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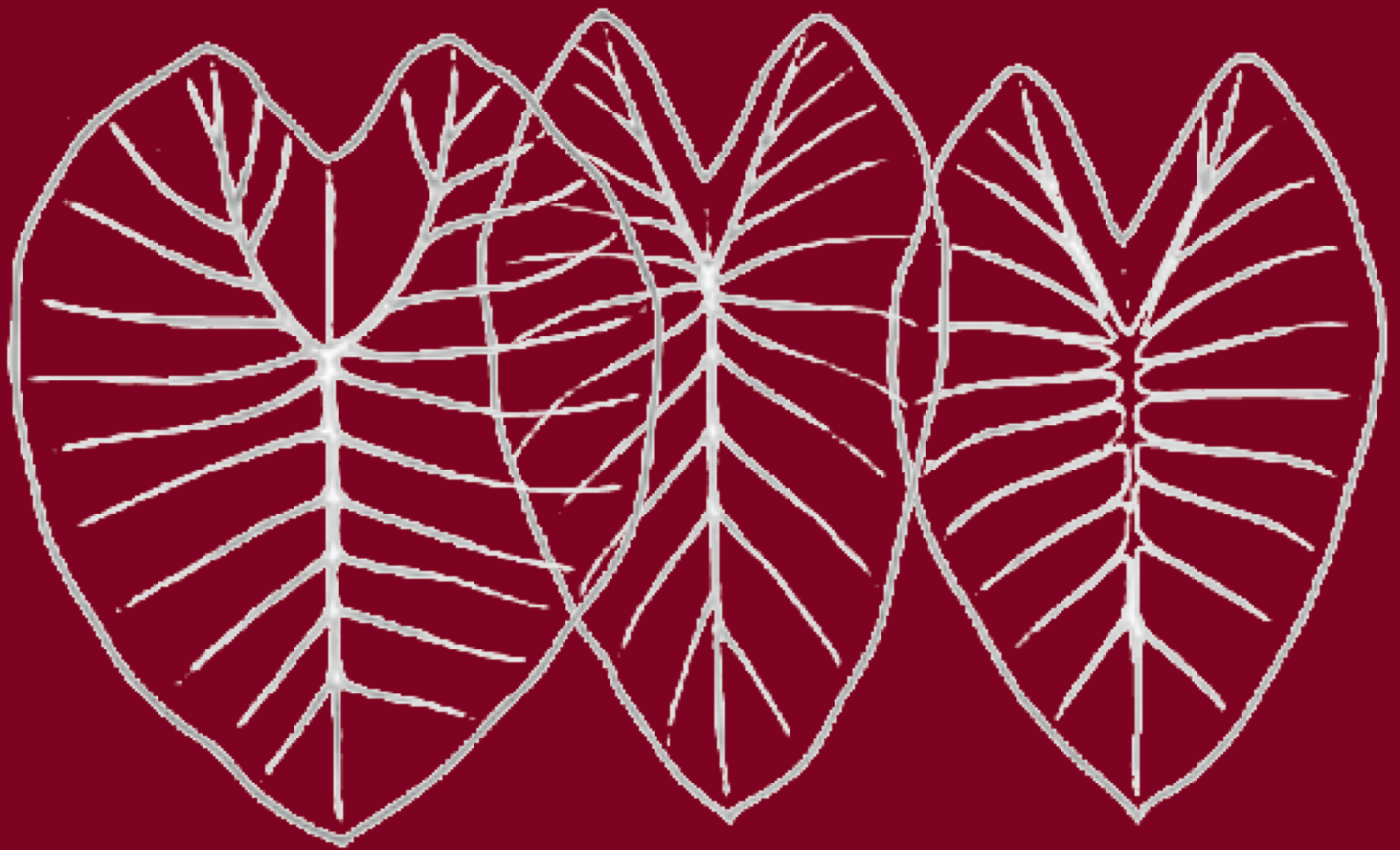
Linguistic Fieldwork and Semantic Theory

Edited by Peng Liu, Erin Sjovall, Xue Sun, Polina Berezovskaya and Vera Hohaus

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On the Zero-Change Construal of
Causative Simple Verbs in Mandarin Chinese[1]

Fabienne Martin — Humboldt Universität zu Berlin
Hongyuan Sun — University of Picardie Jules-Verne
Jinhong Liu — Huizhou University
Hamida Demirdache — Université de Nantes
& Centre National de la Recherche Scientifique (CNRS)

1   On the Typology of Simple Verbs in Mandarin

In a tradition going back to Tai and Chou (1975) and defended by Talmy (1991, 2000) or Chen (2005, 2017) among others, Mandarin simple verb (henceforth SV) counterparts of English lexical causatives such as *shāo* 'burn', *guān* 'close' do not have a causative meaning.[2] Rather these SVs are taken to denote a set of activities performed in order to trigger a certain result state in the theme's referent, though, crucially, the result state itself is not part of the SV's denotation. Thus for instance, Chen (2017) translates Mandarin SVs such as *guān* by 'do.closing' rather than by 'close', precisely to convey the idea that these SVs are activity verbs devoid of causative semantics. Mandarin SVs such as *shāo* 'burn', *guān* 'close' thus behave like transitive activity (manner) verbs of a particular subtype, namely those that defeasibly implicate the occurrence of a result state that obtains when the event described is successful (Talmy 2000, Brisson 1994, Rappaport Hovav and Levin 1998). *Wash* and *wipe* are paradigmatic examples of such verbs, as illustrated in (1) for English and in (2) for Mandarin. The result state implicated in (1)-(2) is that of being clean(er). This expected/result state is 'conceptually associated' and 'pragmatically favored', but not entailed, since its occurrence can be denied without yielding a contradiction. We call this class of activity verbs 'Result-State (RS) oriented activity verbs'.

(1)   Peter washed the window, but it is as dirty as before!

(2)   Mòmo xǐ   le   nèi-shuāng wàzi, dàn gēnběn méi   xǐ   gānjìng.
      Momo wash PFV that-pair   sock but at.all   NEG.PFV wash clean
      'Momo washed that pair of socks, but they are not at all clean.'

In this paper, we contest the position that Mandarin SVs such as *shāo* 'burn', *guān* 'close' and *shā* 'kill' have a radically different meaning from their English counterparts and should be collapsed

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[2]Abbreviations used in glosses: CL = classifier, DP = determiner phrase, DUR = durative aspect, NEG = negation, PFV = perfective, PROG = progressive, RS = result state, SG = singular, SV = simple verb, and VP = verbal phrase.

into one class with RS-oriented activities. Although this position is not in of itself novel[3], what is new and will come perhaps as a surprise are the arguments that we bring to bear on this issue. Indeed, we will argue that so-called *failed-attempt* construals (Tatevosov 2008) which we refer to as *zero-change* construals, provide compelling evidence for the existence of causative SVs, while in the literature, the mere availability of zero-change readings is typically taken as an argument against the existence of causative SVs.

This construal is illustrated with the Mandarin sentences in (3)-(4) built with the perfective marker *le* and a monomorphemic SV, respectively *shāo* 'burn' and *shā* 'kill'.[4]

(3) Lǐsì shāo le yì-gēn mùtou, dàn gēnběn méi   shāo-zháo.
     Lisi burn PFV one-CL wood   but at.all NEG.PFV burn-ignite
     'Lisi burned a piece of wood but it didn't get burned at all.'

(4) Lǎowáng shā le yì-zhī jī   #(hǎojǐcì),   jī   hái huó zhe.
     Laowang kill PFV one-CL chicken several.times chicken still live DUR
     'Laowang killed a chicken several times, but it is still alive.'

The first clause in (3) with the perfective accomplishment VP *shāo yì-gēn mùtou* 'burn a piece of wood' by default implicates that the piece of wood was successfully burnt, but as the second clause explicitly states, it can also be used to describe an event that does not cause any state of the wood being burnt, since the piece of wood in question did not undergo any burning whatsoever. The first clause of (4) with the prototypical causative verb 'kill' by default implicates that several killing attempts ended up provoking the death of the chicken, but event culmination is not entailed, since the death of the chicken can be explicitly denied in the subsequent clause without yielding a contradiction. The fact that perfective sentences built with SVs such as *shāo* 'burn', *shā* 'kill' or *guān* 'close' fail to entail the occurrence of a result state has also been experimentally established by Liu (2018); the corpus data gathered in Chief (2008) and Chen (2018) also corroborate this conclusion.

We nonetheless argue that *shā* 'kill' have causative meanings in Mandarin, just as their English counterparts have, and in so doing, distinguish causative SVs associated with a complex event structure, from activity SVs associated with a simplex event structure, in Mandarin just like in English. Figure 1 recapitulates the finer-grained typology of SVs in Mandarin that we propose. We probe the meaning and (simple vs. complex) event structure of these classes of SVs in Mandarin through the diagnostics presented in sections 4 to 6.

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[3]Lin (2004) already acknowledges the existence of exceptions to his generalization that no SVs are change-of-state verbs in Mandarin. Tham (2019) also acknowledges the existence of change-of-location SVs as well as change-of-state SVs, albeit underlining that they are few. The existence of causative SVs is also argued for by Han (2007, p. 178 & section 6.6.2).

[4]Note that a cardinality or durative adverbial is required for sentences with non-gradable causative verbs such as (2) to be felicitous, as Hongyuan Sun was to our knowledge the first to observe. Sun's observation was experimentally confirmed by Liu (2018). This issue, not addressed here for lack of space, is taken up in Martin et al. (2020b).

2 Degree of Change vs. Degree of Event Realization

Koenig and Chief (2008) offer an interesting take on the meaning and aspectual profile of SVs in Mandarin. They start from the hypothesis that only verbs that denote a change-of-state may give rise to what they call the incompleteness effect, that is, be used in perfective sentences that 'describe killings in which no death occurred, repairs in which nothing gets fixed' (p. 243). They thus take change-of-state verbs to exist in Mandarin, as we do. Our proposal, however, differs crucially from theirs in one core respect: though they recognize the existence of causative change-of-state SVs in Mandarin, they nonetheless do not assume that Mandarin causative SVs have the same meaning as their English counterparts. In English, a lexical causative verb such as *kill* denotes a set of complete, 'causally successful' events leading to death. An event is complete with regard to the property denoted by *kill* if it reaches its endpoint —that is, the moment at which death occurs. In contrast, for Koenig and Chief, a Mandarin change-of-state verb such as *shā* 'kill' denotes a set of complete or incomplete killing events. Importantly, the set of events denoted by the verb thus also includes events that cause the theme to be hurt, but do not develop until causing death proper.

The analysis we argue for is in this respect radically different: we take the null hypothesis to be that Mandarin SVs such as *shā* 'kill' have exactly the same semantics as their English causative counterparts. We locate the source of the incompleteness effect for non-gradable causative SVs, not in the lexical semantics of the verb, but in outer aspect (Koenig and Muansuwan 2000 on Thai, Altshuler 2014 on Hindi). We thus distinguish alongside RS-oriented activity SVs (e.g., *xǐ* 'wash'), analysed as in (5), non-gradable causative SVs such as *shā* 'kill', analysed as in (6), and gradable causative SVs such as *shāo* 'burn', analysed as in (7b).

(5) *xǐ* 'wash' $\rightsquigarrow \lambda y \lambda e.\textbf{wash}(e) \wedge \textbf{theme}(e, y)$

(6) *shā* 'kill' $\rightsquigarrow \lambda y \lambda e.\exists(\textbf{cause}(e, s) \wedge \textbf{dead}(s) \wedge \textbf{theme}(e, y))$

(7) a. $\textbf{burn}_\mu(e, y)$ 'the degree to which a burning event e of y is realized'
     b. *shāo* 'burn' $\rightsquigarrow \lambda y \lambda d \lambda e.\textbf{burn}_\mu(e, y) = d$
     c. $\textbf{burn}_\mu^+(e, d, y) := \textbf{burn}_\mu(e, y) = d \wedge d > 0$
     d. $\textbf{burn}(e, y) := \textbf{burn}_\mu(e, y) = d \wedge d = 1$
     e. $\forall e \forall y (\textbf{burn}(e, y)) \rightarrow \exists s (\textbf{cause}(e, s) \wedge \textbf{burned}(s, y))$

Our analysis of causative gradable SVs builds on Piñón's (2008) analysis of incremental theme verbs. In particular, such verbs, according to Piñón, encode a degree of *event realization* and, crucially, the *degree of event realization* is not to be confused with the *degree of change* (endured by the theme). This proposal allows us to capture the idea that a causation event involving an agent (e.g., Lisi burning a piece of wood) can be realized to a positive degree without the theme actually enduring a change (e.g., without the wood starting to burn). In this scenario, Lisi has started burning the wood as soon as he prepared the fire to do so and put the wood into the fire (the event is realized to a positive degree). But maybe the wood is so damp that it is able to withstand high temperature without starting to burn. In this case, Lisi *has started burning* the wood but the wood *hasn't started burning*.

We assume that gradable causative simple verbs such as *shāo* 'burn' encode gradable properties which are measure functions μ yielding degrees d as values, tracking the degree of realization of events, as in (7a). The argument d gets bound either by the *positive binding operator* or by the *degree maximizing operator* (see (7c) or (7d) respectively, and more generally, Piñón 2008 on incremental theme verbs).

When the value of d in (7b) is set to the maximum (d=1) – i.e. the (burning of y) event is realized to degree 1 – the meaning postulate in (7e) captures that e causes some state of y being burnt. Following Piñón, we assume that the degree maximizing operator is preferred as a binder over the positive degree binding operator, since the former yields a stronger meaning than the latter would yield: if d=1, then $d > 0$, but not vice-versa (Kennedy and Levin 2008 make a similar point regarding the preference that a subset of degree achievements show for telic readings). This proposal accounts for why, in the first place, sentences such as the first clause of (3) by default implicate the occurrence of some result state.

By contrast, non-gradable causative SVs such as *shā* 'kill' do not project a degree argument, as illustrated in (6). This is essentially where our proposal differs from that of Koenig and Chief's (2008) since for the latter causative SVs (*shā* 'kill') are taken to be gradable, while on our proposal they share the same meaning as English non-gradable causatives.

3   A Finer-grained Typology of SVs in Mandarin

The typology for (transitive) SVs that we argue for is summarized and illustrated in Figure 1. We achieve this typology by manipulating six diagnostics. Our first diagnostic is compatibility with a time-span adverbial, a standard diagnostic for telicity which will serve to distinguish SVs that yield *telic* VPs from those yielding *atelic* VPs – thus giving us the first level of classification in Figure 1. Both RS-oriented activity SVs and causative SVs will come out as yielding telic VPs on this test. But our next three diagnostics will crucially serve to distinguish RS-oriented activity SVs from causative SVs. Two of these are compelling, novel diagnostics involving the availability of so-called zero-change construals – namely, the time-span adverbial test, once again, but serving this time to distinguish RS-oriented activity from causative SVs on their zero-change construals, and the *intransitive*-zero-change construal test. Our forth diagnostic involves decomposition adverbs such as *again*, a classic test for causative event structure. The next diagnostic, *gradability*, allows us to distinguish two sub-classes of causative SVs: gradable vs. non-gradable. Finally, our sixth and last diagnostic, temporal extendness, will distinguish non-gradable causative SVs from achievement verbs.

Before proceeding further, however, we provide examples below to illustrate each of our four subclasses of SVs:

(8)   Simple verbs yielding atelic VPs only: *chuí* 'hammer', *mō* 'caress (a pet)', *qīn* 'kiss', *dīng* 'gaze at', *tuī* 'push', *yā* 'press', *zhuài* 'drag'.

(9) Simple verbs yielding VPs with telic uses:

    a. *Result-state oriented activity verbs*: *xǐ* 'wash', *chuī* 'blow', *cā* 'wipe (dust, water)', *tuō* 'mop', *jiā* 'press from both sides (a finger)', *qiā* 'pinch (one's arm)', *bāi* 'bend', *zhǔ* 'cook', *kǎo* 'grill', *hōng* 'blow-dry', *xiū* 'fix/repair', *bǔ* 'fix/repair'.

    b. *Causative gradable verbs*: *shāo* 'burn', *dòng* 'freeze', *kāi* 'open', *guān* (mén) 'close (the door)', *sī* 'tear', *mái* 'bury', *fā* 'leaven', *rǎn* 'dye (one's hair)', *zhé yíge shùzhī* 'break a branch', *jiě* 'unknot (a cravat)', *qiē* 'cut'.

    c. *Causative non-gradable verbs*: *shā* 'kill', *chú* 'get rid of (the tyrant)', *zhāi* 'pick (a flower)', *guān* (*shūdiàn*) 'close (the bookstore)', *suì* 'break (a plate)', *xī* 'blow out (a candle)', *jiù* 'save (a rabbit)'.

    d. *Achievement verbs*: *dào* 'arrive', *sǐ* 'die', *chén* 'sink', *wàng* 'forget', *yíng* 'win'.
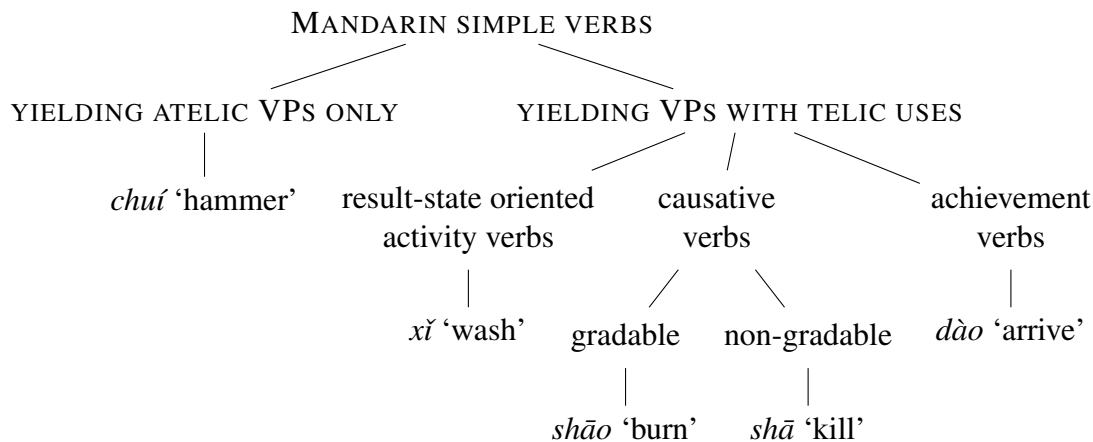
Figure 1: Typology of Mandarin simple verbs

4 SVs Yielding Telic VPs: The Time-Span Adverbial Test

We identify SVs forming telic VPs, by which we mean VPs encoding an inherent terminal point (Garey 1957), by using the standard time-span adverbial test: compatibility of adverbials such as *X fēnzhōng* ('X minute') in preverbal position with a VP containing a quantized object signals a telic interpretation of the VP.[5] As shown in (10)-(11), this test confirms (as expected) that pure activity SVs, such as *chúi* 'hammer' or *mō* 'pet' never yield telic VPs, even when combined with a quantized object:

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[5]Prepositionless adverbials in Mandarin (such as *X fēnzhōng* 'X minute') allow both a time-span and a durative interpretation. Simplifying, these interpretations are determined by position relative to the verb and context (Xiao and Mcenery 2006, Zhang 2016). In pre-verbal position, they yield a time-span interpretation (but see Xiao and Mcenery 2006 and Lin 2008, 38 for some exceptions), while in post-verbal position, they yield a durative interpretation.

(10) #Dāndan shí fēnzhōng jiù chúi   le yí-ge pánzi.
      Dandan ten minute   JIU hammer PFV one-CL plate
      Intended: 'Dandan hammered a plate in ten minutes.'

(11) #Dāndan yì   fēnzhōng jiù mō   le yì-zhī māo.
      Dandan one minute   JIU caress PFV a-CL   cat
      Intended: 'Dandan petted a cat in one minute.'

In contrast, predicates which, according to our classification, are either RS-activity SVs (*xǐ* 'wash')
or (by hypothesis) causative SVs (*shāo* 'burn'), yield telic construals of their VP when combined
with a quantized object, as shown below. The availability of these telic construals for VPs headed
by an SV undermines a widespread view according to which telicity in Mandarin can only be
expressed with result verbal compounds (see, e.g., Lin 2004).

(12) Mòmo yì   fēnzhōng jiù xǐ   le **yì**-shuāng wàzi.
      Momo one minute   JIU wash PFV one-pair   sock
      'Momo washed a pair of socks in one minute.'

(13) Lǐsì shí fēnzhōng jiù shāo le **yì**-gēn mùtou.
      Lisi ten minute   JIU burn PFV a-piece wood
      'Lisi burned a piece of wood in ten minutes.'

The time-span adverbial test allows us to distinguish predicates denoting pure activities, never
allowing telic construals even with a quantized object (*chúi yí-ge pánzi* 'hammer a plate' and *mō
yìzhī māo* 'pet a cat'), from predicates which cannot be classified as such, since they do allow telic
construals. There are however important differences among the latter class of SVs: determiner
choice impacts telicity with RS-activity SVs such *xǐ* 'wash', as the contrast between (12) and (14)
reveals, but not with causative SVs, as the grammaticality of (13) and (15) alike shows.

(14) ??Mòmo shí fēnzhōng jiù xǐ   le **nèi**-jiàn chènyī.
      Momo   ten minutes   JIU wash PFV that-CL   t-shirt
      Intended: 'Momo washed that t-shirt in ten minutes.'

(15) Lǐsì shí fēnzhōng jiù shāo le **nèi**-gēn mùtou.
      Lisi ten minute   JIU burn PFV that-piece wood
      'Lisi burned the piece of wood in ten minutes.'

The difference between (12) and (14) is that the cardinal indefinite determiner *yī* 'one' in (12) nec-
essarily yields a quantized interpretation of the direct object, thus triggering telicity (see Wu 2005,
Zhang 2016, 185 for related observations), while demonstrative *nèi* 'that' is compatible with both
quantized and cumulative reference. Consequently, the availability of a telic construal in (14) is
context dependent and, thus, degraded in the absence of sufficient appropriate context. In sum, the
distribution of judgments in (12)-(15) tells us that the presence of a truly quantized direct object is

essential for the derivation of telic interpretations with RS-activity (non-scalar) verbs but not with causative (scalar) SVs. We take this contrast in turn to show that telicity obtains differently with these two classes of predicates. In particular, adapting to Mandarin Rappaport Hovav's (2008) analysis of English telic VPs built with non-scalar verbs such as *eat* or *wash*, we assume that, with *xǐ* 'wash' type SVs, telicity arises via the object serving to measure out the progress the described event, thus delimiting its bounds and yielding an incremental interpretation of the predicate. In contrast, *shāo* 'burn' is a scalar verb (see (7) and section 6 below), and as such able to yield an incremental interpretation of the VP on its own. A telic construal with a time-span adverbial will thereby be available even if the internal argument does not impose a quantized interpretation by itself.

We now provide further critical evidence for the proposal that *xǐ* 'wash' type SVs instantiate RS-oriented activity verbs, while *shāo* 'burn' type SVs instantiate causative verbs, just like their counterparts in English, by manipulating three diagnostics probing the respective meaning and event structure of these two classes of SVs.

5 Result-State Oriented Activity vs. Causative SVs

We start by proposing two novels diagnostics, both involving the availability of the zero-change construal illustrated in (3)-(4) above. The third test discussed here involves decomposition adverbs (such as, e.g., *again*), a traditional test for probing event structure.

5.1 Zero-Change Construals with Time-Span Adverbials

We established in section 1 that a perfective (agentive) sentence built with a SV such as *shāo* 'burn' implicates – but does not entail – event culmination, since the occurrence of any change-of-state whatsoever in the referent of the theme argument can be explicitly denied in the subsequent discourse, as was illustrated in (3). This is unexpected if indeed such verbs are causative verbs, as we contend, and not RS-oriented activity verbs, as others contend. We further established in section 3, with the time-span adverbial test in (12)-(13), that both *shāo* 'burn' and *xǐ* 'wash' type SVs yield telic construals of their VPs. We now ask what happens if we try to simultaneously enforce a zero-change and a telic construal in the same sentence, as illustrated in (16)-(17) below. Will the zero-change construal survive?

(16) Lǐsì (#shí fēnzhōng) **shāo le** yì-gēn mùtou,
      Lisi ten   minute   burn PFV a-piece wood
      dànshì mùtou gēnběn jiù méi   shāo-zháo.
      but   wood at.all JIU NEG.PFV burn-ignite
      'Lisi burned a piece of wood (in ten minutes), but the wood didn't burn at all.'

(17) Mòmo (yì fēnzhōng) **xǐ** **le** yì-shuāng wàzi,
      Momo a minute wash PFV a-pair sock

      dànshì wàzi gēnběn jiù méi xǐ gānjìng.
      but sock at.all JIU NEG.PFV wash clean

      'Momo washed a pair of socks in a minute, but they didn't get cleaner at all.'

As shown in (17), the zero-change construal remains felicitous in perfective sentences involving an RS-oriented SV, combining with a quantized direct object and the adverbial in preverbal position *yì fēnzhōng* 'one minute' interpreted as a time-span adverbial. Crucially, however, for SVs that we take to be causative, the zero-change construal becomes infelicitous in the presence of a time-span adverbial modifying the VP, as shown in (16).

That telic RS-oriented predicates such as *xǐ wàzi* 'wash the socks' need not describe efficient (wash-the-socks) events is rather unsurprising, for it is standardly assumed that these VPs do not encode the occurrence of the associated result state. But on the widespread view that *shāo* 'burn' is an activity SV, the result entailment observed in (16) is plainly unexpected. No such difference is expected to tease apart telic VPs built with *xǐ* 'wash' from those built with *shāo* 'burn' – if both instantiate RS-oriented activities. If, however, we are dealing here with two different classes of verbs, RS-activity vs. causative SVs, then such a contrast is no longer surprising. The question is why the occurrence of a result state with a causative SV could be successfully denied in (3), but not when we add a time-span adverbial as in (16). Recall the semantics attributed to a gradable causative SV such as *burn*, repeated below for convenience.

(7) a. **burn**$_\mu(e, y)$ 'the degree to which a burning event e of y is realized'
     b. *shāo* 'burn' $\rightsquigarrow \lambda y \lambda d \lambda e.$**burn**$_\mu(e, y) = d$
     c. **burn**$_\mu^+(e, d, y) := $**burn**$_\mu(e, y) = d \land d > 0$
     d. **burn**$(e, y) := $**burn**$_\mu(e, y) = d \land d = 1$
     e. $\forall e \forall y(\textbf{burn}(e, y)) \rightarrow \exists s(\textbf{cause}(e, s) \land \textbf{burned}(s) \land \textbf{theme}(s, y))$

The proposal in (7) will straightforwardly explain why zero-change construals fail to survive, in the presence of time-span adverbials, with VPs headed by gradable causative SVs. This will be the case simply because a time-span adverbial requires the predicate to which it applies to have quantized reference (Krifka 1992, 1998). Crucially, however, whether the reference of the VP headed by *shāo* 'burn' combining with a quantized internal argument is ultimately quantized or not[6], depends foremost on the value obtained for the degree argument encoded in its meaning.[7] There are two options for binding the verb's degree argument.

Suppose that *d* gets bound by the degree maximizing operator (option (7d)), then the meaning postulate in (7e) (according to which, if an event *e* of burning *y* is realized to its maximal degree, then *e* causes some state of *y* being burnt) kicks in. That is to say, if the degree maximizing operator sets the value of *d* to the maximum, the VP *shāo yì-gēn mùtou* 'burn a piece of wood' denotes the

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[6]A VP has quantized semantics if no proper part of the event it denotes can be an event of the same kind as the whole event (Krifka 1992, 1998).

[7]This idea goes back to Piñón's (2008) discussion of how to capture the aspectual flexibility of VPs such as as *eat the apple*.

set of burning events causing some state of a piece of wood being burned. This VP has quantized reference, for no such event in which a piece of wood is successfully burnt contains an event in which a piece of wood is successfully burnt. It thus follows that when we add a time-span adverbial to (13) as in (16), the zero-change construal will not survive: the time-span adverbial requires the predicate to which it applies to have quantized reference, which in turn requires the predicate's d argument to be bound by the degree maximizing operator, thus entailing the occurrence of a result state of the theme being burned (via the meaning postulate (7e)).

Now, suppose that d is bound by the positive degree binding operator (option (7c)). Since the latter merely restricts d's value to being greater than 0, the VP may get an atelic, cumulative interpretation, for the sum of two incomplete events of burning a piece of wood counts also an incomplete event of burning a piece of wood, if a specific piece of wood is at issue. Recall furthermore that if $1 > d > 0$, then the burning event need not actually trigger any change in the theme (this is the scenario where Lisi has started burning the wood by putting it in the fire but the wood is to damp to start burning, to endure any change).[8]

5.2   Intransitive Zero-Change Construals

Our second novel diagnostic for distinguishing RS-oriented activity from causative SVs also involves zero-change construals. This time we ask what happens if we try to enforce a zero-change construal on the *intransitive* use of SVs (where the verb projects a single internal argument appearing in subject position). Will the zero-change construal survive when we switch from the transitive to the intransitive frame of the SV? Once again, we will see that the zero-change reading survives with RS-activity SVs, but not with causative SVs. Consider the contrast between (18) and (19).

(18)   Nèi wàzi **xǐ-le**,   dàn gēnběn méi   xǐ-gānjìng.
       that sock wash PFV but at all   NEG.PFV wash-clean
       'These socks washed, but they didn't get clean at all!'

(19)   Nèi-fēng xìn   **shāo-le**, #dàn gēnběn méi   shāo-zháo.
       that-CL   letter burn PFV but   at all   NEG.PFV burn-ignite
       Intended: 'That letter burned, but it didn't get burned at all.'

As shown in (19), sentences built with causative SVs used intransitively are incompatible with zero-change scenarios. This is in striking contrast with the (agentive) transitive use of these verbs which licenses zero-change construals, as we saw in (3) and (4). (Zhang 2018, 130 makes the same observation for *guān* 'close'.) We thus have a two-way contrast: with a causative (gradable) SV, the zero-change construal is available on its transitive agentive use, but not on its intransitive use,

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[8]For obvious reasons, this explanation for why zero-change construals are possible with gradable verbs such as *shāo* 'burn' does not carry over to non-gradable causative verbs such as *shā* 'kill', but as specifically mentioned in footnote 1, zero-change construals are harder to obtain with non-gradable causative SVs. We refer the reader to Liu (2018) and Martin et al. (2020b) for a more detailed empirical picture of the licensing of zero-change construals across gradable vs. non-gradable causative SVs. Suffice it say that the zero-change construal with non gradable SVs comes about differently, via the partitive semantics of perfective *-le*, analysed as non-completive partitive aspectual operator (Martin and Gyarmathy 2019 and references therein; Martin et al. 2020b).

while with an RS-oriented activity SV, it is available across the board.

What about with non-gradable causative SVs such as *shā* 'kill'? Recall, from footnote 3, that zero-change construals with such verbs are more restricted, requiring the presence of a cardinality adverbial, e.g., *once*, or a temporal durative adverbial. Yet again, we see that the zero-change reading does not survive on the intransitive use, even in the presence of the enhancing adverbial. In particular, (21) weirdly suggests that the chicken came to life again after dying.

(20) Li shā le   nèi-zhī jī   #(yí cì), kě jī   hái huó zhe.
     Li kill PFV that-CL chicken one time but chicken still live DUR

   'Li killed the chicken once, but the chicken is still alive.'
   [Li tried once to kill it, but it was unsuccessful.]

(21) #Jī   shā le   yícì.
      chicken kill PFV one.time
   Intended: 'The chicken got killed once.'

From the above distribution of zero-change construals, we conclude that Mandarin RS-activity SVs do not entail the occurrence of a change towards a conventionally associated result state, be it in transitive or intransitive frames. In contrast, Mandarin causative SVs do not entail the occurrence of a change towards a lexically encoded state in (agentive) transitive frames, but they do entail such a change when used intransitively. We take the result entailments that *kill* and *burn* SVs show on their intransitive use to further support our claim that they do not fall in the same class as *wash*-verbs in Mandarin —that is, they are not RS-oriented activities, but rather have causative semantics. We very briefly summarize Martin's (2020) analysis of the result entailment of causative SVs used intransitively in the following subsection, turning next to RS-activity verbs. In a nutshell, we argue that these two classes of SVs in Mandarin yield distinct types of intransitive alternants. Verbs such as *shāo* are anticausative SVs when used intransitively. They have a causative semantics, and are basically semantically and syntactically similar to anticausatives in English (Alexiadou et al. 2006, 2015). SVs such as *xǐ* 'wash' used intransitively are what we henceforth call *antiagentives*.

5.2.1 Anticausative Verbs

Under the approach adopted here, causatives and anticausatives have the same event structure with two components, a causing event and a result state, semantically differing only in the presence vs. absence of Voice (Kratzer 2005, Alexiadou and Schäfer 2006, Schäfer 2008). On its anticausative use, *shā Fido* 'Fido get kill/die' thus receives the meaning (22), while on its agentive causative use, *shā Fido* 'kill Fido' receives the meaning in (23b).[9] The core idea shared by the proponents of this view in the literature is that anticausatives are just plain causatives, and Martin's (2020) proposal

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[9]Intransitive *shā Fido* is difficult to translate in English because it remains highly agentive just like on its transitive use. That is, used transitively, it can only take a human subject or a non-human one that can be construed as an instrument (and as such is agent-like, see Alexiadou and Schäfer 2006, e.g., *shāchóngyào* 'pesticide'). Used intransitively, *shā* differs from *sǐ* 'die, dead' in that it entails the existence of an implicit agent, remaining syntactically and semantically inactive (see Martin et al. 2020a and references therein).

is that the causing event described by anticausatives is some internal change involving the verb's sole argument, the theme.

(22) *shā Fido* 'Fido get killed/die' ↝
$\lambda e.\exists s(\mathbf{cause}(e,s) \wedge \mathbf{dead}(s) \wedge \mathbf{theme}(s, \mathbf{fido}))$

(23) a. *Voice$_{ag}$* ↝ $\lambda P \lambda x \lambda e.\mathbf{agent}(e,x) \wedge P(e)$
      b. *Voice$_{ag}$ shā Fido* 'kill Fido' ↝
         $[\lambda P \lambda x \lambda e.\mathbf{agent}(e,x) \wedge P(e)]$
         $(\lambda e.\exists s(\mathbf{cause}(e,s) \wedge \mathbf{dead}(s) \wedge \mathbf{theme}(s, \mathbf{fido})) =$
         $\lambda x \lambda e.\exists s(\mathbf{agent}(e,x) \wedge \mathbf{cause}(e,s) \wedge \mathbf{dead}(s) \wedge \mathbf{theme}(s, \mathbf{fido}))$

So why is the zero-change construal no longer available with the anticausative alternant of *shā* 'kill' or *shāo* 'burn'? Martin's (2020) answer is as follows. When Voice is active licensing the projection of a second (external) argument, e.g., the agent in (23b), the causing event is necessarily understood as involving an action performed by the latter (for *x* cannot be the agent of *e* without doing anything). When, however, Voice is not active, and an agent argument is not licensed, then the causing event is necessarily understood as the internal event (the change-of-state) undergone by the theme. Therefore asserting in the subsequent discourse (as in (19) or in (21)), that the theme has undergone no change-of-state whatsoever, thus that such change was not even initiated, is infelicitous, and can only but generate a contradiction.

5.2.2 Antiagentive Verbs

A typologically striking property Mandarin shares with other languages such as Hindi (Bhatt and Embick 2017), Brazilian Portuguese (Carvalho 2016) or Salish (Davis and Demirdache 2000) is that not only core (causative) SVs, but also non-core (non-causative) SVs have intransitive alternants where the single internal argument of the verb appears in subject position (Tai 1984, Aldridge 2015).

(24) a. Wàzi **xǐ**   **le**.
         sock   wash PFV

         'The socks washed.' [i.e., the socks got washed]
      b. Dàngāo **chī** le.
         cake   eat   PFV

         'The cake ate.' [i.e., the cake got eaten]

The intransitive alternant of SVs such as *xǐ* 'wash' are not anticausative since such verbs are RS-oriented activities devoid of causative semantics. We coin the term *antiagentive* to refer to the intransitive use of RS-activities. Antiagentives *denote the subcomponent of the activity involving the theme exclusively*. For instance, when used intransitively, *xǐ* 'wash' describes the subpart of the washing process which involves the theme exclusively. The 'patientive' subcomponent of the activity is distinct from the subcomponent involving the agent. In the case of *wash*, these two subcomponents typically have different locations. For instance, the getting-washed patientive

subevent may take place within a sink, while the active washing subevent typically occurs in front of the sink rather than inside of it. Tellingly, the locative PP *zài shuǐcáo qián* 'in front of the sink' can felicitously modify the VP *xǐ nèi-shuāng wàzi* 'wash that pair of socks' when used transitively (for the action described could indeed be taking place in front of the sink). But the same locative PP is not felicitous when modifying the same VP used intransitively. Only the locative PP *zài shuǐcáo lǐ* 'in the sink' is felicitous on this intransitive use of the same VP (for the patientive getting-washed component is indeed taking place in the sink):

(25) a. Mòmo zài shuǐcáo qián xǐ   le   nèi-shuāng wàzi
          Momo at sink   front wash PFV that-pair   sock
          'Momo washed the pair of socks in front of the sink.'

    b. #Nèi-shuāng wàzi shì zài shuǐcáo qián xǐ   de.
          that-pair   sock be at sink   front wash DE
          Intended: 'It was in front of the sink that the pair of socks washed.'

    c. Nèi-shuāng wàzi shì zài shuǐcáo lǐ   xǐ   de.
          that-pair   sock be at sink   inside wash DE
          'It was in the sink that the pair of socks washed.'

We call the intransitive alternant of RS-oriented activity SVs antiagentive because they focus on the patientive subpart of the manner event, with the subpart of the activity involving the agent proper 'stripped off' and, as such, not accessible for modification by locative adverbials (see (25)). Thereof also the unvailability of modification by agent-oriented adverbials or purpose clauses (Levin and Rappaport Hovav 1995, Schäfer 2008), contrary to what is observed with *bèi*-passives (as also observed by Sybesma and den Dikken 1998):

(26) a. Wàzi **xǐ**   **le**.
          sock wash PFV
          '[The] socks washed.'

    b. Wàzi *(bèi) xiǎoxīn-de   **xǐ**   **le**.
          sock BEI cautious-DE wash PFV
          '[The] socks (were) washed cautiously.'

Since antiagentives denote a subpart of an activity, and not a change-of-state as anticausatives do, denying that the outcome of the described activity was successful, does not yield any contradiction, as illustrated in (18).

5.3   Decomposition Adverbs

We now turn to our third diagnostic for event structure, decomposition adverbs (Rapp and von Stechow 1999), and specifically for Mandarin, the adverb *yòu* 'again' which gives rise to sharper judgments than *chàdiǎn* or *jīhū* 'almost'. As is well-known, the readings that such adverbs display serve as a classic diagnostic for probing (simple vs. complex) event structure representations. For instance, the adverb *again* displays different readings with at least a subset of accomplishment

verbs, readings distinguished by the presuppositions they are associated with (von Stechow 1995, 1996, Rapp and von Stechow 1999, Pedersen 2014, Lechner et al. 2015). For instance, (27) either presupposes that the door was previously opened by John before (repetitive reading), or presupposes that the door was in a previous state of being open (restitutive reading). The restitutive reading is not available with activity VPs, which do not involve a state component, see (28).

(27) It is possible that John opened the door again.

    a. Presupposition on the repetitive (REP) reading: John has opened the door before.
    b. Presupposition on the restitutive (REST) reading: The door had been open before.

(28) It is possible that John ran again.

    a. Presupposition on the repetitive reading: John has run before.
    b. No restitutive reading.

Only those accomplishment VPs whose event structure involves a result state component clearly display the restitutive reading. Verbs that do not lexicalize, but are only 'conceptually associated' with such a state, do not allow the restitutive reading (see von Stechow 2009 on *putzen* 'wash' vs. *säubern* 'clean' in German).

In Mandarin Chinese, *yòu* 'again' occurs preverbally only. The RS-oriented activity SV *chuī* 'blow [e.g., a candle]' and the causative SV *xī* 'blow out [e.g., a candle]' have a very close meaning, and essentially differ in that a result state is lexically encoded by *xī*, but not *chuī*. We therefore predict the restitutive reading to be available with *xī* 'extinguish' but not *chuī* 'blow'. This is indeed the case, as the following scenario shows. Assume that I bought a brand new candle. I lighted it and blew it out once only. In this context, which blocks the repetitive reading of *yòu*, (29b) is acceptable, while (29a) is not.

(29) a. Nèi-gēn làzhú tā yòu **chuī**-le.   [REP only]
       that-CL candle 3SG again blow-PFV
       'He blew the candle again.'
    b. Nèi-gēn làzhú tā yòu **xī**-le.   [REP/REST]
       that-CL candle 3SG again extinguish-PFV
       'He blew out the candle again.'

Nor is the restitutive reading of *yòu* 'again' available either with accomplishment VPs headed by the RS activity SV *xǐ* 'wash'. For instance, (30a) is odd in a situation where Momo bought a pair of brand new socks, and washed them only once after they got dirty. As expected, however, in this very same context (blocking the repetitive reading), a sentence with the corresponding result verbal compound *xǐ-gānjìng* 'wash clean' is fine.

(30) a. Mòmo yòu **xǐ** le nèi-shuāng wàzi.   [REP only]
       Momo again wash PFV that-pair sock
       'Momo washed that pair of socks again.'

(31) a. Mòmo yòu **xǐ**-gānjìng le   nèi-shuāng wàzi.   [REP/REST]
Momo again wash-clean PFV that-pair   sock
'Momo washed that pair of socks clean again.'

These tests thus confirm that neither *xǐ* 'wash', nor *chuī* 'blow [e.g., a candle]' lexically encode a result state, as expected if they are RS-oriented activities. Conversely, the restitutive reading is available with *kāi* 'open', as expected if it has causative semantics.[10]

(32) Sally yòu kāi le   mén.   [REP/REST]
Sally again open PFV door
'Sally opened the door again.'

In summary, the restitutive reading is acceptable with a subset of Mandarin SVs, namely causative SVs which by hypothesis encode a result state at the lexical level.

6   Gradable vs. Non-gradable Causative SVs

We now distinguish two sub-classes of causative SVs by invoking a fifth parameter of classification: *gradability*. To distinguish SVs that yield gradable VPs when combined with an object with a quantized use from those that do not, we test their compatibility with adverbials of completion such as *yíbùfen* 'partly', *yìdiǎn* 'a little' which presuppose that the relation to which they apply may yield degrees greater than 0 but less than 1 (Piñón 2005). This test splits the class of causative SVs into two classes. Gradable causative SVs, e.g., *shāo* 'burn', *rǎn* 'dye', or *guān* 'close', are acceptable with adverbials of completion (*wánquán/quán* 'completely') or degree complements (*yíbùfen/yìdiǎn* 'partly/a little') when combined with a quantized object, as shown in (33).[11]

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[10]Beck (2005) reports that out of the three subjects tested, only one fully accepts the restitutive reading of this example. The other two speakers find it questionable (without plainly rejecting it). We think Beck's test sentence does not sound very felicitous for a reason orthogonal to the interpretation of *yòu*, which may have biased the speakers' judgments. The most usual way of expressing what the sentence means is to use a BA construction and a RVC, where the object is placed in a preverbal position:

(i)   Sally yòu ba mén dǎ-kāi le.
Sally again BA door open PFV

However, we tested (32) with some additional speakers and they mainly find the restitutive reading acceptable (including both Mandarin speaking authors of this paper).

[11]Either object topicalization or the *BA* construction is needed to make adverbials of completion with SVs fully acceptable. For instance, (i) below is quite odd.

(i)   Lǐsì quán   shāo le   nèi-gēn   mùtou.
Lisi completely burn PFV that-piece wood
'Lisi completely burned the piece of wood.'

Although we do not have an account for this restriction, it remains orthogonal to our main point which is to distinguish two classes of causative SVs according to their gradability. On adverbials of completion in Mandarin Chinese, see,

(33) Nèi-gēn   mùtou Lǐsì zhǐ shāo le   yíbùfen/yìdiǎn.
   that-piece wood Lisi only burn PFV a.part/a.little
   'Lisi only partly burned that piece of wood.'

(34) Nèi-gēn   mùtou Lǐsì quán   shāo le.
   that-piece wood Lisi completely burn PFV
   'Lisi completely burned that piece of wood.'

In contrast, non-gradable causative SVs do not yield VPs compatible with adverbials of completion or degree complements, as shown in (35)-(36)).

(35) Nèi-zhī jī   Lǎowáng shā le   (#yìdiǎn).
   that-CL chicken Laowang kill PFV a.little
   Intended: 'Laowang killed (a little) that chicken.'

(36) Nèi-zhī jī   Lǎowáng (#quán)   shā le.
   that-CL chicken Laowang completely kill PFV
   Intended: 'Laowang (completely) killed that chicken.'

7   Non-gradable Causative SVs vs. Achievements: Temporal Extendedness

We now turn to the last parameter of classification in our typology of SVs (Figure 1), which serves to distinguish causative accomplishment SVs from achievement SVs. Our first test is compatibility with the progressive markers *zài* and *zhèngzài*. Mandarin achievements cannot be progressivized (Smith 1997, 357, Klein et al. 2000, 764, Chief 2008, 217, Lu et al. 2019, section 1.2.), as illustrated in (37), patterning in this respect like, e.g., Hungarian achievements (Gyarmathy 2015).

(37) #Zǒngtǒng zài/zhèngzài dào   Bālí.
   president PROG   arrive Paris
   Intended: 'The president is arriving in Paris.'

In contrast, (gradable and non-gradable) causative accomplishment VPs are compatible with the progressive markers *zài* and *zhèngzài*:

(38) Lǎowáng zài/zhèngzài shā nèi-zhī jī.
   Laowang PROG   kill that-CL chicken
   'Laowang is killing the chicken.'

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e.g., Chief (2008, 73-75).

(39) Tíngting zài/zhèngzài zhāi shù shàng de píngguǒ.
Tingting PROG   pick tree above DE apple

'Tingting is picking the apple on the tree.'

(40) Lǐsì zài/zhèngzài shāo nèi-xiē   yèzi.
Lisi PROG   burn that-CL.Pl leaf

'Lisi is burning the leaves.'

Some predicates see their aspectual properties vary with their syntactic frame. Take for instance *shā* 'kill/ die/ get killed'. When this predicate is used transitively (and thus agentively, for recall from footnote 8 that *shā* requires an agentive subject), it is an accomplishment, denoting an event with at least two sub-components: an action and an (instantaneous) change-of-state. In contrast, when *shā* 'kill' is used intransitively as an anticausative, it denotes a set of (instantaneous) changes-of-state, i.e., dying events (from an agentive cause, for the involvement of an agent is also entailed in intransitive frames, although the agent is not present in the structure). Precisely because these changes-of-state are instantaneous, the progressive is infelicitous, as seen in (41a), just like with *sǐ* 'die' (as seen in (41b)).

(41) a. #Nèi-zhī jī   zài   shā.
        that-CL chicken PROG kill

        Intended: 'That chicken is dying [from an agentive/instrumental cause].'
     b. #Nèi-zhī jī   zài   sǐ.
        that-CL chicken PROG die

        Intended: 'That chicken is dying.'

Our second diagnostic is compatibility with the completive suffix *wán/hǎo* 'finish', which selects predicates describing events having some duration. As such, it is incompatible with achievement verbs, as shown in (42), since the latter by definition denote instantaneous events (Piñón 1997). In contrast, causative SVs – whether they are gradable (*shāo* 'burn') or not (*shā* 'kill') – do not denote punctual events and, as such, can combine with the completive suffix *wán/hǎo*, as shown in (43).

(42) a. #Zǒngtǒng dào   wán/hǎo le   Bālí.
        president   arrive finish   PFV Paris

        Intended: 'The president finished arriving in Paris.'
     b. #Zhāngsān yíng wán/hǎo le   bǐsài.
        Zhangsan win finish   PFV match

        Intended: 'Zhangsan finished winning the match.'

(43) a. Lǎowáng shā wán le   nèi-zhī jī.
        Laowang kill finish PFV that-CL chicken

        'Laowang finished killing the chicken.'
     b. Tíngting zhāi hǎo le   nèi-ge píngguǒ.
        Tingting pick finish PFV that-CL apple

        'Tingting finished picking the apple.'

Finally, achievements differ crucially from non-gradable causatives in that they never allow zero-change construals even in the presence of a cardinality adverbial. Thus compare the achievement paradigm in (44) with the non-gradable causative paradigm (4) repeated below: adding a cardinality adverbial in (44) does not rescue the zero-change reading of the achievement, as it did for the non-gradable causative in (4).

(4)   Lǎowáng shā le   yì-zhī jī   #(hǎojǐcì),   jī   hái huó zhe.
       Laowang kill PFV one-CL chicken several.times chicken still live DUR
       'Laowang killed a chicken several times, but it is still alive.'

(44)   Zǒngtǒng dào-le   Bālí hǎojǐcì,   #dōu méi   dào.
       president arrive-PFV Paris several.times DOU NEG.PFV arrive
       Intended: 'The president arrived in Paris several times, but did not arrive.'
       (The president went to Paris several times, but got lost, finally he failed to arrive there.)

We thus conclude that, while cardinality adverbials modifying perfective accomplishment SVs may quantify over non-culminating events, as shown in (4), cardinality adverbials modifying perfective achievement SVs may not. That is to say, perfective achievements (whether modified or not by cardinality adverbials) necessarily denote culminated events, and this is why negating the culmination of the reported event in a subsequent clause yields a contradiction.

We close by pointing out that the contrast between (44) and (4) illustrates two canonical properties of achievement across all languages reported to productively allow non-culminating readings for accomplishments, as documented for instance for Hindi (Singh 1994, Altshuler 2014), German (Bott 2010), Salish languages (Bar-el 2005, Kiyota 2008) or Thai (Koenig and Muansuwan 2000): Achievements denote atomic events and do not allow incomplete event readings (be it zero or partial change) in the perfective.

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