A study of O'dam suppletion and category shift

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1 Agreement isn't what it seems

- This talk concerns the function of reduplication in resultative constructions in O'dam (Southeastern Tepehuan). Previous work has analyzed reduplication in statives and resultatives as purely grammatical agreement (Willett 1991:205).

- However, using stative predicates[1] as an analogous starting point, we argue:

  1. State Number is a grammaticalized feature that is independent from Entity Number or Event Number.

  2. The interaction between State and Entity number is determined by real world properties of both the state and the entity that it is applied to rather than any sort of grammatical agreement.

- O'dam is a Uto-Aztecan language spoken by around 28,000 speakers (INEGI 2010) primarily in the southern part of the Mexican state of Durango.

- Resultatives in O'dam are formed by suffixing a verb stem with *-ix* or *-xim*.[2][3]

  (1) *jix=ɨk-ix   gu   uux*
       COP=cut-RES DET stick

       The cut stick

  (2) *abiar-xim   gu   coca*
       buy.on.credit-RES DET Coke

       'the sold Coke'

- On monovalent verbs (including intransitives), subject number is marked by a suffix[4] on the verb and, where an NP is present, by reduplication on the noun.

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[1]These are sometimes called adjectives in previous literature (e.g. Willett 1991), however there is some doubt as to whether or not O'dam has more than a few true adjectives.

[2]The choice between these allomorphs is lexically specific. There is no meaningful difference although there are some tendencies on which types of events take which suffix (see García Salido 2014:60) for further discussion).

[3]Here we use the practical orthography for O'dam, thus some of the characters have different values than those in IPA and APA, we show those here with their corresponding IPA symbol: <b>= /v/; <bh>= /b/; <dh>= /ɗ/; <lh>= /ɭ/; <x>= /ʃ/.

[4]Objects are marked by a verbal prefix.

(3)   *jix=i'k-ix-**am***   *gu*   ***u'uux***
       COP=cut.RED-RES-3PL.SBJ DET stick.RED
       The cut sticks

- Verbal number can also be indicated via suppletive verb forms, which survive resultative derivation:

(4)   a.   *Siłh*   *jura-'-ran*   *jap*   *moo sɨxi-a'*   *dhi tooxkolh na*
           directly heart-3SG.POSS-POSP:on.body.part 2SG.SBJ doubt sting-FUT DEM pig   SUB
           ba' maa'n jim-dam   ***muki-a'***
           SEQ one   walk-NMLZ die.SG-FUT
           'Stab the pig right in the heart so that it will die quickly' (Willett & Willett 2015:130)

       b.   ***ko'ya-'-am***   *gu*   *pippilh*
           die.PL-FUT-3PL.SBJ DET chicken.RED
           'The chickens will die'

(5)   a.   ***Muk-ix***   *gu*   *yooxi'*
           die.SG-RES DET flower
           'The flower is dead/the dead flower'

       b.   ***Ko'-ix-'am***   *gu*   *yayooxi'*
           die.PL-RES-3PL.SBJ DET flower.RED
           'The flowers are dead/the dead flowers'

- In texts the verb and noun match singular or plural number marking, like in (3) and (5), so an agreement analysis seems superficially intuitive. However, speakers can sometimes use a singular noun with a reduplicated verb like in (6).

(6)   *jix=ɨ'k-ix-am*   *gu*   *uux*
       COP=cut.RED-RES-3PL.SBJ DET stick
       'The cut sticks (cut many times)'

- Not all predicates allow for mismatches like in (6). This is the puzzle we investigate: which cases permit the use of a reduplicated verb stem with a singular noun? And what does this tell us about the interaction of the State Number system and Entity Number system?

- We propose that there are two classes of event types: *cut*-type and *hide*-type, which differ in their ability to stack simultaneous results onto a single object and, therefore their ability to be used with a number mismatch.

- In §2 we overview the uses and properties of reduplication in O'dam outside of resultativized verbs, especially in statives. We then turn to the properties of resultatives in §3 and detail the mismatch puzzle in §3.1. We then turn to the *hide-cut* event-type distinction in §4 and how the distinction plays out in suppletive verbs (§5).

2   Reduplication

- As is common across the Uto-Aztecan family, O'dam makes extensive use of reduplication in all content word categories. The meaning of reduplication in O'dam can described as marking plurality in a broad sense.

- Phonologically, reduplication targets the first syllable of the root and ignores any prefixes. The reduplicated syllable becomes part of the stress domain (which targets the first two syllables of the root). O'dam roots undergo one of three reduplication rules, which are partially phonologically determined and partially lexically determined (see Willett 1982, Kager 1997, Gouskova 2003 for fuller analyses of O'dam phonology).

(7) Long Reduplication

    a. $\varnothing \rightarrow CV_iV_i$ / # ___$CV_i(V_i)$
        tɨrok → tɨitrok
        'lizard' 'lizards'

    b. $\varnothing \rightarrow CV_iV_j$ / # ___CV_iV_j
        taibu' $\rightarrow$ *taitbu'*
        'lighting bug'   'lightning bugs'

(8) Short Reduplication

    a. $\varnothing \rightarrow CV_i$ / # ___$CV_i(V)$
        karbax → kakarbax
        'goat'   'goats'

- As shown in the above examples, when reduplication appears on nouns it indicates plural number.

- On non-resultativized verbs Willett (1991) and Willett & Willett (2015) describe reduplication as marking "iterativity" but there has, thus far, been no close study breaking down what that means.

- A key observation here is that there seems to be no interaction between argument number and reduplication for non-resultativized verbs. In (9) we have reduplication and a plural subject, but the reading is that the subjects saw their mother in a sequential manner, not all at once. In (10) we have no reduplication and a plural subject, and in (11) we have reduplication with a singular subject.

(9)   *Sap* **ba-ñiñii-'ñ-am**   *muk-ix* *gu* *ja-nañ*
    REP.UI SEQ-see.RED-APPL-3PL.SBJ dead-RES DET 3PL.POSS-mother
    'Supposedly, they saw that their mother was dead.' (García Salido 2014:98)

(10)   *sap* *ba' pui' chɨtda-da-'am*   *gu* *ja'tkam na=m*   *bima'n* **ba-nɨi'ñ-dha'**
    REP:UI SEQ SENS say-APPL-3PL.SUBJ DET people SUB=3PL.SUBJ each.one CMP-see-APPL
    na=am   *tu-a'ga-da'*
    SUB=3PL.SUBJ DUR-talk-CONT
    'That the people, who saw them together, were saying to him, when they were chatting.' (García Salido 2014:227)

(11)   *sap* *ba' mu jim-mɨ-da'*   *mu* **nɨnɨi'iñ-dha'**
    REP.UI SEQ DIR go-run-CONT-FUT DIR see.RED-APPL
    'He was going fast to see him.' (García Salido 2014:145)

- Reduplication is also used on statives to indicate a sort of stative plurality. Like with resultatives, in texts it is most common to see singular (non-reduplicated) nouns[5] being modified by non-reduplicated states (12) and plural (reduplicated) nouns being modified by reduplicated states (13).

(12)   a. *gu* *kabai jix=tʉb* *jix=kooma'*
        DET horse COP=tall COP=grey
        'The tall grey horse'

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[5]Mass nouns like *on* 'salt' are morphosyntactically singular and are identified by their lack of a reduplicated form altogether.

b. *gu Pedro onaa-' jix=chua   jix=mes-ta'm-da*
DET Pedro salt-IAL COP=white COP=table-POSP:above-CONT

'Pedro's white salt is on the table'

(13) a. *Jix=xixdhu-ka'-ich*
COP=blessed.RED-EST-1PL.SBJ

'We are blessed. (García Salido 2014:89)

b. *Gu u'ji'   jix=chotob   jix=bhai' jum-tat-am   na joidham tanor*
DET bird.RED COP=white.PL COP=good REFL-feel-3PL.SBJ SUB make   sun

jix=chu-juk   ba'
COP=DUR-hot SEQ

The white birds are happy because it is a good day and the weather is nice. (García 2009)

- However, in elicitation, we find that speakers allow singular nouns to be modified by certain reduplicated states.

- In (14a) we get the unambiguous reading that the blanket is polka-dotted red. While an unreduplicated states, like in (14b) is not incompatible with a polka dot reading, it is underspecified. The unambiguous 'polka-dotted' reading is unavailable for plural nouns like in (14c).

(14) a. *Gu sa'ua jix=bɨpɨ'*
DET blanket COP=red.RED

'The blanket is red (polka-dotted)'

b. *Gu sa'ua jix=bɨ'*
DET blanket COP=red

'The blanket is red'

c. *Gu sasua'   jix=bɨpɨ'*
DET blanket.RED COP=red.RED

"The blankets are red"

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1. Reduplicated statives are compatible with singular nouns.

2. This combination results in unique "polka-dot" meanings.

3. This suggests that reduplication on statives is not simply agreement with entity number, but rather independently marks the number of states.

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3 Resultatives

- Let's first take a moment to characterize resultatives as a category.

- Resultative morphemes appear to convert any verb stem into a monovalent predicate (15).[6]

(15) a. *Tu'-ñ=kɨ'n   ja-mɨi-ch-dha-'   dhi-ñ   duduiñkar*
what-1SG.SBJ=POSP:with 3PL.OBJ-burn-CAUS-APPL-FUT DEM-1SG.POSS pipe.RED

'What am I going to light my pipes with?'

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[6]Resulatativization appears to scope over all derivational and inflectional elements except for argument affixes

b. ***jix=mɨi-ch-dh-ix-'am***   *gu*   *u'uux*
COP=burn-CAUS-APPL-RES-3PL.SBJ DET stick.RED
'The sticks are burnt'

- Like statives, resultatives can take a copula and the stative suffix *-ka*, which García Salido (2014:88-94) associates with non-verbal predicates (see the statives in (16-17) and the resultative in (18)).

(16)   a. *Gɨb gu*   *almua'n* ***jix=dhupi'ñ*** *gio gui'am*   *gɨb* ***gu***   ***tua jix=io'm***
      hit   DET pillow   COP=soft   and 3.PL.SUBJ hit   DET tree COP=hard
      'I hit the the soft pillow and they hit the hard tree'

  b. **gu*   *almua'n dhupi'ñ*
     DET pillow   soft

(17)   *no'=ñ*   *gɨt*   ***jir=alhii-ka'*** *cham bhammuk-da'-iñ*   *gɨt*   *gio*   *na=ñ*
      COND=1SG.SBJ SUBJ COP=little-EST NEG   angry-CONT-1SG.SBJ SUBJ COORD SUB=1SG.SBJ
      cham jiñ-lokiar-da'
      NEG   1R/M-crazy-CONT
      'If I were a child, I could not be able to get angry or get crazy. (García Salido 2014:245)

(18)   a. ***Jix=magon-xim*** *gu*   *kabai*
      COP=tired-RES   DET horse
      'the tired horse/the horse is tired'

  b. *Kugu' tɨi*   *jix=bhai'* ***ulhñ-ix-ka-t***   *lo unico dai ji*   *na-gu'*
     ADVR INT.NR COP=good be.guarded-RES-EST-IMPERF the only   only FOC SUB-ADVR
     ba-psɨk   *na=mɨt*   *jugio*
     mouse.RED SUB=3PL.SBJ.PFV eat
     'That was well kept; the only thing is that the mice finished it.' (García Salido 2014:285)

- Unlike statives, the copula is not obligatory, as seen in (18b) above. Resultatives can also take morphology that typically modifies events, such as the completive *ba-* in (19) below.

(19)   *Tienes que na*   *jum-kambiar-im-am*   *sia*   *makam* ***ba-akustumrar-ix***   *xib*
      have.to   SUB 3R/R/M-change-PROG-3PL.SBJ EXPS different CMP-get.used.to-RES now
      'They need to change, in other words, they are accustomed to something different now. (García Salido 2014:60)

> Resultativized verbs are morphosyntactically somewhat in between canonical verbs and statives in O'dam.

3.1   The Mismatch Puzzle

- Certain resultatives allow for reduplication with a singular argument as in (20b). This type of mismatch consistently yields an unambiguous meaning where the result has been applied to the subject multiple times. (20c) is underspecified for the number of events, the sticks could have been cut with a single chop or many.

(20)   'The cut stick'
  a. *jix=ɨk-ix*   *gu*   *uux*
     COP=cut-RES DET stick
     One time

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b. *jix=i'k-ix   gu   uux*
   COP=cut.RED-RES DET stick
   Many times

c. *jix=i'k-ix-'am   gu   u'uux*
   COP=cut.RED-RES-3PL.SBJ DET stick.RED

- Crucially, the mismatch we see in (20b) is not allowed with all resultatives. Notice that the reduplicated resultative with the singular subject in (21b) is not allowed.

(21) a. *ixchu-xim gu   uux*
         hide-RES DET stick
         'The hidden stick'

      b. **i'xchu-xim   gu   uux*
         hide.RED-RES DET stick
         Desired reading: 'The (many times) hidden stick'

      c. *i'xchu-xim   gu   u'uux*
         hide.RED-RES DET stick.RED
         'The hidden sticks'

- Verbs that do not allow a mismatch require other means to express a similar meaning, such as continuative inflection under the resultative (22), or the adverb *mui'kim* 'many times'.

(22) *Su'nni-dh-ix   gu   tas*
      fill-CONT-RES DET cup
      'the (repeatedly) filled cup'

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1. Resultatives seem to mark State Number, similarly to statives, but not every resultative allows State and Entity number to be different

2. Plural Entity Number entails plural State Number, regardless of the Event Number

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4 *hide*-type vs. *cut*-type Events

- So why do we only find mismatches between plural event and singular participants with certain predicates?

- We've already seen that State, Event and Entity Number operate as independent systems.

- Real-world properties create a continuum of event types which we call *cut*-type and *hide*-type events, which differ specifically with respect to how states and entities can interact.

Cut-type events	State Number $\geq$ Entity Number
Hide-type events	State Number = Entity Number

- It's clear that in cases where O'dam speakers accept mismatches, the real-world properties of the event allow for multiple results to hold over the object *simultaneously*, for example in (20c) a single stick can be described as cut many times. Hide-type events don't allow this stacking of results. In (21b) we're unable to say that the stick has undergone multiple hiding events, since with each new hiding event the result of the previous event is undone. In other words, there can only be one "hidden" state applied to the stick at a time.

- The distinction between hide-type and cut-type events is not dichotomous. The events described by the verbs *cut* and *hide* seem to be natural endpoints because their properties are consistently characteristic of whether we can or cannot stack results. However, some verbs are more gray for speakers. For example, speakers disagree on the grammaticality of (23b)

(23)   a. *bakuañx-ix gu   kalsitin*
             wash-RES   DET sock
             'The (once) washed sock'

       b. *?bopkuñx-ix   gu kalsitin*
             wash.RED-RES DET sock
             'The (many times) washed sock'

- Here, there's a question of how permanent the state of being 'washed' is. If a sock is dirtied after a washing event, can we no longer call it washed? If a sock is washed repeatedly, can we stack the results of each washing event and call it many times-washed? These intuitions seem fuzzy, and the results of washing events seem to waver between stackable cut-type results and strictly singular hide-type results. O'dam speakers' judgments seem to reflect this uncertainty.

- Regardless, certain verbs have clear tendencies as to which type of events they denote. A sampling below:

(24)   *cut*-**type leaning verbs**
       ɨk-ix > i'k-ix 'cut'
       jaiñ-ix > jaix-ix 'split, sliced, cleaved'
       kɨiñx-ix > kɨiyax-ix 'kicked'
       komk-ix > kokmik-ix 'hugged'
       omñ-ix > omx-ix 'broken, fractured'

(25)   *hide*-**type leaning verbs**
       ɨxchu-xim > i'xchu-xim 'hidden'
       jugi-ix > ju'gi-ix 'finished'
       juuka'ñdh-ix > jujukdh-ix 'heated up'
       kupio'k-ix > kukpio'k-ix 'opened'
       mai'gɨx-ix > mai'sulhg-ix 'lost
       muk-ix > ko'-ix 'die'
       mu'kdh-ix > mu'mkadh-ix 'sharpened (transitive base)'

- So is this property characterized by verbs themselves? The verb isn't the only element that contributes to our ability to talk about stacked results of events. Rather, the noun and its relationship to that verb all play an important role. For example, consider (26).

(26) *#siiss-ix*   *gu baiñum*
      straighten.RED-RES DET iron
      'The piece of iron is straightened (in various sections)'

- The reading in (26) is only grammatical if the iron is bent in various places before the straightening event, for example if the iron is a star shape. We cannot get a grammatical reading if the iron is straightened and bent in the same section.

> So, both the noun and the verb contribute to real world properties which determine whether multiple results can be stacked onto a single object, and therefore to whether O'dam speakers will allow a reduplicated verb to be used with a singular noun.

5 The interaction between suppletion and reduplication

- In O'dam, suppletion survives derivation in all cases, including resultativization as we saw in (5).

- The table below is an exhaustive list of the attested suppletive verbs in O'dam. As far as we can tell, most of these verbs are hide-type, with the exception of *bui'ñ∼ iobo* "throw" and *mɨlhi∼bapoo* "run."

(27) Suppletive verbs in O'dam (García Salido & Everdell *in review*)

SG	PL	Meaning
mu'a	*kooda*	'kill'
muki	*ko'i*	'die'
mɨlhi	*bapoo*	'run'
oñi	*ua'ki*	'clear up (sky), clean'
bhɨɨy	*ui'*	'get, acquire, marry, harvest (except corn)'
bakuan	*bopkun*	'wash'
kuan	*kookosa*	'remove (cover), pull out (vertically), undress'
bui'ñ	*iobo*	'throw'
gɨxi	*suulhig*	'swim, be born, bear fruit'
baabu'	*boosog*	'pull out (horizontally), pull aside (to speak to)'

- Suppletion has been described as marking explicit participant number on the verb in O'dam and across the Uto-Aztecan family (for further discussion see Haugen & Siddiqi 2013, Haugen & Everdell 2015, Harley et al. 2017 and García Salido & Everdell *in review*). So if our analysis is true that reduplication is marking State Number on resultative verbs independently from Entity Number, we might expect suppletion and reduplication to act independently on the verb.

- Our two suppletive cut-type verbs only allow for reduplication in the singular form, while the plural form does not have an attested reduplicated form, even outside of resultivization.

(28) a. *Mu buidh-ix   gu pilot*
     DIR throw.SG-RES DET ball
     'The ball is thrown'

  b. *bupp-ix   gu pilot*
     throw.SG.RED-RES DET ball
     'The ball is thrown (many times)'

  c. *gu piplot   mu iob-ix*
     DET ball.RED DIR throw.PL-RES
     'The balls are thrown'

  d. **io'b-ix, *i'iob-ix*

(29) a. *mɨlh-chu-dh-ix   gu kabai*
     run.SG-CAUS-APPL-RES DET horse
     'The horse is run'

  b. *mɨmlhi-chu-dh-ix   gu kabai*
     run.SG.RED-CAUS-APPL-RES DET horse
     'The horse is run (many times)'

  c. *bapoi'-ch-dh-ix   gu kakbai*
     run.PL-CAUS-APPL-RES DET horse.RED
     'The horses are run'

d. *bapboichdhix, *bapoobchudhix, *boopboichdhix

- Like it does in non-resultativized verbs, the suppletion in (28) and (29) is always marking participant number. We know this because the suppletion of the verb is always agreeing with the number of the noun regardless of reduplication.

- However, while reduplication may mark something like event number in non-resultative verbs, once the verbs shift category to become resultativizes, reduplication is used to mark plural State Number. In other words, reduplication cares about the category its modifying.

- When the entity is singular, we can tease apart participant and State number, so we're able to have optional reduplication. However, once we start talking about plural participants, which is marked by a suppletive plural, there's a functional motivation to underspecify for state number since plural participants entails plural states.

- So, we end up with a conflation of Entity number and State number with plural nouns, and suppletion bears the functional load of both categories.

6   A Call to Action: The Field (Re-)beckons

- In texts, we very rarely find mismatches between State Number and Entity Number in resultative constructions, hence the previous agreement analysis. However, given that mismatches are meaningfully contrastive, it is clear that noun and verb reduplication are serving distinct functions in resultatives.

- The non-mismatched event and participant number gives a more general meaning that encompasses the unambiguous meaning given by mismatched event-participant number. Thus, it seems that the mismatches would only occur in specific cases where the unambiguous meaning is necessary.

- It's not the case that O'dam conceives of events in a unique way. English differentiates the same event types based on entailments.

    (30)   a. # I hid the stick and then I hid it again without un-hiding it.
           b. # I heated up the dinner and then heated it up again without letting it cool.
           c. # I opened the door and then opened it again without it closing.
           d. I cut the stick and then I cut it again without mending it.
           e. I was hugged by Kristie and then hugged by Tom without Kristie letting go.
           f. I broke the plate and then broke it again without fixing it.

- However, the ability for O'dam to overtly specify number of results independently from number of participants in resultative constructions allows speakers to bring out the subtle properties that differentiate these universal types of events. Specifically, speakers can encode State Number independently from other aspects of events.

- While to our knowledge no other language has been described as overtly distinguishing between *cut*- and *hide*-type events, nothing about O'dam's system here is typologically rare (e.g. Rubino 2013). So we suspect that many more languages will show patterns similar to O'dam's, however the mismatches discussed here seem to be somewhat rare in natural speech, only occurring where the unam biguous 'polka-dotted' reading is absolutely necessary.

- Merci beaucoup!!!

9

Acknowledgments

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