A2/3SG-by CLF man
     'Miguel was hit by the man'   TS Mam

- Recall our proposal that verbs don't introduce THEMES in Mam.

- Because the subject is assigned a THEME θ-role, we hypothesize that it is the **passive morphology** that is involved in introducing the THEME:

(34) a.
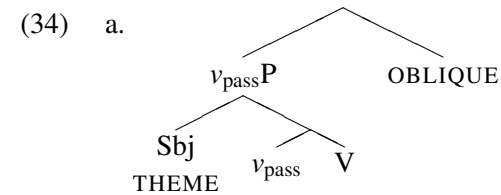
   b. $[\![v_{pass}]\!]$: $\lambda x.\lambda e.$ THEME$(e) = x$

→ Crucially, the directional is predicted to no longer be necessary if the THEME is introduced by this other means.

→ More work is needed on Mam passives to determine whether they also involve implicit agents (also note that there are several flavors of passives in the Mam (England, 2017, 521); as is the case in other Mayan languages, e.g., Coon 2019)

- In sum, Mam *v* heads include:
  - Passive *v* introduces themes
  - Active *v* introduces agents (used for active transitives, unergatives, and antipassives (§5))

A.3 Passives, cont.: derived unaccusatives

- There are a class of unaccusative verbs which show passive morphology:

Table 6: Sample of unaccusative verbs

Directional + verb	suffix	Meaning	Translation
(ku'x) + naj	-j	down.go + wet	sink
*(kub') + na**j***	-j	down + *naj*	vanish
*(ul) + kn**et***	-et	arrive.here + be found	appear
*(kub') + b'uch**j***	-j	down + shatter	shatter
*(jaw) seky'p**j***	-j	up + scare	be scared

- Unaccusative verbs with passive morphology tend to *not* require directionals.

- Some passive-derived unaccusatives change meaning without the directional; this is the case in (35).

(35) a. Ma ∅ **ku'=x** naj a'pj tja' nima'
PROX B2/3SG DIR:down=DIR:go wet rock under river
'The rock sank to the bottom of the river.' (SJA Mam)

b. Ma ∅ naj a'pj.
PROX B2/3SG wet rock
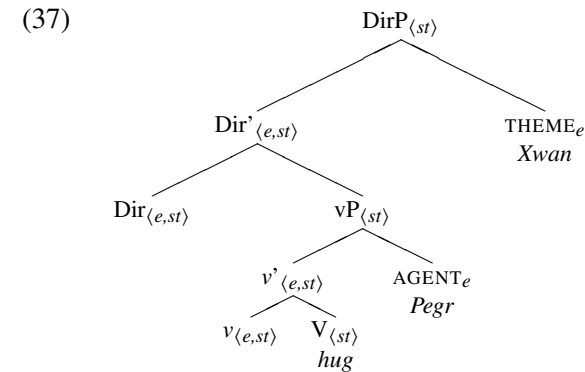'The rock got wet.' (SJA Mam)

- Some passive-derived unaccusatives are accepted (with the same meaning) when prompted without a directional; this is the case in (36).

(36) Ma chin **(jaw)** seky'p-**j**=i.
PROX B1SG DIR:down scare-PASS=1SG
'I was scared.' (SJA Mam)

→ We assume that the directional is optional here because these structures include v_{pass} which introduces the theme argument.

B   Alternative derivation of the syntax

- An alternative syntax to the one assumed in (25) in §5 could be used to derive the necessity of directionals for THEME introduction.

- Directionals could be merged "high", with the THEME merged in a right-specifier above the AGENT (à la Aissen 1992, Little 2020, Scott 2023).

(37)

DirP$_{\langle st \rangle}$
Dir'$_{\langle e,st \rangle}$ THEME$_e$
Xwan
Dir$_{\langle e,st \rangle}$ vP$_{\langle st \rangle}$
v'$_{\langle e,st \rangle}$ AGENT$_e$
Pegr
v$_{\langle e,st \rangle}$ V$_{\langle st \rangle}$
hug

- Crucially, semantic composition can proceed to deliver the correct meaning; i.e., Dir can compose with vP via **Event Identification** to introduce a theme.

(38) ⟦ Dir' ⟧ = $\lambda x.\lambda e.$ HUG(e) & AG(e) = P. & TWD.SPKR(e) & TH$(e) = x$

- While there are reasons to favor the syntax in (25) (see Clemens and Coon 2018 and Elkins 2023), this syntax derives word order for free (without movement).

- It also makes the same predictions with regards to the Ergative Extraction Constraint (the ban on extracting ergative subjects in Mam; see Coon et al. 2014, Aissen 2017, Coon et al. 2021), since THEMES will be more local goals to A-bar probes.

- That said, this option is perhaps less realistic:

→ Crosslinguistically, it may seem strange for THEMES to merge *after* agents (e.g., from a UTAH standpoint; Baker 1985).

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→ Within Mayan, Mam is the only language in the family in which directional auxiliaries appear *before* the verb (Mateo Toledo 2023); in all other Mayan languages, directionals are found *after* the verb:

(39) Ix-ko-<u>kuch</u>   **kot**   te' k'atzitz.
      PFV-A1P-carry DIR:come CLF woodlogs
      'We carried the logs.'   (Chuj)

C Decomposing the verbal domain even further

C.1 Active (agentive) *v* and Voice

- Unergatives, antipassives, and transitives share agents and the *-n* suffix

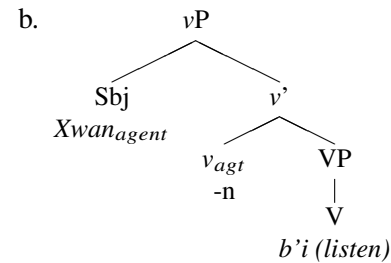- Transitives have an extra glottal feature

Table 7: Verbal morphology

	Arguments		Suffixes
Transitive	**Agent**	Theme	*-n, -ʔ*
Unergative	**Agent**		*-n*
Antipassive	**Agent**		*-n*
Passive		Theme	-j, -et
Unaccusative		Theme	Ø

- Active *v* and Voice morphology:

(40) a. v_{agent} ↔ /*-n*/
      b. Voice ↔ /ʔ/
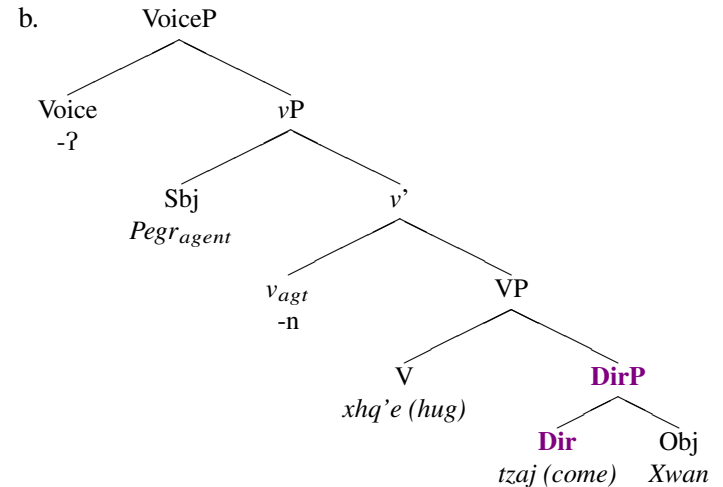
(41) Unergative
      a. Ma ∅   b'i-n   Xwan.
          PROX B2/3SG listen-vAGT Xwan
          'Xwan listened.'   (SJA Mam)

b.   *v*P
              /   \
            Sbj   *v*'
        Xwan$_{agent}$ / \
                      v_{agt} VP
                       -n |
                                 V
                            b'i (listen)

(42) Transitives
      a. Ma   ∅   ***(tzaj)**   t-xhq'e-'-n   Pegr Xwan.
          PROX B2/3SG DIR:come A1SG-hug-TV-vAGT Pegr Xwan
          'Pegr hugged Xwan.'   (TS Mam)

      b.   VoiceP
                    /   \
                Voice   *v*P
                 -ʔ   /   \
                       Sbj   *v*'
                  Pegr$_{agent}$ / \
                             v_{agt} VP
                              -n   / \
                                       V   **DirP**
                                 xhq'e (hug) / \
                                           Dir Obj
                                      tzaj (come) *Xwan*

C.2 Passive (thematic) *v*

- Now consider passive morphology *-j* and *-et* again. (recall that some unaccusatives appear in the passive)

(43) E   ∅   pj-**eet**   q'a Miguel t-u'n   xin xjaal
      COM B2/3SG hit-PASS CLF Miguel A2/3S-by CLF man
      'Miguel was hit by the man'   (TS Mam)

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(44)   Passive *v* morphology
       v_{pass} ↔ /-*j*/ or /-*et*/

C.3 Non-argumental *v*

• We propose that neither agentive nor thematic *v* is present in true unaccusatives:

(45)   Unaccusatives

a. Ma   ∅   ***(kub')**   pax   xar.
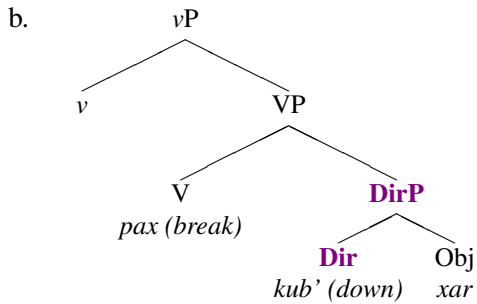   PROX B2/3SG DIR:down break jar

    'The jar broke.'   SJA Mam

b.

```
                 vP
                /  \
               v    VP
                   /  \
                  V    DirP
              pax (break)  /  \
                         Dir    Obj
                    kub' (down)  xar
```

Table 8: Verbal morphology (suffixal, derivational) in Mam

Heads		Morphology	Function	Clauses
Voice	↔	/-ʔ/	Raises objects	transitive
v_{agent}	↔	-*n*	Introduces agents	trans, unerg, antipassive
v_{pass}	↔	/-j/ or /-et/	Introduces themes	pass, pass-derived unaccusative
v_{unacc}	↔	∅	Verbalizer	underived unaccusatives

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