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Agentivity and non-culminating causation in the psych domain: Cross-linguistic evidence from Spanish and Korean

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Among the sources of non-culminating readings, we find the agentive properties of the external argument. According to the Agent Control Hypothesis (ACH), the agenthood of the subject licenses a non-culminating interpretation with causative accomplishment predicates, whereas non-agentive subjects generally oblige a culminating reading. Experiencer object verbs such as *annoy* or *surprise* are analyzed as having a causative reading, encoding a situation where the agent or causer brings about the state in the experiencer. Based on this similarity with causative accomplishments, this article investigates the impact of an agentive interpretation of the subject on the cancellation of the state in object experiencers in Spanish and Korean transitive psych predicates in a parallel experimental design. In accordance with the ACH, results revealed for both languages that *subject animacy* had a significant effect on the acceptability of a zero-state reading. Furthermore, the interaction of *subject animacy* with the *lexical aspect* of the verb yielded a significant effect in the Spanish data such that cancelling of the state in the experiencer was significantly more acceptable with psych verbs denoting *inchoative state causatives* than with those denoting *punctual causative events*. In a second acceptability study, the verbs were tested for their compatibility with an agentive interpretation of the subject. The obtained (gradient) agentivity values turned out to significantly predict the potential of each verb to have a zero-state reading for the subclasses denoting pure and inchoative state causatives, which further supports the ACH.

1 Introduction

Accomplishment predicates in the perfective aspect show an intriguing contrast between a cancellable culmination implicature with agent subjects and a culmination entailment with causer subjects. This phenomenon has been studied in different languages (e.g., Hindi: Singh 1998; Salish languages: Bar-El 2005; Mandarin: Demirdache et al. 2017; German and French: Martin & Schäfer 2017; Korean: Beavers & Lee Juwon 2020), where accomplishment predicates allow for (a) a *non-culminating* reading, i.e. the result state in the object referent does not obtain as in (1a), and (b) a *culminating* reading where the cancellation of the state in the object referent generates a contradiction as in (1b).

(1)   *French* (Martin 2015, ex. 8, 9)
         a.   Ils   l=ont   réparé   mais   ça   ne   fonctionne toujours pas.
               they   it=have repaired   but   this   NEG   works   still   NEG
               'They repaired it but it still doesn't work.'

   b. Le   choc   l=a   réparé   #mais ça   marche toujours pas.
       the shock it=has repaired but   this works   still   NEG
       intended: 'The shock repaired it but it still doesn't work.'

Examples such as (1) show that the agentivity of the subject referent affects the availability of the non-culminating construal of accomplishment predicates. The Agent Control Hypothesis (henceforth ACH, Demirdache & Martin 2015) claims that agenthood properties of the external argument are required for a non-culminating reading (also known as *failed-attempt* reading in Tatevosov 2008; Tatevosov & Ivanov 2009), whereas (inanimate) causer subjects generally oblige a culminating reading.

   Martin and Schäfer (2017) observe that among the verbs that have the availability of defeating a culminating interpretation are agentive experiencer object verbs such as French/German *encourager/ermutigen* 'encourage', *provoquer/provozieren* 'provoke', *rassurer/beruhigen* 'reassure'. Again, as in (1), if the subject is a potential agent, the psych-state in the object experiencer does not have to obtain for the sentence to be true (see the non-contradictory continuation in (2a)). In contrast, with an inanimate causer subject, as in (2b), the same continuation produces a contradiction.

(2)   *French* (Martin & Schäfer 2017, ex. 5)
   a. Pierre l=a   provoquée, mais cela ne   l=a   pas touchée du tout.
       Pierre her=has provoked   but   this NEG her=has NEG touched at all
       'Pierre provoked her, but this didn't touch her at all.'

   b. Cette remarque l=a   provoquée,
       this   remark   her=has   provoked
       #mais cela ne   l=a   pas touchée du tout.
         but   this NEG her=has NEG touched at all
       intended: 'This remark provoked her, but this didn't touch her at all.'

Verbs such as those introduced in (1) and (2) are analyzed as bi-eventive, being composed of a causing event and a state. With agentive subjects they denote an action which is performed with the intention of producing a change of state in the object referent. Since the occurrence of the change of state in the object can be cancelled, they are deemed *defeasible causatives* (Martin & Schäfer 2017).

   Transitive experiencer object (henceforth EO) verbs such as *annoy, bore, frighten* are generally analyzed as being associated with three different interpretations: stative (3a), eventive (3b), or agentive (3c) (Arad 1998; Landau 2010). The two latter readings are assumed to involve causation and are candidates to display the distinction introduced in (2). This is in line with the predominant view that in their eventive and agentive readings these verbs are accomplishment (or achievement) verbs involving a change of state in the object experiencer (Van Voorst 1992; Arad 1998; Landau 2010; Alexiadou & Iordăchioaia 2014).

(3)   *English* (Arad 1998, ex. 2, 3, 4)
   a. John / John's behavior / nuclear war frightened Nina.
   b. The thunderstorm frightened Laura.
   c. Nina frightened Laura deliberately / to make her go away.

Significantly, recent work on the aspectual structure of psych verbs has argued for certain languages that they do not lexicalize a culminating change of state but rather the inception of an experiential state. For instance, Marín and McNally (2011) argue that Spanish reflexive psych verbs such as *divertirse* 'get/be entertained' or *sorprenderse* 'get/be surprised' denote inchoativity in terms of a boundary. These verbs include in their denotation the

inception of the experiential state they are associated with, i.e., they include an initial or left boundary (Piñón 1997). Following Fábregas (2015) and Fábregas and Marín (2015), this aspectual characterization is also valid for the transitive alternants such as *divertir* 'entertain' or *sorprender* 'surprise', which correspond to the English examples in (3). The idea of psych predicates presenting an initial boundary has also been studied in other languages such as Sḵwx̱wú7mesh (Bar-el 2005), Korean (Choi Jiyoung & Demirdache 2014; Choi Jiyoung 2015a; 2015b) and Polish (Rozwadowska 2012), where for Polish, Rozwadowska argues that both experiencer subject and experiencer object verbs behave alike in terms of state inception.

Given this conception of transitive EO verbs as verbs denoting causation of (the inception of) a state in the object experiencer, the question arises whether these verbs generally behave in accordance with the ACH and allow for readings where the state in the object experiencer can be defeated (i.e. zero-state readings[1]) as soon as an agentive subject is involved. The present study sets out to investigate this question experimentally focusing on the availability of zero-state readings with transitive EO predicates and tests predictions about how the semantic properties of these predicates interfere with such readings. The study concentrates on two languages, Spanish and Korean, for which it has been claimed that their psych verbs denote inchoative states, i.e. make reference to the starting of the state in the experiencer (Spanish: Marín & McNally 2011; Fábregas 2015; Korean: Choi Jiyoung & Demirdache 2014; Choi Jiyoung 2015a; 2015b). Furthermore, these two languages differ typologically regarding their morphological structure in terms of valency orientation in the psych domain. While Spanish displays basic transitive EO verbs, Korean systematically derives transitive EO structures by means of overt causativization of basic experiencer subject verbs. In terms of the semantic properties of the verbs, we adopt Marín and McNally's (2011) classification of the Spanish reflexive psych verbs as *inchoative states* (e.g. *divertirse* 'get/be entertained') and *punctuals* (e.g. *sorprenderse* 'get/be surprised') and assume that their transitive alternants can be accordingly classified as *inchoative state causatives* (e.g. *divertir* 'entertain') and *punctual causatives*[2] (e.g. *sorprender* 'surprise') (cf. Fábregas 2015; Fábregas & Marín 2015). In Korean, experiencer subject psych verbs also fall in two groups, either denoting *pure states* (e.g. *culkepta* 'pleased') or *inchoative states* (e.g. *nollata* 'get surprised') (Choi Jiyoung & Demirdache 2014). These verbs can enter a periphrastic causative construction by means of being embedded under -*key hata* '-ADVR do.DECL', which denotes *pure state causatives* (e.g. *culkepkey hata* 'make pleased') *and inchoative state causatives* (e.g. *nollakey hata* 'make get surprised'), respectively. Given the difference in overt morphological structure between Korean and Spanish causative EO predicates, the present study will investigate whether this has a bearing on their ability to allow for zero-state readings with agentive subjects.

For the analysis, two parallel experimental studies were developed in order to examine the ACH with transitive EO predicates of the aforementioned aspectual subtypes. In a first study, we examined the availability of a zero-state reading by means of an acceptability test inspecting the possibility of cancelling the state in the experiencer by stating his/her unawareness of the experiential state. This study tests the impact of the thematic specification of the subject (agent vs. causer) and the aspectual nature of the psych verbs (pure and inchoative state causatives vs. punctual causatives) on the acceptability of zero-state interpretations with transitive EO verbs. In a second study, we tested the compatibility

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[1] In this study, we use the terminology *zero-state* instead of "zero-result" or "zero-change" reading, the latter being generally used to characterize non-culminating readings of regular causative accomplishment predicates. The terminology *zero-state* is used to indicate the aspectual peculiarity of the discussed psych predicates, which is explained in more detail in Section 3.3.

[2] This terminology covers the eventive and agentive readings of the transitive psych verbs, as illustrated in (3b/c).

of the same verbs with agentive interpretations of the subject referent by measuring their acceptability of occurring in a frame with a subject control verb of decision under which the target verbs were embedded (see Grafmiller 2013; Verhoeven 2017). If the ACH is also valid for transitive EO verbs, we expect that the (gradient) acceptability values obtained in the second study significantly correlate with the (gradient) acceptability of zero-state readings obtained in the first study.

This article is structured as follows. Section 2 presents a short overview of existing explanations for non-culminating interpretations with causative verbs cross-linguistically. Section 3 elaborates on the aspectual and argument-structural properties of EO verbs in the languages under investigation which are important for the experimental study, addressing in particular the notion of (gradient) agentivity. Section 4 describes the design of the first experimental study on the availability of zero-state readings and presents the results for both languages. Section 5 presents the second study on the availability of agentive readings with the individual verbs and discusses its correlation with the acceptability of zero-state readings. Finally, Section 6 discusses the patterns found in both languages and Section 7 summarizes the main findings of the study.

2 Non-culminating accomplishments

In this section, we briefly summarize existing approaches to non-culminating readings of accomplishment predicates in order to set the stage for clarifying our expectations concerning the behavior of zero-state readings with EO verbs.

As outlined in Section 1 by means of examples (1) and (2), a perfective sentence with an accomplishment predicate does not necessarily entail culmination of the denoted (complex) event; i.e. the result state in the object does not need to obtain for the sentence to be true. This observation has been shown to be valid for a large number of typologically diverse languages, among them Mandarin Chinese (Lin Jimmy 2004; Demirdache et al. 2017) and Korean (Beavers & Lee Juwon 2020). In addition, the phenomenon has been reported to be present in further languages including Spanish (Martin & Schäfer 2017). While in languages such as German, French, and presumably also Spanish (see Section 1), the set of non-culminating accomplishment predicates is restricted to a subclass of bi-eventive causative accomplishments, in other languages such as Mandarin Chinese or Japanese, core causative verbs such as *kill, open,* etc. have been reported to display non-culminating readings (Demirdache & Martin 2015). For instance, the Mandarin Chinese verb *shāo* 'burn' has two readings: in example (4a) a change of state in the object (the book being burnt) does not take place at any degree, whereas in (4b) the change of state in the object obtains and cannot be cancelled (i.e. the event has reached its natural endpoint).

(4)   *Mandarin* (Demirdache & Martin 2015, ex. 30)
      a.   Yuēhàn shāo le   tā-de   shu, dàn méi shāo-zháo.
           Yuēhàn burn PFV 3.SG-GEN book but NEG burn-touch
           'Yuēhàn burned his book, but it didn't get burnt at all.'

      b.   Huǒ shāo le   tā-de   shu, #dàn méi shāo-zháo.
           fire burn PFV 3.SG-GEN book but NEG burn-touch
           intended: 'The fire burned his book, but it didn't get burnt at all.'

Again, the contrast between (4a) and (4b) is determined by the agentive properties of the subject: non-culminating construals depend on the agentive control of the subject referent over the described event (see (4a)) whereas, in the presence of a causer subject, culmination of the event is entailed (see (4b)). The requirement of agenthood properties of

the subject for non-culminating construals, as stated in the ACH (Demirdache & Martin 2015), is a central prerequisite for non-culminating causation. The other ingredient is the nature of bi-eventive causative accomplishment predicates. These predicates involve an activity or process realized by an agent or causer which brings about a particular state in the object referent (Martin & Schäfer 2017). The change of state in the object referent can be of a gradual nature, as with verbs like *burn* (see (4)) or it can constitute a non-gradual change from not being in a state to being in a state as with verbs like *kill* (Demirdache & Martin 2015). The result state lexicalized with bi-eventive causative accomplishment predicates is associated with a closed scale. Once the result state obtains, the event denoted by the verb has reached its natural endpoint (telos), which is the right boundary (a point in time) of said event (Piñón 1997). Hence the respective verbs are telic.

There are several competing approaches for the explanation of non-culminating readings of causative accomplishment predicates, among them lexical and aspectual accounts (see Demirdache & Martin 2015: Section 3 for an overview). There is also evidence that languages typologically differ in the sources of non-culminating readings (Martin 2019; 2020). While for French, German or English defeasible causatives, a sublexical modal operator is claimed to be responsible for the availability of non-culminating readings, in Mandarin Chinese one way of explaining the non-culminating readings of causative verbs is by the nature of grammatical aspect (more specifically the perfective operator, which does not entail event completion) in that language (see Martin & Gyarmathy 2019; Martin 2020; cf. similarly for Thai and Hindi Koenig & Muansuwan 2000 and Altshuler 2014; 2016). For Korean, the intentionality of the grammatical subject has been claimed necessary for obtaining a non-culminating reading (see Beavers & Lee Juwon 2020 for Korean lexical causatives, and Lee Juwon 2014; 2015 for periphrastic causative *-key hata*).[3] Crucially, common to all approaches to non-culminating causation is the prerequisite of the subject's agenthood. In a recent proposal Martin (2020) argues that the different semantics associated with the Voice heads introducing agents vs. causers and their particular relation to the VP event influence the possibility of a non-culminating reading. In the case of a Voice head introducing a causer the VP necessarily renders a change of state of the object referent; in the case of a Voice head introducing an agent a defeasible causative VP renders the action of the subject referent. Whether the change of state of the object referent obtains is due to the sublexical modal operator. In the present work, we will not investigate the specific (potentially language-specific) mechanism that is responsible for non-culminating readings in terms of grammatical/lexical aspect or modality; rather, we will concentrate on the role of agent control and investigate its impact on putative zero-state readings with causative EO verbs, which might exist in parallel to non-culminating readings with accomplishment predicates. The next section elaborates on the properties of causative psych verbs in terms of thematic and aspectual structure.

3 Properties of causative psych predicates
3.1 Preliminaries

Transitive EO verbs are taken to be ambiguous between three readings – stative, eventive, and agentive – as has been illustrated by means of example (3) in Section 1. This ambiguity also holds for Spanish EO verbs, see (5).

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[3] Note that these authors also propose sublexical modality to be responsible for non-culminating readings whereas Martin (2020) tentatively proposes for Korean that grammatical aspect (i.e. the past marker *-ess* as a so-called weak perfective) licenses non-culminating interpretations (as in Mandarin Chinese).

(5) *Spanish*
    a. A Laura le   asust-ó
       to Laura CL.DAT frighten-PST.3.SG
       Manuel / el   comportamiento de Manuel / la   guerra nuclear.
       Manuel / the behavior   of Manuel / the war   nuclear
       'Manuel / Manuel's behavior / the nuclear war frightened Laura.'

    b. La   tormenta   (la)   asust-ó   a Laura.
       the thunderstorm CL.ACC frighten-PST.3.SG to Laura
       'The thunderstorm frightened Laura.'

    c. Manuel (la)   asust-ó   a Laura
       Manuel CL.ACC frighten-PST.3.SG to Laura
       deliberadamente / para hacer=la   partir.
       deliberately   / to   make.INF=her leave
       'Manuel frightened Laura deliberately / to make her go away.'

While the stative reading is most clearly present with the experiencer marked in the dative and the unmarked word order being OVS (5a), the eventive and agentive readings are typically associated with the experiencer marked in the accusative and the unmarked word order SVO, see (5b) and (5c), respectively (e.g., Cuervo 2010; Marín 2015; Jiménez-Fernández & Rozwadowska 2016; Fábregas et al. 2017; Machicao y Priemer & Fritz-Huechante 2018). In the present study, the eventive (5b) and agentive (5c) readings are of interest. They are also present in Korean, see example (6a) for the eventive reading and (6b) for the agentive reading of the transitive EO structure.

(6) *Korean*
    a. ku chentwung penkay-ka   Minho-lul mwusep-key hay-ess-ta.[4]
       the thunder   lightning-NOM Minho-ACC scared-ADVR do-PST-DECL
       'The thunderstorm frightened Minho.'

    b. Mina-ka   Minho-lul ilpwule   / ku-lul   ttena-key   ha-ki   wihay
       Mina-NOM Minho-ACC intentionally / him-ACC leave-ADVR do-NMLZ for
       mwusep-key hay-ess-ta.
       scared-ADVR do-PST-DECL
       'Mina frightened Minho intentionally / to make him go away.'

Comparing the Korean examples in (6) with the Spanish examples in (5), it becomes evident that their transitive EO predicates differ in terms of internal structure. Spanish EO predicates are morphologically basic transitive verbs, while in Korean transitive EO structures are formed by a transitivizing operation of causativization on intransitive bases through the embedding under the causative verb *hata* 'do.DECL'.

3.2 Agentivity

The ACH "requires the predicate's external argument to be associated with agenthood properties" in order to allow for zero-result non-culminating construals (Demirdache & Martin 2015: 201). The capacity to control a situation is often regarded as a core ingredient of agenthood. Further notions related to agenthood include volition, intention, sentience, action and the capacity to instigate or cause an event (e.g., Dowty 1991; Van Valin & Wilkins 1996; among many others). These notions emphasize different aspects related to agentive control and may be relevant in diverse grammatical phenomena. With respect to EO verbs, the agentivity of the subject referent is crucial; the question is whether this

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[4] We use the Yale Romanization for the transliteration of Korean.

participant can be understood as volitionally bringing about the psych state in the experiencer. Previous work has demonstrated that the possibility for an EO verb to accommodate an agentive reading is lexically conditioned. If a verb allows for both agentive and non-agentive interpretations (as the verbs shown in (3), (5), and (6)) the choice between these readings is determined by context (Verhoeven 2017).

It has been shown for diverse languages that individual transitive EO verbs display differences in their propensity to accommodate an agentive reading (Verhoeven 2010; Grafmiller 2013; Verhoeven 2017). This also holds for Spanish and Korean EO predicates. Individual native speaker intuitions on the acceptability of an agentive reading of EO verbs show variation between the individual lexical items. According to native speaker intuitions, the Spanish sentence in (7a) with the verb *molestar* 'anger' is much more acceptable in combination with the adverb *intencionalmente* 'intentionally' than the verb deprimir '*depress*' in (7b).

(7) *Spanish*
    a. Carolina molest-ó   a la taxista   intencionalmente.
        Carolina bother-PST.3.SG to the taxi.driver on.purpose
        'Carolina bothered the taxi driver on purpose.'

    b. ?Rosa deprim-ió   al   fotógrafo   intencionalmente.
        Rosa depress-PST.3.SG to.the photographer on.purpose
        intended: 'Rosa depressed the photographer on purpose.'

Similarly, for Korean, the sentence in (8a) containing the psych verb *nollata* 'get surprised' was judged more acceptable than the sentence in (8b) containing the psych verb *wenmangsulepta* 'be resentful'. The structure in (8) tests agenthood of the subject referent by embedding the causative structure under a matrix verb of decision, *kyelsimhata* 'decide', which implies that the subject has control over the event given in the subordinate clause.

(8) *Korean*
    a. kwahakca-ka Cinho-lul nolla-key   ha-lyeko kyelsimhay-ss-ta.
        scientist-NOM Cinho-ACC get.surprised-ADVR do-CNJ   decide-PST-DECL
        'The scientist decided to make Cinho get surprised.'

    b. ?miyongsa-ka   Yuna-lul wenmangsulep-key ha-lyeko kyelsimhay-ss-ta.
        hairdresser-NOM Yuna-ACC be.resentful-ADVR   do-CNJ   decide-PST-DECL
        intended: 'The hairdresser decided to make Yuna resentful.'

What lies behind such gradient judgements? Following Verhoeven (2017), we assume that agentivity per se is not a scalar notion. Rather, a verb either allows for an agentive reading or not. The gradient ratings obtained from (7) and (8) are indicative of the possibility to imagine a context in which the verb is used agentively. Furthermore, EO verbs seem to differ as to whether they are more or less directly associated with (specific) actions bringing about the experiential state. In the sentences in (9), the EO verbs seem to invoke certain actions and the subject referent is clearly interpreted as agentive.

(9) *Spanish*
    a. Los jóvenes   asust-aron   a los transeúntes (con sus   máscaras).
        the teenagers frighten-PST.3.PL to the pedestrians with their masks
        'Teenagers frightened the pedestrians (with their masks).'

    b. A los niños   les   gust-a   molestar   a Pablo.
        to the children CL.DAT like-PRS.3.SG bother.INF to Pablo
        'The children like to bother Pablo.'

Note that this also seems to hold for the agentive EO verbs mentioned in Martin & Schäfer (2017). The German EO verbs *ermutigen* 'encourage', *provozieren* 'provoke', *beruhigen* 'reassure' can be associated with acts of communication (or social interaction, see Martin & Schäfer 2017), where the subject referent is talking to/about the object referent in order to encourage or reassure them or to provoke them.

Coming back to the ACH, if the potential to adopt an agentive reading is decisive for zero-state readings with transitive EO verbs, we expect that differences of the former influence the acceptability of the latter. Hence we predict that gradient agentivity (in the introduced sense) should directly correlate with the propensity to allow zero-state readings.

3.3 Lexical aspectual and event structure

As introduced in Section 1 for both Spanish and Korean, it has been argued that some of their psych verbs denote inchoative states (Marín & McNally 2005; 2011; Fábregas et al. 2012; Choi Jiyoung & Demirdache 2014; Choi Jiyoung 2015b; Fábregas 2015; Fábregas & Marín 2015). This analysis contrasts with the hitherto predominant view that transitive EO verbs in their agentive and eventive readings belong to the class of accomplishment or achievement verbs (Van Voorst 1992; Landau 2010; Alexiadou & Iordăchioaia 2014). In the present section we will discuss our basic assumptions about the aspectual and event structural properties of the transitive EO predicates in Spanish and Korean.

Marín and McNally (2005; 2011) claim that Spanish reflexive psych verbs refer to the onset of the experiential state they are associated with, without making any allusion to the change that produces said state. Building on the notion of 'boundary' by Piñón (1997), they distinguish two aspectual subclasses: (a) inchoative states (e.g. *divertirse* 'get/be entertained'), which include both some part of the state and its onset (i.e. the left boundary), and (b) punctual eventualities which allude only to the onset of the state (e.g. *sorprenderse* 'get/be surprised').[5] Following Fábregas (2015) and Fábregas and Marín (2015) this aspectual characterization is also valid for the transitive alternants such as *divertir* 'entertain' or *sorprender* 'surprise' when occurring with an accusative experiencer object (cf. examples (5b/c) and (7), see Appendix, Table 1 for further verbs belonging to the two subclasses of inchoative state causatives and punctual causatives). Based on Pesetsky (1995), Fábregas and Marín (2015) propose that EO predicates are built over the structure of experiencer subject predicates by the addition of a causative layer. This causative layer accommodates the causer responsible of triggering the emotion, and this causation defines the onset of the state which is represented in the lower layer. We follow this analysis in assuming that the Spanish transitive EO predicates are bi-eventive consisting of a causing eventuality and a state component.

For Korean, two types of stative psych verbs[6] have to be distinguished: (a) verbs denoting pure states (e.g. *culkepta* 'pleased') which are atelic with no boundaries, and (b) verbs denoting inchoative states (e.g. *nollata* 'get surprised'), which refer to the inception of a state, with no inherent culmination in its aspectual meaning (Choi Jiyoung & Demirdache 2014; Choi Jiyoung 2015a; 2015b). The two classes are distinguished by their (in)compatibility with the inchoative marker *-eci* 'become'. While pure state verbs can be combined with *-eci* (10a) inchoative state verbs cannot (10b). This is explained by the analysis that the verbs of the latter group lexically incorporate the initial point of the state which blocks the addition of an overt inchoative marker (Choi Jiyoung 2015a; 2015b).

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[5] Marín & McNally (2011) come to the conclusion that these latter verbs are *achievements* in Piñón's (1997) terms; i.e. they refer to a point in time lacking any meaningful duration.

[6] The items belonging to this class are often referred to as adjectives (Sohn Ho-Min 1999). We follow Kim Min-Joo (2002) in calling them stative verbs here, which has however no bearing on the present analysis. For a more detailed discussion on whether items such as those discussed here are better classified as adjectives or stative verbs see, among others, Kim Min-Joo (2002), Kang Soon Haeng (2005).

(10) *Korean*
  a. Mina-ka   (kapcaki) culkew-eci-ess-ta.
      Mina-NOM   suddenly pleased-INCH-PST-DECL
      'Mina (suddenly) became pleased.'

  b. *Mina-ka   (kapcaki) nolla-eci-ess-ta.
      Mina-NOM   suddenly get.surprised-INCH-PST-DECL
      intended: 'Mina (suddenly) got surprised.'

Verbs of both types combine with the causative verb *hata* 'do.DECL' to form a periphrastic causative EO structure (see (6) and (8); see Appendix, Table 2 for further verbs belonging to the two subclasses of pure state causatives and inchoative state causatives). The light verb *hata* 'do.DECL' functions as the syntactic head of the causative construction (Lee Juwon 2015). The experiencer and the stative verb syntactically form a small clause, being subordinated to *hata* 'do.DECL' by means of the adverbializer *–key*. Both the stative verb and the causative verb each contribute their own syntactic and semantic features to the unified complex predicate (Park Ki-Seong 1993). In the sentences in (6) and (8) (see also (16) below), the complex causative predication refers to an unspecified causing eventuality which makes the experiencer (start to) be in the state encoded by the embedded verb. While the embedded inchoative state verbs lexically encode the left boundary of the state, with embedded pure state verbs, the inception of the state arises as a result of the syntactic structure of causativization.

  There are a number of event structure tests which are commonly used to identify bi-eventivity, among them tests which identify different readings with adverbs like *again* or *almost* dependent on whether they relate to the causing event or the caused (result) state (see e.g. Martin & Schäfer 2017). In the following, we apply the *almost*-test[7] starting with Landau's (2010) observation that sentences with agentive psych verbs in co-occurrence with the adverb *almost* display an ambiguity between (a) a reading "in which the causing event almost took place" and (b) a reading in which the event of getting into the psychological state almost took place (Landau 2010: 130). Example (11) shows that the causing event can be targeted by the adverb as well. This reading is explicit under the continuation given in brackets.

(11) *English* (Landau 2010: 130)
      John almost frightened Mary (but at the last moment, he decided not to).

Applying this test to the Spanish verb *sorprender* 'surprise' gives rise to interpretations parallel to the English case. Disregarding the continuation in brackets, the sentence (12) is ambiguous between a reading in which *casi* 'almost' relates to the causing event and a reading in which it relates to the caused eventuality. Again, the former reading is explicit under the continuation given in brackets.

(12) *Spanish*
      Manuel casi   sorprend-ió   a Laura.
      Manuel almost surprise-PST.3.SG to Laura
      (pero al   último momento decid-ió   no   hac-er = lo).
       but to.the last   moment   decide-PST.3.SG NEG do-INF = CL.ACC
      'Manuel almost surprised Laura (but at the last moment he decided not to do it.)'

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[7] The *again*-test, distinguishing between repetitive (i.e. the repetition of the causing action) and restitutive (i.e. the restitution of a former state of the object referent) interpretations, gives corresponding results. However, it seems to be more lexically restricted since the restitutive reading depends on the plausibility of the experiential state holding without causation (Martin & Schäfer 2017; cf. also Alexiadou & Iordăchioaia 2014 for the successful application of the test with Greek and Romanian agentive/eventive EO verbs).

Applying the *casi*-test to other Spanish EO verbs as e.g. *divertir* 'entertain', which are less felicitous with an agentive reading of the subject (cf. Section 3.2), indicates that this test is also sensitive to agentivity, given that the cancellation part presupposes control of the subject referent by using the verb *decidir* 'decide'. The sentence in (13a) is less felicitous with a continuation that cancels the causing event than the sentence in (12).[8] However, once agentivity of the subject is explicitly stated, as in (13b), judgements are again as expected.

(13)   *Spanish*
        a.   Manuel casi   divirt-ió   a Laura
             Manuel almost entertain-PST.3.SG to Laura
             (?pero al   último momento decid-ió   no   contar chistes).
              but to.the last   moment decide-PST.3.SG NEG tell   jokes
             'Manuel almost entertained Laura (but at the last moment he decided not to tell jokes).'
        b.   Manuel casi   divirt-ió   a Laura a propósito
             Manuel almost entertain-PST.3.SG to Laura on purpose
             (pero al   último momento decid-ió   no   contar chistes).
              but to.the last   moment decide-PST.3.SG NEG tell   jokes
             'Manuel almost entertained Laura on purpose (but at the last moment he decided not to tell jokes).'

Similar to the Spanish example in (12), the Korean example in (14) demonstrates ambiguity in readings when applying the *almost*-test to the periphrastic causative construction containing an agent. As in Spanish, (14) conveys two interpretations: (a) a reading that the causing event almost takes place, i.e. Mina almost performing an action that would cause Minho to be pleased or get surprised, and (b) a reading where the experiential state is targeted (Kim Nam-Kil 2002), i.e. Minho almost being pleased or getting surprised.[9]

(14)   *Korean*
        Mina-ka   Minho-lul culkep-key   / nolla-key   ha-l   ppen
        Mina-NOM Minho-ACC pleased-ADVR / get.surprised-ADVR do-ATTR verge
        hay-ess-ta   (kulena macimak swunkan-ey Mina-nun amwukesto ha-ci
        do-PST-DECL but   last   moment-LOC Mina-TOP nothing   do-NMLZ
        anh-ass-ta).
        NEG-PST-DECL
        'Mina almost made Minho pleased / get surprised (but at the last moment, Mina decided not to do anything).'

Thus, it can be concluded that the causative EO predicates of both languages under investigation are consistent with causative accomplishment predicates in their property of being bi-eventive.

However, for both languages, a difference in behavior to canonical bi-eventive causative accomplishment predicates can be shown when applying the traditional (a)telicity tests, i.e. the co-occurrence with the durative adverbial *for x time* and the time-span adverbial

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[8] Fábregas (2015: 60) argues that the second clause of a sentence such as (12) generates a contradiction. However, there seems to be variation among speakers where some do not have problems getting both interpretations identified above. We relate such variation to the reading ambiguities of the EO verbs introduced in Section 1 (i.e., agentive, eventive, stative), which are often quite subtle, and to inter-speaker differences in how easy agentive interpretations are available per verb (see Section 3.2).

[9] Note that a more salient reading targeting the experiential state is possible with the adverb *keuy* 'almost'. However, *keuy* does not allow an interpretation of the causing event almost taking place (Kim Nam-Kil 2002).

in x time (Dowty 1979). *In x time* measures the smallest interval during which the eventuality denoted by the predicate takes place, and *for x time* measures event duration and is compatible with eventuality predicates that do not encode an endpoint. Example (15) demonstrates for Spanish that both subtypes of EO verbs naturally combine with the durative adverbial, however triggering different interpretations: EO verbs denoting inchoative states elicit a durative reading due to their stative component (*divertir* 'entertain' in (15a)), whereas punctual EO verbs elicit an iterative reading due to the presence of only the left boundary (without any temporal extension, as *sorprender* 'surprise' in (15b)). In contrast, bi-eventive causative accomplishment predicates are generally judged as infelicitous with the *for*-adverbial.[10] These latter verbs are most natural in combination with a time-span adverbial (e.g. for *repair* in (1) *he repaired the car in two hours*), where the adverbial measures the causing event (i.e. the action performed by the subject referent, the telos of which coincides with the obtention of the result state in the object referent; cf. Martin 2020). On the contrary, Spanish transitive EO verbs are generally not highly acceptable when combined with the time-span adverbial. With both inchoative state verbs and punctual verbs there is a (possibly marginal) reading with the time-span adverbial, which measures the time until the state in the experiencer starts. This reading is sometimes referred to as *ingressive*, and it can be made explicit by a paraphrase where *in* is replaced with *after* (see translations in (15)). This reading is more easily interpretable with an agentive subject (cf. also Landau 2010: 129 for English). The ingressive reading seems to be the result of a repair mechanism which applies because the psych predicates lack the denotation of a process leading to an endpoint (the obtention of the result state), which could be measured by the adverbial. In other words, the EO predicates are not associated with any scalar properties since the causing events do not involve a change component.

(15)   *Spanish*
   a.   Manuel / la   película   (la)   divirt-ió   a Laura durante/
        Manuel / the movie   CL.ACC   entertain-PST.3.SG   to Laura for/
        ?en cinco minutos.
        in   five   minutes
        intended: 'Manuel / the movie entertained Laura for / in(=after) five minutes.'
   b.   Manuel / la   película   (la)   sorprend-ió   a Laura durante/
        Manuel / the movie   CL.ACC   surprise-PST.3.SG   to Laura for/
        ?en cinco minutos.
        in   five   minutes
        intended: 'Manuel / the movie surprised Laura for / in(=after) five minutes.'

The behavior of Korean causative EO structures is similar, though not identical, to the Spanish inchoative state causatives regarding the (a)telicity tests (cf. example (15) for Spanish). In fact, both durative adverbials and time-span adverbials combine felicitously with the members of both experiential subtypes (16). As shown for the Spanish inchoative state causatives in (15a), also in Korean, the durative adverbial (*sippwun tongan* 'for ten minutes') relates to the duration of the embedded experiential state. The combination with the time-span adverbial *sippwun maney* 'in ten minutes' is possible with an ingressive reading concerning the occurrence of the experiential state. In contrast to the corresponding Spanish case illustrated in (15a), Korean speakers judged the combination with the time-span adverbial *sippwun maney* 'in ten minutes' as natural. With an animate subject

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[10] Note that some authors identify felicitous combinations of accomplishment VPs with durative adverbials, e.g. under reinterpretation as activities, see Martin (2019) for a discussion. In addition, there also may be readings related to the result-state with *for*-adverbials.

(Mina in (16)) the sentence is compatible with a situation where Mina performed an action for 10 minutes and Minho started being pleased/getting surprised at the end of this time span.[11]

(16)   *Korean*
    a.   Mina-ka   / ku yenghwa-ka Minho-lul   sip-pwun   tongan / maney
        Mina-NOM/ the movie-NOM Minho-ACC ten-minutes for   / in
        culkep-key   hay-ess-ta.
        pleased-ADVR do-PST-DECL
        'Mina / the movie made Minho pleased for / in(=after) ten minutes.'

    b.   Mina-ka   / ku yenghwa-ka Minho-lul   sip-pwun   tongan / maney
        Mina-NOM/ the movie-NOM Minho-ACC ten-minutes for   / in
        nolla-key   hay-ess-ta.
        get.surprised-ADVR do-PST-DECL
        'Mina / the movie made Minho get surprised for / in(=after) ten minutes.'

Summarizing the previous discussion, we can conclude that in both of our languages transitive EO predicates differ from canonical bi-eventive causative accomplishment predicates in that they lack a clear change of state component as part of the causing event, i.e. they do not refer to a process undergone by the experiencer prior to (the onset of) the state. This was particularly evident when combining the verbs with a time-span adverbial, where only an ingressive (=*after*) reading related to the experiential state was available. Beyond this difference, the causative EO predicates in Korean and Spanish share structural similarities with the class of causative accomplishment predicates. Most crucially, they are bi-eventive consisting of a causing eventuality and a caused state. Furthermore, causative EO predicates potentially accommodate an agentive subject, which intentionally brings about the state in the object experiencer. Table 1 provides an overview of the differences and similarities of the discussed causative EO predicates compared to causative accomplishment predicates. The properties noted in the table correspond to the prototypical readings and acceptability ratings of the particular tests.

Table 1: Properties of causative EO predicates and accomplishment predicates.*

	Spanish		Korean		Spanish/Korean
	inchoative	**punctual**	**pure**	**inchoative**	**accomplishment**
bi-eventivity	✓	✓	✓	✓	✓
agentivity	✓ | –	✓ | –	✓ | –	✓ | –	✓
telicity (*in*-adverbial)	'after'	'after'	'after'	'after'	regular
telicity (*for*-adverbial)	✓	✓ (iterative)	✓	✓	–

* inchoative = inchoative state causative, punctual = punctual causative, pure = pure state causative, accomplishment = causative accomplishment.

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[11] We tentatively propose that the difference in acceptability can be related to the difference in syntactic structure between the two languages. The periphrastic causative *-key hata* '-ADVR do.DECL' adds an unspecified causing eventuality to the state, so that the causative structure is syntactically transparent. The *in*-adverbial then may be more easily interpreted as related to the causing eventuality and taking the causation of the state as a boundary. In the simple verbal structures of Spanish this interpretation is less transparent. Notably however, in both cases, no change is measured but rather, it is understood that the experiential state starts at the end of the given time-span.

Following a bi-eventive conceptualization of causative accomplishments (cf. Kratzer 2005; Schäfer 2008 among others) causative accomplishment predicates (such as e.g. *repair*) are understood as denoting a set of causing events conceived of as made of some process leading to a culminating natural endpoint. The subject referent is involved as an agent/causer of the causing eventuality while the object referent undergoes a change of state as determined by the verbal meaning (e.g. *repaired/fixed*). While the Spanish and Korean EO predicates are also bi-eventive and causative, they differ from regular causative accomplishment predicates in that they denote a set of causing events conceived of as consisting of some process without including a change in which the experiencer is involved. Rather, the causing events bring about the (start of the) state in the experiencer. While the causing part in the representation is assumed to be identical across subclasses for each language, the state part exhibits language-specific differences. Following Marín & McNally (2011), Spanish inchoative state verbs such as *divertirse* 'get entained' differ from punctual psych verbs such as *asustarse* 'get/be frightened' or *sorprenderse* 'get/be surprised' in that they include both some part of the state and its onset (i.e. the left boundary) in their denotation, while the punctual psych verbs include just the onset (i.e. the left boundary). As introduced above, we assume that their transitive causative counterparts are equipped with the same semantic properties in their state part (Fábregas 2015; Fábregas & Marín 2015). Hence, punctual causative EO verbs (cf. *sorprender* 'surprise' in (17a) or *asustar* 'frighten' in (5b,c), (9a)) in their agentive/eventive readings name an event e of a participant x (i.e. the experiencer *Laura* in (17a)) starting a (lexically specified) experiential state (i.e. *surprise* in (17a)), which is caused by another (lexically underspecified) eventuality of which a participant y (i.e. *Manuel/la película* in (17a)) is the effector, thus generalizing over the more specific thematic roles agent and causer (cf. Van Valin & Wilkins 1996).

(17) *Spanish*
    a. Manuel / la película sorprend-ió   a Laura.
       Manuel / the movie   surprise-PST.3.SG to Laura
       'Manuel / the movie surprised Laura.'

    b. Manuel / la película divirt-ió   a Laura.
       Manuel / the movie   entertain-PST.3.SG to Laura
       'Manuel / the movie entertained Laura.'

Spanish inchoative state causative verbs such as *divertir* 'entertain' in their agentive/eventive reading (see (17b); see also *molestar* 'bother' in (7a)) differ from the punctual causatives in the conceptualization of the state part, which includes some part of the state and its onset. Hence inchoative state causative EO verbs in their agentive/eventive readings name an event e of a participant x (i.e. the experiencer *Laura* in (17b)) starting to be in a (lexically specified) experiential state (i.e. *being entertained* in (17b)), which consists of some part of the state and its onset. As in (17a), e is caused by a lexically unspecified eventuality, of which participant y (i.e. *Manuel/la película* in (17b)) is the effector.

Based on the aspectual analysis of the inchoative state verbs presented above (see (10); Choi Jiyoung & Demirdache 2014; Choi Jiyoung 2015a; 2015b) we assume that the Korean inchoative state causatives such as *nollakey hata* 'make get surprised' in their agentive/eventive reading (see (18a)) are parallel to the Spanish inchoative state causatives. Agentive/eventive *nollakey hata* 'make get surprised' names an event e of a participant x (i.e. the experiencer *Minho* in (18a)) starting to be in the state of surprise which is caused by another eventuality of which participant y (i.e. *Mina/ku yenghwa* in (18a)) is the effector.

(18) *Korean*
  a. Mina-ka   / ku yenghwa-ka Minho-lul   nolla-key   hay-ess-ta.
      Mina-NOM / the movie-NOM Minho-ACC get.surprised-ADVR do-PST-DECL
      'Mina / the movie made Minho get surprised.'

  b. Mina-ka   / ku yenghwa-ka Minho-lul   culkep-key   hay-ess-ta.
      Mina-NOM / the movie-NOM Minho-ACC pleased-ADVR do-PST-DECL
      'Mina / the movie made Minho pleased.'

Finally, for the Korean pure state causatives such as *culkepkey hata* 'make pleased' (cf. (18b)), see also *mwusepkey hata* 'make scared' in (6), we assume a simple state part, in accordance with the denotation of pure state predicates (see argumentation above and Choi Jiyoung 2015b). Hence, *culkepkey hata* 'make pleased' in its agentive/eventive reading denotes an event *e* of a participant *x* (i.e. the experiencer *Minho* in (18b)) being in the state of being pleased which is caused by another eventuality of which participant *y* (i.e. *Mina/ku yenghwa* in (18b)) is the effector.

The characterizations of the causative EO predicates illustrated in (17) and (18) are silent about the nature of the causing eventuality. In Section 3.2, it was argued that the individual EO predicates per language differ in their propensity to accommodate an agent in the effector role and at the same time being associated with more specific actions. For instance, the latter seems to hold for Spanish EO verbs such as *molestar* 'bother' or *asustar* 'frighten' in contrast to *deprimir* 'depress' (cf. (7), (9a)). The same contrast is present in the Korean causative EO predicates, as was shown for *nollakey hata* 'make get surprised' vs. *wenmangsulepkey hata* 'make resentful' (see (8)). Given that the agentive involvement of the subject referent is a prerequisite for non-culminating readings, we assume that those causative EO predicates that are more clearly associated with specific agentive activities are more easily interpreted with zero-state readings. Recall from Section 3.2, that similarly the German EO verbs *provozieren* 'provoke', *beruhigen* 'reassure', *ermutigen* 'encourage' identified in Martin & Schäfer (2017) as defeasible causatives are similarly associated with communicative activities.[12] Insofar as the causative EO predicates can be interpreted as including an action performed by an agent (with the intention of triggering a certain experiential state in the experiencer) in their denotation, they may be compatible with zero-state readings.

Despite the syntactic difference in building transitive EO structures – Spanish uses transitive verbs[13] while Korean uses a periphrastic structure with a causative light verb – the EO predicates of both languages share the properties which have been identified as crucial for non-culminating readings (see Section 2). Based on these prerequisites, we will experimentally investigate their potential for zero-state construals, depending on the potentially gradient agentive involvement of the subject referent. Before presenting the empirical study in Section 4, the impact of punctuality on non-culminating readings needs to be addressed.

3.4 Punctuality and non-culmination

The above (a)telicity tests (see examples (15) and (16)) have demonstrated that the two more specific verb subclasses per language differ with respect to including some part of the state in their denotation (both Korean subclasses, i.e. pure and inchoative state causa-

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[12] This is reflected in Martin's (2019; 2020) approach to defeasible causatives, which is based on the assumption that the respective verbs predicate a manner property of the action performed by the agent.

[13] In fact, the transitive EO verbs are mostly morphologically complex and related to nominal roots by processes which come along with a causative semantics, cf., e.g., *en-fur-ec-er* 'infuriate', *a-sust-ar* 'frighten', *a-temor-iz-ar* 'intimidate', etc. (see Fábregas & Marín 2015).

tives, and Spanish inchoative state causatives) versus including the left boundary of the experiential state (without any temporal extension), as the Spanish punctual causative psych verbs do. The latter was visible through the iterative interpretation yielded by these verbs in combination with the durative adverbial (15b). Following the analysis of Marín and McNally (2011), punctual psych verbs such as *asustarse* 'be frightened' or *sorprenderse* 'be surprised' are perceived as achievements in terms of Piñón (1997), i.e. they make reference to a point in time lacking any meaningful duration. Several researchers have pointed out for different languages that achievements disallow non-culminating construals (cf. Bar-el 2005 on Salish languages; Tatevosov & Ivanov 2009 on Russian; Beavers 2013 on English; Altshuler 2014 on Hindi and Russian). Altshuler (2014) attributes this behavior to the fact that achievement verbs denote atomic (indivisible) stages. Obligatory culmination with achievements is generally discussed and illustrated with examples from intransitive or transitive non-agentive/non-causative verbs such as *arrive, reach, find, win,* etc. Agentive verbs denoting causation of an instantaneous change in the object referent such as *kill* or *break* may allow for non-culminating readings in some languages (Demirdache & Martin 2015; Demirdache et al. 2017 on Mandarin *shā* 'kill'; see also Tatevosov & Ivanov 2009 on *sın-dır-* 'break-CAUS-' in Karachay-Balkar (Turkic)). However, it seems that across languages non-culminating readings with such causative achievement predicates are more difficult to interpret. For instance, for Mandarin it is reported that an interpretation of non-culmination with verbs such as *shā* 'kill' or *suì* 'break' is significantly facilitated when an iterative adverb meaning 'several times' is added (Demirdache et al. 2017). As for languages as German and French, the list of defeasible causatives presented in Martin & Schäfer (2017) does not contain any clearly punctual verbs. Based on this initial evidence we argue for Spanish that causative achievement verbs such as *reventar* 'burst', which include a causative event and a punctual change in their denotation, are perceived as punctual under everyday granularity (cf. Gyarmathy 2015) and hence cannot be easily interpreted as non-culminating. This may be due to the fact that the causing event is perceived as instantaneously provoking the result state. Observe the perfective sentence in (19), where the complex eventuality denoted by the verb *reventar* 'burst' is conceived of as an indivisible unit occurring in a very short moment under everyday granularity. The point in time where the balloon bursts is seen as inseparable from the point in time where Manuel's action causes the balloon to burst. In other words, as soon as the subject referent performs the causing action of bursting the balloon, the object changes state.

(19)   *Spanish*
         Manuel   revent-ó   el   globo   (intencionalmente).
         Manuel   burst-PST.3.SG the balloon on.purpose
         'Manuel (intentionally) burst the balloon.'

Interestingly, in aspectual diagnostics tests causative achievement verbs such as *reventar* 'burst' behave as regular non-causative achievement verbs do. Due to their non-duration, achievement verbs formed in the progressive generate a preliminary circumstance reading[14] (cf. Piñón 1997; Kearns 2003; Marín & McNally 2011). This also holds for the sentence in (20a), which has the interpretation that Manuel has not yet caused the balloon to burst but the balloon is in the stage prior to being burst (i.e. it is still whole). Hence the

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[14] Note that this holds true for the subclass of culmination achievement verbs (Gyarmathy 2015), also known as *right boundary achievements* (e.g. Piñón 1997; Malink 2008; Martin 2011), such as *arrive* in *arrive at the station* or *reach* as in *reach the top of the mountain,* which strongly presuppose a gradual process (or *cover event* in Gyarmathy 2015) that leads to a culmination point which is the arriving at the station or the reaching of the top of the mountain.

sentence in (20a) can be paraphrased with the sentence in (20b) implying that no stage of the predicate is going on yet (cf. Rothstein 2004: 52).[15]

(20)   *Spanish*
    a. Manuel est-á   revent-ando el   globo.
        Manuel be-PRS.3.SG burst-GER   the balloon
        'Manuel is bursting the balloon.'
    b. Manuel est-á   por revent-ar el globo.
        Manuel be-PRS.3.SG for burst-INF the balloon
        'Manuel is about to burst the balloon.'

Similar to causative achievement verbs such as *reventar* 'burst', Spanish punctual causative psych predicates such as *asustar* 'frighten' or *sorprender* 'surprise' denote complex eventualities consisting of a causative event and the left boundary of the caused experiential state. These are equally perceived as instantaneous at everyday granularity. In the agentive use of the verb *sorprender* 'surprise' in (21), the predicate describes a complex eventuality where Manuel's causing activity is understood as inseparable from the caused state in the experiencer.

(21)   *Spanish*
    Manuel sorprend-ió   a Laura (intencionalmente).
    Manuel surprise-PST.3.SG to Laura on.purpose
    'Manuel surprised Laura (intentionally).'

As with causative achievement verbs, when punctual psych verbs are formed in the progressive, they yield a preliminary circumstance reading with respect to the point where the state is caused to start. For sentence (22a), native speakers' judgements consistently yield the interpretation that Manuel has not yet caused the experiencer Laura to enter the state of surprise, and Laura is at the stage prior to entering the state. Importantly, native speakers did not interpret (22a) as referring to an ongoing activity of the subject referent. The progressive structure in (22a) can be paraphrased with the *about to* structure in (22b).

(22)   *Spanish*
    a. Manuel est-á   sorprend-iendo a Laura.
        Manuel be-PRS.3.SG surprise-GER   to Laura
        'Manuel is surprising Laura.'

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[15] Gyarmathy (2015) analyzes achievement verbs such as intransitive *explode* in the progressive as non-durative predicates at an everyday granularity, but as taking non-zero time at a finer granularity which is enforced by a slow-motion manner (e.g. when watching a video recording); cf. examples such as *Look at the screen. The Challenger is exploding now* (cf. Gyarmathy 2015: 88). The native speaker interpretations reported for (20a) are based on everyday granularity. Imposing a slow-motion frame for this example, Spanish speakers still tend to have a preliminary circumstance reading for those actions of the subject's referent that are not immediately causing the change in the object's referent. Assuming a scenario where Manuel bursts a balloon by using a knife for (i), the pressing of the knife against the balloon without causing the tearing of the balloon is still interpreted as a preliminary process. It is at the exact millisecond that the knife causes the balloon to tear apart when the balloon bursts. Hence Spanish speakers tend to continue the sentence in (i) as in (ii), showing the interpretation of the *about to* reading. The true *slow motion* progressive reading arising at a finer granularity (in the sense of Gyarmathy 2015) only applies to the very short moment of directly causing the result.

  (i)   Mira la pantalla. Manuel está reventando el globo ahora.
       'Look at the screen. Manuel is bursting the balloon now.'
  (ii)   … y ahora el globo revienta.
       '… and now the balloon bursts.'

b. Manuel est-á   por sorprend-er a Laura.
Manuel be-PRS.3.SG for surprise-INF to Laura
'Manuel is about to surprise Laura.'

Summarizing the previous discussion, we have argued that Spanish causative achievement verbs, which include verbs such as *reventar* 'burst' and the punctual causative psych verbs such as *sorprender* 'surprise', are perceived as punctual in an everyday granularity. Aspectual diagnostics have shown that under this coarse granularity, they show the same behavior as culmination achievement verbs. Based on this evidence, we expect that the Spanish punctual causative psych verbs behave like regular achievement verbs and disallow, or at least disfavor, non-culminating construals. Hence, for the experimental study, we expect that Spanish punctual EO verbs are not or only weakly acceptable in a non-culminating zero-state interpretation, regardless of the type of subject, i.e. regardless of whether it is an agent or an inanimate causer.

4 Testing zero-state interpretations

The present study aims to test the impact of agentivity on zero-state readings with transitive EO predicates in Spanish and Korean using a repeated observations design. Building on Demirdache and Martin's (2015) ACH, we developed a parallel experimental design for the two languages in order to test whether (and in how far) transitive EO structures in the two languages are instantiations of non-culminating causation, in parallel to putative psych accomplishment predicates as French/German *encourager/ermutigen* 'encourage', *provoquer/provozieren* 'provoke', *rassurer/beruhigen* 'reassure' (cf. Martin & Schäfer 2017). The experimental factors are introduced in Section 4.1, the material is presented in Section 4.2, Section 4.3 describes the procedure and Section 4.4 reports the experimental results.

4.1 Study design

We designed two separate acceptability studies, one for each language. Following the discussion in Section 3, two factors seem to play a role for the possibility of a zero-state non-culminating reading: the agentivity of the subject and the verbal aspect type. The factor agentivity was implemented indirectly via the animacy of the subject referent: only animates can be interpreted as agentive while inanimate referents are necessarily interpreted as non-agentive. Furthermore, verbal aspect in EO verbs differs between the two languages: as outlined in Section 3.3, Korean EO structures denote either pure or inchoative state causatives whereas Spanish EO verbs are inchoative state causatives or punctual causatives. Both experiments have the same design, examining the impact of the fixed factors ANIMACY (SUBJECT) and VERBAL ASPECT on the acceptability of a zero-state in the object experiencer, as outlined in (23).

(23) a. Fixed factors
          ANIMACY (SUBJECT) (2 levels): animate vs. inanimate
          VERBAL ASPECT (2 levels) per language:
              inchoative state causative vs. punctual causative (Spanish exp.)
              inchoative state causative vs. pure state causative (Korean exp.)
      b. Dependent variable
          Acceptability of a ZERO-STATE in the experiencer

Following the considerations presented in Section 3, agentivity (implemented through animacy) of the subject is expected to have an impact on the acceptability of a sentence that cancels the experiential state in the object referent in both Spanish and Korean to the effect that with animate subjects, such sentences are significantly more acceptable than with inanimate subjects. Note that this expectation is based on the similarity of causative EO

predicates to the bi-eventive causative accomplishment predicates investigated in Martin & Schäfer (2017), based on the shared causative component. Furthermore, for Spanish we expect an interaction of the factor ANIMACY (SUBJECT) with the factor VERBAL ASPECT. Cancelling the state in the object experiencer is expected to be more acceptable with inchoative state causatives (e.g. *divertir* 'entertain') than with punctual causatives (e.g. *sorprender* 'surprise'), as explained in Section 3.3. and 3.4. Table 2 gives an overview of the expected effects for the Spanish experiment.

Table 2: Expected effect on zero-state readings across factors of interest (Spanish).

VERBAL ASPECT	ANIMACY (SUBJECT)	
	animate	inanimate
inchoative state causative	zero-state possible	zero-state not possible
punctual causative	zero-state not possible	zero-state not possible

For Korean, expectations concerning the impact of the factor VERBAL ASPECT are different: in this language EO psych structures encode either inchoative state causatives or pure state causatives which are expected to behave in parallel to the Spanish inchoative EO verbs. Hence, for the Korean experiment we only expect a main effect of ANIMACY (SUBJECT) across the two aspect classes (see Table 3). Note that the two classes examined in the Korean experiment cover the existing range of EO verb classes in this language. Hence these two classes exhaust the range of possible EO verb classes for which the possibility of a zero-state interpretation can be tested.

Table 3: Expected effect on zero-state readings across factors of interest (Korean).

VERBAL ASPECT	ANIMACY OF (SUBJECT)	
	animate	inanimate
inchoative state causative	zero-state possible	zero-state not possible
pure state causative	zero-state possible	zero-state not possible

4.2 Material

The factor VERBAL ASPECT was implemented by 10 verbs per aspect class in each language (see Appendix, Table 1 lists the Spanish verbs, Table 2 lists the Korean verbs). The items chosen were part of a larger inventory elicited by a questionnaire targeting alternating psych verbs featuring basic emotion domains in terms of typical emotion triggering situations (i.e. happiness, sadness, anger, fear, and disgust), resulting in an inventory of 118 alternating verbs for Spanish and an inventory of 59 alternating verbs for Korean (see Rott & Verhoeven 2019; Rott et al. 2020). For each language inventory, we screened the verbs with respect to frequency (and for Spanish, frequency considering both macro-varieties of the language, Peninsular Spanish and Latin American Spanish), morphosyntactically more simple items (in Korean, items including body parts were excluded, e.g. *maum-i mwukep-ta* 'have a heavy heart'), and most prototypical items by emotion domain. To identify the verbs' semantic subclasses, the event structure properties of the items such as stativity, inchoativity/punctuality, telicity, and dynamicity (Dowty 1979; for Spanish: Marín & McNally 2011; Fábregas & Marín 2015; for Korean: Choi Jiyoung & Demirdache 2014; Choi Jiyoung 2015b; Beavers & Lee Juwon 2020) were tested with several native speakers of the languages via the compatibility of a verb structure with state vs. event modifiers.

As for the factor ANIMACY (SUBJECT), animate subjects were rendered by proper names in both languages equally distributed over feminine and masculine gender. As inanimate subjects, we considered definite common nouns representing individuals (e.g. *The picture upset Peter*) or natural forces (e.g. *The thunder scared Mary*), avoiding subjects which can be easily reinterpreted as instruments of an implicit agent (e.g. *The speech of the dean flattered John,* Martin & Schäfer 2017; Martin 2019). The experiencer objects were all proper names.

In order to test the acceptability of a zero-state reading we used sentences of the type introduced in (24) for Spanish and in (25) for Korean. (24a–d) and (25a–d) illustrate the four conditions for Spanish and Korean, respectively. (24e) and (25e) present the invariable continuation which targets to test the possibility of cancelling the state in the experiencer by stating their unawareness of the experiential state. Awareness of the experiential situation on the part of the experiencer is generally claimed to be a prerequisite for the existence of a mental state in the experiencer (e.g., Dowty 1991; Landau 2010; see Temme 2018 for an elaboration of the awareness condition). In both languages, the sentences are presented in the past perfective.

(24) *Spanish*
    a. *inchoative state causative, animate subject*
       Manuel divirt-ió   a Laura, …
       Manuel entertain-PST.3.SG to Laura
       'Manuel entertained Laura, (…)'

    b. *inchoative state causative, inanimate subject*
       La película divirt-ió   a Laura, …
       the movie   entertain-PST.3.SG to Laura
       'The movie entertained Laura, (…)'

    c. *punctual causative, animate subject*
       Manuel sorprend-ió   a Laura, …
       Manuel surprise-PST.3.SG to Laura
       'Manuel entertained Laura, (…)'

    d. *punctual causative, inanimate subject*
       La película sorprend-ió   a Laura, …
       the movie   surprise-PST.3.SG to Laura
       'The movie entertained Laura, (…)'

    e. … pero ella no se   dio   cuenta y   sigu-ió
          but   she NEG REFL give.PST.3.SG account and remain-PST.3.SG
       indiferente.
       indifferent
       '(…) but she didn't realize it and remained indifferent.'

(25) *Korean*
    a. *pure state causative, animate subject*
       Mina-ka   Minho-lul culkep-key   hay-ess-ciman, …
       Mina-NOM Minho-ACC pleased-ADVR do-PST-but
       'Mina made Minho pleased, but (…)'

    b. *pure state causative, inanimate subject*
       ku yenghwa-ka Minho-lul culkep-key   hay-ess-ciman, …
       the movie-NOM Minho-ACC pleased-ADVR do-PST-but
       'The movie made Minho pleased, but (…)'

    c.   *inchoative state causative, animate subject*
        Mina-ka   Minho-lul   nolla-key   hay-ess-ciman, …
        Mina-NOM Minho-ACC get.surprised-ADVR do-PST-but
        'Mina made Minho get surprised, but (…)'

    d.   *inchoative state causative, inanimate subject*
        ku yenghwa-ka Minho-lul   nolla-key   hay-ess-ciman, …
        the movie-NOM Minho-ACC get.surprised-ADVR do-PST-but
        'The movie made Minho get surprised, but (…)'

    e.   … ku-nun ku-kes-ul   alachay-ci   mos   hay-ess-ta.
        he-TOP that-thing-ACC realize-NMLZ cannot do-PST-DECL
        '(…) he didn't realize it.'

The verbs were inserted in the sentential frames in (24) and (25) respectively, adhering to the criteria of subject and object choice introduced above; no fillers were included. Note that in the Spanish sentences in (24) the objects are ambiguous for case (accusative vs. dative), which can only be made unambiguously visible by a respective clitic (cf. Section 3.1, example (5)). Since the presented word order is the default word order for an accusative structure (SVO vs. OVS for a dative structure), we assume that the participants interpreted the sentences correspondingly.

In order to evaluate possible effects of the lexicalization – and especially of the absence of clitics in the Spanish sentences – we carried out a separate acceptability study of the test sentences in (24a–d) for Spanish and (25a–d) for Korean, i.e., without the continuation in (24e) and (25e). The sentences were judged on a 1 (=very bad) to 7 (=very good) scale and were presented without fillers; the acceptability task was implemented in OnExp 1.2 (http://onexp.textstrukturen.uni-goettingen.de) and performed online. 15 native speakers of Spanish (9 females, 6 males, age range: 17–64, M = 34,57; origin: Chile, Peru, Argentina, Colombia, Spain) judged the Spanish sentences (grand mean: 6.9). 15 native speakers of Korean (11 females, 4 males, age range: 16–54, M = 31,73; origin: South Korea) judged the Korean sentences (grand mean: 5.1). The acceptability of the individual verbs will be included in the models of interest in the following sections, in order to see whether the differences between the factors of interest hold true beyond the variation that is due to the lexicalization (i.e., the acceptability of individual verbs).

4.3 Procedure

Thirty-two native speakers participated in the Spanish experiment ranging in age from 21 to 76 (8 females, 24 males, age M = 34,57). Participants were monolinguals living mainly in Chile and some other Latin American countries (Peru and Panama) as well as in Spain. In the Korean experiment, thirty-two native speakers were part of the study with an age range from 27 to 54 (15 females, 17 males, age M = 36,32). Participants were monolinguals living in South Korea. All subjects voluntarily and anonymously took part of the study.

Participants were presented the target sentences and were instructed to estimate their well-formedness on a 1–7 Likert scale (1 = very bad, 7 = very good). The target sentences were mixed randomly. Five practice trials were presented prior to the beginning of the experiment to familiarize each participant with the task. The experiments were conducted as web-based studies implemented in OnExp 1.2. Each session took approximately 20 minutes and was unpaid.

4.4 Results

4.4.1 Spanish

Table 4 presents the mean acceptability ratings on the 1-to-7 scale for the zero-state reading broken down by verbal aspect and animacy of the subject (see Table 1 in Appendix for

the mean acceptability values per verb). There were no missing values, i.e. 320 observations for each condition were collected.

Table 4: Mean acceptability of zero-state readings with Spanish psych verbs.

VERBAL ASPECT	ANIMACY (SUBJECT)			
	animate		inanimate	
	mean	confidence*	mean	confidence
inchoative state causative	3.53	.23	2.62	.19
punctual causative	2.81	.22	2.50	.19

* confidence = 95% confidence interval.

Figure 1 provides a visualization of Table 4. Inspection of the results points to an interaction of the two independent variables to the effect that the acceptability of those target sentences with a zero-state reading is higher in the condition with inchoative state causatives constructed with an animate subject (mean 3.53) than in the other three conditions, i.e. with inchoative state causatives construed with an inanimate subject (mean 2.62) and with punctual causative psych verbs independently of the animacy of the subject referent (mean in the animate subject condition: 2.81; mean in the inanimate subject condition: 2.5).
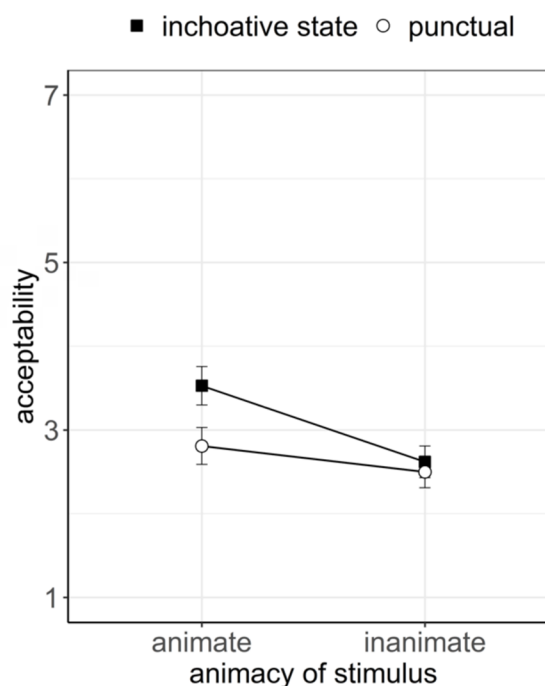
Figure 1: Acceptability of zero-state readings in Spanish (means and 95% c.i.).

The data was fitted with a linear mixed effects model, based on a maximal random-effects model (see Barr et al. 2013). The dependent variable corresponded to the acceptability judgments, the fixed factors were VERBAL ASPECT, ANIMACY (SUBJECT), LEXICALIZATON (i.e., acceptability of the test sentence; see Section 4.2) and their interaction. The random-effects structure contained intercepts for ITEMS (different verbs) and PARTICIPANTS as well as random slopes of PARTICIPANTS with ASPECT/ANIMACY and ITEMS with ANIMACY.[16]

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[16] The random slope of ITEMS with ASPECT was not included in the model, since the items were nested in the factor ASPECT.

The random effects capture the variation between individuals; there is no evidence for multimodality in our sample.[17]

A backwards selection procedure was applied to the fixed effects, choosing model by AIC value in a stepwise algorithm (function "step" in the R Stats, 3.6.0, package; R Core Team 2013), starting from the maximal model. Both fixed effects as well as the interaction effect are kept in the model of the best fit, the parameters of which are listed in Table 5.[18] Removing the interaction between ASPECT and ANIMACY leads to a significant loss of information (in terms of the χ^2 value of the difference between deviances). The maximal fit is reached by a model including the interaction of ASPECT and ANIMACY (with interaction: AIC = 4415.4, df = 18, vs. without interaction: AIC = 4418.2, df = 17; Log-likelihood Test: $\chi^2(1)$ = 4.85, $p < .05$). The factor LEXICALIZATION could be removed from the model, since it did not reach a significant p-value in the model comparison.

Table 5: Model parameters for the Spanish zero-state test.

effect	estimate	st. error	t-test		model comparison (LogLikelihood Test)	
			t-value	p	χ^2	p
INTERCEPT	3.53	.31	11.48	<.001		
ASPECT (punctual)	–.71	.27	–2.60	<.05		
ANIMACY (inanimate)	–.91	.25	–3.57	<.01		
ASPECT^ANIMACY	.59	.26	2.25	<.05	4.85	<.05

4.4.2 Korean

Table 6 presents the mean acceptability ratings for the Korean part of the study measuring the acceptability of a reading of a zero-state in the object experiencer on a 1-to-7 scale. Table 2 in the Appendix lists the mean acceptability values per verb. There were no missing values, i.e. 320 observations for each condition were collected.

Table 6: Mean acceptability of zero-state readings with Korean psych verbs.

VERBAL ASPECT	ANIMACY (SUBJECT)			
	animate		inanimate	
	mean	confidence*	mean	confidence
inchoative state causative	3.75	.21	2.97	.20
pure state causative	3.81	.22	2.92	.19

* confidence = 95% confidence interval.

Figure 2 provides a visualization of Table 6. The results for Korean differ from the Spanish results pointing to a main effect of ANIMACY (SUBJECT) while the aspectual distinction does not seem to play a role for the acceptability of the target sentences. Mean acceptability values with inchoative state causatives (3.75) and pure state causatives

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[17] An anonymous reviewer asked whether speakers in our sample may come from different groups preferring different judgments in the data. In order to examine this possibility we conducted Hartigans' dip test statistic, which tests the alternative hypothesis that the values are multimodal against the null hypothesis of uni-modality. The differences between animates and inanimates per speaker reveal a $D = .065$ ($p = .3$) for inchoative verbs and a $D = .062$ ($p = .4$) for punctual verbs. Thus, there is no evidence that the speakers in our sample represent different populations with respect to the acceptability of zero-state readings.

[18] Final model (lmer): formula = judgment ~ aspect * animacy + (1 + aspect * animacy | participant) + (1 + animacy | item).

(3.81) are similar in the conditions with animate subjects and higher in comparison to the conditions with inanimate subjects, which are again similar to each other (mean with inchoatives: 2.97; mean with states: 2.92).
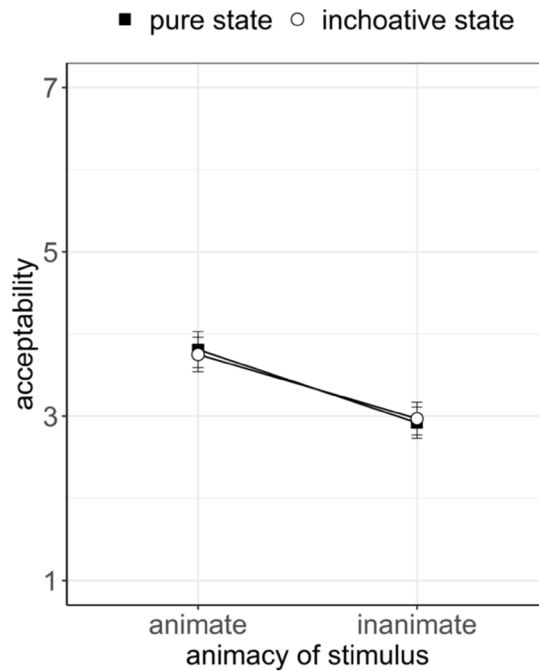

Figure 2: Acceptability of zero-state readings in Korean (means and 95% c.i.).

For the statistical analysis, the same procedure and random-effects structure as for the Spanish part was applied (see Section 4.4.1). There is no evidence for multimodality in our sample.[19] The backwards selection procedure revealed that the best fit is reached by a model only including the main effect of ANIMACY (SUBJECT) and the main effect of LEXICALIZATION (AIC = 4389.2, $df = 17$), while the interaction between ASPECT and ANIMACY (LogLikelihood Test: $\chi^2(1) = .6$) and the effect of ASPECT (LogLikelihood Test: $\chi^2(1) = .01$) can be removed without significant loss of information. The fixed effects of the model with the best fit are given in Table 7.[20]

Table 7: Model parameters for the Korean zero-state test.

effect	estimate	st. error	t-value	p	χ^2	p
			_t_-test		**model comparison (LogLikelihood Test)**	
INTERCEPT	2.54	.43	5.87	<.001		
ANIMACY (inanimate)	−.82	.23	−3.56	<.01	10.73	<.01
LEXICALIZATION	.24	.06	3.49	<.01	8.7	<.01

The experimental results in both Spanish and Korean are compatible with the predictions of the ACH as explained in Section 2, under the assumption that animate subjects of transitive EO verbs can be interpreted as agents. For those EO verbs that encode inchoative or

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[19] The differences between animates and inanimates per speaker reveal a $D = .061$ ($p = .5$) for inchoative causatives and a $D = .062$ ($p = .4$) for pure state causatives. Thus, there is no evidence that the speakers in our sample represent different populations of Korean speakers with respect to the acceptability of zero-state readings.

[20] Final model (lmer): judgment ~ animacy + lexicalization + (1 + aspect * animacy | participant) + (1 + animacy|item).

pure experiential state causatives as part of their meaning, zero-state readings are significantly more acceptable with animate subjects than with inanimate subjects. This result can be explained by the different involvement of agents vs. causers. In addition, the Spanish results revealed an interaction between ASPECT and ANIMACY, indicating that EO punctual causatives are significantly less acceptable when the state in the object experiencer is defeated. Since this result holds across animacy conditions, we conclude that agentivity is overridden by the punctuality of these verbs when it comes to defeating the state in the experiencer. This result will be discussed in more detail in Section 6. In the following section we test our prediction from gradient agentivity, as introduced in Section 3.2.

5 Correlating Agentivity

Previous research has shown that judgements of agentive interpretations of EO verbs involve variation between speakers (see Section 3.2). If the potential to adopt an agentive reading is decisive for the cancellation of the experiential state, as discussed in Section 2, we expect that more fine-grained differences of the former influence the acceptability of the latter. In order to inspect this prediction, we tested the possibility for the verbs used in the zero-state studies to accommodate an agentive reading in a controlled way.

5.1 Study design and material

There are different tests available to inspect the agentivity of the subject in a verbal construction, for instance, by evaluating its volitional or intentional involvement in the event. We used a frame with a subject control verb of decision under which the target verbs were embedded (see Grafmiller 2013: Chapter 5.2; Verhoeven 2017). The matrix verb of decision implies that the subject has control over the event given in the subordinate clause. The sentences in (26) and (27) exemplify this test for Spanish and Korean, respectively, where EO verbs that allow for an agentive reading are expected to be compatible with this frame. (26a) seems to be more acceptable than (26b), and (27a) seems to be more acceptable than (27b) (repeated from (8)).

(26) *Spanish*
    a. El   cajero   decid-ió   molestar a Karen.
        the cashier decide-PST.3.SG bother   to Karen
        'The cashier decided to bother Karen.'

    b. ?La anciana   decid-ió   deprimir a Alejandra.
        the elderly.woman decide-PST.3.SG depress to Alejandra
        'The elderly woman decided to depress Alejandra.'

(27) *Korean*
    a. kwahakca-ka Cinho-lul nolla-key   ha-lyeko kyelsimhay-ss-ta.
        scientist-NOM Cinho-ACC get.surprised-ADVR do-CNJ decide-PST-DECL
        'The scientist decided to make Cinho get surprised.'

    b. ?miyongsa-ka   Yuna-lul wenmangsulep-key ha-lyeko kyelsimhay-ss-ta.
        hairdresser-NOM Yuna-ACC be.resentful-ADVR   do-CNJ   decide-PST-DECL
        'The hairdresser decided to make Yuna (feel) resentful.'

   Each verb used in the zero-state test was inserted in the sentential frame illustrated in (26) for Spanish and in (27) for Korean. Proper names or definite common nouns were used as subjects and objects with each verb. All test sentences contained DPs denoting animate individuals. We assume that the choice of a particular individual and the proper/common noun distinction do not have an impact on the compatibility of the verb with an agentive environment, hence we varied lexicalizations in order to present the participants with a more diversified set of sentences.

5.2 Procedure

Twenty-nine native speakers of Spanish (from Chile, Peru, Panama, Venezuela and Spain; 13 females, 16 males; age range: 13–62, *M*: 34,34) participated in the study. For Korean, twenty-nine native speakers of Korean (from different cities; 11 females, 18 males; age range: 15–65, *M*: 35,55) took part in the study. Again, both studies were implemented in *OnExp 1.2* (http://onexp.textstrukturen.uni-goettingen.de) and performed online. The participants were presented with the target sentences randomly and were instructed to estimate their well-formedness on a 1–7 Likert scale (1 = very bad, 7 = very good). Per language, the study resulted in (29 speakers × 20 verbs =) 580 estimations on the 1–7 scale. Table 3 in the Appendix indicates the mean values and the standard errors per verb for the Spanish part: the means per verb form a scale ranging from 3.62 (*deprimir* 'depress') to 5.72 (*impresionar* 'impress'). The Korean results are presented in Table 4 in the Appendix: the means per verb form a scale ranging from 2.41 (*anthakkapkey hata* 'make pitiful for') to 5.41 (*kippukey hata* 'make happy').

If the ACH explains the acceptability of a zero-state reading with EO verbs in Spanish and Korean, the mean acceptability values obtained in the agentivity tests should predict the results in the zero-state test. In particular, we expect that the gradient agentivity found with the inchoative and pure state causatives in Korean and Spanish significantly correlates with the mean results obtained in the zero-state test in the condition with animate subjects. As for the Spanish punctual EO psych verbs, no such correlation should be found since we expect punctuality to override agentivity.

5.3 Results

Figure 3 shows for the Spanish verb classes that both predictions seem to hold: the average agentivity values per verb correlate stronger with the corresponding average zero-state values (in the animate condition of the zero-state study) obtained with inchoative state causatives (see Figure 3b) than with the punctual causatives (see Figure 3a), as shown by a larger dispersion of the latter verbs from the regression line.

(a) punctual causative   (b) inchoative state causative
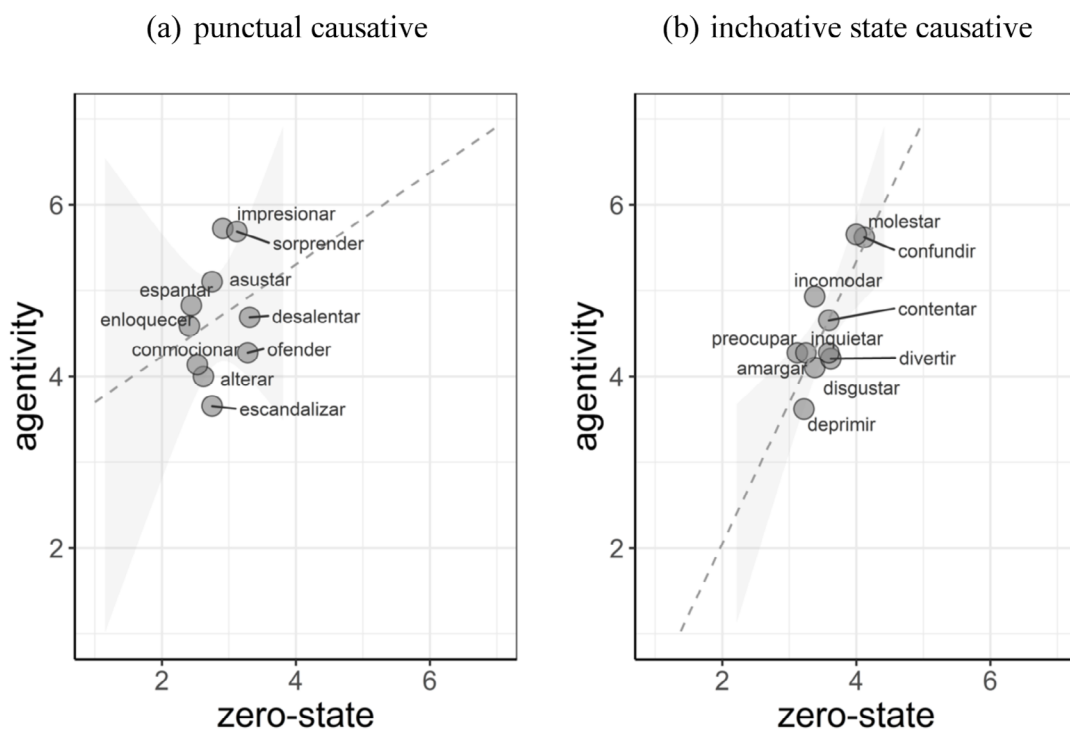
Figure 3: Agentivity as explanatory variable for a zero-state reading with Spanish punctual causatives and inchoative state causatives (animate subjects).

Figure 4 presents the results for Korean: similar to the Spanish inchoative state causatives, there is a clear correspondence of the average agentivity values per verb to the average zero-state values (see Figure 4b). For the pure state causatives visual inspection of Figure 4a indicates a greater dispersion of the verbs from the regression line compared to the inchoative state causatives, which is however smaller than for the punctual causatives of Spanish (see Figure 3a).
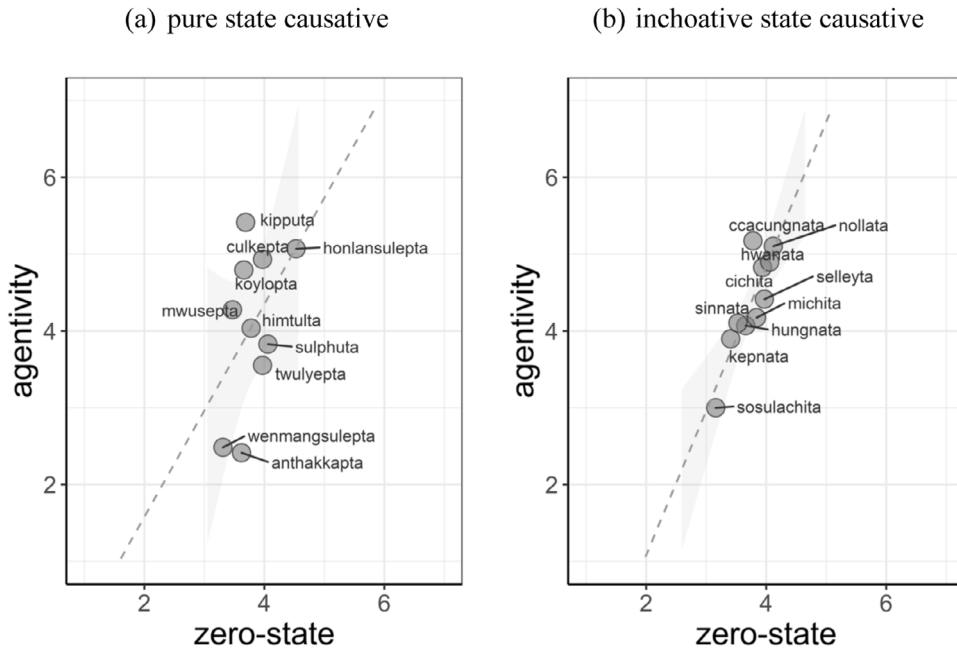

(a) pure state causative

(b) inchoative state causative

Figure 4: Agentivity as explanatory variable for a zero-state reading with Korean pure state causatives and inchoative state causatives (animate subjects).

As in the previous analyses (see Section 4.4), we examined a maximal random-effects model, containing intercepts for PARTICIPANTS as well as slopes with the fixed effect (see Barr et al. 2013). The data for each verb group (Spanish punctual causatives, Spanish inchoative state causatives, Korean pure state causatives, Korean inchoative state causatives) was fitted with a linear mixed effects model, with the JUDGMENTS of a zero-state reading (in the animate condition) as a dependent variable, the mean values of the agentivity test per verb (AGENTIVITY) and the average acceptability of the LEXICALIZATION as fixed factors, and SUBJECTS as random factor (random effects can only be categorical variables; hence AGENTIVITY cannot be inserted in the random-effects structure).

In order to probe whether the effect of AGENTIVITY is modulated by verb class, we test the effect of AGENTIVITY for each level of the predictor ASPECT separately.[21] The results of this analysis are informative for the differences that we observe in Figure 3 and Figure 4 (however, they should be treated with the caveat that in the absence of a significant interaction effect our observations cannot be empirically established). A backwards selection procedure by the AIC value revealed that AGENTIVITY is part of the model of the best fit[22] for Spanish inchoative state causatives and both classes of Korean verbs. Removing the fixed effect of AGENTIVITY leads to a significant loss of informativity of the model, which

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[21] A bifactorial model including AGENTIVITY, ASPECT and their interaction could not be examined because AGENTIVITY and ASPECT are not independent from each other, which violates a core assumption of linear modeling (*variance inflation factors* higher than 9, suggesting strong collinearity).

[22] Final model (lmer): formula = judgment ~ agentivity + (1 | participant).

is reflected in significant chi-square values in the Log-Likelihood test (see Table 8). The model of the best fit for Spanish punctual verbs is a model only containing an INTERCEPT.[23] The model with a fixed effect (AIC = 1142.9, df = 4) is not better than a model without fixed effect (AIC = 1142.2, df = 3); the chi-square value of the Log-Likelihood test does not correspond to a significant p-value ($\chi^2 = 1.3$, $p = .24$). The factor LEXICALIZATION did not have an impact neither in the Spanish nor in the Korean data and was removed through model comparison in all analyses.

Table 8: Model parameters for the impact of agentivity on the judgments of zero-state.

effect	estimate	st. error	t-test		model comparison (LogLikelihood)	
			t-value	**p**	**χ^2**	**p**
Spanish inchoative state causatives						
INTERCEPT	2.27	.78	2.89	<.5		
AGENTIVITY	.36	.16	2.32	<.05	5.34	<.05
Spanish punctual causatives						
INTERCEPT	3.04	.33	9.13	<.001		
Korean pure state causatives						
INTERCEPT	3.19	.41	7.82	<.001		
AGENTIVITY	.15	.07	2.06	<.05	4.25	<.05
Korean inchoative state causatives						
INTERCEPT	1.98	.56	3.56	<.001		
AGENTIVITY	.4	.11	3.59	<.001	12.65	<.001

6 Discussion

The results obtained in the zero-state test (Section 4.4) correspond to the expectations developed in Sections 2 and 3 and expressed in Table 2 for Spanish and Table 3 for Korean. As predicted by the ACH, we observed a significant effect of the factor ANIMACY (SUBJECT) on the acceptability of the test sentences, which cancelled the experiential state in the object referent, as encoded by the predicate. Zero-state readings were significantly more acceptable with animate than with inanimate subjects in both languages. In Korean, this manifested as a main effect of ANIMACY (SUBJECT) (without interaction with VERBAL ASPECT), suggesting that with both inchoative state causatives and pure state causatives the state in the experiencer can be cancelled more easily with agentive subjects than with (inanimate) causer subjects.

As for the Spanish part of the zero-state study, we found a significant interaction of ANIMACY (SUBJECT) and VERBAL ASPECT, as predicted in Section 3.3 and Section 3.4, and summarized in Table 2. This interaction reflects the fact that zero-state interpretations were better accepted with animate subjects than with inanimate subjects for inchoative state causatives, but less so for punctual causatives. As outlined in Section 3.4, several authors have suggested that achievements are not compatible with non-culminating readings due to their non-duration. The same holds for causative achievements, at least in those Indo-European languages that have been investigated with respect to non-culminating causation such as English, German, French and which display defeasible causatives. For Spanish we have argued in Section 3.4. that the complex event denoted by causative

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[23] Final model (lmer): formula = judgment ~ (1 | participant).

achievements is perceived as an indivisible durationless unit under everyday granularity, which precludes non-culminating readings – or at least makes them less acceptable. Note also that the list of defeasible causatives presented in Martin & Schäfer (2017) does not contain any clearly punctual verbs. The experimental results show that the punctual causative EO verbs present the same pattern as causative achievements described in the literature in that the acceptability of zero-state readings does not vary between sentences with agent vs. causer subjects. The test sentences were less acceptable in a zero-state context across the two animacy levels compared to those with inchoative state causatives in the animate condition. This suggests that a potential effect of agentivity cannot take effect since punctual verbs entail culmination. Consequently, Spanish punctual causative EO verbs do clearly not belong to the class of defeasible causatives.

In Section 5, we provided additional evidence for the crucial impact of agentivity on the possibility of defeating the experiential state in the object. By means of an agentivity test, the individual Spanish and Korean EO predicates were shown to differ in their compatibility with an agentive interpretation of the subject. This is evidence for the fact that EO verbs in both languages lexically differ in their potential to accommodate an agent that volitionally brings about the state in the experiencer. Crucially, it turned out that the agentivity means obtained for those EO verbs encoding pure state causatives (Korean) and inchoative state causatives (Spanish and Korean) correlated with the acceptability of cancelling the experiential state (cf. the zero-state test). Hence the potential of a given verb (of the mentioned subclasses) to be compatible with a zero-state interpretation depends on its potential to combine with an agentive subject. This is strong empirical evidence for the ACH and the special role of the agent for non-culminating construals. Expectedly, a correlation of gradient agentivity and gradient acceptability of zero-state readings was not found for the Spanish punctual causative EO verbs: while the punctual causative EO verbs also differed in acceptability when combined with an agentive subject, these agentivity values did not correlate with the results obtained for these verbs in the zero-state study. This fits with the above analysis that with punctual causative EO verbs, agentivity does not have an effect on culmination due to the punctual nature of these verbs. Given that punctual verbs generally receive low acceptance with an interpretation of a zero-state, different levels of agentivity do not take effect here.

Although agentivity had a significant effect on the acceptability of zero-state readings (see Section 4.4), the mean acceptability was generally in the middle range of the 1–7 scale (Spanish inchoative state causatives: 3.53; Korean inchoative state causatives: 3.75; Korean pure state causatives: 3.81). As a general principle, the interpretable part of the results is the significant difference between the experimental conditions. The residual properties of the data, e.g., the mean acceptability (as reflected in the intercept), may stem from very different sources (properties of the sample, the experimental task in general, etc.). Hence, an interpretation of these properties may only be speculative in nature. The average judgments of our study differ from single acceptability judgements reported for non-culminating readings with (regular) defeasible causatives of French and German (Martin & Schäfer 2017). Moreover, in a recent article, Martin (2020) reports an acceptability rating mean of 4,8 (on a 0–5 scale, N = 19 speakers) for French *soigner* 'treat/cure' and *enseigner* 'teach' with agent subjects. Note that these and other verbs classified as defeasible causatives (see lists in Martin & Schäfer 2017) are regular agentive verbs. Hence, it is plausible to conclude that a reduced acceptability in the zero-state test can be related to the fact that the EO verbs investigated in this study are less acceptable/usual with an agentive subject. Given that agenthood is a prerequisite for non-culminating readings (as stated in the ACH), lower acceptability of zero-state readings can

be indirectly explained by the fact that an agentive interpretation with EO verbs is more difficult to obtain. Remember from Section 1 and Section 3.1 that transitive EO verbs are often ambiguous between several readings and individual verbs display differences in being interpreted as agentive, eventive or stative (Arad 1998; Landau 2010). Hence, it seems that the causing event associated with the agent is not as easily or naturally interpreted with EO verbs as it is with regular defeasible causatives.

An additional property that may impede clear non-culmination is the salient stative component of the EO verbs, which was visible in the interpretation of the durative adverbial in combination with EO verbs of the stative subgroups (cf. Spanish (15) and Korean (16)). With EO verbs of these subgroups the salient interpretation is that the durative adverbial measures the duration of the state in the experiencer object. In the case of an agentive reading, there is also the interpretation that the causing event, i.e. the agent's activity, is measured by the adverbial. Most naturally, however, this also includes that the state in the object obtains. Hence, in contrast to the well-established defeasible causatives (such as *repair, treat, teach*), causative EO predicates are less easily interpreted as non-culminating.

To the extent that zero-state readings are interpretable with inchoative and pure state causative EO predicates in Spanish and Korean, the factors responsible for this interpretation are those identified for well-established defeasible causatives, namely the involvement of an (animate) agent and the association of an activity potentially bringing about the result state in the object referent. Against this background, we assume that the zero-state interpretation of the causative EO verbs investigated in this study is brought about by the same mechanism that has been identified for the causative accomplishment psych verbs mentioned in Martin and Schäfer (2017), i.e. French/German *encourager/ermutigen* 'encourage', *provoquer/provozieren* 'provoke', *rassurer/beruhigen* 'reassure', cf. Section 3.2. As soon as an activity of an agent is prominently involved and is interpreted as part of the lexical meaning of a given EO verb, the potential for a zero-state reading arises. These verbs can then be interpreted in a failed-attempt manner with respect to causing the state, i.e. the agent performs an activity, trying (and failing) to bring about the experiential state in the object referent. The experimental results showed that there are lexical differences in this respect within the tested subclasses per language, e.g. verbs such as *molestar* 'bother' or *confundir* 'confuse' are more easily interpreted in a zero-state reading compared to *deprimir* 'depress' or *disgustar* 'upset' (cf. Section 3.2). We propose that this is due to lexical differences with respect to the association of specific activities with these verbs. The fact that an activity part is generally less clearly present with causative EO predicates as those tested in this study differentiates this type of EO predicates from regular defeasible causatives.

In Section 2, we mentioned several approaches which account for non-culminating readings in regular causative accomplishment predicates, which differ typologically to a certain extent (cf. Demirdache & Martin 2015; Martin 2019; 2020). The present empirical study did not test these specific accounts but rather demonstrated the impact of (gradient) agentivity on zero-state readings in the mentioned EO subclasses. As far as the specific source of a non-culminating/zero-state reading is concerned, it is plausible to assume that the mechanism that has been identified for causative accomplishment predicates in a given language also applies to the causative EO predicates of that language. Assuming that Spanish pairs with French, English, and German concerning the source of non-culmination as identified in the work by Martin & Schäfer (2017) among others, zero-state readings of the Spanish inchoative state causatives are expected to be equally due to sublexical modality. As for Korean, Lee Juwon (2014; 2015), Beavers & Lee Juwon (2020) relate non-culminating readings with causative accomplishment verbs to the intentionality of the

subject referent, also proposing the presence of a respective sublexical modal operator.[24] Lee Juwon (2014; 2015) explicitly investigates periphrastic causative structures, which are syntactically consistent with those investigated in the present work (e.g. *malu-key hata* 'dry-ADVR do.DECL', 'make dry') showing that they behave in parallel to Korean lexical causatives with respect to the possibility and the conditions of non-culminating readings. Hence, we assume that zero-state readings with the causative EO predicates studied in the present work can be explained by the very same mechanism.

The reason for investigating two languages which typologically differ with respect to the morpho-syntactic coding of causative structure in the psych domain (see Section 3.1) was to investigate whether this has an impact on the possibility of non-culminating causation. The experimental results did not show that this is the case: whether causation is syntactically encoded – as with Korean EO predicates – or morphologically encoded or even non-transparent – as with Spanish EO verbs – did not turn out to have an impact on the possibility of zero-state readings. This underlines that the semantic factors tested are crucial for understanding non-culminating readings.

7 Conclusion

The aim of the present study was to systematically test whether the Agent Control Hypothesis (ACH, Demirdache & Martin 2015) successfully applies to transitive EO psych verbs, as has been observed before for some German and French psych verbs (Martin & Schäfer 2017). Given that the ACH accounts for the non-culminating behavior of causative accomplishment predicates, we first discussed the properties of the causative EO structures of the two investigated languages Spanish and Korean in terms of agentivity, lexical aspect and event structure. As seen in Section 3, it turned out that the verbs under discussion share the bi-eventive causative structure with canonical causative accomplishment verbs, being composed of a causing event and a caused state. At the same time however, EO verbs in their agentive causative interpretation differ from the former verb class in telicity tests, which showed that the causing event is less easily accessible for event modifiers and a telic interpretation is only available as a repair strategy, resulting in an ingressive reading with respect to the state in the object experiencer.

In an experimental study carried out in parallel in the two languages, we measured the impact of the subject's animacy (implementing agentivity – since animates enhance the agentive reading) on the acceptability of sentences cancelling the state in the object experiencer. Results for both languages showed that in accordance with the ACH, animate subjects significantly increased the acceptability of defeating the state in the object experiencer. For Korean, this manifested as a main effect across aspectual subtypes (pure state causatives vs. inchoative state causatives), whereas for Spanish, the impact of animacy significantly interacted with the aspectual subclasses of inchoative state causatives vs. punctual causatives. With the latter verb class, subject animacy did not have an effect due to the punctual nature of the verbs. Since punctual causatives are conceived of as denoting complex eventualities lacking any meaningful duration in time under everyday granularity, the causing event and the caused state are commonly not separated in languages like Spanish.

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[24] Note that following the literature, the type of sublexical modal operator is different between the two languages. While Beavers & Lee Juwon (2020) show that the interpretation of an unintentional agent is incompatible with non-culmination, the agent's intentionality is not a prerequisite for non-culminating readings with the French/German defeasible causatives according to Martin & Schäfer (2017). We speculate that the respective difference may also hold with respect to Spanish vs. Korean zero-state interpretations of the causative EO predicates.

In a further acceptability study, we tested the EO predicates at issue for their potential to accommodate agentive interpretations. Most importantly, it was shown that the gradient agentivity values obtained in the second study significantly correlated with the first study's gradient acceptability values of defeating the experiential state for the state-subclasses in both languages (Korean pure and inchoative state causatives and Spanish inchoative state causatives), but not for the Spanish punctual causative subclass. This is strong empirical evidence for the crucial influence of agentivity on the possibility of zero-state readings, supporting the predictions of the ACH.

Abbreviations

ACC = accusative, ACH = Agent Control Hypothesis, ADVR = adverbializer, ATTR = attributor, CL = clitic, CNJ = conjunction, DAT = dative, DECL = declarative, DP = determiner phrase, EO = experiencer object, GEN = genitive, GER = gerund, INCH = inchoative, INF = infinitive, LOC = locative, NEG = negation, NMLZ = nominalizer, NOM = nominative, O = object, PFV = perfective, PL = plural, PRS = present, PST = past tense, REFL = reflexive, S = subject, SG = singular, TOP = topic, V = verb, VP = verb phrase

Additional File

The additional file for this article can be found as follows:

- **Appendix.** This document provides the detailed results of the four experimental studies presented in Fritz-Huechante et al. "Agentivity and non-culminating causation in the psych domain: Cross-linguistic evidence from Spanish and Korean". DOI: https://doi.org/10.5334/gjgl.896.s1

Competing Interests

The authors have no competing interests to declare.

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