TRANSLATIVE CASE IN FINNISH: A FORCE-DYNAMIC ACCOUNT*

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1 Introduction

Translative case, morphologically realized as the suffix *-ksi* in Finnish and *-vá/-vé* in Hungarian, is strongly associated with the notion of change (cf. e.g. Fong, 2003; Matushansky, 2008; and references therein). For instance, in Finnish, it marks the predicative complements of such change-denoting verbs as *tulla* 'become' and *muuttua* 'change'/'turn (into)' (1), the second (result-state-denoting) complement of the causative variant *muuttaa* 'change' (2), and the nominal predicates in resultative constructions (3).

(1) a. *Toini   tuli   sairaaksi.*
        Toini   became   sick.TRANSL
        'Toini became sick.'   (Fong, 2003:(5))

     b. *Hän   muuttui   (toukasta)   perhoseksi.*
        s/he   changed   caterpillar.ELA   butterfly.TRANSL
        'S/he changed (from a caterpillar) into a butterfly.'   (Fong, 2003:(6))

(2) *Taikuri   muutti   perhosen   toukaksi.*
     magician   changed   butterfly.ACC   caterpillar.TRANSL
     'The magician changed a/the butterfly into a caterpillar.' (Fong, 2003:(8))

(3) *Ravistin   maton   puhtaaksi.*
     shook.1SG   carpet.ACC   clean.TRANSL
     'I shook a/the carpet clean.'   (Fong, 2003:(10))

For instance, intuitively, in (1a), the use of the translative is related to the presence of the change-entailing verb *tulla* 'come'/'become', and to the fact that Toini undergoes a change of

state: from being healthy to being sick. In (1b), a caterpillar turns into a butterfly; in (2), a butterfly is changed into a caterpillar, and in (3), the carpet acquires the property of being clean. In all these instances, the translative marks the adjectival/nominal phrase that denotes the new, acquired property.

The generalization regarding the distribution of translative case thus seems to be rather simple. However, as Fong (2003) demonstrates, at least in Finnish, facts are more complicated. Specifically, the fact that translative is assigned to predicative complements of the verbs *jäädä* 'remain' and *jättää* 'leave' ((4)-(5)), poses a problem for those analyses that link translative-marking to the notion of change.

(4)   *Kivi   jäi   vanhaksi- pojaksi.*[1]
        Kivi   remained   old.TRANSL-boy.TRANSL
        'Kivi remained a bachelor.'   (Fong, 2003:(45))

(5)   *Lasi   oli   tyhjä.   Jätin   lasin   tyhjäksi.*
        glass   was   empty   left.1SG   glass.ACC   empty.TRANSL
        'The glass was empty. I left it empty.'   (Fong, 2003:(18))

Crucially, neither (4) nor (5) entail a change of state. Quite on the opposite, (4) is likely to be uttered about an individual who used to be a bachelor and remained one (i.e., did not get married); analogously, in (5), the first clause explicitly specifies that the state of being empty held for the glass originally. In other words, both examples relate to **an absence of change**. Still, translative case is possible and even obligatory.

It is worth noting that the verbs in question are also compatible with a scenario in which a change did take place. For instance, the second sentence in (4) could be uttered in a context in which the glass was originally full and the speaker drank the liquid, thereby leaving the glass empty. In this case, a change from fullness to emptiness does take place. But, crucially, such a context is not obligatory in order for the translative to be licensed. Both the verbs and the translative case are perfectly compatible with a no-change context.

The data described above raise at least two questions. First, what meaning component systematically accompanies the presence of translative marking? In other words, what are the semantic conditions under which this case is licensed? Second, is the corresponding meaning component contributed by the translative suffix itself, or is the translative rather checked in its presence? To put the question differently, what is the source of the meaning component?

The paper is organized as follows. In §2, a difference between two 'remain'-verbs, *jäädä* and *pysyä*, is discussed. While the former takes translative complements, the latter does not. §3 shows that similar puzzles arise when goal cases are considered: Again, these cases are compatible not only with predicates of change (ones that denote motion towards a goal), but also with sentences in which an argument is asserted to stay in the same location. In §4, a modal approach to the phenomenon is sketched out and its shortcomings are discussed. §5 is devoted to the proposed analysis, which employs the notion of **force dynamics**. Finally, §6 concludes the discussion.

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[1] My consultants point out that the word *vanhapoika* 'bachelor' is a bit archaic, and in Modern Finnish its synonym *poikamies* is preferred. I have left the original example, but for the purposes of the discussion of translative case, this lexical choice is not important.

2 Two 'Remain' Verbs: *jäädä* versus *pysyä*

Interestingly, while *jäädä* is followed by a translative predicate, the (superficially) synonymous verb *pysyä* is not:

(6)   *Kivi*   *pysyi*   *vanhana-pojana*   */ *vanhaksi- pojaksi.*
      Kivi   remained   old.ESS- boy.ESS   old.TRANSL-boy.TRANSL
      'Kivi remained a bachelor.'   (Fong, 2003:(36))

The nominal complement of *pysyä* is essive, rather than translative. Essive case, too, is assigned to nominal predicates in a range of Finno-Ugric languages, but, unlike the translative case, it is not associated with an event of change.

The case requirements of the two verbs do not constitute a purely accidental idiosyncratic contrast; rather, they correlate with a semantic difference. Thus, in (4), the *jäädä* variant, strongly suggests that Kivi was willing to get married, but for some reason, due to certain circumstances, he did not succeed to, and, thus, remained a bachelor. In contrast, the *pysyä* variant in (6) does not carry such an implication. It merely specifies that a certain state kept holding. An additional and plausibly related difference has to do with the fact that *pysyä*, unlike *jäädä*, is not compatible with a change context. This is illustrated by the following contrast:

(7)   *Nevan*   *suu*   *jäi*   *Täyssinän*   *rauhassa*   *venäläisille.*
      Neva.GEN mouth remained Täyssinä.GEN treaty.INE   Russian.PL.ALL
      'In the treaty of Täyssinä, the mouth of the Neva remained in the possession of the Russians.' (There was no change of hands.)
      Or: 'In the treaty of Täyssinä, the mouth of the Neva went to the Russians.' (The mouth of the Neva changed hands.)   (Fong, 2003:(37))

(8)   *Nevan*   *suu*   *pysyi* *Täyssinän*   *rauhassa*   *venäläisillä.*
      Neva.GEN mouth stayed Täyssinä.GEN treaty.INE   Russian.PL.ADE
      'In the treaty of Täyssinä, the mouth of the Neva stayed in the possession of the Russians.' (There was no change of hands.)   (Fong, 2003:(38))

While (7) is ambiguous between a change and no-change interpretation, (8) is not. (7) may mean either that the mouth of the Neva passed to Russians as a result of the treaty, or that it was Russian and stayed Russian. (8) is only compatible with the latter kind of interpretation. But even if there is no change of hands, there is a (fine) difference in the meanings of (7) and (8). The former suggests that there was a chance of a change taking place (specifically, the mouth of the Neva could be taken away from Russians). Perhaps the issue was disputed and a change of hands was plausible at some stage. (8) does not require this kind of scenario.

3 Spatial Cases: An Analogous Contrast

The puzzle demonstrated above is not peculiar to translative case. Rather, we deal with a more general phenomenon that has to do with cases associated with the notion of change. Specifically, similar properties are observed with 'goal' cases: illative and allative.

Illative and allative are the two Finnish spatial cases associated with the thematic role of a goal. Illative is an internal directional (=goal) case, roughly corresponding to the meaning of the

preposition *into* (cf. (9a)), and allative is an external directional case, whose closest English counterpart is *onto* (cf. (9b)).[2]

(9) a. *Hiiri   juoksi   laatikkoon.*
         mouse   ran   box.ILL
         'A/The mouse ran into the box.'

     b. *Hiiri   juoksi   laatikolle.*
         mouse   ran   box.ALL
         'A/The mouse ran onto the box.'

The notion of goalhood is, of course, strongly interrelated with change. Specifically, these examples entail a particular kind of change: change of location. At the beginning of the event, the argument that undergoes motion does not occupy the location denoted by the goal phrase. At the endpoint of the event, it does. Thus, here, too, we deal with a kind of change from not P to P, e.g., in (9a), from not being inside the box to being inside it. Indeed, these cases are compatible with verbs of motion and change of location, such as *laittaa* 'put', *tulla* 'come', *ajaa* 'drive', *juosta* 'run', *mennä* 'walk', etc. But, crucially, they also mark locational complements of the verb *jäädä* 'remain':[3]

(10) a. *Jäin   kaupunkiin.*
          remained.1SG   town.ILL
          'I stayed in town.' (Literally: I stayed to town.)

      b. Merimiehen ei   tarvitse jäädä   **merelle** yksin.
          sailor   NEG.3SG   need   remain   sea.ALL   alone
          'A sailor doesn't have to stay at sea alone.'

The sentences in (10) do not entail a change of location; quite the opposite, they assert that such a change did not take place. Still, in both instances, 'goal' cases are used. This state of affairs is, of course, reminiscent of what has been observed for the translative.

The similarity extends further. Once again, the case-related properties of *jäädä* differ from those of the superficially synonymous *pysyä* 'remain'. The latter, more predictably, combines with expressions that appear in locative cases, specifically, inessive (internal) and adessive (external). These cases correspond to the thematic role of location, rather than goal, and can be roughly translated as the English prepositions *in* and *on* (in their locative use).

(11) a. *Pysyin   kaupungissa.*
          remained.1SG   town.INE
          'I stayed in town.'

      b. Merimiehen ei   tarvitse pysyä   **merella** yksin.
          sailor   NEG.3SG   need   remain   sea.ADE   alone
          'A sailor doesn't have to stay at sea alone.'

Once again, the intuitive difference between sentences with the two verbs has to do with the potential dynamicity of the situation. According to native speakers of Finnish, *jäädä*-sentences create a feeling that the subject was likely to leave the place denoted by the illative/allative DP

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[2] See Lestrade (2010) for a detailed discussion of spatial cases and their roles across languages.

[3] Example (10) is taken from: https://issuu.com/espanjansanomat/docs/es120/4.

but, ultimately, stayed there. In contrast, *pysyä*-examples merely assert that a certain locational relation continued to hold. Thus, just as under the translative/essive contrast, *jäädä* is associated with a potential or expected change, whereas *pysyä* is not.

4 A Modal Analysis and Its Shortcomings

Potentially, the distribution of the "cases of change" (translative, illative, and allative) and their compatibility with *jäädä* could be accounted for within the framework of a modal analysis. Let us begin with the translative. The modal analysis would link this case to the notion of change, while taking it to be realized in a certain (set of) world(s), not necessarily identical to w_0. Essentially, this approach is taken by Fong (2003), although she does not mention modality explicitly. She argues that even *jäädä*-sentences involve a change, whether entailed or presupposed, real or unrealized. Thus, the change may take place in alternative versions of reality. These may be worlds representing a salient individual's expectation/desire state, or possibly inertia worlds (cf., Dowty 1979). To illustrate, according to (4), repeated as (13) below, Kivi stops being a bachelor within those worlds that confirm to his desire state.

One potential problem of a modal analysis has to do with its vagueness, as the relevant set of worlds will probably be difficult to define in a precise way. However, an even more immediate problem has to do with the **direction of change**. Taking P to be the predicate denoted by the translative-taking phrase, the change in sentences like (1)-(3) is **from not-P to P**. For instance, in (1a), repeated here as (12), Toini's state changes from not being sick to being sick. In contrast, the potential/expected/desired change in sentences of the (13) type is **from P to not-P**. Thus, according to (4), repeated as (13), Kivi remained a bachelor but he was willing/expected to get married, i.e., the unrealized change is one from having the property denoted by the predicate to lacking it (one of stopping being a bachelor).

(12)   *Toini   tuli   sairaaksi*.
         Toini   became   sick.TRANSL
         'Toini became sick.'   **(not-P > P; in w_0)**
                                                                   (Fong, 2003:(5))

(13)   *Kivi   jäi   vanhaksi- pojaksi*.
         Kivi   remained   old.TRANSL-boy.TRANSL
         'Kivi remained a bachelor.'   **(P > not-P; in Kivi's desire worlds)**
                                                                   (Fong, 2003:(45))

An analogous contrast can be observed between the two readings of (7), repeated here as (14). Under the (14a) reading, we deal with a non-instantiated change from being in the possession of the Russians to being in somebody else's possession. In turn, (14b) asserts an actual change from belonging to a different country to belonging to Russians.

(14)   *Nevan   suu   jäi   Täyssinän   rauhassa   venäläisille*.
         Neva.GEN   mouth   remained Täyssinä.GEN treaty.INE Russian.PL.ALL
         'In the treaty of Täyssinä, the mouth of the Neva remained in the possession
         of the Russians.' (There was no change of hands.)

         Or: 'In the treaty of Täyssinä, the mouth of the Neva went to the Russians.' (The
         mouth of the Neva changed hands.)   (Fong, 2003:(37))

Thus, under the modal view, translative case turns out to be compatible with a change in either direction. This leads Fong to state that in its semantics, "the exact ordering of phases in the diphasic structure is left unspecified. The ordering of phases could be not-P < P, or P < not-P […], depending on the event structure as determined by the verb and its arguments" (ibid.:17). However, it remains somewhat unclear how the direction of change is determined in each particular case. For instance, the current model cannot explain why (12) above cannot mean that Toini recovered from sickness. In other words, it cannot account for the fact that (12) does not have a reading according to which the subject underwent a change from sickness to non-sickness. If the translative is equally compatible with a shift from not-P to P, and from P to not-P, we would expect (12) to be ambiguous between two possible readings: (i) Toini got sick (from not-P to P), and (ii) Toini recovered from sickness (from P to not-P). Nothing in the lexical semantics of the individual words that appear in the sentence seems to rule out the second interpretation. Still, it is unavailable.

The absence of the direction-based ambiguity in (12) (as well as in all the examples in (1)-(3)) suggests that the translative case is, after all, sensitive to the temporal ordering of P and not-P.

In fact, we can formulate the generalization regarding the choice between the two directions in a precise manner: In instances of real change, the shift is from not-P to P, whereas with unrealized/expected change, it is from P to not-P. But this kind of difference is very difficult to account for within the modal approach. Why would the translative be licensed by a change from not-P to P in w_0, but by a change from P to not-P in alternative versions of reality? This contrast seems to be too radical and remains unexplained.

An analogous problem holds for the account of "goal" cases, illative and allative. Here, too, a modal analysis is tempting: The cases are licensed as soon as a change-of-location event takes place in some salient possible world, which does not have to be the actual one. In fact, however, the problem of such an analysis becomes even more striking than with the one concerning translative case. Just as with the translative, the goal cases are normally associated with a change from not-P to P (i.e., an argument that originally does not occupy a certain location comes to occupy it). With *jäädä*, in contrast, the hypothetical change is from P to not-P (from being at the location denoted by the illative or allative DP, to leaving it in a world of one's desires or expectations). For instance, the subject of (10a) above, repeated here as (15), has been presumably expected to leave the town, meaning that a change from being there to NOT being there occurs in some hypothetical possible world. But while the translative could, in principle, be associated with a change in either direction, with the spatial cases this is totally unjustified. Once the (potential) change is from P to not-P, namely, from occupying the location to not occupying it, the location in question is no longer a goal. Rather, it is **a source**. And sources receive totally different cases in Finnish, specifically, **elative** and **ablative**. Thus, if the local case in (15) reflected the motion AWAY from the town (no matter which world is the relevant one), we would predict the noun to appear in the elative form, *kaupungista* 'from the town', and not in the illative as can be observed.

(15)   *Jäin*   ***kaupunkiin***.
        remained.1SG   town.ILL
        'I stayed in town.' (Literally: I stayed to the town.)

To sum up thus far, the modal approach faces the problem of direction reversal. The change in w_0 and in alternative possible worlds is entailed to occur in opposite directions, which makes the analysis not as uniform as desired and, moreover, makes wrong predictions regarding the form of locationa

l arguments with *jäädä*. The next section puts forward an approach that captures the facts described above without assuming that the semantics of *jäädä*-sentences involves alternative possible worlds.

5 Cases of Change: A Force Dynamic Analysis

5.1 The Intuition behind the Proposal

I propose that "cases of change" are sensitive not to the notion of change *per se*, but rather to an inherent component of change: Energy being exerted for the purposes of the P-state to hold.

The intuition behind the proposed account is as follows. Sentences with "cases of change", whether with telic predicates (1b) or with *jäädä* (4), repeated below as (16a-b), imply that energy is exerted in order for the P-state (the one denoted by the translative/illative/allative expression) to hold.

(16) a. *Hän   muuttui   (toukasta)   perhoseksi.*
           s/he   changed   caterpillar.ELA   butterfly.TRANSL
           'S/he changed (from a caterpillar) into a butterfly.'   (Fong, 2003:(6))

      b. *Kivi   jäi   vanhaksi- pojaksi.*
           Kivi   remained   old.TRANSL-boy.TRANSL
           'Kivi remained a bachelor.'   (Fong, 2003:(45))

In (16a), the energy is required in order for an event of change (from a caterpillar state to a butterfly state) to take place. In (16b), the energy is required in order for the state of bachelorhood **to keep holding**. As pointed out above, the sentence implies that Kivi had a tendency toward getting married, and energy had to be exerted in order for this change NOT to take place, i.e., in order for Kivi to remain in the bachelor state. In other words, while a change takes place in (16a), but not in (16b), energy, or dynamism, is needed in both instances in order for the P-state to hold.

Here, I follow Talmy's (2000) insight that the semantics of such verbs as *stay*, *keep*, and *remain* (unlike *be*) involves **force dynamics**. The notion of force has played a substantial role in cognitive semantic literature of the last two decades, and is also gaining attention in formal semantics (cf. e.g. Talmy, 2000; Wolff, 2007; Croft, 2012; Copley and Harley, 2015; Goldschmidt and Zwarts, 2016). Copley and Harley (2015:104) informally define force as "an input of energy that arises from the objects and properties in a situation". Roughly, force is entailed to be exerted in order for the situation to remain unchanged. This makes the above-listed verbs more dynamic than classical statives. To illustrate, (17) is compatible with a situation whereby the ball has a tendency to remain in place, but the tendency is overcome by an external force acting on it. Alternatively, the ball may, in fact, have a tendency to move, which is opposed by external factors, e.g., by stiff grass. The sentence then asserts that the ball **overcomes** these factors. Under both types of scenario, force/energy is exerted in order for the rolling event not to stop.

(17)   *The ball kept (on) rolling along the green.*   (Talmy, 2000:(1aii))

Analogously to the first scenario, I propose, the use of *jäädä* in (16b) suggests that Kivi has a tendency/desire to get married, but other circumstances (for instance, girls rejecting him) force him to remain in the bachelor state. In other words, action/force/energy is needed for the purposes

of maintaining this state. This is what licenses (and even requires) translative case-marking.[4] In contrast, *pysyä* is purely stative. It implies no force or dynamics, and is used merely to assert that no change of state took place.

More generally, "cases of change"-marking signals that force is exerted in order for the P-situation to hold (i.e., in order for the argument to have the property denoted by the case-marked predicate). This may happen in two types of situations. The prototypical case is one whereby, originally, the argument lacks the property P and force is exerted in order for it to acquire this property. In other words, a change from not-P to P takes place. Naturally, this is the configuration that is most closely associated with both the translative and goal cases. However, another type of situation is compatible with the required configuration as well: One in which force is exerted in order for the argument to remain in the state in question, and NOT to undergo a change. This happens when a change is for some reason expected or natural, namely, there is a tendency toward a change, and then force/energy exertion is needed in order to overcome this tendency. Such a situation is signaled by *jäädä*, and this is why this verb is accompanied by a translative, illative, or allative complement.

To summarize: "Cases of change"-marking signals that force is exerted in order for the P-situation to hold. This happens in two types of situations:

(i)   A **change** from not-P to P takes place.

(ii)   Energy is exerted in order for the argument to **remain** in the P-state.

Note that under this approach, the direction is never reversed, as it is within the modal analysis. The force is always exerted in order for a P-situation to hold.

5.2   Formalizing Force Dynamics (Copley and Harley, 2015)

Before proposing a formal account of "cases of change", that captures the intuition spelled out in the previous subsection, I introduce the framework which will be employed for this purpose. Specifically, I follow Copley and Harley (2015), who formalize the concept of force dynamics in a generative linguistic account. Within the framework they develop, forces are represented as functions from situations to situations, type $< s, s >$. The input is the original situation s (the **initial situation** of force f) and the output – a (potentially different) situation s' which is brought about by exertion of **the net force** of s (the force that arises from all the individuals and properties in s). s' is referred to as the **final situation** of force f. A linguistic situation, which constitutes a linguistic representation of a conceptual situation, is defined as follows:

(18)   (Linguistic) situations:
          A (linguistic) situation s corresponds to a conceptual situation σ, which is a spatiotemporally bounded "annotated snapshot" of individuals and their property attributions.   (ibid.:118)

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[4] It may seem, on the basis of the above discussion, that *jäädä*-sentences involve a force leading to the termination of the P-situation, and not to its persistence. After all, (16b) suggests that Kivi wishes to get married and, presumably, takes some steps towards this goal. Quite plausibly, in many instances, this is indeed true: Some force is present that could potentially bring about the not-P state (an intuition that lies at the basis of the modal account). However, crucially, if force f_1 is exerted towards not-P, but P keeps holding, this means that there is also a force f_2 which overcomes f_1. There must be a "counter-force" which makes it possible for P to persist. It is, I argue, the presence of such a force (independently of the (non-)existence of f_1), that licenses those cases which have been originally conceived of as implying change.

Stage-level stative predicates, which are (truly) non-dynamic, are defined as predicates of situations of type $< s, t >$. In turn, dynamic predicates constitute predicates of forces and as such are of type $< f, t >$.

Copley and Harley follow the approach according to which the event/argument structure correlates with the syntactic structure of the verb phrase, which is thus decomposed into several functional projections (whose more precise number depends on the lexical semantic complexity of the predicate). For instance, with intransitive change–of-state predicates such as *open* in (19), the maximal verbal projection (vP) contains two phrasal projections. The lower one is a small clause (SC) of type $< s, t >$ (a predicate of situations p), which denotes the resulting state (the door being open). The higher one, vP, is of type $< f, t >$ (a predicate of forces). Its head v° contributes the BECOME meaning. More precisely, it "introduces a force f and asserts that p holds of the final situation of that force" (ibid.:124). Further, it contributes the presupposition according to which the initial situation is a not-p situation. The contribution of this v_{BECOME} head is formally represented in (21), taken from Copley and Harley (2015:(19)). The syntactic structure and semantic types of the constituents proposed by Copley and Harley for the vP in (19) are represented in (20) (ibid.:(20))

(19) *The door opened.*

(20)
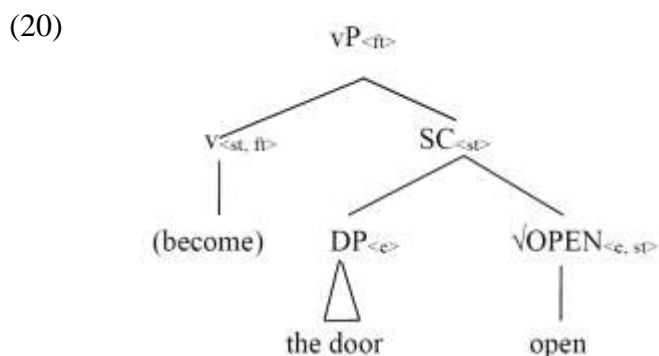
(21) $[[v_{BECOME}]] = \lambda p \lambda f . p(\text{fin}(f))$
      presupposed: $\sim p(\text{init}(f))$, $(\text{init}(f))$ is efficacious.[5]

fin(f) is the final situation of f (one that is rendered after f takes the situation of which it is a force as its argument) and p is a predicate of situations, type $< s, t >$ (an analogue of an event predicate within event semantics). Roughly, according to (21), the predicate p is asserted to characterize the situation which results from the exertion of force f. It is further presupposed that the original situation was not characterized by the property p.

Quite interestingly, the contribution of verbs of maintenance such as *keep*, illustrated in (17) above, and *stay*, is quite similar to what we find in (21). In fact, Copley and Harley treat *stay* as "a verb-of-maintaining version of v_{BECOME}" (ibid.:148). The use of this verb is illustrated in (22) and its semantics, in (24). Note that the truth-conditional contribution of *stay* is exactly the same as that of v_{BECOME}: A force is exerted, and its final situation is a p-situation (here, the door being open). The difference between v_{BECOME} and *stay* has to do with their presuppositions. While the former presupposes that the initial situation is NOT a p-situation (and, thus, a change takes place), the latter, quite on the contrary, contributes the presupposition according to which the initial

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[5] "A situation S_0 is *efficacious* just in case its *ceteris paribus* successor situation occurs" (Copley and Harley, 2015:121). This aspect of meaning will be less relevant for my present purposes.

situation IS a p-situation (and, thus, the force f is exerted in order for a p state of affairs to be *maintained*).

The tree diagram representing the structure of (22) is provided in (23) (Copley and Harley, 2015:(69)). It is worth pointing out that *stay*, just like v_{BECOME}, takes a predicate of situations as an argument and returns a predicate of forces as the value, hence the semantic type $< sf, ft >$.

(22)   *The door stayed open.*

(23)
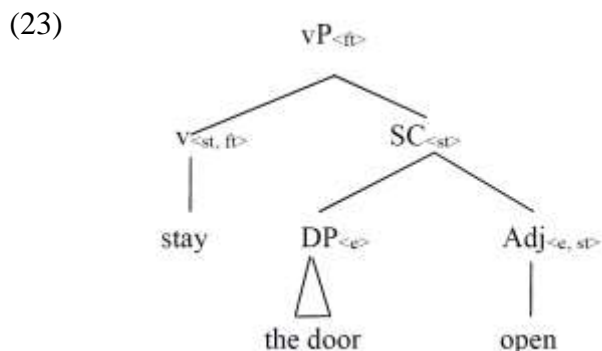
(24) $[[stay]] = \lambda p \lambda f . p(\text{fin}(f))$
                 presupposed: $p(\text{init}(f))$ (ibid.:(70))

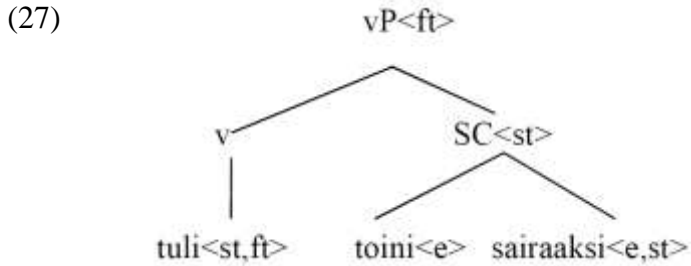## 5.3   A Force-Dynamic Account of the Finnish Translative

Let us now turn back to the Finnish case system and begin with the translative. I propose that this case is assigned to a nominal or adjectival predicate of situations in the presence of the semantic meaning component that is shared by v_{BECOME} and *stay*:

(25)   The nominal/adjectival predicate P (type $< e, st >$) will appear in translative case iff the sentence entails that
        $\exists f[p(\text{fin}(f))]$
       (where p is the predicate of situations that is obtained by applying P to its individual-type argument)

The translative is assigned when the final situation is entailed to hold by virtue of force exertion. However, this case is indeterminate regarding the nature of the original (initial) situation: It could be a p-situation, as with *jäädä*, or a not-p situation, as with, e.g., *muuttua* '(undergo a) change', which contributes a v_{BECOME} head.

(27) and (28) below represent the structure and the compositional semantics of the vP in (26), respectively. The sentence illustrates translative case-marking in the presence of a change-denoting verb *tulla* 'come/become', which, I propose, carries the meaning of v_{BECOME} under its present use.

(26)   *Toini   tuli   sairaaksi.*
          Toini   became   sick.TRANSL
          'Toini became sick.'   (Fong 2003:(5))

(27)

```
                        vP<ft>
                       /      \
                      /        \
                    v          SC<st>
                    |          /     \
                    |         /       \
              tuli<st,ft>  toini<e>  sairaaksi<e,st>
```

(28)   a. $[[sairas]] = \lambda x \lambda s. sick(x)(s)$
        b. $[[SC]] = \lambda s. sick(Toini)(s)$
        c. $[[tuli]] = \lambda p \lambda f. p(\text{fin}(f))$
                    presupposed: $\sim p(\text{init}(f))$
        d. $[[vP]] = \lambda f. sick(Toini)(fin(f))$
                    presupposed: $\sim sick(Toini)(\text{init}(f))$

The BECOME head *tulla* takes a small clause (SC) denoting, roughly, a situation predicate *Toini being sick* and returns a predicate of forces: A force is exerted such that at its final situation, Toini is sick. It is presupposed that in the original situation, Toini is not sick.

Before I proceed, it is important to point out that the rule in (25) is taken to be a **condition** on the licensing of the translative, rather than its semantic **contribution**. I draw this conclusion on the basis of the following generalization. The meaning component in (25) is entailed by the presence of certain lexical and/or functional heads, such as v_{BECOME} or *jäädä*. The translative suffix does not affect the meaning of the sentences. Rather, it is licensed and required when the appropriate meaning component is (independently) contributed. For instance, if the translative is substituted by a different case in (29), the sentence becomes ungrammatical, but the meaning component of change does not disappear. Analogously, (4) is unacceptable with the essive – instead of the translative – case, as revealed in (30). This is due to the fact that the verb *jäädä* contributes the meaning of a force being exerted in order for the p-situation to hold. In both examples, this meaning component is supplied by the verb, and the appropriate case is required.

(29)   a.   *Toini   tuli   sairaaksi.*
              Toini   became   sick.TRANSL
              'Toini became sick.'   (Fong 2003:(5))

        b.   **Toini   tuli   sairaana.*
               Toini   became   ill.ESS
              'Toini became sick.'

(30)   a.   *Kivi   jäi   vanhaksi- pojaksi.*
              Kivi   remained   old.TRANSL-boy.TRANSL
              'Kivi remained a bachelor.'   (Fong 2003:(45))

        b.   **Kivi   jäi   vanhana-pojana.*
               Kivi   remained   old.ESS- boy.ESS
              'Kivi remained a bachelor.'   (based on Fong 2003:(35))

Inspecting the semantics of the two 'remain'-verbs in Finnish, *jäädä* and *pysyä*, it becomes evident that they share the following meaning components: The p-state holds of the asserted situation and is presupposed to have held of the preceding situation. The main difference has to do with the fact that *jäädä* entails force exertion, whereas *pysyä* does not.

Jäädä makes the same semantic contribution as proposed by Copley and Harley (2015) for *keep*.

(31) $[[jädää]] = \lambda p \lambda f. p(\text{fin}(f))$
                        presupposed: $p(\text{init}(f))$

A sentence with *jäädä* entails that a force f is exerted due to which the p-state holds at the final situation of f. It further presupposes that p holds of the initial situation of f. (32) below illustrates the use of this verb. (33) represents the structure of the relevant part of the sentence and the semantic type of each constituent, and (34) provides the compositional semantics of the vP.

(32)   *Matti   jäi   vanhaksi- pojaksi.*
          Matti   remained   old.TRANSL-boy.TRANSL
          'Matti remained a bachelor.'

(33)
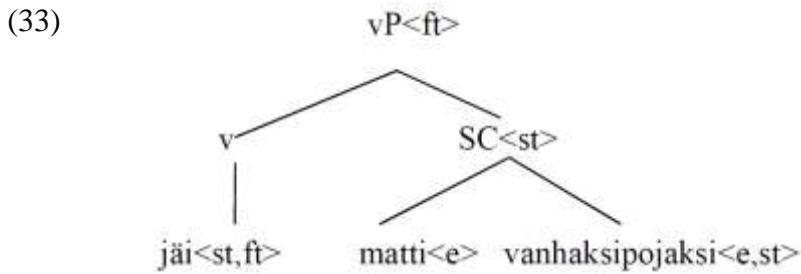
(34)   a. $[[vanha(ksi)poja(ksi)]] = \lambda x \lambda s. bachelor(x)(s)$
         b. $[[SC]] = \lambda s. bachelor(Matti)(s)$
         c. $[[jäi]] = \lambda p \lambda f. p(\text{fin}(f))$
                        presupposed: $p(\text{init}(f))$
         d. $[[vP]] = \lambda f. bachelor(Matti)(fin(f))$
                        presupposed: $bachelor(Matti)(\text{init}(f))$

Verbally, (32) entails that a force f is exerted due to which Matti is a bachelor at the final situation of f, and presupposes that Matti is a bachelor at the initial situation of f.

In contrast, as stated above, the semantics of *pysyä* does not involve force. The entailment part is thus quite simple: A p-situation s holds. However, the verb also presupposes that s constitutes a continuation of a p-situation that held previously. Formally, I propose for *pysyä* the semantics in (35):
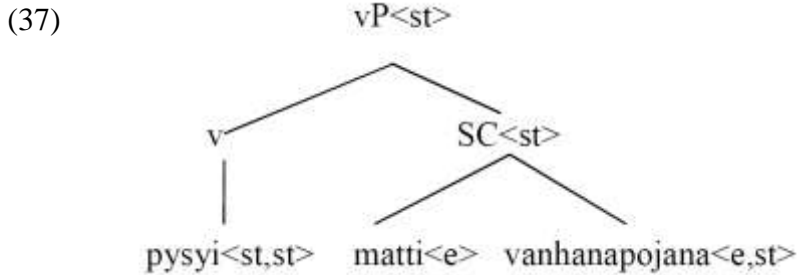
(35) $[[pysyä]] = \lambda p \lambda s. p(s)$
          presupposed:
          $\exists s'[p(s') \wedge \tau(s') < \tau(s) \wedge \sim \exists s''[\sim \boldsymbol{p(s'')} \wedge \boldsymbol{\tau(s')} < \boldsymbol{\tau(s'')} < \boldsymbol{\tau(s)}]]$

The part of the formula which is marked in bold makes sure that there is no interruption between s' and s. Otherwise, the use of *remain/pysyä* would be inappropriate. Specifically, it is specified that for every temporal interval t between the temporal traces of s' and s, there is a p-situation that holds at t.

(36)-(38) illustrate a sentence with *pysyä* (nearly identical to the one provided in 6 above), its structure and compositional semantics, as well as the semantic types of its constituents. Note that *pysya* is of type $< st, st >$: It takes a predicate of situations and returns a predicate of situations.

Roughly, the shift is from situations whereby *Matti is a bachelor* to situations whereby *Matti remains a bachelor*. Both are stative.

(36)   *Matti   pysyi   vanhana-pojana.*
        Matti   remained   old.ESS-boy.ESS
        'Matti remained a bachelor.'

(37)

(38)   a. $[[vanha(na)poja(na)]] = \lambda x \lambda s. bachelor(x)(s)$
        b. $[[SC]] = \lambda s. bachelor(Matti)(s)$
        c. $[[pysyi]] = \lambda p \lambda s. p(s)$
                    presupposed:
                    $\exists s'[p(s') \wedge \tau(s') < \tau(s) \wedge \sim\exists s''[\sim p(s'') \wedge \tau(s') < \tau(s'') < \tau(s)]]$
        d. $[[vP]] = \lambda s. bachelor(Matti)(s)$
                    presupposed: $\exists s'[bachelor(Matti)(s') \wedge \tau(s') < \tau(s) \wedge$
                    $\sim\exists s''[\sim bachelor(Matti)(s'') \wedge \tau(s') < \tau(s'') < \tau(s)]]$

The vP denotes a set of situations whereby Matti is a bachelor, with a presupposition that s is a continuation of a temporally preceding situation s' of Matti being a bachelor.

5.4   Force-Dynamics and "Goal" Cases

In this subsection, I briefly sketch out an analysis of spatial cases that is based on the notion of force. The main proposal is analogous to what has been suggested for the translative. Illative (internal "goal" case) and allative (external "goal" case) are assigned whenever the sentence entails that a force is exerted, and the result (the final situation) is that an argument appears in a certain state. This time, we deal with a state of occupying the specified location. Similarly to the translative, these cases are **indeterminate** as to whether the same spatial relation holds at the initial situation of the force or not. In other words, the argument may: (i) move to this location, or (ii) remain in this location.

    Formally, I propose that the "goal" cases are assigned in the presence of the following meaning components:

(39)   a.   Illative: $\exists x \exists y \exists f. LOC(y, in[x])(fin(f))$
        b.   Allative: $\exists x \exists y \exists f. LOC(y, on[x])(fin(f))$[6]

    In order to provide a detailed analysis of the derivation, it is necessary to distinguish between two meaning components (both of which are present in (39)):

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[6] $LOC(y, in[x])$ stands for 'y is located in x', and $LOC(y, on[x])$, for 'y is located on x'. This formal way to represent spatial relation meaning is largely based on Stiebels (1998).

(i)   A situation s whereby y is located in/on x;

(ii)   A force f is exerted in order for s to hold

To illustrate, consider the example in (9a), repeated below as (40), which contains an illative phrase *laatikkoon* 'into the box'. This choice of case is related to the following entailments: (a) A force is exerted in order for the mouse to occupy a certain location (roughly, the 'goal' component), and (b) The resulting location is one whereby the mouse stands in the IN (containment) relation to the box. (If, in contrast, the mouse and the box come to stand in the ON (support) relation, a different case, specifically, allative, will be used.)

(40)   *Hiiri   juoksi   laatikkoon.*
         mouse   ran   box.ILL
         'A/The mouse ran into the box.'

An analysis of (40) is provided below. The tree diagram, on which the semantic types of all constituents are specified, is given in (41). The compositional semantics of the VP is represented in (42). I follow van Riemsdijk and Huybregts (2007) in assuming that, cross-linguistically, distinct positions should be posited for configuration (e.g., IN as opposed to ON) and directionality (e.g., GOAL versus SOURCE) markers (**Location** and **Direction** in their terminology) in the grammar. This holds even for a language like Finnish, in which both meaning components are associated with the same case suffix.

LOC(ation) is a P head, specified as INTERNAL, and phonologically empty. It looks for two individual arguments (the ground and then the figure). When it combines with them, we get a small clause, which is semantically a predicate of situations (in which the mouse is in the box). Hence the semantic type of LOC is: $< e, < e, st \gg$. Then, another phonologically empty head, DIR(ection) (specified as GOAL), takes the small clause as its complement. It turns a predicate of situations into a predicate of forces. This PP constitutes a complement of the verb *juoksaa* 'run'.

(41)
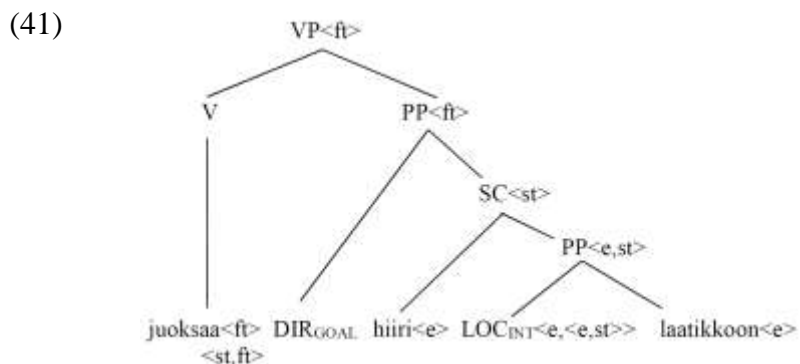
Let us now consider the semantics of each node. Finnish words are substituted by their English translations for the sake of convenience.

(42)   a. $[[\text{LOC}_{\text{INT}}]] = \lambda x \lambda y \lambda s. \text{LOC}(y, in[x])(s)$
         b. $[[\text{box. LOC}]] = \lambda y \lambda s. \text{LOC}(y, in[the. box])(s)$
         c. $[[\text{SC}]] = \lambda s. \text{LOC}(the. mouse, in[the. box])(s)$
         d. $[[\text{DIR}_{\text{GOAL}}]] = \lambda p \lambda f. p(\text{fin}(f))$
                              (where p is a locational predicate)
                        presupposed: $\sim p(\text{init}(f))$

e. $[[\text{PP}]] = \lambda f.\,\text{LOC}(the.mouse, in[the.box])(\text{fin}(f))$
 presupposed: $\sim\text{LOC}(the.mouse, in[the.box])(\text{init}(f))$

f. $[[run]] = \lambda f.\,run(f)$

g. $[[\text{VP}]] = \lambda f.\,run(f) \wedge \text{LOC}(the.mouse, in[the.box])(\text{fin}(f))$
 presupposed: $\sim\text{LOC}(the.mouse, in[the.box])(\text{init}(f))$

Note that the combination of verb semantics with that of the higher PP in (42g) is analogous to Event Identification (cf. Kratzer, 1996; Copley and Harley, 2015:125). Here, however, we deal with force identification. The same force that is exerted in running also leads to the situation whereby the mouse ends up in the box.

6   Conclusion

Translative case is assigned to a predicate in the presence of the following meaning component: A force has been exerted as a result of which a P-state holds of the argument. Typically, this means that an event of change from not-P to P took place. Alternatively, force may be exerted in order for the P-state to keep holding. This entailment is contributed by the verb *jäädä*, but not by *pysyä*.

An analogous state of affairs holds with location-denoting phrases and the "goal" cases. Such cases are licensed iff force is exerted in order for the argument to occupy the specified location: either to move there or to stay there.

The notion of force thus plays a substantial role in the Finnish case system, partially substituting the notion of change.

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