Agents, causers, results, and contentfulness in Mandarin expressions of caused change
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This work proposes that the major and minor encoding patterns of events of caused change in Mandarin Chinese reflect a principle of content maximization (CMax) – a preference for forms of expression that can pack more components of grammatically-relevant meaning over others – which is enabled by a productive morphological compounding process in the language. I show that a prototypicality requirement on causers to correspond to volitional agents in Mandarin monomorphemic verbs of caused change may also be attributed to to CMax.

The major encoding pattern for events of caused change in Mandarin is via the ubiquitous resultative verb compound (RVC) (Li and Thompson 1981: 55-67), a typically bimorphemic form that combines an intransitive verb describing some change, often a change of state (COS) (e.g. (1), with a verb describing a causing activity or process (e.g. (2)). Importantly, the COS verb when monomorphemic can only be intransitive. A cause for the COS must be introduced by another verb: that is, the presence of *cì* 'prick' in (2) is obligatory.

(1) qìqiú pò le
    balloon break PERF
    The balloon burst. (COS verb)

(2) Sānmáo *(cì-)pò-le qìqiú
    Sanmao prick-break-PERF balloon
    Sanmao pricked and burst the balloon. (RVC)

Mandarin RVCs are able to, and generally do, encode both the manner and result of an event of caused change. Although considered by many researchers to function as a single verb (Li 1990, Cheng and Huang 1994), they are unaffected by the constraint of manner result complementarity (MRC) (Levin and Rapaport Hovav 1991): the inability of a single verb to specify both manner and result meanings. Their bi- (or poly-)morphemic structure allows both manner and result to be specified in the description of an event of caused change. At the level of the component verbal morphemes, or the root, however, MRC is still satisfied.

If CMax is the first priority, a polymorphemic structure will always be favoured over a monomorphemic one. This accounts for the general ubiquity of RVCs for encoding events of caused change in Mandarin. Yet monomorphemic verbs of caused change are still available in Mandarin, suggesting that other factors are also relevant. Economy is presumably one factor: a monomorphemic form is more economical than a polymorphemic one. If a single morpheme can pack (close to) as much content as two or more, this would satisfy both CMax and economy, and there would be reason to prefer, or at least allow, the monomorphemic form.

I argue that Mandarin monomorphemic verbs of caused change do indeed reflect the workings of CMax. First, monomorphemic verbs are the minor strategy for encoding events of caused change. Any event of caused change that may be monomorphemically encoded can also be expressed using an RVC, but not vice versa. The favoured status of RVCs is consistent with the priority status of contentfulness. Second, Mandarin monomorphemic verbs of caused change are constrained to have agentive causers, with very few exceptions (see below). I argue below that this can also be understood as a content maximization strategy.

The most numerous class of monomorphemic verbs of caused change in Mandarin are those encoding caused change of location and caused motion (caused CLM verbs). These include *fàng* 'put' (3), *guà* 'hang', *bǎi* 'place', *sāi* 'stuff' etc., and verbs of caused motion such as *rēng* 'throw', *pāo* 'toss', etc., which select for a result location complement.

(3) Pípi **fàng**-le yì běn shū zài/jìn hézi-lǐ
    NAME put-PERF one CL book be.at/enter box-within
    Pipi put a book into the box.

Mandarin also allows a limited number of monomorphemic caused COS verbs. These may be regarded as alternants of intransitive COS verbs: they show show both intransitive (4) and transitive caused COS (5) uses. Examples inlucde *rè* 'hot/heat' (4-5), *kāi* 'open', *dòng* 'freeze'.

(4) shuǐ rè le
    water hot PERF
    The water heated up.

(5) Sānmáo (zhǔ-)rè-le shuǐ
    Sanmao cook-hot PERF water
    Sanmao heated the water (by boiling it).

As noted, both monomorphemic caused CLM and the abovementioned caused COS verbs require the causer to correspond to a volitional agent. Other kinds of causes, including inanimate (6) or abstract (8) entities and natural forces, are disallowed.

(6) *huǒ rè-le   shuǐ
    fire hot-PERF water
    Intended: The fire heated the water.

(7) huǒ zhǔ-rè-le   shuǐ
    fire cook-hot-PERF water
    The fire boiled the water hot.

(8) *tāmen de xuǎnzé fàng-le   wǒmen zài yí gè kùnnán de chǔjìng zhōng
    3pl DE choice put-PERF 1pl   be.at one CL difficult DE situation within
    Intended: Their choice put us in a difficult situation.

Other things being equal, a verb specfiying an agentive subject is more contentful than one that leaves the nature of the causer unspecified. This is especially so given that the nature of the result is known. That the causer is specified to be agentive allows us to draw inferences about the nature of the causing event. In this way, these monomorphemic verbs of caused change encode, or allow to be inferred, elements from both the causing event and the result. Indeed, the events described by a monomorphemic verb of caused change are in some way "canonical" events meeting that description. For instance, causative *rè* 'to heat up' can only mean to heat something using a heat source such as a flame, but not say, to warm a seat by sitting in it.

Not all monomorphemic verbs of caused change in Mandarin agentive, though. A very few allow both volitional agents and other kinds of causers, e.g. *jiù* 'rescue/save' and *hài* 'harm':

(9) Sānmáo (de gùzhí) jiù-le   Pípi
    Sanmao DE obstinate rescue-PERF Pipi
    Sanmao('s obstinacy) saved Pipi.

(10) nà zhèn fēng jiù-le Pípi
    that CL wind rescue-PERF Pipi
    That gust of wind saved Pipi.

I argue that the "agentivity split" between these two classes of monomorphemic verbs of caused change reflects a distinction in the kind of result specified by each class. Specifically, the verbs in the agentive category also entail a particular (kind of) result. Caused CLM verbs specify a change of location. The agentive caused COS verbs such as *rè* 'heat up' are named using the same form as the predicate describing the result state. In contrast, those caused COS verbs that accept non-agentive causers are also relatively non-specific with regards to the kind of result state entailed. For instance, while being heated entails only that an entity's temperature might rise, something that is saved or rescued could undergo different changes (11):

(11) *jiù huó* "save the life of *lit.* save-alive"
    jiù chū "rescue from some adverse situation *lit.* save-out"
    jiù xǐng "restore to consciousness *lit.* save-awake"
    jiù qǐ "rescue by lifting up from a lower place (usually water) *lit.* save-arise"

I speculate that, absent a specific kind of result, an agentivity specification only reduces the descriptive flexibility of a verb without really reducing the possibilities for events that could fit the description, thus the non-agentive status of these verbs. This suggests CMax is not about more entailments, but rather about whether a more specific event description is obtained.

Languages differ in the contentfulness of their expressions of caused change, whether at the lexical or phrasal level, but the reasons for these differences are not well-understood (Levin and Rappaport Hovav 2006). This work points to some factors, including the relationship between agentivity and result specifications, that may help to illuminate some of the workings behind the expressive options for, and constraints on, events of caused change in different languages.