Monomorphemic verbs in Mandarin Chinese and their anticausative vs. antiagentive alternants

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Contents

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Abstract. Mandarin monomorphemic counterparts of English causative verbs (e.g., *shāo* 'burn' or *shā* 'kill') are often taken not to be causative themselves. This difference in the lexical semantics of English causatives and their Mandarin counterparts is supposed to explain why Mandarin, but not English, allows zero-change construals for perfective sentences headed by such verbs (*Yuehan burned his book, but he didn't get burned at all*). On this view, Mandarin simple verbs such as *shāo* or *shā* are "implied fulfillment verbs", i.e. verbs that implicate but do not entail the result obtained when the described action is successful, like English *wash*. The current paper argues against this view by showing on the basis of old and new event structure tests that Mandarin simple verbs cannot be collapsed into one class of implied fulfillment verbs: Mandarin has underived simple verbs with causative semantics, whose intransitive alternants are anticausatives, while intransitive alternants of *wash*-verbs form what we call *antiagentives*. A key aspectual difference between the two types of intransitive alternants is that while antiagentives allow zero-change construals, anticausatives do not (e.g. in Mandarin, *The t-shirt has washed, but it isn't cleaner at all* is felicitous, while *The book has burned, but it didn't get burned at all* is not). We show that there is a perfect correspondence between the set of simple verbs that yield (respectively do not yield) telic VPs and the set of transitive simple verbs that allow (respectively do not allow) intransitive uses in sentences with a theme subject (Cheng 1989). This paper account for Cheng's generalization, and in the same time uncovers a striking similarity between Mandarin antiagentive construals and German adjectival passives. While we show that accomplishments derived from simple verbs do exist in Mandarin, we also confirm the general view according to which simple verbs are more weakly telic than their resultative verbal compounds, since the latter yield neither atelic readings, nor zero-change construals.

1 Introduction

A typologically striking property of Mandarin Chinese is that it allows so-called non-culminating readings of perfective accomplishment sentences.[1] Under this reading, these sentences defeasibly imply but do not entail event culmination (Tai 1984, Smith 1997, Talmy 2000, Chief 2008, Koenig and Chief 2008, Zhang 2018, Tham 2019, a.o.). This phenomenon, attested in a variety of typologically diverse languages including Atayal (Chen 2017b), Hindi (Singh 1991, 1994, 1998), Indonesian (Sato 2020), Korean (Park 1993, Beavers and Lee 2020), Salish (Bar-el et al. 2005, Bar-el 2005), Tagalog (Dell 1983), Samoan and Daakaka (Hopperdietzel 2020), Tamil (Paramasivam 1979, Pederson 2008), or Thai (Koenig and Muansuwan 2000), is illustrated with the Mandarin sentences in (1)-(3) built with the perfective marker *le* and the (monomorphemic) SIMPLE VERBS (henceforth SVs) *shāo* 'burn' and *shā* 'kill'.

(1) *Yuēhàn* ***shāo*** *le tā-de shū, dàn gēnběn méi* ***shāo-zháo.***
Yuehan burn PFV 3SG-DE book but at.all NEG.PFV burn-ignite
'Yuehan burned his book, but it didn't get burned at all.'

(2) *Yuēhàn* ***shāo*** *le tā-de shū, dàn zhǐ* ***shāo*** *le* ***yíbàn.***
Yuehan burn PFV 3SG-DE book but only burn PFV half
'Yuehan burned his book, but it was just half burned.'

[1] Acknowledgements omitted for review. We provide literal counterparts of Mandarin examples in English, even if these literal translations are not always felicitous in English. Abbreviations used: CL: classifier, CV: complex verb, DP: determiner phrase, DUR: durative aspect, NEG: negation, PFV: perfective, PROG: progressive, RVC: resultative verbal compound, SG: singular, SV: simple verb, TS: target state, V: verb, VP: verbal phrase.

(3) *Lùlu shā le Yuēhàn* ***hǎojǐcì***, *Yuēhàn hái huó zhe.*
Lulu kill PFV Yuehan several.times Yuehan still live DUR
'Lulu killed Yuehan several times, but Yuehan is still alive.'

The first clause in (1) with the perfective accomplishment *shāo tā-de shū* VP 'burn his book' by default implicates that the book 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 book being burnt, since the book in question did not start burning (as is the case in (1)), or did not finish burning (as is the case in (2)). The first clause in (3) that contains the prototypical causative verb *shā* 'kill' by default implicates that the subject's several attempts to kill Yuehan ended up provoking his death, but event culmination is not entailed, since the latter's death 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 established experimentally by van Hout et al. (2017) and Liu (2018), and documented in the data gathered in Chief (2008) and Chen (2018).

The obvious question is why sentences such as (1)-(3) are felicitous in Mandarin, while their English literal translations are not. A widespread account is that English predicates such as *burn, open* or *kill* and their SV counterparts in Mandarin have radically different semantics. English verbs *burn, open* or *kill* are causative verbs: they denote a set of events causing a result state of a certain type (Levin and Rappaport Hovav 1995, Horvath and Siloni 2011, Alexiadou et al. 2015, Beavers and Koontz-Garboden 2020 a.m.o). The question of whether Mandarin has causative SVs is quite controversial. In a tradition going back to Tai and Chou (1975) and Chu (1976) and defended by authors such as Shi (1988), Talmy (1991, 2000), Lin (2004) and Chen (2008, 2017a) among others, Mandarin SV counterparts of English causatives are not causative themselves. Rather, they denote a set of activities performed in order to trigger a certain result state in the theme's referent, but the result state itself is not encoded by the predicate. Thus for instance, Chen (2017a) translates Mandarin SVs such as *guān* by 'do.closing' rather than by 'close', to convey the idea that these SVs are activity verbs devoid of causative semantics.

On this view, Mandarin SVs such as *burn, close* or *kill* pattern on the surface like transitive *activity* (manner) verbs of a particular subtype, namely those that defeasibly implicate the occurrence of a target (result) state that obtains when the event described is successful (Talmy 1991, 2000, Brisson 1994, Rappaport Hovav and Levin 1998, Levin 2020, a.o). *Wash* and *wipe* are paradigmatic examples of such verbs, as illustrated in (4) for French and English, and in (5) for Mandarin. Talmy (2000: 262–263) calls them "implied fulfilment verbs', as the verb implicates the result obtained when the described action (on its agentive sense) is successful.[2] As a successful washing event is an event yielding a state of being clean(er), the implied target state in (4)-(5) is that of being clean(er). It is 'conceptually associated' and 'pragmatically favored', but not entailed, since the occurrence of the expected target state can be denied without yielding a contradiction. We call this class of activity verbs TARGET-STATE (TS) oriented activity verbs.

(4) Cléo a lavé la vitre, mais elle est aussi sale qu'avant ! FRENCH
Cleo washed the window, but it is as dirty as before!

[2]These verbs form a subclass of what Beavers (2010) calls potential-for-change verbs. The latter class also contains verbs of impact such as *hit*, which behave very differently than verbs like *wash* in Mandarin, as will be made clear in section 3-5.

(5) *Lùlu* ***xǐ*** *le* *nèi-jiàn* *dàyī,* *dàn* *gēnběn* *méi* ***xǐ-gānjìng.***
Lulu wash PFV that-CL coat but at.all NEG.PFV wash-clean
'Lulu washed the coat, but it is not at all clean!'

In sum, under this first view, all Mandarin SVs, including *shāo* 'burn' and *shā* 'kill', are devoid of causative semantics, since just like TS oriented activity verbs —be it in English, French or Mandarin—they allow a reading which we will refer to as FAILED-ATTEMPT or ZERO-CHANGE: the action performed by the subject fails to bring about the TARGET STATE, that is, the state that obtains when the VP-event is successful. This reading was illustrated in (1)-(5). Variations on this core view are illustrated by the different quotes below:

> "We have so far found no Chinese action verbs necessarily implying the attainment of goal." (Tai and Chou 1975: 52, *apud* Sybesma 1997: 224)
>
> "Chinese action verbs in general are (...) non-implicative (...) each (...) must be expressed by some [separate] syntactic device in Chinese. (Chu 1976: 47, *apud* Sybesma 1997: 224)
>
> "Statement: Chinese has no inherently telic predicates verbs." (Sybesma 1997: 223)
>
> "With very few exceptions, no monomorphemic verbs in Mandarin are telic --- no monomorphemic verb encodes a result, a natural endpoint, an end state, or the attainment of a goal." (Lin 2004: 53)
>
> "English has many monomorphemic action verbs (e.g. *pick, break*) that entail the fulfillment of a state change. If speakers want to express implied fulfillment or moot fulfillment, they must use an additional form, for example the progressive aspect (*she was picking the apple*) or the conative construction (*She picked at the apple*). Mandarin shows the opposite pattern: monomorphemic action verbs do not in themselves entail state change and an additional form must be added to encode this meaning." (Chen 2017a: 698)
>
> "Bare transitive MMFP [Mapping to minimal final part] verbs in Mandarin are activity predicates that do not encode the change-of-state process of the theme or the patient, and this change-of-state is instead encoded in the resultative adjective/verb" (Zhang 2018: 129).

A corollary and prevailing assumption in the literature is that truly causative predicates (that is, predicates describing events causing a result state) are expressed as verbal V1-V2 compounds where V1 denotes an activity and V2 a (resulting) state (Li and Thompson 1981, Lin 2004, Xie 2009 among others).

Although we agree that compounding in Mandarin is prevalently used to express resultativity, causativity, telicity (see also Tham 2019), we aim to challenge the view that Mandarin SVs such as *shāo* 'burn', *guān* 'close' and *shā* 'kill' have a radically different meaning from their English counterparts. Specifically, we argue against this view by showing that Mandarin SVs (i) cannot be collapsed into one class with TS-oriented activities, and (ii) can yield telic VPs. To this effect,

we carefully distinguish the parameters of causativity and telicity—often intertwined as some of the quotations above suggest—which have been shown to form two independent features in lexical semantics (Levin 2000 a.m.o). In the quotation above, Lin (2004) already acknowledges the existence of exceptions to his generalization that no SVs are change-of-state verbs in Mandarin. Shih (2006) also argues that a subset of SVs (that he identifies with incremental theme verbs) may yield telic VPs in Mandarin, and thus that compounding is not the only way to derive telicity in Mandarin; see also Soh and Kuo (2005), Basciano (2017). Tham (2019) acknowledges the existence of change-of-location SVs, as well as change-of-state SVs, though underlining that they are few. The existence of causative SVs is also argued for by Han (2007: 178 and section 6.6.2).

Koenig and Chief (2008) offer an interesting take on this debate. 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). Thus, they also presume the existence of change-of-state verbs. Our proposal is in line with this view, with an important difference though. Koenig & Chief assume a semantic difference between English causative verbs and their Mandarin SV 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 corresponding to the moment when 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. This set also includes events that cause the theme to be affected (e.g. wounded), but do not develop until causing death proper.

The analysis we argue for in this paper is however conceptually different in that we assume that Mandarin SVs instantiate the same primitive event types as found in languages like English: Mandarin has underived verbs (SVs) with causative semantics that divide up into two subclasses – gradable causatives such as *guān* 'close' vs. non-gradable causatives such as *shā* 'kill' (contra Koenig and Chief for whom all causative verbs including e.g. 'kill' in Mandarin are gradable), alongside TS-oriented activity SVs (e.g., *xǐ* 'wash'), as shown with the semantic representations we attribute to *shā mǎlā* 'kill Marat' and to *xǐ dàyī* 'wash the coat' in (6a)-(6b), respectively.

(6) a. $[\![\text{xǐ dàyī}]\!] \rightsquigarrow \lambda y \lambda e.\mathbf{wash}(e) \wedge \mathbf{theme}(e, \mathbf{the\text{-}coat})$
b. $[\![\text{shā mǎlā}]\!] \rightsquigarrow \lambda y \lambda e.\exists(\mathbf{cause}(e, s) \wedge \mathbf{dead}(s) \wedge \mathbf{theme}(e, \mathbf{marat}))$

What then is the source of what Koenig and Chief (2008) call the incompleteness effect in Mandarin for say verbs with the meaning of 'kill'? We locate the source of the incompleteness effect not in the lexical semantics of the verb, but in outer aspect (cf. Koenig and Muansuwan 2000 on Thai, Altshuler 2014 on Hindi, Smith 1997, Soh and Kuo 2005, Liu 2009 and Martin et al. 2021 on Mandarin).

We moreover offer a telling and novel argument for distinguishing causative SVs from TS activity SVs, provided by their intransitive use in constructions that have been called ergative (see Cheng and Huang 2006), where the theme appears in subject position. In particular, with causative SVs, the zero-change reading (illustrated in (1) and (3)) is available on their transitive use, but crucially not on their intransitive use as illustrated in (7a/b) (for a related observation in other languages, see Lyutikova and Tatevosov 2010: 44 in Karachay-Balkar, Ikegami 1985: 274 on Japanese, Sato 2020 on Indonesian). The zero-change reading is diagnosed via the denial of the target state associated with the verb, where the target state is the state that obtains when the event

is successful (e.g., a successful opening/burning/washing is an event that leads to a state of being open/burned/clean, etc.)

(7) a. *Mén* ***kāi*** *le, (#dàn yìdiǎn méi kāi-kāi).*
door open PFV but a.little NEG.PFV open-open
Intended: 'The door opened, but it didn't get opened at all.'

b. *Shū* ***shāo*** *le, (#dàn gēnběn méi shāo-zháo).*
book burn PFV but at.all NEG.PFV burn-ignite
Intended: 'The book burned, but it didn't get burned at all.'

In contrast, the zero-change use of TS-oriented activity SVs is felicitous even when the verb is used intransitively, see e.g. (8). The contrasts between (7) and (8) support the claim that the two classes of SVs must be distinguished in Mandarin—that is, that causatives cannot be collapsed with TS-oriented activities into one class.

(8) *Yīfú* ***xǐ*** *le, dàn gēnběn méi xǐ-gānjìng.*
coat wash PFV but at.all NEG.PFV wash-clean
'The coat washed, but it didn't get clean at all!'

We offer a detailed fine-grained aspectual typology of Mandarin SVs established on the basis of traditional but also new diagnostics, and provide an account of the non-culminating construals of perfective accomplishments in transitive and intransitive uses.

The paper is organized as follows. Section 2 delineates the four parameters underlying the typology of SVs we argue for. Section 3-4 offers arguments for the claim that some SVs yield accomplishment VPs with a quantized object. Standard tests are discussed in section 3, and section 4 offers a novel diagnostic of telicity based on Cheng's (1989) analysis of transitivity alternations. Sections 5-6 establish that TS-oriented activity SVs and causative SVs do not have the same event structure. Section 7 focuses on the aspectual differences between accomplishment sentences built with an SV and an RVC.

2 The typology: parameters & novel diagnostics

We argue for the typology of (transitive) SVs summarized and illustrated in Figure 1. This classification will be established by combining four parameters: telicity, temporal extendedness, event structure, and gradability.

Telicity. Firstly, we distinguish SVs according to whether they can form a telic VP, that is, a VP encoding an inherent terminal point (Garey 1957) with a quantized object or not[3]. We identify the class of SVs that may yield telic VPs on the basis of two different diagnostics. First, we use standard *in/for*-adverbials tests. Second, we provide a novel diagnostic for distinguishing VPs that allow (vs. do not allow) telic uses based on Cheng's (1989) analysis of transitivity alternations in Mandarin: we show that there is a perfect correspondence between the set of SVs that yield (respectively do not yield) telic VPs and the set of transitive SVs that allow (respectively do not allow) intransitive uses in sentences with a theme subject.

[3]There is a lot of debate on the question of which nominal expressions in Mandarin may or must receive a quantized interpretation; see, in particular, Chierchia (1998), Cheng and Sybesma (1999), Soh and Kuo (2005). This debate, however, is orthogonal to our goal of identifying how the verb itself partakes in aspectual composition in Mandarin. For telicity tests, we avoid bare nouns which are known to give rise to manyfold ambiguities, and select nominal expressions favoring quantized interpretations such as the demonstrative *nèi* 'that'.

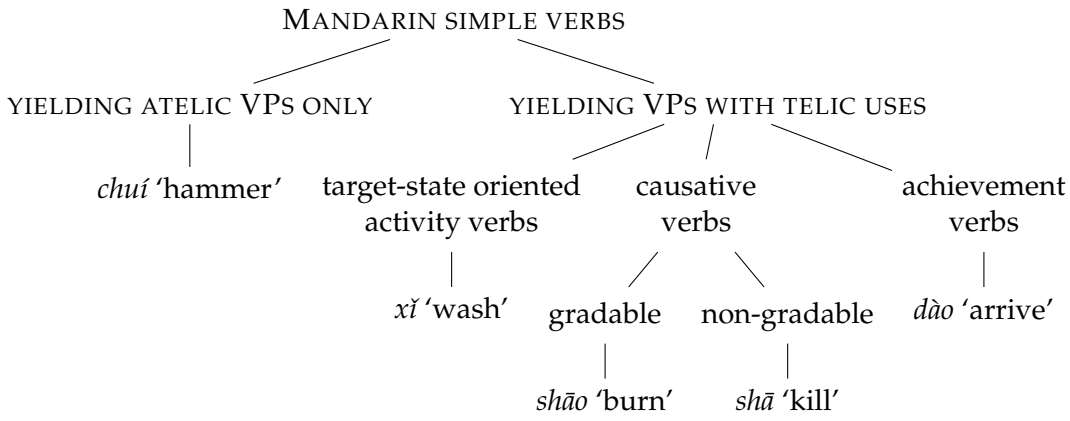


Figure 1: Typology of simple verbs in Mandarin

As we shall see, while non-incremental activity SVs (*mō* 'pet') never yield telic VPs in default contexts, TS-oriented activity SVs (*xǐ* 'wash') and causative SVs always can with a quantized object; see also Soh and Kuo (2005), Basciano (2017) on VPs headed by consumption/creation SVs. This undermines the widespread view according to which Result Verbal Compounds (RVCs) are necessary to express telicity in Mandarin (see, e.g., Lin 2004 and the authors quoted in section 1).

Temporal extendedness. Among SVs yielding telic VPs, we distinguish those that denote instantaneous (or 'thin') events, from those that denote extended (or 'thick') events. With Piñón (1997), we define instantaneous events as event boundaries, and take such events to serve as the denotata of achievement SVs. Accomplishments VPs in contrast denote extended events.[4] For tests delineating accomplishment and achievement SVs in Mandarin, we refer to Basciano (2017), Martin et al. (2023).

Event structure. Assuming a decompositional analysis of causative-inchoative verbs in line with Alexiadou et al. (2015), we associate causative and anticausative predicates with the same bi-eventive structure made of a causing event leading to a result state. With Levin (2000), Rothstein (2004) and Rappaport Hovav (2008) among others, we take accomplishment VPs not to be necessarily causative, and causative VPs not to be necessarily accomplishments. We distinguish *causative SVs*, associated with a complex (bi-eventive) structure, and *activity SVs*, associated with a simple event structure. We make use of four diagnostics to probe event structure. These diagnostics will show that if an activity SV in combination with a quantized object (and in the absence of any other modifier/adjunct) yields an accomplishment VP, this VP is always monoeventive, while under the same conditions, causative SVs yield bi-eventive accomplishment VPs. To probe event structure, we use classic tests with decomposition adverbs (Rapp and von Stechow 1999), specifically *yòu* 'again', as well as the compatibility with the modifier *zìjǐ* 'by itself' in the intransitive construction. As mentioned in the introduction, a noteworthy contribution of this paper is the use of a novel diagnostic which we will use to probe the event structure SVs in Mandarin in order to establish the fine-grained typology illustrated in Figure 1: the availability of the zero-change construal in critical contexts.

[4] Although many English achievements such as *hear, see* and *find* do not have monomorphemic counterparts in Mandarin and are thus expressed by compound verbs as pointed out by Sybesma (1997: 225), achievement SVs *do* exist in Mandarin, a claim also defended by authors such as Tai (1984), Lin (2004), Basciano (2017) a.o.

Gradability is our third and last parameter of classification. Gradable predicates are those that encode degree properties against which degrees of change can reasonably be distinguished (Piñón 2008). Atelic predicates and achievements are not gradable. Adverbials of completion such as *partly* or *completely* presuppose that the relation to which they apply may yield degrees greater than 0 but less than 1 (Piñón 2005). To distinguish SVs that yield gradable VPs when combined with a quantized object from those that do not, we test this compatibility with such adverbials in Mandarin (*yíbùfen* 'partly', *yìdiǎn* 'a little'). This test splits the class of causative SVs into two classes, according to whether they yield gradable accomplishment VPs or not with a quantized object (see Martin et al. 2021, 2023 for data).

The careful reader will have noticed that Figure 1 does not include consumption and creation SVs such as *xiě* 'write', *chī* 'eat' or *dú* 'read'. These verbs yield telic VPs with a quantized object in Mandarin (Soh and Kuo 2005, Shih 2006, Basciano 2017). We have chosen not to address the question of how these verbs should be incorporated in our typology, but we follow Martin and Demirdache (2020: 2016-2017) on the view that Mandarin consumption and creation verbs have a simplex event structure, just as their English counterparts according to Levin (2000) and Rappaport Hovav (2008) among others.

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

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

(10) *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)'.

(11) *Achievement verbs:*
dào 'arrive', *sǐ* 'die', *chén* 'sink', *wàng* 'forget', *yíng* 'win'.

3 Telicity : standard diagnostics

This section offers arguments for the claim that SVs yield accomplishment VPs with a quantized object. Standard tests of telicity include compatibility with temporal frame adverbials and incompatibility with durative ones (e.g. *break a glass in/#for two minutes*), see Verkuyl (1972), Dowty (1979), Krifka (1998) among many others. These tests are applied across predicate types in Mandarin in sections 3.1 and 3.2. We conclude by discussing the issues raised by these tests, before turning to a novel diagnostic based on Cheng's (1989) analysis of transitivity alternations (Section

4).

3.1 Frame (completive) adverbials

In Mandarin, both *in*- and *for*-adverbials may be expressed by the very same preposition-free temporal adverbial; for instance, *shí fēngzhōng* 'ten minutes' (e.g. (12a/b)) is ambiguous between *in/for ten minutes*. Generally, what distinguishes the durative and frame interpretation of such adverbials in Mandarin is their syntactic positions and the context: while time adverbials in pre-verbal positions are most likely to receive a frame (completive) interpretation (but see Xiao and Mcenery 2006 and Lin 2008: 38 for some exceptions), they are strongly biased toward the durative reading in a post-verbal position as in (12a); cf. He (1997), Xiao and Mcenery (2006), Zhang (2016) a.o.

(12) a. *Lùlu shāo le yì-běn shū shí fēngzhōng.*
Lulu burn PFV one-CL book ten minutes.
'Lulu burned a book for/in ten minutes.' [for-reading strongly preferred]

b. *Lùlu shí fēngzhōng shāo le yì-běn shū.*
Lulu ten minutes burn PFV one-CL book
'Lulu burned a book for/in ten minutes.' [in-reading strongly preferred]

Mandarin also has pre-verbal time adverbials formed with the preposition *nèi*, equivalent to the preposition '(with)in'. Those univocally receive a frame interpretation; see, for instance, *shí fēngzhōng nèi*, literally 'ten minutes within'.[5]

(13) *Lùlu shí fēngzhōng* ***nèi*** *(jiù) shāo-le nèi-běn shū.*
Lulu ten minutes within JIU burn-PFV that-CL book
'Lulu burned that book in ten minutes.'

In (14), *wǔ fēnzhōng nèi* ' five minutes within' is compatible with the VP *xǐ yí-jiàn chènshān* 'wash one shirt', containing a quantized object, indicating that the VP *xǐ yí-jiàn chènshān* has a telic use. Similarly, VPs headed by the SV *shāo* 'burn' in (15) or *shā* 'kill' in (16) combined with a quantized object are also telic.[6]

(14) *Lùlu wǔ fēnzhōng nèi jiù xǐ le yí-jiàn chènshān.* (TS-oriented activity SV)
Lulu five minute within JIU wash PFV one-CL shirt
'Lulu washed a shirt in five minutes.'

(15) *Lùlu yì fēnzhōng nèi jiù shāo le nèi-běn shū.* (causative SV)
Lulu one minute within JIU burn PFV that-CL book
'Lulu burned the book in one minute.'

[5] In order to ensure that the object receives a quantized interpretation when we test telicity, we systematically use the demonstrative *nèi* 'that' or the indefinite *yī* 'one', which excludes all (quantized or non-quantized) plural interpretation of the noun (see also footnote 3).

[6] The adverb *jiù* in this example and the following sentences with a completive adverbial is optional in most cases, but it sounds more natural to add it, especially when the described event or the culmination has a short duration. It emphasizes that the event was accomplished in a short time.

(16) *Lùlu wǔ fēnzhōng nèi jiù shā le nèi-tóu niú.* (causative SV)
Lulu five minute within JIU kill PFV that-CL ox
'Lulu killed that ox in five minutes.'

In contrast, VPs such as *mō nèi-zhī māo* 'pet that cat' in (17), *chúi nèi-ge pánzi* 'hammer that plate' in (18) and *tuī nèi-liàng tóngchē* 'push that stroller' in (19) cannot be modified by completive adverbials, indicating that these VPs are inherently atelic.

(17) #*Lùlu wǔ fēnzhōng nèi jiù* ***mō*** *le nèi-zhī māo.* (pure activity SV)
Lulu five minute within JIU caress PFV that-CL cat
Intended: 'Lulu petted the cat in five minutes.'

(18) #*Lùlu wǔ fēnzhōng nèi jiù* ***chúi*** *le nèi-ge pánzi.* (pure activity SV)
Lulu five minute within JIU hammer PFV that-CL plate
Intended: 'Lulu hammered the plate in five minutes.'

(19) #*Lùlu wǔ fēnzhōng nèi jiù* ***tuī*** *le nèi-liàng tóngchē.* (pure activity SV)
Lulu five minute within JIU push PFV that-CL stroller
Intended: 'Lulu pushed the stroller in five minutes.'

3.2 Durative adverbials: accomplishmenthood vs. variable telicity

Applied to the same set of VPs just discussed, the test of the durative adverbial shows that VPs headed by pure activity SVs such as *mō* 'pet' in (20) and *chúi* 'hammer' in (21) can be modified by a post-verbal time adverbial *wǔ fēnzhōng* '(for) five minutes'. The adverbial in (18)-(19) necessarily has a durative interpretation, which indicates that the VP is inherently atelic, no matter whether the object is quantized or not.

(20) *Nèi-zhī māo Lùlu mō le wǔ fēnzhōng.* (pure activity SV)
that-CL cat Lulu caress PFV five minute
'Lulu petted the cat for five minutes.'

(21) *Nèi-ge pánzi Lùlu chúi le wǔ fēnzhōng.* (pure activity SV)
that-CL plate Lulu hammer PFV five minute
'Lulu hammered the plate for five minutes.'

Post-verbal time adverbials (strongly biased towards a durative interpretation) are infelicitous with achievement SVs such as *yíng* 'win', cf. (22) (see Cheng 1989: 85 for a similar example). But they are acceptable with VPs headed by TS oriented activity SVs such as *xǐ* 'wash' in (23), or by causative SVs *shāo* 'burn' in (24) and *shā* 'kill' in (25) combined with the very same quantized object as in previous examples, indicating the availability of an atelic reading (see also Basciano 2017: 214(90) for an atelic use of *kāi mén* 'open the door').[7]

[7]With non-gradable causative verbs, the durative interpretation of the post-verbal temporal adverbial is more readily available when the result state is overtly denied in the subsequent clause, as in (25). We come back to this point in fn. (15) section 7.

(22) #*Nèi-chǎng bǐsài Lùlu* ***yíng*** *le wǔ fēnzhōng.* (achievement SV)
that-CL match Lulu win PFV five minute
Intended: 'Lulu won the match for five minutes.'

(23) *Nèi-jiàn chènshān Lùlu* ***xǐ*** *le wǔ fēnzhōng.* (TS-oriented activity SV)
that-CL shirt Lulu wash PFV five minute
'Lulu washed the shirt for five minutes.'

(24) *Nèi-běn shū Lùlu* ***shāo*** *le wǔ fēnzhōng.* (gradable causative SV)
that-CL book Lulu burn PFV five minute
'Lulu burned the book for five minutes.'

(25) *Nèi-tóu niú nóngfū* ***shā*** *le shí fēnzhōng (niú dōu méi sǐ).*
that-CL ox farmer kill PFV ten minute ox DOU NEG.PFV die
'The farmer killed the ox for ten minutes (but it didn't die).'

The fact that all Mandarin SVs except achievement VPs have atelic uses is often taken to be an argument for the widespread assumption that all Mandarin SVs are activities and, as a corollary, that accomplishments are derived from activities in the syntax, through verbal compoundhood (as mentioned in section 1). The (often implicit) reasoning is that if the VP may receive an atelic reading, then it cannot be an accomplishment VP.

But this hasty conclusion is, in fact, not warranted, since as is well known, crosslinguistically, many predicates show aspectual flexibility and are compatible both with *in*- and *for*-adverbials, although they are generally analysed as accomplishments; see Zucchi (1998), Kratzer (2004), Smollett (2005), Filip (2008), Rappaport Hovav (2008), Piñón (2008), Deo and Piñango (2011), Rothstein (2012), Champollion (2013), Civardi & Bertinetto (2015), Wright (2014) on English, Bott (2010), Bott and Hamm (2014) on German, Arche (2014) on Spanish, Tatevosov (2002) on Mari, Martin (2019) on French and German. For instance, while the English VP *eat the pizza* is uncontroversially analyzed as an accomplishment, it has been repeatedly observed that it is compatible with a *for*-adverbial and thus has an atelic use with some contextual support (see Smollett 2005, Piñón 2008, Wright 2014).

(26) Mary ate the pizza for several minutes until she found a bug in it. ENGLISH
(*flexible accomplishment*, Wright 2014:113)

We thus conclude that compatibility with a *for*-adverbial is *not* in of itself an argument against accomplishmenthood.

But given that VPs headed by TS-oriented activity SVs such as *xǐ* 'wash', or by the causative SVs *shāo* 'burn' and *shā* 'kill', are compatible with both frame and durative adverbials, how do we determine whether the VPs they head qualify as an accomplishment? We follow Bar-el et al. (2005), Bott (2010), Bott and Hamm (2014), Martin (2019) and Gyarmathy and Altshuler (2020) and take the lexical bias of the VP towards the telic meaning *in the absence of temporal modification* and the ensuing inference of event culmination as one of the defining properties of English accomplishments. Thus for instance, when used *without a temporal adverbial* in a non-progressive English sentence, the telic use of *eat the pizza* is selected, and the inference that the telos it encodes has been reached is triggered. Following Wright (2014), we call FLEXIBLE ACCOMPLISHMENTS those

accomplishments that select a telic use in the absence of temporal modification, but can also be used atelically if a modifier within the VP domain requires an atelic, cumulative interpretation of the predicate it applies to.

(27) Yesterday, I ate the pizza. ENGLISH
(*flexible accomplishment*)

As Pancheva (2003) emphasizes, it is not the case that all predicates compatible with both *for*- and *in*-adverbials are flexible accomplishments. Take for instance the English VP *read the Bible* in (29), compatible with both types of adverbials:

(28) This morning, we read the Bible. ENGLISH
(*predicate of variable telicity*, English, Pancheva 2003: 286)

As Pancheva (2003) observes, the atelic interpretation for a predicate as in (28) is the most natural one in the absence of temporal modification. We call PREDICATES OF VARIABLE TELICITY those predicates that are compatible with both *for*- and *in*-adverbials, but do not have a lexical bias towards the telic interpretation *in the absence of* temporal modification. Such predicates are not accomplishments *stricto sensu*, although they have accomplishment uses (Martin 2019).

The crucial observation is that *in Mandarin, when combined with a quantized object, both TS-oriented activity SVs and causative SVs form flexible accomplishment VPs rather than predicates of variable telicity*. In other words, they also show a bias towards the telic interpretation in the absence of durative modification: a non-progressive sentence containing such a VP also triggers the inference that the described event culminates with regard to the VP in its telic use.

(29) a. *Lulu* ***shāo*** *le nèi-běn shū.*
Lulu burn PFV that-CL book
'Lulu burned that book.'
b. ⇝ Lulu finished burning that book.

(30) a. *Lùlu* ***xǐ*** *le nèi-jiàn dàyī.*
Lulu wash PFV that-CL coat
'Lulu washed the coat.'
b. ⇝ Lulu finished washing that coat.

Summarizing, the facts reviewed in sections 3.1 and 3.2 show that subsets of SVs form accomplishment VPs with a quantized object. These VPs are flexible accomplishments since they accept atelic uses with *for*-adverbials, beyond their default telic use in the absence of a temporal modifier.

4 A novel diagnostic for telicity: transitivity alternations (Cheng 1989)

A typologically striking property that Mandarin shares with other languages such as Hindi (Bhatt and Embick 2017), Salish languages (Davis and Demirdache 2000), Brazilian Portuguese (Carvalho 2016) and Puyuma (Chen 2022) is that not only core (causative) transitives, but also non-core (non-causative) transitive verbs can appear in intransitive sentences whose subject corresponds to an internal argument (Tai 1984, Cheng 1989, Aldridge 2015), as illustrated for instance in (31b), (32b), and (33b), built with the activity SVs *xǐ* 'wash', *chī* 'eat', and *xiě* 'write'.[8]

[8]In the intransitive examples in this section, we cannot tell whether the aspectual marker *le* holds a post-verbal or a sentence-final position. We address the role of sentence-final *le* in the acceptability of antiagentive construals in section

(31) a. *Lùlu* ***xǐ*** *le* *nèi-jiàn* *yīfu.*
Lulu wash PFV that-CL coat
'Lulu washed the coat.'
b. *Yīfu* ***xǐ*** *le.*
coat wash PERF
'The coat has washed.'

(32) a. *Lǐsì* ***chī*** *le* *xīguā.*
Lisi eat PFV watermelon
'Lisi ate the watermelon.'
b. *Xīguā* ***chī*** *le.*
Watermelon eat PERF
'The watermelon has eaten.'

(33) a. *Lùlu* ***xiě*** *le* *yì-fēng* *xìn.*
Lulu write PFV one-CL letter
'Lulu wrote a letter.'
b. *Xìn* ***xiě*** *le.*
letter write PERF
'The letter has written.'

In English, only transitive verbs with causative semantics may undergo the transitive-intransitive alternation (Smith 1970, Levin and Rappaport Hovav 1995, Schäfer 2008, Alexiadou et al. 2015, a.m.o); the English translations of these examples are thus all infelicitous. Among Romance and Germanic languages, Brazilian Portuguese is exceptional in allowing Mandarin-like patterns, as noted by Carvalho (2016) and illustrated in (34).

(34) *A* *roupa* *lavou.* BRAZILIAN PORTUGUESE
the cloth wash-PST.3SG.
'The cloth washed.'

4.1 Intransitive alternants: antiagentives

Some authors call any freely alternating verb *anticausative* when used intransitively, independently of whether the alternating verb has causative semantics or not (see, e.g., Schäfer 2007, Carvalho 2016). We will refrain from doing so, since the label 'anticausative' suggests the demotion of an external *cause*, and thus that the verb describes caused results. The verbs in (31) to (33) are activity verbs devoid of causative semantics. We restrict the label anticausative to the intransitive use of causative verbs (discussed in 4.2), and we label the intransitive form of non-core (activity) transitive verbs such as *xǐ* 'wash' *antiagentive.* This term is motivated by semantic considerations. When

4.4. Roughly, we take the verbal *le* to be a perfective marker and the sentence-final *le* to be a (stativizing) perfect, in line with Li et al. (1982) and Tsai (2013) for instance.

As the gloss makes clear, however, we take *le* in intransitives such as (31b) to be a sentence final perfect marker, an assumption which will be motivated in section 4.1. See Chao (1968), Teng (1973), Chan (1980), Li and Thompson (1981: 296), Sybesma (1999: 65) and Paul (2015: 14) for discussion on the semantics of sentence-final *le*.

used as intransitives, non-core transitive verbs denote eventualities of a very different nature than anticausatives. Anticausatives denote a set of changes leading to some result state satisfying the result property spelled-out by the root (Koontz-Garboden 2009, Alexiadou et al. 2015, Beavers and Koontz-Garboden 2020). For instance, in (35), *kāi* 'open' denotes a set of events leading to some state of being open, and the ultimate cause of this change (an agent, a natural force, an external event) is 'stripped off' the denotation.

(35) *Mén* ***kāi*** *le.*
door open PFV/PERF
'The door (has) opened.'

On the other hand, antiagentive verbs denote the subcomponent of the activity involving the theme *to the exclusion of the agent*. For instance, when used intransitively, *xǐ* 'wash' describes a 'getting-washed' event, that is, the event of getting immersed, moved within a liquid, etc. We henceforth refer to this component as a *patientive manner event*. The latter is ontologically distinct from the subcomponent involving the agent. Importantly, modification by any adverb that refers —be it to the agentive subcomponent of the activity or to the agent— is unavailable, as the contrasts in (36)-(37) show. Thus, in (36), adverbs such as *shǐjìn de* 'vigorously', *gùyì* 'intentionally', referring to the agent's activity or to the agent herself can felicitously modify VPs like *xǐ nèi-jiàn tīxù* 'wash the T-shirt' on its transitive use, but the very same modifiers cannot be used felicitously to modify the same VPs on their intransitive use, as shown in (37).

(36) *Lùlu shǐjìn de/ gùyì* ***xǐ*** *le nèi-jiàn tīxù.*
Lulu vigorously intentionally wash PFV that-CL T-shirt
'Lulu washed the T-shirt vigorously/intentionally.'

(37) **Nèi-jiàn tīxù shǐjìn de/ gùyì* ***xǐ*** *le.*
that-CL T-shirt vigorously intentionally wash PERF
Intended: 'The T-shirt has washed vigorously/intentionally.'

The ungrammaticality of modification by an agent-oriented adverb such as *gùyì* 'intentionally' in (37) clearly establishes that the intransitive uses with an internal argument as subject discussed here are ***not* passives**. The contrast in (38) between the anti-agentive in (38a) and the *bei*-passive in (38b) which, unlike the anti-agentive in (38a), allows modification by an agent-oriented adverb confirms this conclusion (see also den Dikken and Sybesma 1998 for relevant discussion).

(38) a. **Chē gùyì de* ***xǐ*** *le.*
car intentionally DE wash PERF
Intended: 'The car has washed intentionally.'
b. *Chē bèi gùyì de* ***xǐ*** *le.*
car BEI intentionally DE wash PFV
'The car was washed intentionally.'

Antiagentive construals of activity verbs such as *xiě* 'write' or *chī* 'eat' are equally unacceptable with agent-oriented modifiers like *xiǎoxīn* 'cautious(ly)'; examples (39) below become acceptable only if *bèi* is added.

(39) a. *Xìn (#xiǎoxīn de) xiě le.*
letter cautious DE write PERF
'The letter wrote (cautiously).'
b. *Xīguā (#xiǎoxīn de) chī le.*
watermelon cautious DE eat PERF
'The watermelon has eaten (cautiously).'

Thus, the Voice layer, that we take to introduce the external argument (Kratzer 1996, Alexiadou et al. 2015 a.m.o.), is not projected in antiagentives. The agent is conceptually present (as in the passive), but syntactically not active (differently from passives). Antiagentives are impossible in languages like English. We assume that it is because in English differently from Mandarin, Voice cannot *not* be projected in the presence of non-core (activity) transitive verbs like *wash*.

Recapitulating, TS-oriented activity SVs used intransitively focus on the patientive part of the manner event, but 'strip off' the subpart of the activity involving the agent proper which, as such, is not accessible for modification by adverbials referring to the agent or to the activity she is carrying out. This is why we call such activity verbs used intransitively ANTIAGENTIVE VERBS.

4.2 Intransitive alternants: anticausatives

SVs with causative semantics also alternate in Mandarin, just as they do in English, as illustrated in (40) to (42).

(40) a. *Lǐsì **kāi** le nèi-shàn chuānghù.*
Lisi open PFV that-CL window
'Lisi opened the window.'
b. *Nèi-shàn huānghù **kāi** le.*
that-CL window open PFV/PERF
'The window (has) opened.'

(41) a. *Lǐsì **shāo** le nèi-běn shū.*
Lisi burn PFV that-CL book
'Lisi burned the book.'
b. *Nèi-běn shū **shāo** le.*
that-CL book burn PFV/PERF
'The book (has) burned.'

(42) a. *Lǐsì **fā** le miàn.*
Lisi leaven PFV dough
'Lisi leavened the dough.'
b. *Miàn **fā** le.*
dough leaven PFV/PERF
'The dough (has) leavened.'

Similarly to English, anticausatives cannot be modified with agent-oriented modifiers; such modifiers are licensed only in passive *bèi* construals; see (43).

(43) *Niú #(bèi) gùyì de **shā** le.*
Ox BEI intentionally DE kill PFV/PERF
'The ox (was) intentionally killed.'

There is, however, yet another striking typological difference between Mandarin and English type languages. In English, only causative verbs which *do not* require an agent as external argument may be used intransitively (see Levin and Rappaport Hovav 1995, Piñón 2001, Reinhart 2002, Alexiadou et al. 2015 among others). Thus in English, *murder* or *assassinate*, despite being causative, do not alternate because they require an agent as their external argument. Likewise, *build* and *write* (analysed as externally caused change-of-state verbs by e.g., Rothstein 2004), fail to alternate, as they require an agent, too. Mandarin provides a striking counter-example to this generalization. For instance, *qiē* 'cut' and *shā* 'kill', which only accept agentive subjects (that can also be inanimate, e.g. instruments, such *dāo* 'knife' for *qiē*, *shāchóngyào* 'pesticide' for *shā*) can be used intransitively, as shown below.[9]

(44) a. *Lǐsì **shā** le niú.*
Lisi kill PFV ox
'Lisi killed the ox.'
b. *Niú **shā** le.*
ox kill PFV/PERF
'The ox (has) killed.'

(45) a. *Lǐsì **qiē** le fānqié.*
Lisi cut PFV tomato
'Lisi cut the tomato.'
b. *Fānqié **qiē** le.*
Tomato cut PFV/PERF
'The tomato (has) cut.'

Moreover, anticausatives in Mandarin ((46a)), unlike *bei*-passives ((46b)), do not allow modification by agent-oriented adverbials just like in English (Levin and Rappaport Hovav 1995, Schäfer 2008), and just as we observed with anti-agentives (recall (37)):

(46) a. **Niú gùyì de **shā** le.*
Ox intentionally DE kill PFV/PERF
Intended: 'The ox (has) intentionally killed.'
b. *Niú bèi gùyì de **shā** le.*
Ox BEI intentionally DE kill PFV/PERF
'The ox was intentionally killed.'

In summary, there are two types of alternating SVs in Mandarin. *Anticausative SVs* have change-of-state semantics, and are semantically and syntactically similar to anticausatives in English (Levin

[9]The fact that *shā* 'kill' alternates is even more surprising given that Mandarin does have a corresponding lexical unaccusative verb, namely *sǐ* 'die, dead'. For English, the existence of the unaccusative verb *die* has been given as the reason for why *kill* is an exception to the generalization according to which non-inherently agentive causative verbs have an anticausative counterpart (Alexiadou et al. 2015). The verb *shā* 'kill' nevertheless still differs in its intransitive use from *sǐ* 'die, dead' in that it implies the existence of an implicit *but syntactically inactive agent*.

and Rappaport Hovav 1995, Koontz-Garboden 2009, Alexiadou et al. 2015). The crucial difference with English is that even inherently agentive causative SVs may alternate in Mandarin. *Antiagentive* SVs are devoid of change-of-state semantics.

In the next section, we show that SVs that can freely alternate without resorting to any special pragmatic licensing can all form telic VPs with a quantized object. This observation supports our proposal that the 'pragmatically unmarked' intransitive use constitutes a further test for telicity in Mandarin Chinese.

4.3 Antiagentivity and anticausativity as hallmarks of telicity

Cheng (1989) observes that verbs that allow intransitive alternants – in our terms, antiagentive or anticausative alternants – can form either accomplishments or achievements. Putting together Cheng's proposal with the typology of verbs identified in section 3 makes a straightforward and strong prediction – namely, that all the SVs identified in section 3 as yielding accomplishments VPs when combined with a quantized object — that is, TS oriented activity SVs such as *xǐ* 'wash', and causative SVs such s*hāo* 'burn' or *shā* 'kill', but not non-incremental theme activity SVs such *mō* 'pet' or *chuí* 'hammer' — allow intransitive alternants. That both TS oriented activity SVs and causative SVs alternate was the subject matter of the two preceding sections (4.1 and 4.2, respectively). The contrast between (47) on the one hand and (48) on the other confirms that verbs identified in section 3 as yielding inherently atelic VPs fail to alternate, as opposed to those identified as yielding telic VPs.

(47) a. #*Māo* ***mō*** *le/ zài mō.* (pure activity SV)
cat caress PERF PROG caress
Intended: 'The cat has petted/is petting.'

b. #*Páizi* ***chuí*** *le/ zài chuí.* (pure activity SV)
plate hammer PERF PROG hammer
Intended: 'The plate has hammered/is hammering.'

c. #*Nèi-liàng chē* ***tuī*** *le.* (pure activity SV)
that-CL car push PERF
Intended: 'The car has pushed.' (Chen 1989)

(48) a. *Nèi-piàn shùlín* ***shāo*** *le/ zhèngzài shāo.* (gradable causative SV)
that-CL wood burn PFV/PERF PROG burn
'The wood (has) burned/is burning.'

b. *Nèi-tuán miàn* ***fā*** *le/ zhèngzài fā.* (gradable causative SV)
that-CL dough leaven PFV/PERF PROG leaven
'The dough (has) leavened/is being leavened.'

c. *Nèi-kuài ròu* ***dòng*** *le/ zhèngzài dòng.* (gradable causative SV)
that-CL meat freeze PFV/PERF PROG freeze
'The meat froze/has frozen/is freezing.'

We take Cheng's generalization as exemplified by the above contrasts to provide strong support for the position advocated here: first, not all SVs denote activities in Mandarin: rather they form two classes – true inherently atelic activities (like *mō* 'pet') vs. TS-oriented activities (like *xǐ* 'wash').

Furthermore, the latter can all yield telic VPs when built with a quantized object, like causative SVs (e.g., *shāo* 'burn').

Interestingly, although atelic VPs such as *mō māo* 'pet the cat' are not good in intransitive frames in an out of the blue context, an intransitive use can be licensed under two joined conditions: in the presence of the sentence-final stativizer *le*[10] and with an appropriate pragmatic context very similar to that required to save predicates that are not good inputs to German adjectival passives, what Kratzer (2000) calls the 'job-is-done' context (see also Rapp 1996, Maienborn 2007, 2009a). Kratzer thus notes that whereas (49) is infelicitous out of the blue, it becomes good if it was the speaker's job to pet the cat. In the presence of the stativizer sentence final *le* and with an appropriate pragmatic context very similar to Kratzer's context, the example (50) becomes acceptable, too.

(49) *Die Katze ist gestreichelt.* GERMAN
the cat is petted
'The cat is petted.' (*Ok in the 'job is done' reading*)

(50) *Māo* ***mō*** *le.*
cat pet PERF
'The cat has petted.' (*Ok in the 'job is done' reading*)

The same type of context makes other Mandarin examples in (47) much better. So for instance, in a scenario where Lisi is supposed to hammer 3 plates, and he just hammered one of them, we can utter (47b) by pointing to a plate to inform the interlocutor that Lisi finished hammering that plate.

For Rapp (2015: 510), the job-is-done interpretation forces an otherwise dispreferred telic interpretation of the German participle *gestreichelt* 'petted'. The same appears plausible for the Mandarin predicate *mō* 'pet' too: the context in which it took Lulu two minutes to perform her job to pet the cat also makes (51) (repeated below from example (17) in section 3.1) more felicitous:

(51) *Lùlu liǎng fēnzhōng nèi jiù* ***mō*** *le nèi-zhī māo.*
Lulu two minute within JIU caress PFV that-CL cat
'Lulu petted the cat in two minutes.'

4.4 Explaining Cheng's generalization and the role of sentence-final *le*

We conclude from the discussion in the previous section that Mandarin intransitive frames built with SVs obey a lexical restriction which is to some extent similar to the one proposed by Kratzer (2000), Rapp (2015) and Gehrke (2015) for the adjectival passive in German:

(52) *Lexical restriction on the Mandarin transitive-intransitive alternation.* Only transitive verbs that can form telic VPs with a quantized object can be used intransitively in a default context (i.e., without resorting to some pragmatic licensing).

But what is behind this generalization? What is the property shared by telic VPs that is responsible for the fact that they are easier to use in intransitive construals? In this section, we argue that the reason for this is that intransitive sentences whose subject is an internal argument "must be about

[10] See section 4.4. about the role of sentence final *le*.

some state property" of this argument (see (53)). We argue that this rule is easier to obey with verbs that form telic VPs than with verbs that do not.

(53) In Mandarin, intransitive construals with an internal argument in subject position must describe *the property of some state* yielded by a VP-event.

Let us first show why something like the principle in (53) is at stake and sheds light on the distribution of SVs in intransitive construals.

We start with SVs with causative semantics. With these verbs, the principle in (53) is automatically obeyed, because these verbs denote predicates of states. But verbs with no causative semantics and a simplex event structure, such as creation or consumption verbs (*xiě* 'write' or *chī* 'eat') or TS-oriented activity verbs (e.g. *xǐ* 'wash') are non-scalar/non-result verbs (the scale needed for telicity being provided by the incremental theme); see, e.g., Rappaport Hovav (2014: section 12.6). Thus, they do not *lexicalize* a state property under Rappaport Hovav's (2014) and our approach, and as also shown through several event structure tests in sections 5-6 below. As a result, given (53), they cannot, in principle, be used intransitively.

There are, however, other ways of introducing a state property in the semantic representation of a sentence than via the event structure of the bare predicate, namely, *outer aspect*, and in particular perfect operators, often analyzed as stativity operators (Nishiyama and Koenig 2010 among others). And for Li and Thompson (1981), sentence-final *le*, which they describe as an operator that gives rise to a 'currently relevant state', is a stativizing perfect, too.

A clear piece of evidence that sentence-final *le* plays a crucial role in the licensing of intransitive construals for (state-less) antiagentive VPs is that in a default context, antiagentive construals are acceptable *only in the presence of sentence-final le*. For instance, progressive antiagentives are often very marked, see (54), in contrast with previous examples where antiagentive VPs are used with perfect sentence-final *le*.

(54) a. #*Yì wǎn fàn zhèngzài* ***chī***.
one bowl rice PROG eat.
Intended: 'A bowl of rice is eating.'
b. #*Yīfu zhèngzài* ***xǐ***.
coat PROG wash
Intended: 'The coat is washing.'
c. #*Xìn zhèngzài* ***xiě***.
letter PROG write
'The letter is writing.'

Verbs with causative semantics, by contrast, form intransitive alternants with or without sentence-final *le*. For instance, anticausatives can be progressivized:

(55) a. *Miàn zài* ***fā***.
dough PROG leaven
'The dough is fermenting.'
b. *Nèi-piàn sēnlín hái zài* ***shāo***.
that-CL forest still PROG burn
'The forest is still burning.'

We propose that while an activity VP is not yet "about a state property", a sentence combining with perfect *le can be* about such a property. That is, in a perfect sentence built with an activity VP, the perfect *le adds* to the semantic representation state properties, whose nature must be contextually determined, like other perfect operators according to Van Eijck and Kamp (1997), Nishiyama and Koenig (2010), Piñón (2014) among others. And among activity verbs, those that are conventionally associated with state properties facilitate the identification of state properties, as required for a perfect sentence to be felicitous. These verbs are precisely those that form felicitous antiagentive predicates out of the blue. For instance, creation verbs are associated with the state properties of existing, being available, ready to consume, etc–which are all subtypes of what Maienborn (2009b) calls 'post state' properties (that is, the property of being in the post state of a VP-event). TS-oriented activity verbs like *wash* are associated with the state properties of being cleaner, ready to be used, etc.

More formally, we adopt the analysis of the perfect of Piñón (2014) repeated in (56), which itself elaborates on Nishiyama and Koenig's (2010) stative analysis of the perfect, but adding to it an "evidence-related" component. Piñón's (2014) analysis makes use of a relation 'is evidence for' $\rightarrowtriangle$, which is a relation between propositions and sets of properties of states.

(56) Representation of the perfect (Piñón 2014):
$\lambda\mathcal{S}.\exists e(P(e) \wedge \tau(e) \prec t_t) \wedge$
$\exists e(P(e) \wedge \tau(e) \prec t_t \rightarrowtriangle \mathcal{S} \wedge$
$\mathcal{S} = \lambda Q.\exists s(Q(s) \wedge \tau(s) \circ t_t)$
'a predicate of sets $\mathcal{S}$ of properties of states such that there is an eventuality e of type P (the event predicate) before the topic time t_t and the fact that there is an eventuality of this type before t_t is evidence for $\mathcal{S}$, where $\mathcal{S}$ is the set of properties Q of states such that there is a state s of type Q and s overlaps temporally with t_t.'

Thus for instance, for an event of eating the chicken, examples of Q-properties of states are given in (57). Obviously, contextually relevant Q-properties are very much *ad hoc*, just as are event-based *ad hoc* properties, though the latter correspond to the core notion of adjectival passives in German according to Maienborn (2009b).

(57) a. $\lambda s.\textsf{there-be-no-chicken-left}(s)$
b. $\lambda s.\textsf{the-guests-be-full-and-happy}(s)$
c. ...

Such Q-properties are very easy to identify in a default context with TS-oriented activities, or either creation or consumption verbs, because all these verbs are 'conventionally associated' with some type of state, even though they do not lexicalize this property. This is why these verbs easily enter antiagentive construals: their conceptual association with properties of states makes the rule (53) very easy to obey. But because in a default context, Q-properties are more difficult to identify with 'pure' activity verbs such as *mō* 'pet' or *chàng* 'sing', these verbs enter less easily into antiagentive construals. As made clear in the previous section, the problem is of pragmatic nature; enriching the context so as to make some stative Q-property salient makes antiagentive construals more acceptable for those verbs, too. For instance, (58) is fine in a context with Q = $\lambda s.\textsf{the-singer-be-relieved}(s)$ or $\lambda s.\textsf{the-party-can-start}(s)$, for instance.

(58) *Nèi-shǒu gē chàng le.*
that-CL song sing PERF
'The song has sung.'

Let us now come back to our original question, namely why activity verbs that can easily enter into antiagentive construals correspond precisely to the class of verbs that can yield telic VPs (Cheng's generalization). We propose that this is because *activities that can easily be associated with an endpoint also are typically activities that are conceptually associated with state properties*. Activity verbs that form good telic VPs either have an incremental theme object, or describe activities done with the intention of triggering a specific type of state. For instance, when a specific quantity of watermelon has all been eaten up, there is no way for the eating event to go on, the washing event of a specific T-shirt has no *raison d'être* anymore once the T-shirt is clean, etc. This natural endpoint helps define properties of post states (Maienborn 2009a), namely, states whose left boundary is defined by this endpoint. Activities that neither have an incremental theme nor are typically performed with the intention to obtain some types of state (e.g. *pet, caress*) are also *not* associated with properties of states in a default context.

5 Event structure: standard diagnostics

The previous sections established that both TS-oriented activity SVs and causative SVs can yield telic VPs. In this section, we show that these two classes of verbs differ in event complexity. We probe the event structure of TS-oriented activity SVs vs. causative SVs with tests involving the decompositional adverb *yòu* 'again' (section 5.1), the adverb *zìjǐ* 'by itself' (section 5.2), and the entailment of a target state by its intransitive variant in non-progressive clauses (section 6).

5.1 Decompositional adverbs: *yòu*

It is well-established that the adverb *again* displays different readings with at least a subset of accomplishment verbs, readings distinguished by the presuppositions they are associated with (Dowty 1976, von Stechow 1995, 1996, Pedersen 2014, Lechner et al. 2015 a.o.). For instance, (59) 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).

(59) It is possible that John opened the door again.
   a. Presupposition on the repetitive reading: John has opened the door before.
   b. Presupposition on the restitutive reading: The door had been open before.

Only accomplishment VPs whose event structure involves a result state clearly display the restitutive reading; those that are only 'conceptually associated' with such a state do not allow it (see also Spathas and Michelioudakis (2021) for related observations on additive operators in Greek). In Mandarin Chinese, *yòu* 'again' occurs preverbally only. The TS 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 the verb in the latter, but not in the former. We, therefore, expect the restitutive reading to be available with *xī* 'blow out/extinguish', but not *chuī* 'blow', which is what we observe. Assume that I bought a brand-new candle that was never lit and that I lighted it and blew it out once only. In that context, the repetitive reading of *yòu* 'again' is blocked (since only one blowing event has taken place). Therefore, sentence (60), which contains an activity (manner) verb, should be unacceptable in this context, which fits

our judgments. On the other hand, (61), which contains a causative (result) verb, is acceptable in this context. Unsurprisingly, the example (62), where *chuī* is used as the V1 of an RVC, is also acceptable in this situation.

(60) *Nèi-gēn làzhú wǒ yòu* ***chuī*** *le.* (TS activity SV)
that-CL candle 1SG again blow PFV
'I blew the candle again.' (✗*restitutive*)

(61) *Nèi-gēn làzhú wǒ yòu* ***xī*** *le.* (causative SV)
that-CL candle 1SG again extinguish PFV
'I blew out the candle again.' (✓*restitutive*)

(62) *Nèi-gēn làzhú wǒ yòu* ***chuī-miè*** *le.* (resultative compound)
that-CL candle 1SG again blow-go.out PFV
'I blew out that candle again.' (✓*restitutive*)

The restitutive reading of *yòu* 'again' is not available either with accomplishment VPs built with the TS activity SV *xǐ* 'wash'. Take for instance (63). This sentence is odd in a situation where Lulu bought a brand new jacket, and washed it once after it got dirty (the repetitive reading is blocked by the context).[11] In the same context, a sentence with the corresponding RVC *xǐ-gānjìng* 'wash clean' is fine, see (64).

(63) *Lùlu yòu* ***xǐ*** *le nèi-jiàn shàngyī.* (TS oriented activity SV)
Lulu again wash PFV that-CL jacket
'Lulu washed her jacket again.' (✗*restitutive*)

(64) *Lùlu yòu* ***xǐ-gānjìng*** *le nèi-jiàn shàngyī.* (resultative compound)
Lulu again wash-clean PFV that-CL jacket
'Lulu washed her jacket clean again.' (✓*restitutive*)

5.2 *zìjǐ* 'by itself' in intransitives

A further diagnostic for event structure is the *by itself* test, often used to distinguish anticausative from middle, passive or impersonal interpretations of non-active morphological markers such as reflexive marking in Romance (see, e.g, Chierchia 2004; Schäfer 2008; Koontz-Garboden 2009; Alexiadou et al. 2015). Anticausatives, but neither passive nor middle uses of non-core transitive verbs, are felicitous with *by itself*, at least when this adverbial has what Alexiadou et al. (2015) call the 'no particular cause' reading. Under this reading, the adverbial conveys that no entity other than the subject's referent can be identified as responsible for the coming about of the reported eventuality; e.g., *the branch broke by itself* indicates that nothing can be identified as responsible for the breaking of the branch.

In Mandarin, anticausative SVs are acceptable with *zìjǐ* 'by itself' as long as they are not inherently agentive, see for instance the contrast between (65) and (66) (*shā* 'kill' is inherently agentive).

[11] For German, Wittek (2002) similarly observes that most speakers reject the restitutive reading of *wieder* with the accomplishment *das T-shirt waschen* 'wash the T-shirt' derived from the activity verb *waschen* 'wash'.

(65) *Mén* ***guān*** *le, dàn bú shì shéi guān de (mén shì zìjǐ guān-shàng de).*
door close PFV but NEG SHI who close DE door SHI self close-up DE
'The door closed, but nobody closed it. (It was closed by itself).'

(66) *Nèi-zhī jī* ***shā*** *le, #dàn bú shì shéi shā de (jī shì zìjǐ shā de).*
that-CL. chicken kill PFV but NEG SHI who kill DE chicken SHI self kill DE
Intended: 'The chicken killed, but nobody killed it (it died by itself).'

That inherent agentivity blocks the use of this adverbial is expected: these verbs entail the involvement of an external argument (differing from the theme argument) and this even in contexts where it is not syntactically projected, i.e., when these verbs are used intransitively. This clashes with the semantic requirements of *zìjǐ* 'by itself' under the relevant 'no particular cause' reading. Verbs such as *guān* 'close', *kāi* 'open', *suì* 'break', *xī* 'blow out', *fā* 'leaven' all accept a non-instrumental inanimate subject when used transitively.

In contrast, any TS-oriented activity verb is infelicitous with *zìjǐ* 'by itself' when used intransitively. This holds also for verbs that can have an inanimate subject in transitive uses. Thus, for instance, *xǐ* 'wash' can take an inanimate external argument (see (67a)) but remains nevertheless not compatible with *zìjǐ* 'by itself' when used intransitively, see (67b).

(67) a. *Bàoyǔ* ***xǐ*** *le chē-chuāng.*
heavy.rain wash PFV car-window
'The rain washed the car window.'

b. *Chē-chuāng* ***xǐ*** *le, dàn bú shì shéi xǐ de (#Chē-chuāng shì zìjǐ xǐ de.)*
car-window wash PFV but not SHI who wash DE car-window SHI self wash DE
Intended: 'The car window washed, but nobody washed it. (It got washed by itself).'

Verbs such as *xǐ* 'wash' always entail the involvement of an entity different from the theme, since they denote activities, and this also in contexts where this entity is not syntactically projected (via Voice), as in antiagentive SVs. This entailment enters in conflict with the meaning of *zìjǐ*, just as before.

In summary, the modifier *zìjǐ* 'by itself' provides a further argument in favor of the idea that SVs like *kāi* 'open' and those like *xǐ* 'wash' do not denote the same type of events: the former denote changes-of-state, but the latter denote activities. The latter are never compatible with *zìjǐ* 'by itself' because activities on a theme necessarily involve an agent (which can be inanimate or animate). This clashes with the meaning of *by itself* adverbials, which indicate that the event does not involve any external entity.

The modifier *zìjǐ* 'by itself' also provides a further argument in favour of our and Cheng's (1989) view that SVs with change-of-state semantics built with a theme subject are true intransitives, rather than passives. In particular, as shown in (68)-(69), the use of this modifier is possible in the absence of the passive marker *bèi* but not in its presence. This patterns with facts observed in other languages such as Italian (Chierchia 2004) or English (Alexiadou et al. 2015: 21 and authors cited therein).

(68) a. *Mén zìjǐ* ***kāi*** *le.*
door itself open PFV
'The door opened by itself.'

b. *Mén (*bèi) zìjǐ **kāi** le.*
door BEI itself open PFV
Intended: 'The door was opened by itself.'

(69) a. *Miàntuán zìjǐ **fā** le.*
dough self leaven PFV
'The dough leavened by itself.'
b. *Miàntuán (*bèi) zìjǐ **fā** le.*
dough BEI self leaven PFV
Intended: 'The dough was leavened by itself.'

6 A novel diagnostic for event structure: zero-change intransitives

As mentioned in the introduction, a noteworthy contribution of this paper is the use of a novel diagnostic to probe the meaning of SVs in Mandarin in order to establish the fine-grained typology illustrated in Figure 1: the availability of the zero-change construal in critical contexts. Under this use, the event described by the sentence fails to develop into a change in the theme's referent yielding to the target state. The target state is here defined as the state obtained when the VP-event is performed successfully; e.g., *Tom successfully washed the bike* is interpreted as meaning that the bike is clean as a result of the washing. The zero-change construal is exhibited either by verbs encoding a change-of-state (like causative-inchoative verbs), or by verbs that are conventionally associated with such a change (like TS-oriented activity verbs). Activity verbs like *pet* that neither denote changes, nor are conventionally associated with changes do not have such readings in non-enriched contexts. As a result, when the adverbial *successfully* modifies such verbs, the ensuing sentence is typically not interpreted as entailing a specific type of result. [12]

The diagnostic probing event structure of antiagentive vs. anticausative intransitives concerns the availability of the zero-change reading in such syntactic contexts. Anticausative SVs and antiagentive SVs have very different entailments, as the contrasts between (70)-(71) on the one hand, and (72b)-(74b) on the other, nicely show. Sentences built with an antiagentive SV are compatible with zero-change scenarios. So for instance, in (70)-(71), the first clause is compatible with the denial of the whole conventionally associated change in the second clause.

(70) *Yīfú **xǐ** le, dàn gēnběn méi xǐ-gānjìng.*
coat wash PERF but at.all NEG.PFV wash-clean
'The coat has washed, but it didn't get clean at all!'

(71) *Yīfú **xǐ** le, dàn yīdiǎn dōu méi xǐ-gānjìng.*
coat wash PERF but a.little DOU NEG.PFV wash-clean
The coat has washed, but not a little bit of it did even get clean!'

In contrast, sentences built with an anticausative SV are incompatible with zero-change scenarios, see (72b)-(74b). This is in striking contrast with the (agentive) transitive use of these verbs, which enables zero-change construals, as the acceptability of (72a)-(74a) (repeated from (7a)) shows; see

[12] E.g., *John kissed the princess successfully* does not imply a state of awakeness in a default context. In contrast, *John washed the T-shirt successfully* does entail that the T-shirt is clean in a default context, precisely because TS-oriented activity verbs are 'conventionally associated' with a particular type of state (Talmy 2000).

Zhang (2018: 130) for the same observation about *guān* 'close'.

(72) a. *Lùlu* ***guān*** *le nèi-shàn mén, (dàn gēnběn méi guān-shàng).*
Lulu close PFV that-CL door but at.all NEG.PFV close-up
'Lulu closed the door, but it didn't get closed at all.'

b. *Mén* ***guān*** *le, (#dàn gēnběn méi guān-shàng).*
door close PFV/PERF but at.all NEG.PFV close-up
Intended: 'The door (has) closed, but it didn't get closed at all.'

(73) a. *Lùlu* ***fān*** *le miàn, (dàn gēnběn méi fā-qǐlái).*
Lulu leaven PFV dough but at.all NEG.PFV leaven-up
'Lulu leavened dough, but it didn't get leavened at all.'

b. *Miàn* ***fā*** *le, (#dàn gēnběn méi fā-qǐlái).*
dough leaven PFV/PERF but at.all NEG.PFV leaven-up
Intended: 'The dough (has) leavened, but it didn't get leavened at all.'

(74) a. *Yuēhàn* ***shāo*** *le tā-de shū, dàn gēnběn méi shāo-zháo.*
Yuehan burn PFV 3SG-DE book but at.all NEG.PFV burn-ignite
'Yuehan burned his book, but it didn't get burned at all.'

b. *Shū* ***shāo*** *le, (#dàn gēnběn méi shāo-zháo).*
book burn PFV/PERF but at all NEG.PFV
Intended: 'The book (has) burned, but it didn't get burned at all.'

The case of non-gradable causative SVs, such as *shā* 'kill', *zhāi* 'pick', *chú* 'get rid of' and *guān nèi-ge shūdiàn* 'close the bookstore' is a bit more intricate, but confirms again that the zero-change use available for causative SVs used transitively becomes infelicitous when they are used intransitively. The complication is that as shown in Martin et al. (2021), with non-gradable causative transitive SVs, the zero-change reading is available only in the presence of a cardinality adverbial, e.g., *once*, or a temporal durative adverbial, see (75)-(76).

(75) *Lùlu* ***shā*** *le nèi-tóu niú #(yí cì), kě niú hái huó zhe.*
Lulu kill PFV that-CL ox one time but ox still live DUR
'Lulu killed the ox once, but the ox is still alive.' (He tried once to kill it, but it was unsuccessful)

(76) *Lùlu* ***zhāi*** *le #(hǎojǐcì) nèi-gè píngguǒ, dōu méi zhāi-xiàlái.*
Lulu pick PFV several.times that-CL apple DOU NEG.PFV pick-down
'Lulu picked the apple several times, but didn't manage to take it down.'(she tried several times)

Again, the zero-change reading does not survive in the intransitive use, and this even in the presence of the enhancing adverbial. For instance, (77) weirdly suggests that the ox came to life again after dying, and (78) oddly implies that the apple returns to its original place after having picked, contrary to the transitive variants in (75) and (76), which are felicitous descriptions of unsuccessful attempts.

(77) #*Niú* ***shā*** *le* *yícì.*
ox kill PFV one.time
Intended: 'The ox killed once.'

(78) #*Nèi-gè* *píngguǒ* ***zhāi*** *le* *hǎojǐcì.*
that-CL apple pick PFV several.times
Intended: 'The apple picked several times.'

From the above distribution of zero-change construals, we conclude that Mandarin TS-oriented 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 TS-oriented activities, but rather have change-of-state semantics.

So why is the zero-change construal no longer available with the anticausative alternant of *shā* 'kill' or *shāo* 'burn'? We adopt here Martin (2020)'s answer to this question, which we briefly summarize as follows. The bare, aspectless, predicate denotes a set of complete events, both in its transitive or intransitive uses. When agent Voice is not active, and an agent argument is not licensed as in (79a), the causing event described by the VP only has one participant, namely the theme. The causing event is then identified with the change leading to the result state. When, however, agent Voice is active licensing the projection of a second (external) argument, e.g., Lulu in (79b), the causing event has two participants (the agent and the theme), and is understood as having the action performed by this agent as one of its subparts (the other part being the change undergone by the theme).

(79) a. *shā* 'kill' $\rightsquigarrow \lambda y \lambda e. \exists s(\textbf{cause}(e, s) \wedge \textbf{dead}(s) \wedge \textbf{theme}(e, y))$
b. [Lùlu $Voice_{ag}$ shā nèi-tóu niú] $\rightsquigarrow$
$\lambda e. \exists s(\textbf{agent}(e, \textbf{lulu}) \wedge \textbf{cause}(e, s) \wedge \textbf{dead}(s) \wedge \textbf{theme}(s, \textbf{that-ox}))$

These bare predicates serve as the input to perfectivization. Several authors such as Smith (1997), Soh and Kuo (2005), Liu (2009) argued that Mandarin perfective *-le* does not require event completion and is a partitive operator, returning (proper or improper) parts of VP-events. We thus attribute to *le* the meaning in (80).[13]

(80) $[\![\text{PFV}_P]\!] = \lambda P \lambda e[\tau(e) \subseteq t_T \wedge \textsf{PART}(e, P)]$
('P' stands for partitivity)

Applied to the agentive predicate (79b), the perfective partitive operator *le* returns parts of agentive Lulu-kill-the-ox events. In the appropriate context, these parts may amount to unsuc-

[13]For reasons of space, we leave aside the question of whether *-le* is also associated with a maximality requirement, that is, not only requires the event *e* it returns to be a part of a possible *VP*-event, but also that *e* not be a proper part of any actual event that is part of a possible VP-event (Altshuler 2014, see also Martin and Gyarmathy 2019 for an extension of Altshuler's proposal to Mandarin). Here, we simply assume that *le* is partitive, i.e. returns a (proper or improper) part of a VP-event. Also, we follow Martin et al.'s (2021) assumption that *le* can compose with the predicate before the durative or cardinality adverbial, and therefore separate out existential closure over events from its meaning (as Matthewson 2012 does for Gitksan). See section 7 for more details.

cessful attempts to kill the ox. This accounts for the availability of the zero-change reading in the agentive variant of these verbs. But when perfective *le* applies to this anticausative predicate, it necessarily returns parts of changes-of-state, as the bare VP is understood as denoting a set of changes-of-state on its intransitive use. Therefore, asserting in the subsequent discourse (as in (77)), that the theme has undergone no change-of-state whatsoever, is infelicitous, and can only but generate a contradiction.

On the other hand, since the set of complete events denoted by antiagentive predicates such as *yīfú xǐ* 'the coat wash' does not involve any change-of-state leading to the conventionally associated target state as their subparts, denying the occurrence of any part of such a change-of-state does not yield any contradiction. This is why the zero-change construal remains available for TS-oriented activity verbs used intransitively.

7 Monomorphemic verbs vs. resultative compounds

Previous sections established that VPs built with an SV and a quantized object can have a telic reading and project a syntactically accessible constituent denoting a state property that adverbials can scope over. But under this view, the meaning of causative SVs such as *shāo* 'burn' or *shā* 'kill' is very close to the one traditionally attributed to RVCs such as *shāo-huǐ* 'burn-destroy' or *shā-sǐ* 'kill-dead' for those according to which telic or causative SVs do not exist in Mandarin Chinese. The question, then, is how to pin down the semantic differences between causative SVs and their corresponding RVCs in our typology.

There are two main tasks to accomplish. First, we have to explain why, in striking contrast with perfective SV sentences, perfective RVC sentences formed with these SVs in the V1 position do not have atelic readings. Second, we must account for why these RVCs *entail* the occurrence of a result state satisfying the property encoded by the second predicate (V2)–while the corresponding SVs only defeasibly implicate it, as noted, for instance, by Li and Thompson (1981), Lin (2004), and Xie (2009). This is illustrated in (81).

(81) *Yuēhàn* ***shāo(#-zháo)*** *le* *tā-de* *shū,* *dàn* *gēnběn* *méi* *shāo-zháo.*
Yuehan burn-ignite PFV 3SG-DE book but at.all NEG.PFV burn-ignite
Intended: 'Yuehan burned his book (ignited), but it didn't get burned at all.'

Why this difference in the strength of the culmination inference? In which respects do causative SVs differ from RVCs derived from them? Under the widespread view according to which Mandarin SVs are all activity predicates, the answers to these questions are straightforward: since SVs never denote causation events, Mandarin speakers must use RVCs in order to convey a causative meaning (Talmy 1991, 2000, Chen 2008, 2017a, see also Lin 2004: 62). The following sections focus on the semantic effects triggered by the addition of what Talmy (2000) calls the 'confirmation satellite', i.e., the V2 in an RVC whose V1 is *already* causative under our analysis.

7.1 Weak vs. strong telicity

This section compares SVs with resultative verbal compounds (RVCs) in their aspectual properties. We will defend a view compatible with the general wisdom according to which RVCs are 'more telic' than their SV counterparts. But rather than translating this difference in the assumption that SVs never yield telic VPs (which we showed to be wrong in section 3), we argue that RVCs are 'more strongly telic' because those that yield telic VPs *do not have atelic readings*. On this

point, they contrast with SVs yielding telic VPs, since we established that the latter typically also accept atelic readings, except for achievement SVs.

We focus on RVCs whose V1 is one of our causative SVs. Such RVCs have telic uses, see (82).

(82) a. *Lùlu wǔ fēnzhōng nèi jiù* ***shāo-(huǐ)*** *le yì-běn shū* (SV/RVC)
Lulu five minute within JIU burn-destroy PFV one-CL book
'Lulu burned a book in five minutes.'

b. *Nóngfū shí fēnzhōng nèi jiù* ***shā(-sǐ)*** *le nèi-tóu niú.* (SV/RVC)
farmer ten minute within JIU kill-die PFV that-CL ox
'The farmer killed the ox in ten minutes.'

RVCs built with a quantized object like those in (82) are incompatible with a durative adverbial under the event-oriented reading (by which the adverbial measures the time span of the VP-event, see Piñón 1999), which is the reading diagnosing atelicity. On this point, these RVCs are more strictly telic than the SV found in the V1 position, see the contrasts in (83)-(85).

(83) a. *Nèi-běn shū Lùlu* ***shāo*** *le wǔ fēnzhōng.* (SV)
that-CL book Lulu burn PFV five minute
'Lulu burned that book for five minutes.' (✓*event-oriented reading*)

b. #*Nèi-běn shū Lùlu* ***shāo-huǐ*** *le wǔ fēnzhōng.* (RVC)
that-CL book Lulu burn-destroy PFV five minute
Intended: 'Lulu destroy-burned that book for five minutes.' (✗*event-oriented reading*)

(84) a. *Nèi-zhāng hǎibào Lùlu* ***sī*** *le liǎng fēnzhōng.* (SV)
that-CL poster Lulu tear PFV two minutes
'Lulu tore the poster for two minutes.' (✓*event-oriented reading*)

b. #*Nèi-zhāng hǎibào Lùlu* ***sī-huài*** *le liǎng fēnzhōng.* (RVC)
that-CL poster Lulu tear-damage PFV two minutes
Intended: 'Lulu tear-damaged the poster for two minutes.' (✗*event-oriented reading*)

(85) a. *Nèi-tóu niú nóngfū* ***shā*** *le shí fēnzhōng.* (SV)
that-CL ox farmer kill PFV ten minute
The farmer killed the ox for ten minutes.' (✓*event oriented reading*)

b. #*Nèi-tóu niú nóngfū* ***shā-sǐ*** *le shí fēnzhōng.* (RVC)
that-CL ox farmer kill-die PFV ten minute
Intended: 'The farmer killed-dead the ox for ten minutes.' (✗*event oriented reading*)

In summary, with a quantized object, RVCs yield 'inherently telic' VPs, without atelic uses. In contrast, with a quantized object, VPs formed with a causative SV have a default telic reading, but also accept atelic uses.

7.2 Why one can kill the ox for ten minutes in Mandarin

In sections 4–5, we argued that SVs like *shā* 'kill' or *zhāi* 'pick up' have the same meaning as in English, they denote a set of causing events bringing about some particular result state. But in the previous section as well as in section 3.2, we have established that with a quantized object, these

SVs can have atelic readings, in striking contrast with English, where such readings are not possible for non-gradable causative VPs (see #*Lulu picked the flower/killed the ox for ten minutes*). If the Mandarin counterparts of such VPs have the same meaning as in English, what explains this difference? We propose that the aspectual marker *le* is one of the sources for the cumulative reading for SVs that otherwise yield accomplishment VPs when combined with a quantized object.[14]

A revealing and to our knowledge not yet observed fact is illustrated below with the contrasts in (86)-(89). What these contrasts show is that whereas non-gradable causative SVs can felicitously combine with durative adverbials when used *with* the aspectual marker *le*, this is not the case without *le*. So for instance, (87) cannot be used as an order to perform a killing-the-ox event for ten minutes, and (89) cannot be used to express that one agrees to be involved in a pick-a-flower event for a while. These examples are weird for the same reason as they are in English: these bare predicates cannot yield cumulative, atelic VPs as required by the durative adverbial. But they can have this reading when perfectivized.

(86) *Nèi-tóu niú nóngfū* ***shā*** *le shí fēnzhōng (niú dōu méi sǐ).*
that-CL ox farmer kill PFV ten minute ox DOU NEG.PFV die
'The farmer killed the ox for ten minutes (but it didn't die).'

(87) #*Wǒ mìnglìng nǐ* ***shā*** *nèi-tóu niú shí-fēnzhōng.*
1SG order 2SG kill that-CL ox ten-minute
Intended: 'I order you to kill that ox for ten minutes.'

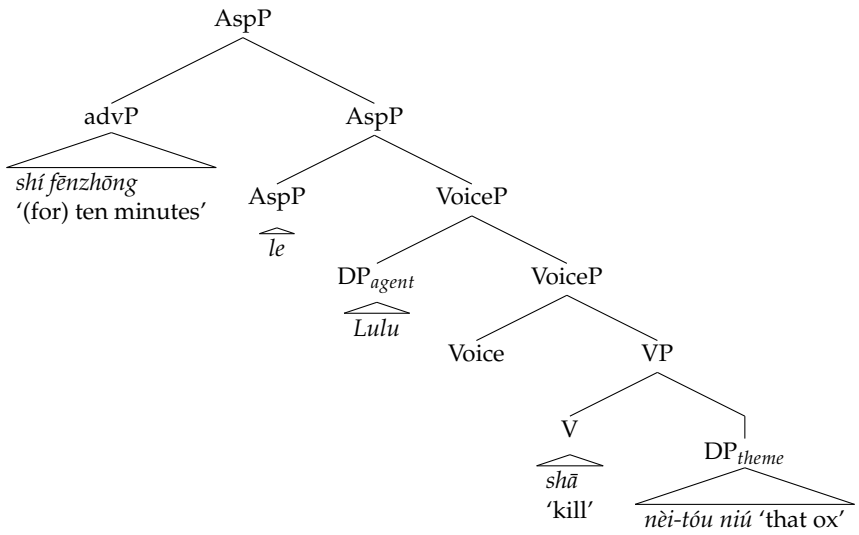
(88) *Lùlu* ***zhāi*** *le nèi-duǒ huā yīhuìr (méi zhāi xiàlái)*
Lulu pick PFV that-CL flower a.while NEG.PFV pick down
'Lulu picked that flower for a while (but she failed to pick it up).'

(89) #*Wǒ tóngyì* ***zhāi*** *yīhuìr nèi-duǒ huā.*
1SG agree pick a.while that-CL flower
Intended: 'I agree to pick that flower for a while.'

So why are non-gradable causative SVs modifiable by durative adverbials once perfectivized, but not when used bare? In other words, why do they have a cumulative reading when perfectivized, but not when used bare? Our proposal rests on Martin et al.'s (2021) idea that the aspectual marker *le* can scope *below* temporal or cardinality adverbials in Mandarin, as shown in (90).

[14] We concentrate here on non-gradable causatives, as these are the verbs that exhibit the most striking contrast with English. Gradable causative verbs such as *burn* can have cumulative readings in English too (see e.g. Kearns 2007).

(90)



We propose that perfectivization of a VP like *shā nèi-tóu niú* 'kill that ox' with *le* yields a predicate that can have cumulative readings because once such a predicate is perfectivized, it no longer denotes a set of complete events of killing that ox, but a set of complete *or* incomplete events of killing-that-ox. And if in a particular context, the VP's denotation is restricted to a set of incomplete killing-that-ox events, this VP is cumulative, because the sum of two incomplete events of killing-that-ox is again an incomplete event of killing-that-ox.[15] More formally, the bare, aspectless predicate **Lulu-kill-that-ox** denotes a (singleton) set of complete events, as shown in (91a). Such a predicate is quantized (and therefore not cumulative), since no event in which an ox is properly killed contains an event in which that same ox is killed. This accounts for the absence of atelic readings in (87) and (89).

(91) a. $[\![$ Lulu $Voice_{ag}$ shā nèi-tóu niú $]\!] \rightsquigarrow$
$\lambda e.\exists s(\textbf{agent}(e, \textbf{lulu}) \wedge \textbf{cause}(e, s) \wedge \textbf{dead}(s) \wedge \textbf{theme}(s, \textbf{that-ox}))$

b. $[\![\text{PFV}_P$ Lulu Voice_{ag} shā nèi-tóu niú $]\!] \rightsquigarrow$
$\lambda e.\tau(e) \subseteq t_T \wedge \mathsf{PART}(e, \lambda e'.\exists s(\textbf{agent}(e', \textbf{lulu}) \wedge \textbf{cause}(e', s) \wedge$
$\textbf{dead}(s) \wedge \textbf{theme}(s, \textbf{that-ox})))$

When the predicate (91a) is combined with the perfective *le*, we obtain the (non-completive) perfectivized predicate (91b). By contrast with (91a), (91b) has cumulative uses. This accounts for the availability of the atelic reading in examples such as (86) and (88).

7.3 Why one can't kill-dead the ox for ten minutes in Mandarin

The last question that remains to be addressed is why atelic readings are not available for RVCs, as established in section 7.1. If, as we argued above, the perfective is a partitive operator in Mandarin, this is at first sight unexpected, given that the aspectual operator should be able to return incomplete events, and licenses a cumulative reading for the RVC in the appropriate context.

[15] Interestingly, to our ears, the Mandarin counterpart of *Lulu killed the ox for ten minutes* is easier to obtain when the continuation makes clear that the ox didn't die. We think this is because such a context helps to restrict the denotation of the VP to incomplete events, which is necessary to obtain cumulativity.

Focusing on Hindi, Altshuler (2014: 746) solves the problem by assuming that Hindi has two different perfective operators. He proposes that SVs combine with the partitive perfective, while complex verbs combine with the perfective requiring event completion. We would however prefer to avoid this solution, given that in Mandarin (as in Hindi), the very same morphology is used to express perfectivity with both types of predicates.

We see two solutions to this problem. A first one is proposed by Martin and Gyarmathy (2019), who extend Piñón's (2011) account for the semantic differences between English simple vs. particle verbs such as *eat* vs. *eat up* to the contrast between SVs and RVCs in Mandarin. Piñón (2011) starts from a suggestion by Higginbotham (2000) that verbs may either denote predicates of events, or of *ordered pairs of events*. Piñón's (2011) proposal is that verbs like *eat* may come in two variants, as in (92a) and (92b), where b is a variable for boundary events, and 'V+' indicates that b is the boundary of e, see (92c).

(92) a. $[\![\text{eat}]\!] \rightsquigarrow \lambda e.\mathbf{eat}(e)$
b. $[\![\text{eat up}]\!] \rightsquigarrow \lambda\langle e,b\rangle.\mathbf{eat}^{+}(\langle e,b\rangle)$
c. $\forall\langle e,b\rangle(\mathbf{V}^{+}(\langle e,b\rangle) \rightarrow b = \mathbf{right\text{-}boundary\text{-}of}(e) \wedge b \sqsubset e)$

Martin and Gyarmathy's (2019) strategy is to treat Mandarin RVCs as denoting predicates of ordered pairs of events, as does *eat up* in (92b), while SVs denote predicates of events.

When V2 is a state predicate rather than a predicate of boundaries like English *up*, Piñón's analysis has to be modified. Typically, in RVCs, a causal relation holds between the eventualities respectively expressed by the first and second members of the ordered pair. For instance, Martin and Gyarmathy (2019) analyse the simple and complex Mandarin variants of the causative verb *burn* as follows.[16]

(93) a. $[\![\text{shāo}]\!] \rightsquigarrow \lambda e.\exists s.(\mathbf{cause}(e,s) \wedge \mathbf{burnt}(s))$
b. $[\![\text{shāo-zháo}]\!] \rightsquigarrow \lambda\langle e,s'\rangle.\exists s.(\mathbf{cause}(e,s) \wedge \mathbf{burnt}(s) \wedge \mathbf{cause}(e,s') \wedge \mathbf{ignited}(s'))$

Such an analysis requite denotations that are type-logically more complex, but the aspectual contrast can be accounted for. When the partitive perfective *le* applies to an RVC denoting a predicate of ordered pairs of events, it returns a part of an ordered pair of events, i.e. $\text{PART}(\langle e,e'\rangle, \text{V1.V2})$. For instance, the perfectivized form of *shāo-zháo* 'burn-ignited' receives the semantics in (94) (and the PART operator must now, of course, be extended to accept event pairs as argument):

(94) $[\![\text{PFV}_P \text{ shāo-zháo}]\!] \rightsquigarrow \exists\langle e'',s''\rangle.\,(\tau(\langle e'',s''\rangle) \subseteq t_T) \wedge$
$\text{PART}\big(\langle e'',s''\rangle, \lambda\langle e,s'\rangle.\exists s.(\mathbf{cause}(e,s) \wedge \mathbf{burnt}(s) \wedge \mathbf{cause}(e,s') \wedge \mathbf{ignited}(s'))\big)$

The partitivity requirement is satisfied either by a pair of eventualities which is a complete V1.V2-pair of events, or by a pair of eventualities which is an incomplete V1.V2-pair of eventualities. The crucial point is that an incomplete *pair* of events must still be a *pair* of events: an ordered pair of events cannot be made up of an initial part of the first member of the pair only. As a result, a perfectivized RVC requires at least a part of a V2-eventuality to occur. When V2 is a state predicate, the ensuing perfective RVC minimally entails a proper part of a V2-state. For instance, the perfectivized form of *shā-sǐ* 'kill-dead' requires at least a part of a state of death to occur. As

[16] In Mandarin, predicates are often categorically underspecified and can be both used as a verb or an adjective; we assume that in a causative RVC, V1 is used as a verb, introducing an event leading to a state s, and V2 introduces a state s'.

any part of a state of being dead is itself a state of being dead, the perfective RVC *shā-sǐ-le* entails death proper, despite the partitive semantics of *le*. Therefore, in worlds where dying events are 'once-only' events, the RVC *shā-sǐ le nèi-tóu niú* 'killed-dead that ox' denotes a *singleton* set of pairs of eventualities, even perfectivized. This makes cumulative readings impossible.

Under this view, an RVC like *shā-sǐ* 'kill dead' redundantly predicates the same result property. This is at first sight surprising, but it should be emphasized that such RVCs are precisely felt as redundant and somewhat emphatic; the SV *shā* is to our ears the default choice for expressing a killing event in Mandarin. For instance, (95a) is by default more natural than (95b).

(95) a. *Nóngfū* ***shā*** *le* *yì-tóu* *niú.*
farmer kill PFV one-CL ox
'The farmer killed an ox.'
b. *Nóngfū* ***shā-sǐ*** *le* *yì-tóu* *niú.*
farmer kill-dead PFV one-CL ox
'The farmer killed an ox.'

RVCs built with predicates that do not encode the same state property are not felt to be redundant. For instance, while *shāo* 'burn' in (96a) expresses the result property of being burnt, *huǐ* encodes the stronger property of destroyed; as a result, the RVC *shāo-huǐ* in (96b) ends up conveying a higher degree of affectedness than the embedded V1 *shāo* (since being burnt does not entail being destroyed).

(96) a. *Lùlu* ***shāo*** *le* *nèi-běn* *shū.*
Lulu burn PFV that-CL book
'Lulu burnt that book.'
b. *Lùlu* ***shāo-huǐ*** *le* *nèi-běn* *shū.*
Lulu burn-destroy PFV that-CL book
'Lulu burn-destroyed that book.'

A second solution to this problem consists in analyzing RVCs as denoting complex events (e.g. event sums), like Rothstein (2004: 35) does for a subclass of accomplishments (see also Martin 2018: 123 for a discussion of the application of an analysis *à la* Rothstein to English lexical causatives). This is the road taken by Johnston (2023) to account for a contrast in White Hmong similar to the one we have between Mandarin SVs and RVCs. Johnston (2023) observes that in Hmong, SVs such as *nrhiav* 'find' do not entail culmination, while the combination of a SV with a secondary predicate such as *nrhiav pom* 'find see' does entail culmination. Johnston (2023) proposes to analyze *nrhiav pom* 'find see' as denoting a complex event in which the V1-eventuality causes the V2-eventuality:

(97) $[\![\text{nrhiav pom}]\!] \rightsquigarrow \lambda e.\exists e_1 \exists e_2 (e = \textbf{cause}(e_1, e_2) \wedge \textbf{find}(e_1) \wedge \textbf{see}(e_2, \textbf{the-ball}))$ (Johnston 2023)

Similarly, one could analyze RVCs such as *shāo-zháo* 'burn-ignited' as sums of burning events and ensuing ignited states, as in (98) (where '$v = (e' \oplus s)$' indicates that v is the mereological sum of e' and s):

(98) $[\![\text{shāo-zháo}]\!] \rightsquigarrow \lambda e.\exists e' \exists s (e = (e' \oplus s) \wedge \textbf{cause}(e', s) \wedge \textbf{burn}(e') \wedge \textbf{ignited}(s))$

This solution has the advantage of keeping denotations more simple type-logically, and also accounts for the absence of cumulative readings for RVCs, even when combined with an aspectual partitive marker like *le*.

8 Conclusions

In this paper, we have elaborated a new aspectual typology of Mandarin SVs. We first showed that a distinction has to be made between, on the one hand, pure (process-denoting) activity SVs, that neither encode a result state, nor are conceptually associated with such a result, and TS-oriented activity SVs on the other. The latter, but not the former, can form accomplishment VPs with quantized objects. We showed that among simple verbs yielding accomplishment VPs with a quantized object, TS-oriented activity verbs differ from causative SVs in that only the latter have causative syntax and semantics, i.e. *encode* the associated result at the lexical and syntactic levels. While we showed that monomorphemic accomplishments do exist in Mandarin, we also confirmed the general view according to which SVs are more weakly telic than their RVC counterparts, since the latter yield neither atelic readings, nor zero-change construals.

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