Lexical aspect and evidential meaning*

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This paper examines the effect of lexical aspect on the evidential reading of a Korean sentence
with the evidential marker *-te*. I show that statives and inchoatives exhibit different patterns
of interaction with tense in a *-te* sentence. I analyze both cases in line with Lee (2011a,
2013), and account for how evidential readings arise from relevant components in the proposed
analysis. On the basis of the compositional analysis, I argue that the generalization on the
interaction between tense and *-te*, proposed in the literature (Chung 2005, 200; Lee 2011a,b,
2013, inter alia), holds for the *-te* sentences with both predicate types. **(Seoul National University)**

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1. Introduction

Evidentiality, a linguistic category that specifies the source of information conveyed
(de Haan 1999; Aikhenvald 2004, inter alia), is closely related to temporal meaning
because the availability of certain evidence types is constrained in a temporal dimension.
For example, we cannot directly observe an event that has not yet occurred. Despite this
close relationship, it was not until recently that evidentiality has been explored in terms
of its interaction with temporal categories; See, e.g. Lee (2011a,b, 2013) for Korean,
Smirnova (2013) and Koev (2017) for Bulgarian, Bowler (2018) for Tatar (Turkic). These
studies have provided an important insight on the meaning of evidentiality and its
relationship to temporality, but they have been restricted to the meaning contributions of
tense and grammatical aspect to evidential sentences. This paper extends the empirical
scope of the previous work on evidentiality-temporality interaction, by investigating the
effect of lexical aspect on the evidential meaning of natural language sentences.

This paper focuses on the evidential readings of Korean sentences with *-te*. The expression *-te* is one of the morphemes that have received a lot of attention in the literature on Korean evidentials. It lexically encodes the evidential meaning of a sensory observation (Song 2002; Lee 2011a,b, 2013, inter alia), and a sentence with *-te* is available with both direct and indirect evidential readings (Chung 2005, 2007; Lee 2011a,b, 2013, inter alia). The directness in an evidential interpretation pertains to whether an eventuality described by the prejacent (henceforth, a described eventuality) is directly observed by the speaker, or its existence is indirectly inferred on the basis of the speaker's sensory observation of its preceding or result state (Willett 1988). For example, consider the evidential readings of the following *-te* sentences with the prejacent *pi-ka o-* 'rain-nom fall': (1a) and (1b) form a minimal pair with present tense ∅ and past tense *-ess*, respectively.

(1) a. [Context: Yenghi saw it raining yesterday. Now, she says:]
      Pi-ka   o-∅-te-la.
      rain-NOM   fall-PRES-TE-DECL
      '[I made a sensory observation that] it was raining.'
   b. [Context: Yenghi saw the wet ground yesterday. Now, she says:]
      Pi-ka   o-ass-te-la.
      rain-NOM   fall-PAST-TE-DECL
      '[I inferred (from the acquired sensory evidence) that] it had rained.'

                                                                (Lee 2013: 2)

(1a) receives a direct evidential interpretation, according to which the speaker experienced the raining event herself. By contrast, the speaker in (1b) did not experience the raining event, but inferred on its existence by seeing the wet ground and taking it as its result state. Examples like (1) have led previous researchers (Chung 2005, 2007; Lee 2011a,b, 2013, inter alia) to argue that a *-te* sentence with past tense *-ess* gives rise to an indirect (inferential) evidential reading whereas a *-te* sentence with present tense ∅ is available with a direct evidential reading.

(2) Generalization on the evidential reading of a *-te* sentence
   a. A *-te* sentence of the form *p-**PRES**-TE-DECL* can yield a **direct** evidential reading, according to which the speaker made a sensory observation of the

> **ongoing state** of the eventuality denoted by *p*.
>
> b. A *-te* sentence of the form *p*-**PAST**-TE-DECL yields an **indirect** (inferential) evidential reading, according to which the speaker made a sensory observation of the **result state** of the eventuality denoted by *p*.

However, subsequent work has provided some counterexamples to this generalization. For example, Lim (2014) points out that both tense morphemes, $\varnothing$ and *-ess*, can occur with *-te* in the same context where the speaker acquired sensory evidence for a certain state, as shown in (3).[1]

> (3) [Context: While Yenghi was out of town last week, her neighborhood was flooded. She came back home yesterday, and stopped by her basement. Now, she says:]
>
> a. Patak-ey   mwul-i   hungkenha-**#yess/**$\varnothing$-**te**-la.
>   floor-LOC   water-NOM   be.full.of-PAST/PRES-TE-DECL
>   ʻ[I made a sensory observation that] the floor was full of water.ʼ
>
> b. Patak-i   mwul-ey   cec-**ess/#**$\varnothing$-**te**-la.
>   floor-NOM   water-LOC   become.wet-PAST/PRES-TE-DECL
>   ʻ[I made a sensory observation that] the floor was wet with water.ʼ
>
> (Lim 2014: 135-136)

One might take examples like (3) to argue against the generalization in (2); that is, a direct evidential reading is not necessarily restricted to the case where the evidential *-te* is realized with present tense, but it can arise from the combination of *-te* and past tense as well.

However, a crucial question here is whether the state observed by the speaker in (3) is an ongoing state of a described eventuality, or it is its pre-state or result state. In this paper, I argue that (3a) and (3b) are sharply distinguished in this respect: while the former illustrates the case where the speaker perceived the ongoing state of a described eventuality, the latter shows the case where the speaker perceived the result state of a described eventuality. Following Lim (2014), I argue that the lexical aspect of the prejacent affects the evidential reading of a *-te* sentence; More specifically, I analyze (i)

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1   The contextual information and the English translations in (3) are mine.

predicates like *mwul-i hungkenha-* 'be full of water' in (3a) as statives which are internally uniform without involving any culmination point, and (ii) predicates like *mwuley cec-* 'become wet with water' in (3b) as inchoatives which lexically encode both a prior change and its result state. I provide independently-motivated empirical evidence for these two separate types of predicates on the basis of previous studies (Yang 1977, 1978; Jeong 1981; Yoon 1996; Chung 2005; Kim 2005; Choi 2019, inter alia), and show that they exhibit different empirical patterns in a −*te* sentence: When the speaker made a sensory observation of a certain state, inchoatives are felicitous with past tense -*ess*, but not with present tense ∅. This contrasts with statives which are felicitous with present tense in the same context. I analyze inchoatives as denoting two subevents, i.e. a prior change and its result state, and show that tense constrains the former subevent which is immediately followed by the latter subevent. I provide a compositional analysis of a -*te* sentence with inchoatives in comparison with the case with statives in line with Lee (2011a, 2013), and argue that the generalization in (2) holds for the -*te* sentences with inchoatives as well as those with statives. I discuss the main idea of Lim's (2014) analysis of a -*te* sentence, and show that it poses significant empirical and conceptual problems.

This paper proceeds as follows: I show the different properties between statives and inchoatives on the basis of previous studies in §2, and discuss their evidential readings with -*te* in §3. I present a proposed analysis in §4, and compare it with Lim's (2014) proposal in §5. §6 concludes the paper.

2. Statives vs. inchoatives

Stativity is one of the three main distinctions used in Vendler's four-way classification of Aktionsarten: While states denote internally uniform eventualities, events have a culmination point as they proceed. This section shows that there are two different types of predicates that we use to describe a state in Korean. One is a simple stative, and the other is an inchoative which involves a prior change and its result state. They are distinguished via a range of diagnostics proposed in the literature (Yang 1977, 1978; Jeong 1981; Yoon 1996; Chung 2005; Kim 2005; Choi 2019, inter alia).

First, the inchoative marker -*eci* can occur with statives, as in (4).[2] However, it is not compatible with inchoatives, as shown in (5).

(4) **Statives**

    a. Kongsa   hwuey ku   kil-i   nelp-eci-ess-ta.

       construction after   that   street-NOM wide-INCHO-PAST-DECL

       ʻThe street got widened after construction.ʼ

    b. Ku-ui   elkwul-i   capcaki   phalay-ci-ess-ta.

       he-GEN   face-NOM   suddenly blue-INCHO-PAST-DECL

       ʻHis face became blue suddenly.ʼ

    c. Cangmachel-ey pokto   patak-i   chwukchwukhay-ci-ess-ta.

       rainy.season-at hallway floor-NOM   wet-INCHO-PAST-DECL

       ʻThe hallway floor got wet during the rainy season.ʼ

(5) **Inchoatives**

    a. #Elum-i   nok-eci-ess-ta.

       ice-NOM   melt-INCHO-PAST-DECL

       ʻThe ice melted.ʼ

    b. #Kwanlipi-ka   olu-eci-ess-ta.

       maintenance.fee-NOM   rise-INCHO-PAST-DECL

       ʻThe maintenance fee rose.ʼ

    c. #Chelswu-ka   naka-eci-ess-ta.

       Chelswu-NOM   go.out-INCHO-PAST-DECL

       ʻChelswu went out.ʼ

Also, statives and inchoatives differ in terms of their compatibility with the progressive *-koiss*: the latter can, but the former cannot occur with the progressive (Yang 1977, 1978; Jeong 1981; Yoon 1996, inter alia).[3]

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2 It has been observed in the literature (Lim and Zubizarreta 2012; Lim 2016, inter alia) that the morpheme ⁻*eci* can also function as a passivizer. This is illustrated in the following two sentences; the sentence in (i-b) is realized with the morpheme *-eci*, and it is a passive version of the sentence in (i-a).

(i) a. Chelswu-ka   changmwun-ul   tat-ass-ta.

        Chelswu-NOM   window-ACC   close-PAST-DECL

        ʻChelswu closed the window.ʼ

    b. Changmwun-i   tat-aci-ess-ta.

        window-NOM   close-PASS-PAST-DECL

        ʻThe window was closed.ʼ

3 Statives realized with *-eci*, which I call morphologically-derived inchoatives, exhibit the same pattern as lexically-specified inchoatives. They are compatible with the progressive as in (i), and time frame adverbials like *han sikan maney* ʻin an hourʼ as in (ii).

(6) **Statives**

    a. #Ku   kenmwul-i   nop-koiss-ess-ta.

       that   building-NOM   high-PROG-PAST-DECL

       ʻThe building was being high.ʼ

    b. #Ku   haksayng-i   celm-koiss-ess-ta.

       that   student-NOM   young-PROG-PAST-DECL

       ʻThe student was being young.ʼ

    c. #Ku   pang-i   kkaykkusha-koiss-ess-ta.

       that   room-NOM   clean-PROG-PAST-DECL

       ʻThe room was being clean.ʼ

(7) **Inchoatives**

    a. Cangcak-i   hwalhwal   tha-koiss-ess-ta.

       firewood-NOM   vigorously   burn-PROG-PAST-DECL

       ʻFirewood was burning vigorously.ʼ

    b. Elum-i   ppalukey   nok-koiss-ess-ta.

       ice-NOM   quickly   melt-PROG-PAST-DECL

       ʻIce was melting quickly.ʼ

    c. Chelswu-ka   nemeci-koiss-ess-ta.

       Chelswu-NOM   fall-PROG-PAST-DECL

       ʻChelswu was falling.ʼ

(i) a. Phoksel-lo   on   seysang-i   hayah-eci-koiss-ess-ta.

       heavy.snow-due.to every world-NOM   white-INCHO-PROG-PAST-DECL

       ʻAll the world was getting white due to the heavy snow.ʼ

    b. Ecey   ku   sikan-ey   nalssi-ka   nappu-eci-koiss-ess-ta.

       yesterday   that time-at   weather-NOM   bad-INCHO-PROG-PAST-DECL

       ʻYesterday the weather was getting bad at that time.ʼ

    c. Ku   cha-nun   ppalu-eci-koiss-ess-ta.

       that   car-TOP   fast-INCHO-PROG-PAST-DECL

       ʻThe car was getting fast.ʼ

(ii) a. Eyekhon-ul thul-un.hwuey pang-i   o   pwun-maney   siwuenha-eci-yess-ta.

       AC-ACC   turn.on-after room-NOM five minute-in   cool-INCHO-PROG-PAST-DECL

       ʻAfter turning on the AC, the room got cool in five minutes.ʼ

    b. Ku   chalhulk-i   han   sikan-maney   tantanha-eci-ess-ta.

       that   clay-NOM   one   hour-in   hard-INCHO-PROG-PAST-DECL

       ʻThe clay got hard in an hour.ʼ

    c. Chelswu-ui   silyek-i   il nyen-maney manhi   nappa-ci-ess-ta.

       Chelswu-GEN eyesight-NOM one year-in   a.lot   bad-INCHO-PROG-PAST-DECL

       ʻChelswuʼs eyesight got bad in a year.ʼ

In addition, statives cannot occur with time frame adverbials such as *han sikan maney* ʿin an hourʾ, but inchoatives can (Kim 2005).

(8) **Statives**

    a. #Pal-ui   mwulcip-i   halwu-maney   cak-ass-ta.
       foot-GEN   blister-NOM   one.day-in   small-PAST-DECL
       ʿThe blister on the foot is small in a day.ʾ

    b. #Sikhye-ka   sam   il-maney   talkhomha-yess-ta.
       rice.drink-NOM   three   day-in   sweet-PAST-DECL
       ʿThe rice drink was sweet in three days.ʾ

    c. #Kanguisil-i   halu-maney   telep-ess-ta.
       classroom-NOM   one.day-in   dirty-PAST-DECL
       ʿThe classroom was dirty in a day.ʾ

(9) **Inchoatives**

    a. Ku kkoh-i   il   cwuil-maney   situl-ess-ta.
       that   flower-NOM one   week-in   wither-PAST-DECL
       ʿThe flower withered in a week.ʾ

    b. Chelswu-ka   han sikan-maney cangmwun-ul   kkayttuli-ess-ta.
       Chelswu-NOM one hour-in   window-ACC   break-PAST-DECL
       ʿChelswu broke the window in an hour.ʾ

    c. Chelswu-ka   sey   sikan-maney   cip-ulo   tolaka-ess-ta.
       Chelswu-NOM   three hour-in   home-to   return-PAST-DECL
       ʿChelswu returned home in three hours.ʾ

Stative and inchoative predicates in Korean, including those exemplified in this section, are presented below. I classify them according to Beavers et al.ʾs (2021) cross-linguistic work on property concept vs. result roots.

(10) **Statives**

    a. dimension: *khu-* ʿlarge/bigʾ, *cak-* ʿsmallʾ, *ccalp-* ʿshortʾ, *kil-* ʿlongʾ, *kip-* ʿdeepʾ, *nelp-* ʿwideʾ, *noph-* ʿhighʾ

    b. age: *celm-* ʿyoungʾ, *eli-* ʿlittleʾ

    c. value: *nappu-* ʿbadʾ, *coh-* ʿgoodʾ

    d. color: *hayah-* ʿwhiteʾ, kkamah- ʿblackʾ, *pwul-* ʿredʾ, *phalah-* ʿblueʾ

      e. physical property: *siwuenha-* ʻcoolʼ, *chwup-* ʻcoldʼ, *ttattusha-* ʻwarmʼ, *tep-* ʻhotʼ, *telep-* ʻdirtyʼ, *kencoha-* ʻdryʼ, *chwukchwukha-* ʻwetʼ, *kot-* ʻstraightʼ, *ttakttakha-* ʻhardʼ, *pwutulep-* ʻsoftʼ, *tantanha-* ʻtightʼ, *kkaykkusha-* ʻcleanʼ, *nalkhalop-* ʻsharpʼ, *talkhomha-* ʻsweetʼ, *yakha-* ʻweakʼ, *kangha-* ʻstrongʼ, *nalssinha-* ʻslimʼ, *pishusha-* ʻsimilarʼ

      f. speed: *ppalu-* ʻfastʼ, *nuli-* ʻslowʼ

(11) **Inchoatives**

      a. entity-specific change of state: *tha-* ʻburnʼ, *nok-* ʻmeltʼ, *el-* ʻfreezeʼ, *ssek-* ʻrotʼ, *cala-* ʻgrowʼ, *phi-* ʻbloomʼ, *situl-* ʻwitherʼ, *noksul-* ʻrustʼ, *malu-* ʻget thinʼ, *nulk-* ʻget oldʼ, *talm-* ʻresembleʼ

      b. verbs of destroying: *kkayttuli-* ʻbreakʼ

      c. verbs of calibratable change of state: *olu-* ʻriseʼ, *nayli-* ʻgo downʼ

      d. verbs of inherently directed motion: *o-* ʻcomeʼ, *ka-* ʻgoʼ, *tuleka-* ʻenterʼ, *naka-* ʻgo outʼ, *tolaka-* ʻreturnʼ, *nemeci-* ʻfallʼ

The above list shows that some Korean predicates belong to different groups although they look like having a similar meaning at first glance. For example, while predicates like *celm-* ʻyoungʼ and *eli-* ʻlittleʼ are statives, the predicate *nulk-* ʻget oldʼ is an inchoative. A similar contrast is found in pairs like *pisusha-* ʻsimilarʼ vs. *talm-* ʻget alikeʼ, and *nalssinha-* ʻslimʼ vs. *malu-* ʻget slimʼ, and *ttwungttwungha-* ʻfatʼ vs. *salcci-* ʻget fatʼ; the former predicates are statives and the latter predicates are inchoatives.

3. Evidential readings with statives vs. inchoatives

This section examines which evidential readings arise from statives and inchoatives when they occur in a *-te* sentence.

3.1 Evidential readings with statives

When a speaker expresses that he/she has sensory evidence for the ongoing state of a certain eventuality, present tense occurs with *-te*, as predicted by the generalization in (2). This holds for statives, as illustrated in the following examples:

(12) **Statives: Direct evidential reading with present tense**

[Context: Yenghi met Chelswu and his family at his house party. Now, she says:]

a. Chelswu-ui   ai-ka   acik   eli-#ess/∅-te-la.

   Chelswu-GEN   child-NOM   still   little-PAST/PRES-TE-DECL

   '[I made a sensory observation that] Chelswu's child was still little.'

b. Ku   cip   chako-ka   khu-#ess/∅-te-la.

   the house garage-NOM   big-PAST/PRES-TE-DECL

   '[I made a sensory observation that] the garage of the house was big.'

c. Chelswu-ui   chyechu-nun   hayah-#ess/∅-te-la.

   Chelswu-GEN   shirt-TOP   white-PAST/PRES-TE-DECL

   '[I made a sensory observation that] Chelswu's shirt was white.'

d. Ecey   cengmallo   cwup-#ess/∅-te-la.

   yesterday   really   cold-PAST/PRES-TE-DECL

   '[I made a sensory observation that] it was really cold yesterday.

e. Chelswu-ui   kelum-i   ppalu-#ess/∅-te-la.

   Chelswu-GEN   walking-NOM   fast-PAST/PRES-TE-DECL

   '[I made a sensory observation that] Chelswu's walking was fast.'

In (12), the speaker acquired sensory evidence about Chelswu and his family when she visited his house. What is crucial here is that present tense ∅ is required for this direct evidential reading; past tense -*ess* is not felicitous in this context.

If statives occur with past tense in a -*te* sentence, they yield an indirect evidential reading according to which the speaker did not experience a described state herself, but she made an inference of it on the basis of her sensory observation of its result state. The examples in (13) illustrate the case where the speaker did not have a chance to observe the entire house before it collapsed. But she inferred about its garage size, groundwork, and floor plan on the basis of what she saw after the collapse.

(13) **Statives: Indirect evidential reading with past tense**

[Context: Yesterday the speaker was asked to come to inspect a house site where a half of the 2-story building was collapsed for an unknown reason a few days ago. She had never been to the area, but she made an inference as an architect on the basis of her observation of the debris and the

remaining part of the house. Now, she says:]

a. Ku   cip   chako-ka   emcheng   khu-ess/#∅-te-la.
   the   house   garage-NOM   very   big-PAST/PRES-TE-DECL
   ‘[I inferred (from the acquired sensory evidence) that] the garage of the
   house was very big.’

b. Ku   cip   kicho.kongsa-ka   pwusilha-yess/#∅-te-la.
   the   house   groundwork-NOM   not.solid-PAST/PRES-TE-DECL
   ‘[I inferred (from the acquired sensory evidence) that] the groundwork of
   the house was not solid.’

c. Ku   cip   kwuco-ka   an-coh-ass/#∅-te-la.
   the   house   floor.plan-NOM   NEG-good-PAST/PRES-TE-DECL
   ‘[I inferred (from the acquired sensory evidence) that] the floor plan of
   the house was not good.’

The examples in (13) receive an indirect (inferential) reading, and crucially, they are all felicitous with past tense, but not with present tense.

The evidential readings with statives in (12) and (13) are predicted by the generalization in (2), i.e. present tense in a -*te* sentence results in a direct evidential reading whereas past tense in a -*te* sentence yields an indirect (inferential) evidential reading. However, when inchoatives occur in a -*te* sentence, they seem to induce a different pattern at first glance. This led previous authors (Lim 2014, inter alia) to argue that examples like (3) are counterexamples to the generalization in (2). In the following section, I provide more of such examples and spell out their evidential readings when they are realized with different tense morphemes.

3.2 Evidential readings with inchoatives

Inchoatives must occur with past tense when a speaker obtained sensory evidence for the state which is straightforwardly related to the described eventuality, as we have seen in (3b). More similar examples are provided in (14); the speaker observed the ice melt, the food rotten, the weed grown, the flower withered, the doorknob rusted, the maintenance fee risen, and water flooded into the closet.

(14) **Inchoatives: Indirect evidential reading with past tense**
[Context: Chelswu came back from a 2-month trip yesterday. He was panicked about what had happened for the past two months, particularly due to flooding and power outage. Now, he says:]

a. Nayngcangko-ui   elum-i   nok-ass/#∅-te-la.
   fridge-GEN   ice-NOM   melt-PAST/PRES-TE-DECL
   '[I made a sensory observation that] the ice in the fridge melted.'

b. Nayngcangko-ui   umsik-i   ssek-ess/#∅-te-la.
   fridge-GEN   food-NOM   rot-PAST/PRES-TE-DECL
   '[I made a sensory observation that] the food in the fridge rotted.'

c. Capcho-ka   manhi   cala-ass/#∅-te-la.
   weed-nom   a.lot   grow-PAST/PRES-TE-DECL
   '[I made a sensory observation that] the weed grew a lot.'

d. Cengwen-ui   kkoch-i   situl-ess/#∅-te-la.
   garden-GEN   flower-NOM   wither-PAST/PRES-TE-DECL
   '[I made a sensory observation that] the flower in the garden withered.'

e. Mwun.soncapi-ka   noksul-ess/#∅-te-la.
   doorknob-NOM   rust-PAST/PRES-TE-DECLl
   '[I made a sensory observation that] the doorknob rusted.'

f. Kwanlipi-ka   olu-ess/#∅-te-la.
   maintenance.fee-NOM   rise-PAST/PRES-TE-DECL
   '[I made a sensory observation that] the maintenance fee rose.'

g. Oscang-ey   mwul-i   tuleka-ss/#∅-te-la.
   closet-LOC   water-NOM   go.in-PAST/PRES-TE-DECL
   '[I made a sensory observation that] water went into the closet.'

The above examples are in a sharp contrast with (12), in terms of which tense they are felicitous with; inchoatives must occur with past tense, but not with present tense.

If inchoatives are realized with present tense, they result in a different evidential reading, according to which the speaker observed a change in progress. For example, what the speaker observed in (15a) is the process of the ice melting, but not its result state. If there is no remaining ice in the fridge, then (15a) cannot be uttered felicitously. The compatibility with the adverb *cemcem* 'gradually' and the progressive *-koiss* in the following examples lends further support for the fact that what the speaker observed is

the ongoing state of a changing process.

(15)   **Inchoatives: Direct evidential reading with present tense**

    a. [Context: The speaker received a text message, which said that electricity had been cut off temporarily in the neighborhood. As soon as she read the message, she opened the fridge to check the food. Now, she says:]

Nayngcangko-ui   elum-i   (cemcem)
fridge-GEN   ice-NOM   gradually
nok-(koiss)-#ass/∅-te-la.
melt-PROG-PAST/PRES-TE-DECL

ʻ[I made a sensory observation that] the ice in the fridge was melting (gradually).ʼ

    b. [Context: When the speaker turned around, she saw her little son pouring water in front of the closet. Now, she says:]

Oscang-ey   mwul-i   (cemcem)
closet-LOC   water-NOM   gradually
tuleka-(koiss)-#ess/∅-te-la.
go.in-PROG-PAST/PRES-TE-DECL

ʻ[I made a sensory observation that] water was going into the closet (gradually).ʼ

Now, a question arises as to how each evidential reading in (14) and (15) can be identified in terms of the notion of directness, which has been utilized in Willett's (1988) classification of evidence types and adopted in the literature on Korean evidentials, as shown in the generalization in (2). This direct vs. indirect distinction is concerned with how the speaker's sensory evidence is taken to support the truth of the prejacent. If the speaker makes a sensory observation of a described eventuality itself, she is assumed to acquire direct evidence for the truth of the prejacent, as in (1a). In contrast, if the speaker uses her sensory evidence to make an inference on the truth of the prejacent, the evidence is assumed to be indirect. Particularly, one type of indirect evidence that Willett (1988) proposes is result-based inferential evidence, as illustrated in (1b).

In this paper, I analyze the meaning of inchoatives as being composed of a prior change and its result state in line with prior works (e.g. Yoon 1996; Lee 2006; Choi 2019, inter alia), and show that tense modifies the time of change (but not the time of

the result state) in a *-te* sentence. I extend Lee's (2011a, 2013) compositional analysis to *-te* sentences which contain inchoatives, and claim that the generalization in (2) obtains for the cases with inchoatives as well, if we consider their lexical aspectual meaning.

4. Proposed analysis

This section begins with some assumptions about the temporal interpretation in Korean, such as the 'relative' tense meaning (§4.1) and the effect of stativity on the temporal interpretation (§4.2). Next, I formalize the meaning of inchoatives on the basis of prior work (§4.3). I briefly introduce Lee's (2011a, 2013) key proposal on how a temporal reading affects an evidential reading in a *-te* sentence (§4.4), and then provide a compositional analysis of *-te* sentences with inchoatives in comparison with those with statives, in line with Lee (2011b, 2013) (§4.5).

4.1 The 'relative' tense in Korean

Following the assumptions within the Reichenbachian framework, I analyze tense as constraining the reference time (**RT**) with respect to some other time interval, which I call the *evaluation time* in this paper. In languages like Korean which employ the so-called 'relative tense' system, tense in an embedded clause is evaluated with respect to the reference time of the eventuality denoted by a matrix clause (**RT$_{mat}$**) while tense in a matrix clause is evaluated with respect to the utterance time (**UT**). I illustrate this 'relative' tense interpretation with the predicate *ttena-* 'leave' below:

(16) a. Chelswu-nun   (ecey/#cikum/#nayil)   ttena-ss-e.
        Chelswu-TOP   yesterday/now/tomorrow   leave-PAST-DECL
        'Chelswu left (yesterday/#now/#tomorrow).'   [**RT**<**UT**]
    b. Ecey   Yenghi-nun Chelswu-ka   ttena-ss-ta-ko
       yesterday Yenghi-TOP Chelswu-NOM   leave-PAST-DECL-COMP
       malha-yess-e.
       say-PAST-DECL
       'Yesterday Yenghi said that Chelswu had left.'
                                    [**RT$_{emb}$**<**RT$_{mat}$**], [**RT$_{mat}$**<**UT**]

In (16b), past tense *-ess* in the embedded clauses locates its reference time (RT_{emb}) prior to the reference time of the saying-eventuality denoted by the matrix clause (RT_{mat}). This differs from the case where *-ess* occurs in a simple sentence as in (16a) or in the matrix clause of a complex sentence as in (16b); it locates **RT** prior to the **UT**.

This meaning of Korean tense is translated in (17); they constrain the temporal location of the reference time t' with respect to the evaluation time t. In (34a), I assume that the reference time is not existentially bound, but its exact temporal location is contextually determined, following the dynamic semantic view of tense meaning (Partee 1984; Hinrichs 1986; Kamp and Reyle 1993, inter alia).

(17) a. *-ess* 'PAST' $\Rightarrow$ $\lambda p.\lambda w.\lambda t \ [\ t' \ < \ t \ \wedge \ p \ (w, \ t') \ ]$
  b. *-$\varnothing_{pres}$* 'PRES' $\Rightarrow$ $\lambda p.\lambda w.\lambda t \ [\ t \ \leq \ t' \ \wedge \ p \ (w, \ t') \ ]$

Lee (2011a, 2013) shows how this 'relative tense' interpretation arises from a *-te* sentence. In the proposed analysis, she introduces the notion of an *evidence acquisition time* (**EAT**) at which the speaker acquired some sensory evidence for a described eventuality.[4] She argues that the evidential *-te* is responsible for the temporal location of **EAT**, and its co-occurring tense constrains the **RT** of a described eventuality. More specifically, *-te* locates the **EAT** prior to the **UT**, and tense occurring with *-te* is evaluated with respect to the **EAT.** Consider the example in (1b), repeated below:

(18) [Context: Yenghi saw the wet ground this morning. Now, she says:]
  Ecey   pi-ka   o-ass-te-la.
  yesterday   rain-NOM   fall-PAST-TE-DECL
  '[I inferred (from the acquired sensory evidence) that] it had rained
  yesterday.'   [**RT**<**EAT**], [**EAT**<**UT**]

In (18), **EAT** is the time at which the speaker saw the wet ground, and it temporally precedes the **UT**, as described in the above scenario. The speaker inferred from the wet ground that it had rained before: In other words, (18) receives the temporal reading according to which the **ET** of the raining eventuality temporally precedes the **EAT**. According to Lee's analysis, past tense *-ess* in (18) locates the **RT** of the raining

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4   The notion of evidence acquisition time has been adopted in the subsequent work on evidentiality (e.g. Koev 2017; Bowler 2018; Johnson 2022). See more references in Hirayama and Matthewson (2022).

eventuality prior to the **EAT** which functions as the evaluation time of *-ess* in a *-te* sentence. The exact temporal location of the **ET** of the raining eventuality with respect to the **RT** is further constrained by the lexical aspect of a predicate, as discussed in the next section.

4.2 Statives vs. eventives

The temporal relation between **RT** and **ET** is constrained by the stativity of a described eventuality (Kamp and Rohrer 1983; Partee 1984; Dowty 1986; Hinrichs 1986; Klein 1994, inter alia): The **ET** of an *eventive* eventuality is included in its **RT**, but the **ET** of a *stative* eventuality includes its **RT**. In (19), the **RT** is included in the time interval denoted by the time adverb *ecey* ʻyesterdayʼ. While the event of Chelswuʼs leaving in (19a) is temporally interpreted as occurring in some subinterval of the **RT**, the state of Chelswuʼs being sick in (19b) can be construed as holding in the time interval larger than the **RT**.

(19) a. Chelswu-ka   ecey   ttena-ss-e.
      Chelswu-NOM   yesterday   leave-PAST-DECL
      ʻChelswu left yesterday.ʼ   **[RT⊆yesterday′], [ET⊂RT]**
   b. Chelswu-ka   ecey   apha-ss-e.
      Chelswu-NOM   yesterday   sick-PAST-DECL
      ʻChelswu was sick yesterday.ʼ   **[RT⊆yesterday′], [RT⊆ET]**

The same **RT-ET** relationship is observed in events and states denoted by a *-te* sentence as well: The **ET** of the event of Chelswuʼs leaving in (20a) is included in the **RT**, but the **ET** of the state of Chelswuʼs being sick in (20b) includes the **RT**.

(20) a. [Context: When Yenghi arrived home this morning, she could not find
         Chelswuʼs bag. Instead, she found his memo about his trip to Rome.
         Now, she says:]
      Chelswu-ka   ecey   ttena-ss-te-la.
      Chelswu-NOM   yesterday   leave-PAST-TE-DECL
      ʻ[I inferred (from the acquired sensory evidence) that] Chelswu had left
      yesterday.ʼ   **[RT⊆yesterday′], [ET⊂RT]**

b. [Context: When Yenghi arrived home this morning, she found a prescription for Chelswu dated on the day before her arrival. Now, she says:]

Chelswu-ka   ecey   aphu-ass-te-la.

Chelswu-NOM   yesterday   sick-PAST-TE-DECL

'[I inferred (from the acquired sensory evidence) that] Chelswu had been sick yesterday'   **[RT⊆yesterday′], [RT⊆ET]**

Given the above empirical patterns, I specify the lexical aspect of a predicate in terms of Condoravdi's (2002) AT-predicate, which invokes a different temporal relation between **ET** and **RT**, depending on the stativity of a given predicate.[5]

(21) AT(t,w,P)

 $= \exists e \;[\; P(w)(e) \;\wedge\; \tau\,(e,w) \subset t \;]$ if P is eventive

 $= \exists e \;[\; P(w)(e) \;\wedge\; t \subseteq \tau\,(e,w) \;]$ if P is stative

According to (21), when the property of the eventuality e is instantiated at t in w, (i) **ET** (represented by the trace function τ of the eventuality e) is included in **RT** if a predicate is eventive, but (ii) **ET** includes **RT** with a stative predicate.[6]

4.3 Inchoatives

In the proposed analysis, I distinguish inchoatives from simple eventives and statives, building on previous studies (Yoon 1996; Lee 2006; Choi 2019, inter alia). Yoon (1996) makes it clear that the view that inchoatives denote two subevents (unlike statives) dates back to very early work on Korean linguistics, such as Yang (1977, 1978), and Jeong (1981). He refers to what I call inchoatives as result verbs, and translates their meaning in terms of a **RES**-operator (Kamp and Roβdeutscher 1992, inter alia), as shown in the case of the verb *ssu-* 'put on' in (22).[7]

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5   The trace function τ in (21) is modified from Krifka (1998).

6   This paper focuses on the effect of lexical aspect to the evidential reading of a *-te* sentence, and thus I do not formally analyze the case where the progressive marker *-koiss* occurs in a *-te* sentence. But see Lee (2023) for the compositional meaning of Korean grammatical aspectual markers such as the progressive.

7   As pointed out by a reviewer, Lim (2014) also discusses a *-te* sentence with a verb of wearing, as a counterexample to the generalization in (2). Following Yoon's (1996) view that verbs of wearing are

(22) *ssu-* 'put on' $\Rightarrow \lambda y.\lambda x.\lambda T.\lambda e$ [put.on(x,y,e) & $\exists s[\textbf{RES}_{\text{put.on}}(s,e)$ & $T(s)]]$

(Yoon 1996: 183)

Lee (2006) attempts to characterize the properties of inchoatives by comparing them with typical achievements. Following Kamp & Reyle's (1993) schema of eventuality, she assumes that events have a preparatory phase prior to a transition point and a result state after it.[8] While typical achievements (which she calls 'climactic achievements') are understood as referring to the culmination of the preparatory stage I in Figure 1, she argues that there is another type of achievements in Korean, where the transition point is taken as the inception of the result state; she calls it an 'inchoative achievement'.

preparatory phase	transition point	result state
I	II	III
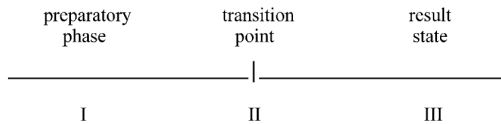
Figure 1. A schematic picture of events in Korean: Lee (2006: 699)

Along the same line, Choi (2019) conducts an extensive comparison between typical achievements and inchoatives, and argues that inchoatives make reference to a change of state (like typical achievements), but they are not punctual but durative (like states). Building on Bar-el (2005), she proposes the following semantics of inchoatives in Korean.

(23) $\lambda e. \exists e_1. \exists e_2.\ e = e_1 \oplus e_2$ and e_2 immediately follows e_1
and $[\![\textbf{BECOME}\ P]\!](e_1) = 1$ and $[\![P]\!](e_2) = 1$

In (23), a temporal contiguity is imposed on a prior change e_1 and its result state e_2 by

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inchoatives as formalized in (22), I argue that the analysis proposed in this paper can be extended to examples like (i) as well.

(i) [Context: The speaker met John yesterday. Now, he says:]

John-i   ecey   ppalkan   syechu-lul   ip-ess-te-la.
John-NOM yesterday red   shirt-ACC   wear-PAST-TE-DECL
'John wore a red shirt yesterday.'   (Lim 2014: 126)

8   This contrasts with the schema of states which is composed of a single unbroken line, and thus represents that states are not dynamic.

a summation operation (Rothstein 2004).[9]

 This idea of a result state being lexically specified in the denotation of certain eventives has been widely adopted for various constructions across languages; See, e.g. the adjectival passive construction in German (Kratzer 2000), a result state interpretation with durative adverbials in English, German, and Hungarian (Piñón 1999), repetitive/restitutive ambiguity exhibited by the German adverb *wieder* (von Stechow 2003), a diachronic change from resultative to perfect aspect and then to perfect plus perfective aspect in Old and Middle Indo-Aryan languages (Condoravdi and Deo 2015).[10] Beavers et al.'s (2021) work on simple vs. derived statives across typologically varied languages follows this line of formalization as well, according to which inchoatives lexically encode the existence of a prior change and its result state, as shown in (24c). Statives, which denote a state as in (24a), can also have a change-of-state meaning by combining with an inchoative marker whose meaning is represented by a **BECOME**-operator in (24b).[11]

(24) a. $[\![flat]\!] = \lambda x.\lambda s\ [\ flat\,'\,(x,\ s)\ ]$

   b. $[\![v_{\text{become}}]\!] = \lambda P.\lambda x.\lambda e.\exists s\ [\ become\,'\ (e,\ s)\ \wedge\ P(x,\ s)\ ]$

   c. $[\![melt]\!] = \lambda x.\lambda s\ [\ melted\,'\ (x,\ s)\ \wedge\ \exists e'\ [become\,'\ (e\,',\ s)]\ ]$

             (Beavers et al. 2021: 452-453)

 Following these approaches, I analyze Korean inchoatives as being composed of two subevents: e_1 (for a prior change) and e_2 (for its result state). This is represented in terms of the AT-predicate, as shown in (25). I utilize von Stechow's (1996) **BECOME**-operator defined in (26), whereby the pre-state is assumed to be 'the state that holds immediately

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9 The **BECOME**-operator in (23) was first proposed by Dowty (1979) within the interval-based temporal semantics, as follows:

(i) $[\![\textbf{BECOME}\ \Phi]\!]$ is true at I iff

  (a) there is an interval J containing the initial bound of I such that $\neg\Phi$ is true at J,

  (b) there is an interval K containing the final bound of I such that Φ is true at K, and

  (c) there is no non-empty interval $I\,'$ such that $I\,' \subset I$ and conditions (i) and (ii) hold for $I\,'$ as well

    as I.   (Dowty 1979: 141)

10 Marín and McNally' (2011) work on two subclasses of Spanish reflexive psychological verbs contains a similar insight, but it was formalized in terms of Piñón's (1997) ontology for eventualities, whereby two fundamentally different sorts of entities are assumed: happenings (for events, states, and processes) vs. boundary happenings (for onsets or endings of happenings).

11 For a syntactically-oriented approach to a result-state predication in English, see Embick (2004, 2009).

before the event e occurs', and the target state is assumed to be 'the state reached at the end of the event' (von Stechow 1996: 96).[12]

(25) AT(t,w,P)
        = $\exists e_1. \exists e_2$ [**BECOME**($P(\text{w})(e_1)$) $\wedge$ $P(w)(e_2)$ $\wedge$ $\underline{\tau\ (e_1,\text{w})} \ll \underline{\tau\ (e_2,\text{w})}$
          $\wedge$ $\underline{\tau\ (e_1,w)} \subset t$] if P is inchoative.

(26) ⟦**BECOME** ($P(w)(e)$)⟧ = 1 iff e is the smallest event such that P is not
        true of the pre-state of e but P is true of the target state of e in w.

(von Stechow 1996: 96)

The first underlined part in (25) reflects an immediate precedence relation between the **ET**s of the two subevents e_1 and e_2; the former immediately precedes the latter, as defined in (27). Choi (2019) incorporates this relation in her analysis of Korean inchoatives as well, as we have seen in (23).

(27) $t' \ll t \leftrightarrow t' < t \wedge \neg \exists t'' [\ t' < t'' \wedge t'' < t\ ]$

This property of lexical inchoatives pertains to the notion of direct causation. In his experimental research, Wolff (2003: 3) demonstrates that whether a sequence of eventualities is viewed as a single eventuality or not is determined by the concept of direct causation, which is defined by the no-intervening-cause criterion, i.e. whether or not it is possible for another event to intervene between two subevents. For example, there is no intermediary between the two subevents of ice becoming melt and its result state, and thus it is usually construed as a single eventuality.[13] According to Wolff (2003), previous researchers have adopted various notions in the definition of direct causation, such as temporal contiguity, intentionality, mediacy, physical contact, efficiency, conventionality, stereotypicality, and prototypicality; See the references therein.

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12   In the proposed analysis, I do not formalize the degree to which an entity under discussion undergoes change of state, but the current analysis is compatible with the version with the degree variable d as in Hay et al. (1999). See Kim (2005) for different types of change-of-state predicates in Korean, which includes gradable and semi-gradable inchoatives as well as ungradable ones.

13   This contrasts with the case of a raining event and a state of the ground being wet (as its result state); we can easily think of an eventuality that can occur between them. For example, suppose that when it rained, the ground at the speaker's backyard did not get wet, because it was covered by the roof. But when it started raining again very hard, the roof was broken, which finally caused the ground to be wet. Under this scenario, the event of the roof being broken intervenes the raining event and the state of the ground being wet.

I incorporate the direct causation of an inchoative predicate by specifying an immediate precedence relation between its two subevents in (25).

The second underlined part in (25) is concerned with tense modification. Recall that the time interval t in (25) corresponds to the **RT** of a described eventuality, and tense constrains the temporal location of **RT** with respect to its evaluation time. Crucially, what is located with respect to the **RT** is the **ET** of a prior change e_1, but not the **ET** of its result state e_2. This is a key empirical fact with Korean inchoatives, which is observed in both simple and complex sentences, as shown in (28). This differs from the case with statives where tense is responsible for the time of a described state, as shown in (29).

(28) **Inchoatives in simple/complex sentences**

a. [Context: Chelswu is looking at the couple who lives next door, and now he says:]

Ce   pwupwu-nun   selo   talm-ass/#nun-ta.
that   married.couple-TOP each.other resemble-PAST/PRES-DECL
'That married couple resembles each other.'

b. [Context: Chelswu met a couple yesterday, and talked about them to his wife. Now, Chelswu's wife says:]

Ecey   Chelswu-nun   ku-tul-i   selo
yesterday   Chelswu-TOP   they-PL-NOM   each.other
talm-ass/#nun-ta-ko   malha-yess-ta.
resemble-PAST/PRES-DECL-COMP   say-PAST-DECL
'Yesterday Chelswu said that they resembled each other.'

(29) **Statives in simple/complex sentences**

a. [Context: same as (28a)]

Ce   pwupwu-nun   selo   pisusha-#yess/∅-ta.
that   married.couple-TOP each.other alike-PAST/PRES-DECL
'That married couple looks alike each other.'

b. [Context: same as (28b)]

Ecey   Chelswu-nun   ku-tul-i   selo
yesterday   Chelswu-TOP   they-PL-NOM   each.other
pisusha-#yess/∅-ta-ko   malha-yess-ta.
alike-PAST/PRES-DECL-COMP   say-PAST-DECL
'Yesterday Chelswu said that they looked alike each other.'

Both simple and complex sentences in (28) show that inchoatives must occur with past tense when they are used to describe a given state at the reference time. This contrasts with statives which must occur with present tense in the same context, as shown in (29). For example, in (28a) and (29a), the speaker is describing what he is seeing at the utterance time; while the stative *pisusha-* 'alike' must occur with present tense, the inchoative *talm-* 'resemble' must occur with past tense. That is, past tense realized with inchoatives constrains the **RT** of a prior change e_1 to precede its evaluation time, so that the result state e_2 can overlap the evaluation time.

4.4 Temporal reading and its effect on the evidential reading

Lee (2011a, 2013) argues that the temporal interpretation of a *-te* sentence affects its evidential interpretation. For example, in (20a), (i) the **RT** of the leaving-event temporally precedes the **EAT** at which the speaker acquired sensory evidence for it (due to the meaning of past tense *-ess*), and (ii) the **ET** of the leaving-event is included in its **RT** (due to its non-stativity). The temporal relation between the **EAT** and the **ET** of the leaving-event gives rise to a backshifted temporal reading, and it in turn yields an indirect inferential evidential reading such that the speaker inferred about the leaving-event from the acquired sensory evidence. In contrast, present tense allows **EAT** to overlap **RT** (and thus **ET**), which results in a direct evidential interpretation. Lee's (2011a, 2013) main focus was the interaction between *-te* and its co-occurring tense and how the resulting temporal relation between **EAT** and **RT** affects the direct vs. indirect evidential reading in a *-te* sentence. Although Lee adopts the AT-predicate in (21) which reflects the different **RT-ET** relationship between statives and eventives, she does not address how different lexical aspectual properties can affect evidential readings.[14]

The present work takes into account the effect of lexical aspect on the interpretation of a *-te* sentence, with a particular focus on the difference between statives and inchoatives. I propose that the aspectual properties affect not only the temporal

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14 Lee's (2011a, 2013) analysis of a *-te* sentence includes the case with future tense, which yields an indirect (inferential) evidential reading from the sequential temporal relation between **RT** and **EAT**. A similar case where present tense gives rise to a futurate reading is analyzed as yielding an indirect (inferential) evidential reading as well. In this paper, I focus on the empirical fact that a direct evidential reading is available from the combination of *-te* and present tense, in comparison with its corresponding *-te* sentence with past tense, and thus the cases of futurate temporal readings of a *-te* sentence are not discussed here; but see Lee (2011a, 2013) for such examples and their compositional analyses.

interpretation but also the evidential interpretation of a -*te* sentence in line with Lee (2011a, 2013). While Lee's work focuses on the interaction between the evidential -*te* and its co-occurring tense, this paper extends her claim by incorporating the lexically specified aspectual meanings of predicates into the compositional analysis of a -*te* sentence, as presented in the next section.

4.5 Compositional analysis

This section provides a semantic derivation of the following -*te* sentences which are selected from (12)-(15).

(30) **Statives**
  a. **Direct evidential reading with present tense**
  Ku   cip   chako-ka   khu-∅-te-la.
  the   house   garage-NOM   big-PRES-TE-DECL
  '[I made a sensory observation that] the garage of the house was big.'
  b. **Indirect evidential reading with past tense**
  Ku   cip   chako-ka   khu-ess-te-la.
  the   house   garage-NOM   big-PAST-TE-DECL
  '[I inferred (from the sensory evidence) that] the garage of the house was big.'

(31) **Inchoatives**
  a. **Direct evidential reading with present tense**
  Elum-i   nok-∅-te-la.
  ice-NOM   melt-PRES-TE-DECL
  '[I made a sensory observation that] the ice was melting.'
  b. **Indirect evidential reading with past tense**
  Elum-i   nok-ass-te-la.
  ice-NOM   melt-PAST-TE-DECL
  '[I inferred (from the sensory evidence) that] the ice melted.'

I argue that the generalization in (2) holds for both cases with statives and inchoatives: -*te* results in a direct evidential reading with present tense, and an indirect (inferential)

evidential reading with past tense. Sentences like (31b) seem to receive a direct evidential reading at first glance, because they are felicitous only when the speaker acquired some sensory evidence on the result state e_2. In this section, I account for how this implication arises from the compositional meaning of (31b), and how it differs from the direct evidential reading of sentences like (30a).

The lexical entries for a compositional analysis of the above sentences are given below. First, the denotation of a sentence radical is a function from a world to a set of time intervals, as shown in (32): The constant like **ice.melt**$'$ in (32b) is a function from a world to sets of eventualities described by the prejacent.

(32) a. *ku cip chako-ka khu-* 'the house garage-NOM big'
$\Rightarrow \lambda w.\lambda t$ [AT(t,w,**house.garage.big**$'$)]

b. *elum-i nok-* 'ice-NOM melt' $\Rightarrow \lambda w.\lambda t$ [AT(t,w,**ice.melt**$'$)]

The AT-predicate, which incorporates the aspectual properties of inchoatives as well as statives and eventives, is repeated below.

(33) AT(t,w,P)
$= \exists e$ [$P(w)(e) \wedge \tau (e,w) \subset t$] if P is eventive
$= \exists e$ [$P(w)(e) \wedge t \subseteq \tau (e,w)$] if P is stative
$= \exists e_1. \exists e_2$ [**BECOME**(P(w)(e_1)) $\wedge P$(w)(e_2) $\wedge$ $\underline{\tau (e_1,w) \ll \tau (e_2,w)}$
$\wedge$ $\underline{\tau (e_1,w) \subset t}$] if P is inchoative.

Except for the AT-predicate, the translations of other relevant components are adopted from Lee (2011a, 2013). The translations of Korean 'relative' tenses, which have already been discussed in §4.1, are repeated in (34).

(34) a. *-ess* 'PAST' $\Rightarrow \lambda p.\lambda w.\lambda t$ [$t' < t \wedge p$ (w, t')]

b. *-$\varnothing_{pres}$* 'PRES' $\Rightarrow \lambda p.\lambda w.\lambda t$ [$t \leq t'$ $\wedge p$ (w, t')]

Lee's analysis of *-te* in terms of Kratzer's (1977, 1981, 1991) modal theory is adopted as well. According to (35), *-te* has temporal and modal meaning contributions: given a world-time pair, *-te* maps it to (i) the set of worlds determined by the modal base SO (Sensory Observation) and the ordering source ST/DX (Stereotypical/Doxastic) and to (ii)

the time preceding another time.[15]

(35) $\neg te \Rightarrow \lambda p.\lambda w.\lambda t\ [t''{<}t \wedge \forall w'\ [w'{\in}BEST(SO,ST/DX,\ w,\ t'')\rightarrow p(w')(t'')]]$

Finally, the translation of the declarative *-la* is provided in (36): w^* and **now** stand for the actual world and the utterance time, respectively.

(36)   *-la* 'DECL' $\Rightarrow \lambda p.\lambda w.\lambda t\ [\ p(w^*,\ \textbf{now})\ ]$

In the semantic derivation, a sentence radical first combines with tense, and then the resulting tensed clause combines with *-te*. Next, the tensed evidential clause combines with the declarative *-la*, which produces the final truth-conditional meaning translations of the *-te* sentences in (30) and (31), as follows. In (37) and (38), the two variables t'' (for the **EAT**) and t' (for the **RT** of a described eventuality) are not existentially bound, but their exact temporal locations are contextually determined.

(37) a. *ku cip chako-ka khu-$\varnothing_{pres}$-te-la*
     'the house garage-NOM big-PRES-TE-DECL'
     $\Rightarrow [\ t'' < \textbf{now} \wedge \forall w'\ [w' \in BEST(SO,\ ST/DX,\ w^*,\ t'')$
       $\rightarrow (t'' \leq t' \wedge \exists e\ [\textbf{house.garage.big}'(w')(e) \wedge t' \subseteq \tau\ (e,w')\ ])]]$
   b. *ku cip chako-ka khu-ess-te-la*
     'the house garage-NOM big-PAST-TE-DECL'
     $\Rightarrow [\ t'' < \textbf{now} \wedge \forall w'\ [w' \in BEST(SO,\ ST/DX,\ w^*,\ t'')$
       $\rightarrow (t' < t'' \wedge \exists e\ [\textbf{house.garage.big}'(w')(e) \wedge t' \subseteq \tau\ (e,w')\ ])]]$
(38) a. *elum-i nok-$\varnothing_{pres}$-te-la*   'ice-NOM melt-PRES-TE-DECL'
     $\Rightarrow [\ t'' < \textbf{now} \wedge \forall w'\ [w' \in BEST(SO,\ ST/DX,\ w^*,\ t'')$
       $\rightarrow (t'' \leq t' \wedge \exists e_1.\exists e_2\ [\textbf{BECOME (ice.melt}'(w')(e_1))$
       $\wedge\ \textbf{ice.melt}'(w')(e_2) \wedge \tau\ (e_1,w')\ll\tau\ (e_2,w')\ \wedge\tau\ (e_1,w')\subset t'\ ])]]$
   b. *elum-i nok-ass-te-la* 'ice-NOM melt-PAST-TE-DECL'
     $\Rightarrow [\ t'' < \textbf{now} \wedge \forall w'\ [w' \in BEST(SO,\ ST/DX,\ w^*,\ t'')$
       $\rightarrow (t' < t'' \wedge \exists e_1.\exists e_2\ [\textbf{BECOME (ice.melt}'(w')(e_1))$
       $\wedge\ \textbf{ice.melt}'(w')(e_2) \wedge \tau\ (e_1,w')\ll\tau\ (e_2,w')\ \wedge\tau\ (e_1,w')\subset t'\ ])]]$

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15 Portner's (1998) BEST-function has been utilized in (35).

According to (37) and (38), statives and inchoatives yield different temporal readings: while the **ET** of the described state *e* includes its **RT** in (37), the **ET** of the prior change e_1 is included in its **RT** in (38). Present tense locates **RT** at or after **EAT**, and past tense locates **RT** before **EAT**. Consequently, the **ET** can overlap the **EAT** when statives occur with present tense, but the **ET** precedes the **EAT** when statives occur with past tense; the former temporal relation results in a direct evidential reading and the latter an indirect inferential evidential reading. This is straightforwardly predicted by Lee's analysis.

In the case of -*te* sentences with inchoatives, the **ET** of a prior change e_1 can overlap the **EAT** if present tense is realized, as shown in (38a). This correctly captures the direct evidential reading such that the speaker made a sensory observation of the ice undergoing a melting process. In contrast, if past tense occurs, the **ET** of a prior change e_1 precedes the **EAT**, as shown in (38b). That is, an indirect (inferential) evidential reading arises from this sequential relation just like the corresponding example with a stative in (37b).

The important point to note here is that the implication that the **ET** of e_2 overlaps the **EAT** is also available from (38b) due to the following conditions:

(39) a. the speaker acquired sensory evidence at **EAT**.
  b. the **ET** of a prior change e_1 immediately precedes the **ET** of its result state e_2.

In the proposed analysis, (39a) was formalized in terms of the Modal Base SO (Sensory Observation), and (39b) was reflected in the AT-predicate for inchoatives. Due to (39a) and (39b), the sensory evidence that the speaker acquired at **EAT** is straightforwardly concerned with the result state e_2. The direct connection between e_1 and e_2, which is formulated by the immediate precedence relation in the proposed analysis, might lead us to construe them as a single eventuality, and analyze a past tensed -*te* sentence with inchoatives like (38b) as receiving a direct evidential reading. However, crucially, the way the implication on the temporal overlap between the **ET** of e_2 and **EAT** arises from (38b) differs from the case of a direct evidential reading with statives in (37a). In (37a), the **ET** includes the **RT** which overlaps the **EAT**; that is, the **ET-EAT** overlap is compositionally calculated. In contrast, what the compositional meaning in (38b) says about the temporal reading is that the **ET** of the prior change e_1 is included in the **RT** which precedes the **EAT**, and it immediately precedes the **ET** of the result state e_2. Unlike the case with statives, the overlap between the **ET** of e_2 and the **EAT** is not

compositionally computed, but it is available due to the conditions in (39).

Note that Lee's key idea is applicable to the case with inchoatives as well. Her main point is that the **RT** of a described eventuality denoted by the prejacent is constrained by tense, and the temporal (non-)overlap between **ET** and **EAT** determines whether a *-te* sentence receives a direct vs. indirect evidential reading. In *-te* sentences with inchoatives, tense modifies the **RT** of a prior change e_1, and thus (i) a direct evidential reading can arise with present tense such that the speaker acquired evidence for the ongoing state of e_1, and (ii) an indirect evidential reading arises with past tense such that the speaker inferred on the existence of e_1 based on her sensory evidence on the result state of e_1, which exactly corresponds to e_2 due to the lexical aspectual properties of inchoatives.

4.6 Summary

This section showed how the direct vs. indirect evidential readings are derived from the compositional analyses of *-te* sentences with inchoatives in comparison with the cases with statives. The crucial difference between them lies in the pattern of tense modification. According to Lee (2011a, 2013), tense in a *-te* sentence locates the **RT** of a described eventuality with respect to the **EAT**. In this section, I showed that when a *-te* sentence contains an inchoative, tense constrains the **RT** of one of the subevents denoted by inchoatives, i.e. a prior change e_1, but not its result state e_2. I argued that given this tense modification, Lee's analysis can be extended to the *-te* sentences with inchoatives as well. Also, I elaborated on how the implication on the overlap between **EAT** and the **ET** of the result state e_2 is available from the relevant components in the proposed compositional analysis.

5. Comparison to Lim's (2014) analysis

Building on Kalsang et al.'s (2013) work on Tibetan direct evidentials, Lim (2014) proposes a felicity condition on the evidential *-te* in terms of two situations:

(40) The felicity condition on *-te*: ES⊇IS
  a. Information Situation (IS): the situation in which "the speaker perceived
    some eventuality on which his/her assertion is based"

   b. Evaluation Situation (ES): the situation in which "the speaker's assertion
      is evaluated as true"   (Lim 2014: 122, 128)

According to (40), IS should be a subset of ES in order for a *-te* sentence to be uttered
felicitously. For example, in a past tensed *-te* sentence like (1b), repeated below, the
speaker made a sensory observation of the result state of a described eventuality. Here,
Lim argues that ES corresponds to the resulting situation (like the ground being wet) as
well as the raining situation, but IS corresponds to only the resulting situation (because
the speaker did not see it raining).

   (41) [Context: Yenghi saw the wet ground yesterday. Now, she says:]
        Pi-ka   o-ass-te-la.
        rain-NOM   fall-PAST-TE-DECL
        '[I inferred (from the acquired sensory evidence) that] it had rained.'

Under Lim's (2014) analysis, the *-te* sentence in (41) is correctly predicted to be
felicitous because the speaker perceived only some part of the situation against which the
truth value of the prejacent is evaluated; that is, the ES includes the IS.

   Lim (2014) applies the felicity condition to the *-te* examples with inchoatives as well.
Adopting Pustejovsky (1995), he analyzes the predicate *cec-* 'become wet' in (42) as
denoting a complex event which is comprised of a process event and a state event.

   (42) Patak-i   mwul-ey   cec-ess/#∅-te-la.
        floor-NOM   water-LOC   become.wet-PAST/PRES-TE-DECL
        '[I made a sensory observation that] the floor was wet with water.'
                                                         (Lim 2014: 135-136)

In (42), there are two relevant situations; (i) the situation of the floor becoming wet, and
(ii) its resulting situation of the floor being wet. Both situations are necessary to evaluate
the truth value of the prejacent, and thus they are ESs. But since the speaker experienced
only the result state, IS is restricted to the second situation. Consequently, the ES
includes the IS, which satisfies the felicity condition on *-te*.

   However, Lim's proposed analysis poses significant problems. First of all, the felicity
condition on *-te* is empirically untenable since *-te* can also be used for the reversed

inclusion relation between IS and ES. That is, even in a context where IS includes ES, a -*te* sentence can be uttered felicitously. Lim himself recognizes this problem, and provides examples like (43).[16] He argues that the problem can be resolved by an equivalence relation between IS and ES, but this is not correct because we can utter (43) felicitously in the following context as well:

(43) [Context: On the way home, the speaker saw the sky getting dark and cloudy all of a sudden, and then it started raining very hard. But when he arrived home, it stopped raining. Now, he says:]
Pi-ka   ttak   o   pwun   tongan   nayli-∅-te-la.
rain-NOM   exactly   5   minute   during   fall-PRES-TE-DECL
'It rained for exactly five minutes.'

Under the given scenario, ES is the situation where it rains, but all of its pre-state, ongoing state, and the result state are ISs. In other words, a -*te* sentence can be uttered felicitously although IS includes ES, contrary to Lim's felicity condition on -*te*.

Furthermore, it is not sufficient to represent a felicity condition on -*te* only in terms of IS and ES, without considering the meaning contribution of its co-occurring tense. According to Lim's analysis, a -*te* sentence is felicitous as long as ES includes IS. This incorrectly predicts that in a context for a past tensed -*te* sentence like (41), its corresponding ⁻*te* sentence with future tense like (44) is felicitous as well:

(44) [Context: Yenghi saw the overcast sky yesterday. Now, she says:]
Pi-ka   o-kyess/#ass-te-la.
rain-NOM   fall-FUT/PAST-TE-DECL
'[I inferred (from the acquired sensory evidence) that] it would rain.'

In (44), a raining situation and its pre-state are ESs, but only the latter is IS. Thus, Lim's felicity condition on -*te* is satisfied in (44). But it remains unexplained why the past-tensed -*te* sentence is infelicitous in this context while its corresponding future-tensed one is felicitous. Lim notices this overgeneration problem, and admits that the compositional meaning of the temporal expressions -*ess/-kyess* needs to be considered in

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16 I added the contextual information to Lim's example in (43).

the course of interpretation.

However, his account for the function of -*ess* in (42) raises a further question on the role of tense/aspect in a -*te* sentence. Lim (2014) analyzes -*ess* as perfective aspect, and argues that its combination with a predicate denoting a complex event causes the result state subevent to be 'prominent'. Due to this function of -*ess* as perfective aspect, (42) with -*ess* is felicitous when the speaker perceived only the 'prominent' subevent. In contrast, he analyzes the present tensed -*te* sentence in (42) as not involving any tense or aspectual morphemes, and argues that the lack of tense/aspect forces the speaker to perceive both subevents denoted by inchoatives. That is, such sentences are felicitous only when the speaker perceived both a prior change and its result state. However, it is conceptually unclear what it exactly means a certain subevent is 'prominent' and why tense or aspect plays such a role. Furthermore, how this notion of 'prominence' can be incorporated in the compositional meaning of tense/aspect is left unaddressed.

6. Concluding remarks

An evidential sentence with -*te* in Korean has received a lot of attention in the literature. One of the empirical findings was that its direct vs. indirect (inferential) evidential reading is affected by its temporal reading. In particular, Lee's (2011a, 2013) analysis of -*te* and its interaction with tense showed how the evidential reading is compositionally derived by the temporal (non-)overlap between an evidence acquisition eventuality and a described eventuality. That is, a direct evidential reading can arise if -*te* occurs with present tense, but the occurrence of past tense in a -*te* sentence results in an indirect (inferential) evidential reading. This paper extended Lee's key proposal to -*te* sentences with inchoatives, and compared them with those with statives. I showed that while both predicate types are used to describe a certain state, they exhibit different patterns of interaction between -*te* and tense. Building on previous work, I analyzed inchoatives as being composed of two subevents, i.e. a prior change and its result state. Furthermore, I showed that when a -*te* sentence contains an inchoative, tense constrains the time of a prior change, but not that of its result state. I argued that given this lexical aspectual meaning of inchoatives, Lee's analysis can be extended to the -*te* sentences with inchoatives as well.

This paper provides an important insight on the relationship between our perception

and inference. When we obtain sensory evidence, we make an inference on its prior and/or resulting state. This reasoning is based on our world knowledge and discourse context. For example, we can draw a conclusion that the reason why the ground was wet was because it had rained before. While a causal relation among eventualities is pragmatically inferable this way, it can also be lexically specified. This paper shows how such a lexically encoded causal relation affects our inference. One point to note is that the availability of a single event construal pertains to our inference pattern. When a described eventuality is construed as a single eventuality like the case of raining, our inference on its development is pragmatically based. In contrast, if a described eventuality is complex itself as in the case of inchoatives, then the lexically specified causal relation among the subevents affects our inference. Wolff (2003) accounts for the availability of a single event construal in terms of the notion of direct causation in his work on single-clause vs. multi-clause expressions of causation, and suggests that it can be extended to other linguistic constructions such as the resultative construction. In the proposed analysis of a -*te* sentence, I showed how its evidential reading arises from the interactions of relevant components, including the meaning of an inchoative which itself encodes the meaning of direct causation in terms of an immediate temporal precedence relation between two subevents. I hope this work can be taken as a starting point for future work on how the individuation of events affects our inference based on perception, which is essential in understanding the meaning of evidentiality.

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