Recursive passivization: a causative coercion account[*]

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1. Introduction

Various theories of affix ordering, be they articulated within formal (e.g. Baker's (1985) Mirror principle) or functional (e.g. Bybee's (1985) relevance theory) frameworks, aim at reducing the observed ordering patterns to mechanisms underlying syntactic or semantic scope-taking. For instance, the universal tendency for tense grammatical morphemes to occur outside aspectual morphemes can be accounted for on the assumption that it is temporal operators (which locate the reference time with respect to the speech time) that take scope over aspectual operators (which establish temporal relations between the reference time and event time), but not vice versa.

Relative ordering of different pieces of morphology is thus thought of as reflecting hierarchical relations between linguistic categories, apparent deviations from this pattern being subject to various intricate restrictions (see, e.g., den Dikken 2003 on Atapaskan verbal morphology).

A trivial consequence of this view is that the output of an operation merging a piece of morphology must be a suitable input to a subsequent merge of the next piece of morphology. But the matter becomes less trivial when it comes to a recursive application of the same grammatical morpheme. The prediction is that we only find recursive derivations where the structure created by the first instance of a morpheme can feed an application of a second instance of the same morpheme. Consider a double causative in Japanese:

(1)   Intyoo-sensei-wa   Taroo-ni   tuuzyoo-yori nagakubyooin-ni
       chief   physician   Taro-DAT   usual-than   longer hospital-at
       hahaoya-o   i-***sase-sase***-ta.
       mother-ACC   be-**CAUSE-CAUSE**-PAST
       'The chief physician caused Taro to cause his mother to stay in the hospital longer than usual.' (Miyagawa, to appear)

Abstracting away from a few details about Japanese causativization irrelevant for our illustrative purposes, one can assume with Pylkkänen 2002 that the causative adds a causing subevent to the event structure. If so, its first application to the predicate 'mother stay in the hospital' gives rise to a more complex configuration 'Taro cause mother to stay in the hospital'. This configuration is a suitable input to further causativization: merging the second causative morpheme, one gets one more causing subevent, and the whole sentence ends up describing a complex event where the chief physician causes Taro to cause mother to stay in the hospital. Recursive causativization can be constrained by extralinguistic factors (e.g., the increasing morphological complexity of the verb brings about parsing problems for the for the addressee), but linguistically, there seems to be nothing wrong about causativizing (1) even further and getting a triple causative, quadruple causative, and so on.

Things are different for such operations as passivization. Theories of the passive (Chomsky 1981, Jaeggli 1986, Baker et al. 1989, Collins 2005, Gehrke, Grillo 2009) differ as to what exactly they assume about a syntactic mechanism involved. There is, however, a fundamental agreement that passivization deprives the external argument of the ability to be projected as a sentential subject. The prediction about recursive passivization, then, is clearly negative: a suitable input for the passive is a structure where the external argument is syntactically active, but as soon as the passive applies, we get a configuration with no external

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argument available for further manipulations. Any application of the passive should bleed further passivization.

If this reasoning, even stated loosely, is correct, we do not expect to find anything like (2) from Karachay-Balkar (Altaic, Turkic).

(2) kölek   zırt-**ıl-ın**-dı.
     shirt.NOM   tear-**PASS-PASS**-PST.3SG
     'A/the shirt was torn.'

What we see in (2) are the two instances of the passive –*l* morpheme[1] ocurring in combination with the transitive stem *zırt* 'tear', illustrated in (3).

(3) alim   kölek   zırt-tı.
     A.NOM   shirt.NOM   tear-PST.3SG
     'Alim tore a/the shirt.'

Any transitive verb in Balkar is effectively passivized by exactly one application of the –*l* morpheme, as illustrated in (4):

(4) kölek   zırt-**ıl**-dı.
     shirt.NOM   tear-**PASS**-PST.3SG
     'A/the shirt was torn.'

Given (4), the very possibility of (2) looks like a huge mystery: how can the passive apply to (4), which is passive already, to yield (2)?

A closer look at differences between (2) and (4) reveals even more issues. Compare (5) and (6), corresponding to (4) and (2), respectively, where a PP refers to the external argument.

(5) kölek   kerim-ni   küc-ü ble   zırt-**ıl**-dı.
     shirt.NOM   K.-GEN   force-3 with   tear-**PASS**-PST.3SG
     'A/the shirt was torn by Kerim.'
(6) kölek   kerim-ni   küc-ü ble   zırt-**ıl-ın**-dı.
     shirt.NOM   K.-GEN   force-3 with   tear-**PASS-PASS**-PST.3SG
     1.'A/the shirt was torn by Kerim (on someone's order).'
     2. 'A/the shirt was torn (by someone) on Kerim's order.'

(5) is unambiguous, and a PP *kerimni kücü ble* 'by (the force of) Kerim' functions in exactly the same way as the *by*-phrase in English, referring to the external argument of the verb 'tear'. (6) is different. Here we have three participants of the whole event, the theme (shirt), the

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[1] The passive morpheme in Balkar, as well as in other Turkic languages, allows for two phonological realizations, -*l* and –*n*. Their distribution is phonologically conditioned: -*n* occurs if the final consonant of the stem (no matter whether lexical or derived) is –*l*, -*l* is found elsewhere. (i) illustrates this for a lexical –*l* stem, for a derived –*l* stem, and for two stems with no stem-final –*l*.

(i)   a.   al   al-ın   *al-ıl
             buy   buy-PASS   buy-PASS
       b.   zırt-ıl   zırt-ıl-ın   *zırt-ıl-ıl
             tear-PASS   tear-PASS-PASS tear-PASS-PASS
       c.   qıjına   *qıjına-n   qıjına-l
             torture   torture-PASS   torture-PASS
       d.   al-ın   *al-ın-ın   al-ın-ıl
             buy-PASS   buy-PASS-PASS buy-PASS-PASS

agent (the one who tears the shirt), and the causer (the one who makes the agent tear the shirt). PP *kerimni kücü ble* in (6) can either refer to the agent, (6.1), or to the causer, (6.2).

Examples in (5) and (6) suggest that the second application of the passive doesn't result in passivization – not surprisingly, given that (4) is passive already. What is surprising is that (6) contains one more argument (even if implicit) as compared to (5), the causer who makes the agent to tear a shirt. Introducing arguments is not what we expect from the passive morphology.

Argument introducing capacity of the passive morpheme does not only manifest itself in passive configurations like (6). The same happens if the passive is combined with intransitives, either unaccusatives or unergatives, as illustrated in (7)-(8).

(7) a.   illew   (*alim-ni   küc-ü ble)   sın-dı.
      toy.NOM   A.-GEN   force-3 with   break-PST.3SG
      'The toy broke (*by Alim).'

    b.   illew   alim-ni   küc-ü ble   sın-**ıl**-dı.
      toy.NOM   A.-GEN   force-3 with   break-**PASS**-PST.3SG
      'The toy was broken by Alim.'

(8) a.   alim   (*farida-nı küc-ü ble)   bar-dı.
      A.NOM   F.-GEN   force-3 with   leave-PST.3SG
      'Alim left (*by Farida).'

    b.   alim   farida-nı   küc-ü ble   bar-**ıl**-dı.
      A.NOM   F.-GEN   force-3 with   leave-**PASS**-PST.3SG
      'Alim left (because something was done) by Farida.'

The *by*-phrase, ungrammatical in (a) examples in (7)-(8), is readily available in (b) examples, where the passive morpheme occurs. In both cases, the *by*-phrase refers to an argument that brings about an event denoted by the non-derived verbal predicate, the breaking event in (7b) and leaving event in (8b).

(7)-(8), together with (6), is a huge challenge for our understanding of the passive. In each case, the passive morphology appears in a configuration which is not a suitable input for passivization, either because it is intransitive in the first place, (7)-(8), or because passivization has already occurred, (6). This does not prevent the *–l* morpheme from applying in such configurations, however. Moreover, what this morpheme does in these examples is right the opposite from what the canonical passive is supposed to do: instead of demoting an argument it introduces a new one.

Finally, the "passive intransitive" in (7)-(8) can be combined with one more occurrence of the passive morpheme. (9a-b) show this for the unergative 'leave' (for the sake of space we leave out corresponding examples for 'break'):

(9) a.   alim   (kerim-ni   küc-ü ble)   bar-**ıl**-dı.
      A.NOM   K.-GEN   force-3 with   leave-**PASS**-PST.3SG
      'Alim left (because something was done) by Kerim.'

    b.   alim   (kerim-ni   küc-ü ble)   bar-**ıl**-**ın**-dı.
      A.NOM   K.-GEN   force-3 with   leave-**PASS**-**PASS**-PST.3SG
      1. 'Alim left (because something was done by Kerim on someone's order).'
      2. 'Alim left (because something was done by someone on Kerim's order).'

Native speakers' judgments about (9b) are entirely consistent: (9b) describes a leaving event and two implicit causing events with one causing participant each. That is, (9b) is ambiguous in a way (9a) is not. In (9b.1), the *by*-phrase 'by Kerim' can refer to the immediate causer of Alim's leaving. On this reading, there is also an implicit remote causer whose causal contribution is to make Kerim make Alim leave. On the other reading, (9b.2), it is Kerim who is

involved as such a remote causer. The immediate causer, the one who makes Alim leave, is not specified.

Here is a summary of the distribution of the passive morpheme in Karachay-Balkar. If the verb stem is transitive, the first occurrence of the passive morpheme creates a regular passive clause (see (4)). The second occurrence introduces the meaning of external causation, as in (2), which will be called *the causal passive* from now on. If, on the other hand, the verb is intransitive to begin with, both instances of the passive (cf. (7)-(8) and (9)) do the same thing: they introduce causal semantics.

Therefore, the puzzle is: where does the causal passive come from? How can the passive morpheme introduce a causing subevent and a causing participant of that subevent, even if implicit?

Two possible ways of solving this puzzle seem to be open at this juncture. First, one can say that there are in fact two distinct morphemes that happened to be realized by the same phonological exponent. The *-l* marker is ambiguous between 'passive' and 'causal passive' meanings. But if we assume as a reasonable null hypothesis that identity of form implies identity of function, we may want to provide a uniform analysis of the *-l* morpheme. We may want to treat apparent differences between 'passive' and 'causal passive' as the outcome of interaction between a single general meaning of *-l* and its lexico-syntactic environment.

In what follows we will argue for the latter type of approach. More specifically, we will propose that *–l* is in fact always passive. What we refer to as 'causal passive' emerges as a product of the **causative coercion**, a process of covert causativization that feeds the application of the passive morpheme whenever the initial configuration fails to satisfy its selectional requirements.

We suggest that the *-l* morpheme always applies to a transitive predicate. What it does is a usual job of the passive: it existentially binds the agent/causer argument and induces promotion of the patient to the subject position. If a verb provides a suitable argument structure, the *-l* morpheme produces a regular passive. That is what we see in examples like (4). But if the verb fails to have a transitive argument structure, which is the case in (2), (7), (8), and (9), it undergoes coercion through covert causativization. Causativization introduces a new agent/causer subevent, as usually, creating a transitive structure, and it is this structure that the *-l* morpheme applies to.

The rest of the paper is organized as follows. In Section 2, we briefly review coercion phenomena discussed in the literature so far and make a case for a new type of such an operation, the causative coercion. In Sections 3-4 we establish an argument supporting our hypothesis that the causative coercion underlies what superficially looks like a causal passive. The argument is based on striking parallelism between causal passives and overt causatives. In Section 3, we find out that passives and causatives of intransitives, apart from the difference in active/passive voice, have identical event structure that can be traced across distinct verb classes. We show that the hypothesis that passives of intransitives involve covert causativization correctly predicts precisely this distribution. In section 4, we extend the argument to double passives of transitives: their event structural characteristics are such that they can only be accounted for if the (covert) causativization intervenes between two applications of the passive morpheme. Main results and wider implications of our analysis are summarized in the Conclusion.

2. Coercion

Coercion has been a topic of quite a number of studies, including Moens & Steedman 1988, Jackendoff 1997, Michaelis, Lambrecht 1996, de Swart 1998, Zucchi 1998, Michaelis 2004, 2006, Deal 2007, among many others. Zucchi (1998) and many other semanticists, for example Koontz-Garboden (2007), emphasize that coercion is essentially a conflict resolution:

"Let d be a syntactic constituent of form [a b c] and R the semantic rule which forms the meanings of the constituents of type a. If combining the meanings of b and c via R leads

to trouble (for example, leads to inconsistency or prevents from assigning an interpretation to d), the speaker has the option of re-analyzing the meaning of b or c (coercing the meaning of b or c into a different meaning) in order to apply R to form the meaning of d." (Zucchi 1998)

Coercion occurs if two elements we want to combine do not have matching meanings, and one of them gets re-analyzed. It follows, then, that coercion cannot happen for free; it has always to be triggered by something.

Different types of coercion have been discussed in the literature so far, including type coercion, domain structure coercion, and aspectual coercion.

Examples of type coercion are (10a-b), where proper names are used as property-type NPs, not as referential NPs.

(10)   a. This is not the *Paris* I know.
        b. There is a *Santa Claus*.

In examples like these, arguments of the individual type, *Paris* and *Santa Claus*, are converted into predicates, that is, into the type expected by a function in the denotation of the definite and indefinite articles.

Another example of type coercion are expressions like *a stone lion, a fake gun, a chocolate teapot* (Coulson, Fauconnier 1999, Pustejovsky 1995, Kamp, Partee 1995, Kluck 2006, Partee 2010). Since the intersection of lions and stone things is empty, the predicate *stone lion* must have an empty extension. As a matter of fact, it does not. A possible reason for this is that the adjective forces the noun to be interpreted as denoting images of things in its original extension. As soon as this happens, the mismatch disappears.

An ontological type shift is also attested in examples like (11) (Anick, Bergler 1991, Pustejovsky 1991, Jayez, Godard 1993), where DP *the book* based on a predicate of individuals is arguably coerced to a phrase of type of events.

(11)   a. to begin reading the book
        b. to begin *the book*

Analyzing example (11) in terms of individual/event coercion, one can explain how verbs like *begin* accept arguments of syntactic type S, VP, and NP without requiring multiple verb entries in the lexicon.

Examples in (12)-(13) represent another type of coercion known as a domain structure coercion.

(12)   I had a *tea*.
(13)   Give me some *blanket.*

A mass noun like *tea* receives an individuated construal when paired with the indefinite article (12), and a count noun receives a mass construal when paired with unstressed *some*, as in (13). If domains from which count and mass nouns take their denotations are structured in different ways, the latter being non-atomic (Link 1983 and much subsequent literature), in (12)-(13) domains of *tea* and *blanket* must be restructured before combining with determiners.

Intensively studied in the past few years is aspectual coercion which is attested if an eventuality description does not meet the input requirements of an aspectual operator (e.g., de Pustejovsky, Bouillon 1995, Swart 1998). If this happens, as in examples in (14), where the progressive combines with a state description, the state is coerced into a dynamic eventuality:

(14)   a. Susan *is liking* this play a great deal.
        b. Peter *is believing* in ghosts these days.

c. Charles *is being silly*.

Aspectual coercion can also be induced by adverbials, as in (15a-b). In (15a), *suddenly* triggers coercion of a state into an inception of state; in (15b), the accomplishment predicate acquires the iterative interpretation after combining with the durative adverbial *for three hours*.

(15)   a. Suddenly, I *knew* the answer.
        b. She *played* sonata for three hours.

Now that we have seen a wide variety of coercion operations, we are in a position of introducing the main ingredient of the proposal.

We argue that one of the coercion operations available in natural languages is a causative coercion, represented in (16).

(16) $Op_{trans}(V_{intrans}) \rightarrow Op_{trans}(CAUS(V_{intrans}))$
        where Op_{trans} is an operator that selects for a transitive verbs, and CAUS is a covert causative operator

According to (16), if a semantic operator that wants a transitive predicate as its input combines with an intransitive predicate, in order to resolve this transitivity mismatch the latter can be coerced by means of covert causativization.

To the best of our knowledge, coercion phenomena involving causativization have not been much discussed in the literature so far. Sag and Pollard (1991:83) indicate that in languages like English a semantic shift is forced in non-agentive clauses when they occur in an agentive environment such, e.g., in the imperative: *Be optimistic*! means, roughly, 'make yourself optimistic' or 'put effort in maintaining an optimism'. Here the addressee of the imperative is interpreted as exercising control over the state 'be optimistic' — by virtue of causative coercion, Sag and Pollard suggest. Sag and Pollard (1991) and Pollard and Sag (1994), then, argue that the same type coercion is observed in control configurations like *John promised Mary to be allowed to attend the reception* (Sag, Pollard 1994: 312) where the infinitival complement is interpreted as 'cause X to be allowed to attend the reception'. In both cases, the coercion seems to be triggered by the requirement that a relevant argument must have a certain properties of the agent for the whole structure to receive a coherent interpretation, but the input (the holder of state like 'optimistic' or the internal argument of *allow)* fails to meet this requirement.

However, what happens in Sag and Pollard's examples is not exactly what (16) is aimed to account for. (16) represents a situation where the causative coercion is induced by the operator what expects a **transitive** input, not just an input where the agent is present. (16) predicts that an intransitive configuration, be it agentive or not, can be causativized if some Op_{trans} wants to merge with it. Below we will develop an argument that this is precisely what happens in Karachay-Balkar when the passive morpheme attaches to an intransitive configuration, as represented in (17).

(17)   *-l-$_{PASS}$* ($V_{intrans}$) $\rightarrow$ *-l-$_{PASS}$* (CAUS($V_{intrans}$))

The argument is based on the following reasoning. (17) says that an intransitive predicate undergoes covert causativization. Therefore, it predicts a strict parallelism between causal passives and overt causatives. Whatever properties overt causatives have, their coerced counterparts must have the same, because causativization is part of the derivation of both. Besides, if (17) is essentially a coercion phenomenon, it cannot go without a trigger. We should not find a coerced intransitive predicate in any environment other than in combination with the passive morpheme.

In what follows we will test both of these predictions. First of all, we will show that causal passives do indeed resemble overt causatives in all relevant respects, and this would be a crucial piece of evidence for the claim that causal passives involve covert causativization. Specifically, evidence for the analysis in (17) comes from the observations that intransitives combined with the passive pattern with overt causatives with respect to the semantic type of causation, interpretation of agent-oriented, time-span and rate adverbials, and the scope of negation.

Secondly, we will show that coercion in question can only occur if the intransitive predicate is an argument of the passive operator.

3. Coerced intransitives

In this section we will present evidence for a strict parallelism between the causative and the causal passive. We will take causatives from different types of intransitives and compare them with corresponding causal passives, and what we will see is their identity in all relevant respects. Then we will show that generalizations drawn from these observations extend naturally to recursive passivization. This will provide us with clues to solving the problem we started with in the introduction: how to treat recursive derivations where one application of an operator bleeds another application.

Table 1 summarizes semantic characteristics of overt causatives and their causal passive counterparts derived from unaccusative and unergative verbs.

Table 1. Causatives and causal passives of intransitives

	Unaccusative		Unergative	
	Causative	Causal passive	Causative	Causal passive
Type of causation	direct	direct	indirect	indirect
Scope of time-span and rate adverbials	unambiguous	unambiguous	three-way ambiguous	three-way ambiguous
Interpretation of agent-oriented adverbials	unambiguous	unambiguous	two-way ambiguous	two-way ambiguous
Scope of negation	two-way ambiguous	two-way ambiguous	three-way ambiguous	three-way ambiguous

In a nutshell, what we see is that there is a huge difference between unaccusative-based and unergative-based configurations. However, there is no difference at all between causatives and causal passives derived from the same predicate, be it unergative or unaccusative. In other words, differences between the causative applied to unaccusatives and unergatives are mirrored by the causal passive.

For instance, we see that causatives of unaccusatives combined with rate adverbials are unambiguous, and so are passives of unaccusatives. In contrast, causatives of unergatives are three-way ambiguous in combination with the same adverbials, and so are passives of unergatives. Let us review these data in more detail.

The first observation has to do with semantic type of causation.

(18) alim   butaq-nı   sın-dır-dı.
      Alim.NOM   branch-ACC   break.INTR-CAUS-PST.3SG
      1. 'Alim broke the branch.
      2. *'Alim caused the branch to break.'

The causative of unaccusative in (18) involves a direct causation whereby the agent's activity is an immediate cause of the change of state of the theme (Kratzer 2005). (18) is illicit if

the activity and the change of state are mediated by any other events. For instance, Alim asking his friend to break a branch, his friend taking a hammer and hitting the branch, and the branch finally breaking would be an impossible scenario for (18).

Compare the causal passive in (19).

(19)   butaq   (alim-ni   küc-ü ble)   sın-ıl-dı.
        branch.NOM   Alim-GEN   force-3 with   break.INTR-PASS-PST.3SG
        1. 'The branch was broken (by Alim).
        2. * The branch was caused to break by Alim.'

Native speakers' judgments are absolutely clear: abstracting away from transitivity, (19) has precisely the same meaning as (18), the one of direct causation with no intermediate events in a causal chain connecting the agent's activity and the change of state.

Unergatives are different. For unergative-based causatives, the indirect causation construal is readily available. In (20), there can be quite a long causal chain connecting the causer's activity and the causee's action. A possible scenario can, for instance, include Alim's asking his friend to convince Kerim's father to remind Kerim that he has to run.

(20)   alim   kerim-ni   cap-tır-dı.
        Alim.NOM   Kerim-ACC   run-CAUS-PST.3SG
        'Alim caused || allowed || asked || convinced... Kerim to run.'

Crucially, the same is true of the causal passive in (21).

(21)   kerim   cab-ıl-dı.
        Kerim.NOM   run-PASS-PST.3SG
        'Kerim was caused || allowed || asked || convinced... to run.'

Where the difference between unergatives and unaccusatives with respect to causativization comes from is irrelevant for our story. The direct/indirect distinction has been a constant topic in the studies of causativization phenomena since late 1960s and one of the central issues surrounding the debate on lexical and syntactic causatives (Lakoff 1965, 1971, Fodor 1970, McCawley 1971, 1972, Cruse 1972, Shibatani 1973, Yang 1976, see a recent discussion in Kratzer 2005, and Miyagawa, to appear). In this paper, we do not have to add much to this discussion, see Author 1, Author 2 (to appear) for more details. What we are interested in here is a simple generalization that can be drawn from these examples: that the causative and the causal passive never show differences in terms of the semantic type of causation. Whenever the indirect interpretation is available for the causative, the causal passive will have it, too.

The same pattern – semantic contrast between unaccusatives and unergatives, no contrast between causatives and causal passives – is attested with temporal adverbials. Consider the distribution of time span adverbials as an example:

(22)   alim   beš   minut-xa   cojun-nu   tol-dur-du.
        Alim.NOM   five   minute-DAT   pot-ACC   fill.INTR-CAUS-PST.3SG
        1. 'Alim filled the pot in five minutes.'
        2. *'What Alim did in five minutes was make a/the pot fill.'
        3. *'What Alim did was make a/the pot fill in five minutes.'
(23)   cojun   beš   minut-xa   tol-un-du.
        pot.NOM   five   minute-DAT   fill.INTR-PASS-PST.3SG
        1. 'The pot was filled in five minutes.'
        2. *'Some event that happened in five minutes made the pot fill.'

3. *'Some event made the pot fill in five minutes.'

Causatives and causal passives again pattern together: in both cases the adverbial indicates that it takes five minutes for the whole filling event to occur, as in (22.1) and (23.1). Interpretations where the adverbial only takes scope over a causing subevent, (22.2) and (23.2), or over a caused subevent, (22.3) and (23.3), are impossible.

The interpretation of time span adverbials combined with causatives and causal passives of unergatives is different:

(24) alim beš minut-xa kerim-ni škol-ʁa cap-tïr-dï.
Alim.NOM five minute-DAT Kerim-ACC school-DAT run-CAUS-PST.3SG
1. 'Alim made Kerim run to the school in five minutes.'
2. 'What Alim did in five minutes was make Kerim run to the school.'
3. 'What Alim did was make Kerim run to the school in five minutes.'

(25) kerim beš minut-xa škol-ʁa cab-ïl-dï.
Kerim.NOM five minute-DAT school-DAT run-PASS-PST.3SG
1. 'Kerim was made run to the school in five minutes.'
2. 'Some event that happened in five minutes made Kerim run to the school.'
3. 'Some event made Kerim run to the school in five minutes.'

Here the adverbial can take scope over the causing subevent, over the caused subevent or over both. On the first reading, both causing and caused subevents occur within the 5 minute interval, (24.1)-(25.1). The second reading is where the adverbial identifies the duration of the causing subevent without indicating how long the running subevent lasts (24.2)-(25.2). The other way round, in (24.3)-(25.3) it took five minutes for the causee to reach the school with the duration of the causing subevent left unspecified.

What is crucial is that the range of interpretations of the causative and the causal passive is again identical. The causative in (24) is three-way ambiguous, and so is the causal passive in (25).

The next piece of evidence supporting our proposal comes from the distribution of purpose adjuncts. Purpose adjuncts, unless used metaphorically, are strictly agent-oriented, since only agents can act volitionally and exercise control over their actions. Causatives of unaccusatives only have one agent, hence purpose adjuncts do not yield ambiguity. The same holds for causal passives, and their implicit agents, as illustrated in (26a-b).

(26) a. fatima lejla-ʁa acuuʁa butaq-nï sïn-dïr-dï.
Fatima.NOM Leila-DAT to.spite branch-ACC break.intr-CAUS-PST.3SG
'Fatima broke the branch to spite Leila.'
b. butaq lejla-ʁa acuuʁa sïn-ïl-dï.
branch.NOM Leila-DAT to.spite break.intr-PASS-PST.3SG
'The branch was broken to spite Leila.'

Most unergatives are agentive to begin with, so causativization creates a structure that can contain two agents — the agent of causing subevent and the agent of caused subevent. As a result, purpose adjuncts can be associated with either of these two agents. This is what (27a) illustrates for causatives and (27b) for causal passives. Again, no difference can be detected as to the range of interpretations available for (27a) and (27b).

(27) a. fatima lejla-ʁa acuuʁa alim-ni züz-dür-dü.
Fatima.NOM Leila-DAT to.spite Alim-ACC swim-CAUS-PST.3SG
1. 'Fatima let Alim swim to spite Leila (it was Alim who wanted to spite Leila).'

2. 'In order to spite Leila, Fatima made Alim swim (it was Fatima who wanted to spite Leila).'

b. alim lejla-ʁa acuuʁa fatima-nı küc-ü
    Alim.NOM   Leila-DAT   to.spite   fatima-GEN   force-3

ble züz-ül-dü.
with   swim-PASS-PST.3SG

1. 'Alim was allowed by Fatima to swim to spite Leila (it was Alim who wanted to spite Leila).'
2. 'Alim was allowed to swim by Fatima, who wanted to spite Leila.'

Finally, consider the scope of negation. Causativized unaccusatives license two interpretations:

(29) alim cojun-nu tol-dur-ma-dı.
     Alim.NOM   pot-ACC   fill.INTR-CAUS-NEG-PST.3SG
     'Alim didn't fill the pot.'
     1. No filling activity has occurred.
     2. Alim started filling the pot but has not finished.

Being derived accomplishments, causatives like *fill* provide the negation with two scope possibilities. In (29.1), the negation takes wide scope that includes both activity and change of state. In (29.2), only the change of state falls under the scope of negation whereas the activity does occur. Again, the same range of interpretations is available to the causal passive in (30).

(30) cojun tol-un-ma-dı.
     pot.NOM   fill.INTR-PASS-NEG-PST.3SG
     'The pot was not filled.'
     1. No filling activity has occurred.
     2. Someone started filling the pot but has not finished.

Causatives of unergatives are ambiguous under negation, too, but in a considerably different way. The first interpretation of (31) corresponds to (29.1): neither causing nor caused subevents occur. The second interpretation involves the causer's activity that fails to bring about the caused subevent. It can be thought of as being scopally equivalent to (29.2). However, causatives of unergatives allow for one more option not available for causatives of unaccusatives. On the third reading, (31) means that what was caused is not running:

(31) alim kerim-ni škol-ʁa cap-tır-ma-dı.
     Alim.NOM   Kerim-ACC   school-DAT   run-CAUS-NEG-PST.3SG
     1. 'Alim didn't make Kerim run to the school.' (neither causing nor running events occur)
     2. 'Alim didn't make Kerim run to the school.' (attempted but hasn't succeded)
     3. 'Alim made Kerim not run to the school.'

The precise analysis of the negation in Karachay-Balkar is not our immediate focus. Rather, we use it as a means for discerning the difference between unaccusatives and unergatives and making sure that causatives and causal passives are alike. Again, we see that the causal passive behaves in exactly the same way as the corresponding causative: (32), like (31), licenses the 'cause not to run' reading in addition to the other two.

(32) kerim škol-ʁa cab-ıl-ma-dı.
     Kerim.NOM   school-DAT   run-PASS-NEG-PST.3SG

1. 'Kerim wasn't made run to the school.' (neither causing nor running events occur)
2. 'Kerim wasn't made run to the school.' (attempted but not succeded)
3. 'Someone made Kerim not run to the school.'

Again, the evidence from the scope of negation lends support to the view that causal passives and causatives involve the same derivation.

What the evidence from causativization of unaccusatives and unergatives teaches us is that semantic characteristics of causatives and causal passives are strictly parallel. The hypothesis that the derivation of causal passives involves causativization, even if covert, accounts for this parallelism in a principled way.

With this in mind, we have everything we need to approach recursive passivization phenomena, to which we now turn.

4. Recursive passivization

In the previous section, we have seen that combining intransitives with the –*l* morpheme involves covert causativization. What we are going to do now is show that the same happens if the –*l* morpheme combines with a predicate which is passive already. The relevant example is repeated as (33):
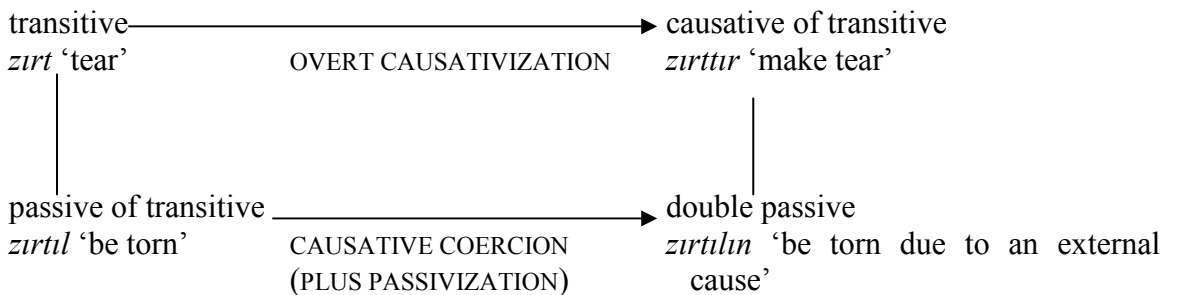
(33) kölek   kerim-ni   küc-ü ble   zırt-**ıl-ın**-dı.
      shirt.NOM   K.-GEN   force-3 with   tear-**PASS-PASS**-PST.3SG
      1.'A/the shirt was torn by Kerim (on someone's order).'
      2. 'A/the shirt was torn (by someone) on Kerim's order.'

Specifically, we will show that combining –*l* morpheme with passives like *zırtıl* triggers causative coercion of the latter.

One complication that emerges at this point is that we can not use the same strategy as before, namely, we cannot compare the double passive like *zırtılın* in (33) with the corresponding overt causative of the form **zırtıldır*. In Balkar, as in many other Turkic languages, the causative -*tır* can only be merged inside the passive morpheme, not outside, which possibly reflects the hierarchy of functional projections these morphemes are inserted into (Enç 2003). Since causatives like **zırtıldır* do not exist, we propose another, slightly more complicated way of identifying effects of covert causativization.

We will show that double passives like (33) are to single passives like (4) as causatives of transitives are to ordinary transitives, as represented in Scheme 1:

Scheme 1. Transitives, causatives, passives, and double passives

transitive————————————————————▶ causative of transitive
zırt 'tear'   OVERT CAUSATIVIZATION   *zırttır* 'make tear'

passive of transitive _____▶ double passive
zırtıl 'be torn'   CAUSATIVE COERCION   *zırtılın* 'be torn due to an external
                         (PLUS PASSIVIZATION)   cause'

We will look at the difference between transitive verbs like *zırt* and their causatives like *zırttır* and make sure that the event structure of the latter contains an additional causing subevent, as expected. The presence of this subevent can be detected due to additional scope possibilities it creates. Relevant scope taking operators we take into account will be the same as before: various

types of adverbials and negation. Then we will see that the difference between the passive like *zɪrtɪl* 'be torn' and the double passive *zɪrtɪlɪn* 'be torn due to an external cause' is exactly the same, and this will be our crucial argument for the claim that the derivation of the latter involves causativization through causative coercion.

Let us first take a look at adverbial modification data. In terms of the scope of adverbials, causatives of transitives pattern together with causatives of unergatives discussed above. Unlike their non-derived counterparts, causatives allow for multiple scope ambiguities, whereby the adverbials modify causing and caused subevents independently from each other. Examples in (34b) and (35b) illustrate this for time-span and agent-oriented adverbials, respectively. Non-derived verbs in (34a) and (35a) are unambiguous.

(34) a. farida   beš   minut-xa   xalı   zɪrt-tɪ.
          Farida.NOM   five   minute-DAT   thread   tear-PST.3SG
          'Farida tore a thread in five minutes.'

      b. alim   beš   minut-xa   farida-ʁa   xalı   zɪrt-tɪr-dɪ.
          Alim.NOM   five   minute-DAT   Farida-DAT   thread   tear-CAUS-PST.3SG
          1. 'Alim made Farida to tear a thread in five minutes.'
          2. 'What Alim did in five minutes was make Farida tear a thread.'
          3. 'What Alim did was make Farida tear a thread in five minutes.'

(35) a. farida   lejla-ʁa   acuuʁa   xalı   zɪrt-tɪ.
          Farida.NOM   Leila-DAT   to.spite   thread   tear-PST.3SG
          'Farida tore a thread in order to spite Leila.'

      b. alim   lejla-ʁa   acuuʁa   farida-ʁa   xalı   zɪrt-tɪr-dɪ.
          Alim.NOM   Leila-DAT   to.spite   Farida-DAT   thread   tear-CAUS-PST.3SG
          1. 'Alim let Farida tear a thread to spite Leila (it was Farida who wanted to spite Leila).'
          2. 'In order to spite Leila, Alim made Farida tear a thread (it was Alim who wanted to spite Leila).'

When it comes to the negation, one can observe that non-derived transitives are two-way ambiguous under negation whereas the range of interpretations of causatives is much wider.

(36) a. farida   xalı   zɪrt-ma-dɪ.
          Farida.NOM   thread   tear-NEG-PST.3SG
          'Farida did not tear a thread.'
          1. Farida did not do anything
          2. Farida tried to tear a thread, but did not succeed.

      b. alim   farida-ʁa   xalı   zɪrt-tɪr-ma-dɪ.
          Alim.NOM   Farida-DAT   thread   tear-CAUS-NEG-PST.3SG
          'Alim didn't make Farida tear a thread.'
          1. Neither Alim nor Farida did anything.
          2. Alim failed to make Farida tear a thread.
          3. Farida tried to tear a thread on Alim's order but did not succeed.
          4. Alim made Farida not tear a thread.

On the widest scope reading, (36b.1), the sentences implies that no subevent of the whole complex event has occurred. In (36b.2), the causing subevent escapes from the scope of negation, and Alim performs some causing activity which, however, does not bring about tearing of the thread. In (36b.3), both causing subevent and tearing activity occur, and what is negated is a change of state of the theme. One more reading is (36b.4), where the causal relation is established between what Alim is doing and Fatima's not tearing the thread.

Observations from (34)-(36) are summarized in Table 2.

Table 2. Transitives vis-à-vis causatives of transitives

	Transitives *zırt* 'tear'	Causative of transitives *zırt-tır* 'tear-CAUS'
Time-span and rate adverbials	unambiguous	three-way ambiguous
Agent-oriented adverbials	unambiguous	two-way ambiguous
Negation	two-way ambiguous	four-way ambiguous

The literature can provide us with various ideas about where the range of interpretations we observed in (34) – (36) comes from. For instance, the scope of adverbials can be accounted for if one assumes an event-based semantic analysis of the causative in Pylkkänen's (2002) style coupled with the view that syntactically, the causative morpheme is an exponent of the *v* head (Folli, Harley, 2007, Harley 2008, Travis 2010, Miyagawa, to appear). If causatives of transitives involve a configuration with two *v*Ps (Lidz 2004, Harley 2008, Ramchand 2008), if semantic contribution of *v* is a causing subevent, and if time-span and rate adverbials are *v*P adjuncts, the pattern in (34) is easily explained. When an adverbial adjoins to a lower *v*P, the narrow scope reading in (34.3) obtains. If the adverbial merges at the higher *v*P level, two options are available. First, it can only modify a causing subevent introduced by *v* within the same *v*P, in which case the reading in (34.2) is derived. If, secondly, it scopes over the whole complex *v*P, including the lower one, one gets the reading in (34.1). See Author 1, Author 2, to appear for a more detailed discussion.

However, in the case at hand we do not even have to know why the scope of negation and scope of adverbials pattern the way they do in (34)-(36). We simply take them as a signature of causativization, and use them as a diagnostic when we need to make sure that a certain configuration has undergone the causative derivation. For instance, if we see that a certain structure based on a transitive verb stem is four-way ambiguous in the same way as the causative in (36b), we have every reason to suggest that its derivation involves causativization even if no causative morphology shows up on the surface. If this reasoning is correct, and if the recursive passivization in (33) does indeed involve causative coercion, our prediction is straightforward: double passives must differ from plain passives in exactly the same way as causatives in (34b)-(36b) and non-derived transitives in (34a)-(36a). The prediction is borne out, as the data in Table 3 show.

Table 3. Passives vis-à-vis double passives.

	Passive of transitives *zırt-ıl* 'tear-PASS'	Double passive of transitives *zırt-ıl-ın* 'tear-PASS-PASS'
Scope of time-span and rate adverbials	unambiguous	three-way ambiguous
Agent-oriented adverbials	unambiguous	two-way ambiguous
Scope of negation	two-way ambiguous	four-way ambiguous

Table 3 summarizes differences between simple passives and double passives of transitives: these differences turn out to be identical to these between transitives and their causatives in Table 2. Like causatives, double passives provide more scope options than simple passives. Let us see a few illustrations.

(37) kölek   eki   minut-xa   kerim-ni   küc-ü ble   zırt-ıl-dı.
      shirt.NOM two   minute-DAT K.-GEN   force-3 with tear-PASS-PST.3SG
      'The shirt was torn by Kerim in two minutes.'

(37) illustrates a simple passive, and here a time span adverbial is unambiguous: the tearing event occurs in two minutes, in exactly the same way as in its active counterpart in (34a). This is what happens to passives in languages like English, too. Now consider the double passive in (38):

(38) kölek   eki   minut-xa   kerim-ni   küc-ü ble   zırt-ıl-ın-dı.
     shirt.NOM   two   minute-DAT   K.-GEN   force-3 with tear-PASS-PASS-PST.3SG
     1. 'The shirt was torn by Kerim on someone's order in two minutes.'
     2. 'The shirt was torn by Kerim because someone convinced him in two minutes to do so.'
     3. 'The shirt was torn in two minutes by Kerim, because someone ordered him to do so'.

In contrast with (37), the double passive in (38) is three-way ambiguous. On one reading, (38.1), the adverbial takes scope over both causing and tearing subevents. On the second reading, (38.2), the causing subevent only falls under the scope of the adverbial, and the sentence means that it took two minutes for someone to make Kerim tear his shirt. The temporal extent of the tearing event is not specified on this reading. Finally, the third reading, (38.3), is where the adverbial scopes over the caused event, and it is the tearing event that occupies two minutes, the duration of the causing event left indeterminate. Therefore, time-span adverbials provide us with evidence that the event structure of the double passive is more complex than that of a regular passive. Moreover, the difference between (38) and (37) is exactly the same as that between (34a) and (34b). If the derivation of the double passive involves causativization, this is what we expect.

Consider agent-oriented adverbials:

(38) kölek   lejla-ʁa   acuuʁa kerim-ni   küc-ü ble   zırt-**ıl-ın**-dı.
     shirt.NOM   Leila-DAT   to.spite K.-GEN   force-3 with tear-**PASS-PASS**-PST.3SG
     1.'A/the shirt was torn by Kerim (on the order or by permission of some person X) to spite Leila.'
          a. It was Kerim who wanted to spite Leila.
          b. It was X who wanted to spite Leila.
     2. 'A/the shirt was torn (by someone) on Kerim's order or by Kerim's permission to spite Leila.'
          a. It was X who wanted to spite Leila.
          b. It was Kerim who wanted to spite Leila.

As we have seen in (2), the *by*-phrase 'by (the force of) Kerim' can refer to either the agent of a tearing event or to the external causer X, the one who causes the agent to tear a shirt. No matter which of these options is realized, the adverbial be anteceded by either of these two arguments, which creates four possible combinations, represented in Table 4:

Table 4. Possible readings of (38)

By-phrase refers to	Antecedent of the adverbial	
	Agent	Causer
Agent	(38.1a)	(38.1b)
Causer	(38.2a)	(38.2b)

For native speakers, readings in (38.1a) and (38.2b), where the antecedent of the adverbial is identical to the referent of the by-phrase, are the first choice. However, the other two readings are never excluded either. What this means is: like the causative in (35b), the double

passive in (38) always creates two possible antecedents for the purpose adjunct, one of which is the agent of the tearing event, another one being a participant who makes or lets him perform this event. Again, if the causative coercion occurs between the two applications of the passive, this result falls out for free.

Under negation, the double passive shows the same four interpretations as the corresponding causative in (36b):

(39) kölek   kerim-ni   küc-ü ble   zırt-**ıl-ın**-dı.
      shirt.NOM   K.-GEN   force-3 with tear-**PASS-PASS**-PST.3SG
      'The shirt was not torn by Kerim on somebody's order.'
      1. Neither the causer nor Kerim did anything.
      2. The causer failed to make Kerim tear a thread.
      3. Kerim tried to tear a thread on the causer's order but failed to do so.
      4. The causer made Kerim not tear a thread.

As in (36b.1), in (39.1) the negation has he widest possible scope including the causing subevent and the whole tearing event. In (39.2), the occurrence of the tearing event is only negated. In (39.3), the scope of negation is narrower: it only includes the change of state of the shirt, cf. (36b.3). Finally, (39.4) corresponds to (36b.4) where the causer's action prevents the agent from tearing a shirt.

Now we are in a position of summarizing our observations and generalizations. In all relevant respects, as evidence from the scope of adverbials and negation suggests, the double passive from a transitive verb differs from the single passive in the same way as the causative differs from a non-derived transitive in the active voice. If the derivation of the double passive involves covert causativization, this identity falls out naturally. The double passive possesses an additional causing subevent visible for adverbials and an implicit participant of this subevent that can be identified by the *by*-phrase. On the proposed analysis, this follows from the fact that the simple passive is essentially intransitive, hence the second occurrence of the passive morpheme induces causative coercion — in exactly the same way as in case of the passive of intransitives discussed in Section 3. Otherwise, the pattern in (33)-(39) comes out as a mysterious coincidence.

Now that we have established an argument that recursive passivization involves causative coercion, we can complete our analysis by developing semantic derivations for double passives and other configurations we have discussed so far. This will be done in the next section.

5. Derivations

In this final section, we will present a model-theoretic fragment that makes the analysis presented above fully explicit. The two essential components of the analysis are semantics for the coercion operator and for the passive.[2] These are represented in (40)-(41):

(40) Coercion operator:
      $\|CAUS\| = \lambda P.\lambda x.\lambda e.\exists e'[P(e') \wedge Agent(x)(e) \wedge cause(e')(e)]$

(41) Passive:
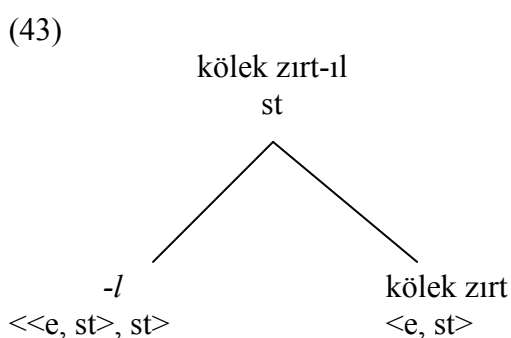 $\| \text{-}l\text{-} \| = \lambda R.\lambda e.\exists x[R(x)(e)]$

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[2] In what follows, we assume an extensional λ-calculus with basic types e (individuals), s (events) and t (truth values). Complex types are recursively defined in the standard manner. The only rule of semantic composition used below is Functional Application. We focus on the derivation of complex event predicates where all individual argument positions are saturated; for simplicity DPs are taken to denote individual constants. Irrelevant details about the unaccusative/unergative distinction are ignored. For the sake of space, we leave integration of adverbials, *by*-phrases and negation into the whole picture, which requires a lot of technical elaboration, for another occasion. We believe that this simplification does not affect the argument we are trying to establish throughout the paper.

Both operators do exactly what the causative and passive operators are supposed to do. The causative coercion operator takes a predicate of events and returns a two-place relation between individuals and events. It existentially binds an event from the original extension of the event predicate, and introduces a causing event as well as a participant of that event.[3] The passive morpheme takes a relation between individuals and events and returns an event predicate, existentially binding an individual variable. Crucially, as we will see in a moment, the outcome of causative coercion is always a suitable input for passivization.

The simplest case is of course the passive of transitives repeated in (42) that does not require any coercion: the vP is of logical type $\langle e, st\rangle$, a relation between individuals and events, which serves as an argument of the passive morpheme:

(42) kölek   zırt-ıl-dı.
      shirt.NOM   tear-PASS-PST.3SG
      'The shirt was torn.'

(43)

$$\begin{array}{c}
\text{kölek zırt-ıl} \\
\text{st}
\end{array}$$

```
           kölek zırt-ıl
                st
               /  \
              /    \
             /      \
           -l        kölek zırt
<<e, st>, st>          <e, st>
```

The relevant part of the derivation of (42) is shown in (44).

(44) a. **Transitive verb:**
    $\| \text{zırt} \| = \lambda y.\lambda x.\lambda e \exists e'[\text{tear}(y)(e') \wedge \text{Agent}(x)(e) \wedge \text{cause}(e')(e)]$
    b. **Saturation:**
    $\| \text{kölek zırt} \| = \lambda y.\lambda x.\lambda e \exists e'[\text{tear}(y)(e') \wedge \text{Agent}(x)(e) \wedge \text{cause}(e')(e)](\text{shirt}) =$
             $= \lambda x.\lambda e.\exists e'[\text{tear}(\text{shirt})(e') \wedge \text{Agent}(x)(e) \wedge \text{cause}(e')(e)]$
    c. **Passive:**
    $\| \text{-l-} \| = \lambda R.\lambda e.\exists x[R(x)(e)]$
    d. **Passivization:**
    $\|\text{-l-} [\text{kölek zırt}] \| = \lambda R.\lambda e.\exists x[R(x)(e)](\lambda x.\lambda e \exists e'[\text{tear}(\text{shirt})(e') \wedge \text{Agent}(x)(e) \wedge$
             $\text{cause}(e')(e)]) = \lambda e.\exists x \exists e'[\text{tear}(\text{shirt})(e') \wedge \text{Agent}(x)(e) \wedge \text{cause}(e')(e)]$

The denotation of the transitive verb in (44a) is a three-place relation between two individuals and events. After the saturation of internal argument position in (44b) the passive, repeated in (44c), applies. The outcome is an event predicate in (44d). This predicate denotes tearing events in which the shirt is torn. These events are brought about by some individual with the agent properties.

Let us consider a more complex case, the passive of intransitives discussed in section 3; an example of this type of the passive derived from an unaccusative verb *sın* 'break' is repeated in (45) (the account for unergatives would be similar, possibly with minor technical adjustments).

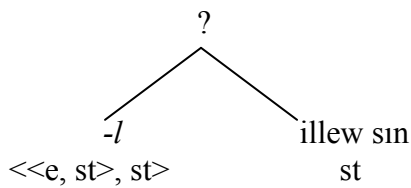(45) illew   (alim-ni   küc-ü ble)   sın-ıl-dı.

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[3] We assume with Pylkkanen 2002, Ramchand 2008 and many others that the causee is not an argument of the causative. See Alsina 1992 for an alternative view.

toy.NOM   Alim-GEN   force-3   with   break-PASS-PST.3SG
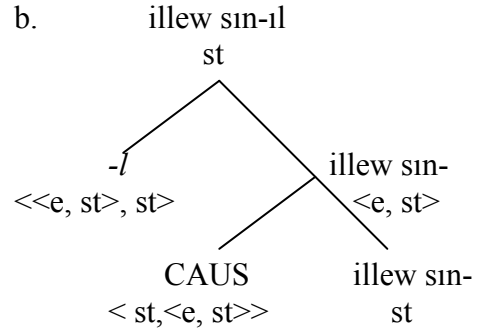'The toy was broken (by Alim.)'

Unlike in (43), in (44) the causative coercion is necessary to obtain an interpretable configuration. Indeed, the passive morpheme in (41) requires a relation between individuals and events to apply to. But the intransitive predicate fails to provide a suitable input to the passive: as soon as its single argument position is saturated we get an event predicate, and a type mismatch results, as shown in (46a). This mismatch is repaired if the event predicate is coerced by means of covert causativization into a relation between individuals and events, as required. This is shown in (46b).

(46)
a.   b.   illew sın-ıl
                                                               st

                    ?   -l   illew sın-
                   /\   <<e, st>, st>   <e, st>
                  / \   \   /
                 /   \   \   /
               -l   illew sın   CAUS   illew sın-
         <<e, st>, st>   st   < st,<e, st>>   st

        (47) presents a derivation for (45).

(47)   a. **Unaccusative verb:**
        $\| sın \| = \lambda x.\lambda e.\mathrm{break}(x)(e)$
        b. **Saturation:**
        $\| illew\ sın \| = \lambda e.\mathrm{break}(toy)(e)$
        c. **Coercion operator:**
        $\| CAUS\| = \lambda P.\lambda x.\lambda e.\exists e'[P(e') \wedge \mathrm{Agent}(x)(e) \wedge \mathrm{cause}(e')(e)]$
        d. **Coercion:**
        $\| CAUS\ [\ illew\ sın] \| = \lambda x.\lambda e.\exists e'[\mathrm{break}(toy)(e') \wedge \mathrm{Agent}(x)(e) \wedge \mathrm{cause}(e')(e)]$
        e. **Passive:**
        $\| \text{-}l\text{-} \| = \lambda R.\lambda e.\exists x[R(x)(e)]$
        f. **Passivization:**
        $\|\text{-}l\text{-}\ [CAUS\ [illew\ sın]] \| = \lambda e.\exists x\exists e'[\mathrm{break}(toy)(e') \wedge \mathrm{Agent}(x)(e) \wedge \mathrm{cause}(e')(e)]$

The crucial step of the derivation is (47d): application of the coercion operator to the event predicate in (47b) creates a relation between causing events and agent individuals in (47d). This relation is a legitimate input for the passive operator in (47e). The output of passivization is shown in (47f): it is a predicate that denotes events that bring about a change of state of the toy. The individual variable ranging over agent individuals is existentially bound. This derivation shows how the meaning of causation emerges when the passive applies to an intransitive predicate.

Now comes the crucial component of our proposal: semantic derivation of recursive passivization. What we are going to see is that a well-formed semantic configuration can only be derived through the causative coercion. Essentially, we will show that this type of passivization can be reduced to the derivation in (47).

Recall that the double passives of transitives involve an extra causing event and its agentive participant, as in (48).

(48)   kölek   (kerim-ni   küc-ü ble)   zırt-ıl-ın-dı.
       shirt.NOM   K.-GEN   force-3 with   tear-PASS-PASS-PST.3SG
       'The shirt was torn by Kerim (on someone's order).'

The informal idea we have discussed in section 1 is that the first instance of the passive morpheme yields an intransitive configuration. This configuration must be coerced before it can be combined with the second instance of the passive morpheme. To be more specific, after the first application of the passive morpheme we get a predicate of events, similar to the non-derived one in (47b), and the causative coercion is called for the same reason as in (47d), that is, to resolve a type mismatch.

In schemes (49), we can see what is going on.

(49)
a.

b.   kölek zırt-ıl-ın
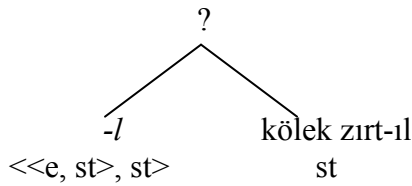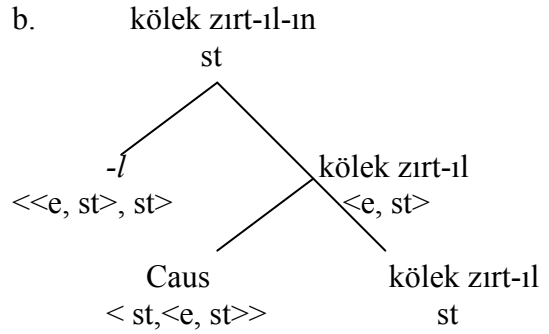
In (49a), the result of combining the transitive verb 'tear' with the passive is of type st, that of event predicates. This is what has been shown in (44d) above. As a consequence, this predicate cannot be merged with the second instance of the passive morpheme (of type $<<e, st>$, $st>$) directly due to the familiar type mismatch. To resolve the mismatch, the causative coercion applies in (49b) in precisely the same way as in case of lexical intransitives in (46). After the causative coercion, the second instance of the passive morpheme can be merged, yielding an interpretable configuration.

The derivation of the double passive is shown in (50).

(50)   a. **Passive (=44d):**
       $||$-*l*- [kölek zırt] $|| = \lambda e.\exists y \exists e'[tear(shirt)(e') \wedge Agent(y)(e) \wedge cause(e')(e)]$

       b. **Coercion operator:**
       $|| CAUS|| = \lambda P.\lambda x.\lambda e.\exists e'[P(e') \wedge Agent(x)(e) \wedge cause(e')(e)]$

       c. **Coercion:**
       $|| CAUS (kölek zırt-ıl) || = \lambda P.\lambda x.\lambda e.\exists e'[P(e') \wedge Agent(x)(e) \wedge$
       $cause(e')(e)](\lambda e.\exists y \exists e'[tear(shirt)(e') \wedge Agent(y)(e) \wedge cause(e')(e)]) =$
       $\lambda x.\lambda e.\exists y \exists e' \exists e''\ [tear(shirt)(e'') \wedge Agent(y)(e') \wedge cause(e'')(e') \wedge Agent(x)(e) \wedge$
       $cause(e')(e)]$

       d. **Passive:**
       $|| $ -*l*- $ || = \lambda R.\lambda.e \exists x[R(x)(e)]$

       e. **Passivization:**
       $||$-*l*- (CAUS (kölek zırt-ıl)) $|| =$
       $\lambda e.\exists x \exists y \exists e' \exists e''\ [tear(shirt)(e'') \wedge Agent(y)(e') \wedge cause(e'')(e') \wedge Agent(x)(e) \wedge$
       $cause(e')(e)]$

The product of the causative coercion is a relation between causing events and individuals, agents in these events, in (50c). This relation combines with the passive morpheme

creating an event predicate in (50e). This predicate involves a complex event structure consisting of three subevents, with one participant each. One of subevents is a change of state where the shirt gets torn. The second subevent is a causing subevent, with a corresponding individual variable existentially bound. The third subevent is the one that causes the second subevent; its individual participant receives an existential interpretation, too. It is not difficult to check that (50e) is exactly what the sentence in (48) means.

This completes the analysis of recursive passivization. In the concluding section, we will summarize main results of this study and its implications for a theory accounting for multiple occurrences of the same piece of derivational morphology.

6. Conclusion

We started this paper by asking a question about what constrains recursive application of the same morphosyntactic operation whereby we get multiple occurrences of the same morphology in a relevant piece of structure. If one assumes a theory where the main tool of semantic composition is functional application (Heim, Kratzer 1998, Heim, von Fintel 2010), and if grammatical morphemes are functions that take their complements as arguments, an obvious expectation is that we only find true recursion if our operation O is essentially a modification, that is, a function of logical type $\langle \sigma, \sigma \rangle$, where σ is a logical type. Whenever the type of the input is not identical to the type of the output, something else should happen for the operation to apply more than once. Specifically, if O is of quantifier type $\langle \sigma\tau, \tau \rangle$, the configuration of the form (51) is predicted to be uninterpretable, for an obvious reason: whenever β is semantically well-formed, it would be of type τ, not of type $\sigma\tau$ required by O. α, then, would fail to have a denotation.

(51) $[_\alpha M(O) [_\beta M(O) [_\gamma \ ... \ ]]$, where $M(O)$ is a morphological exponent of O

It is not difficult to see what we need to repair (51): we have to take β and to turn it into an expression of type $\langle \sigma\tau, \tau \rangle$. What this means is that two applications of O are to be mediated by a function of type $\langle \tau, \sigma\tau \rangle$:

(52) $[_\alpha M(O) [_{\beta'} f_{\langle \tau, \sigma\tau \rangle} [_\beta M(O) [_\gamma ...]]$

We can think of different logical types in place of σ and τ, and of different means of morphosyntactic realization of the f function. In this paper we examined one specific case showing that the scenario outlined in (51) and (52) is empirically real.

In this case, O is a passivization operation of the type $\langle\langle e, st \rangle, \ st \rangle$ (so that e corresponds to σ in (51)-(52), and st corresponds to τ. The f function is thus of type $\langle st, \langle e, st \rangle\rangle$, the one the causative morpheme has in systems in the spirit of Pylkkänen 2002.

We have seen that there are good reasons to believe that causativization does indeed occur to mediate between two applications of the passive. Evidence from the scope of adverbials and negation suggests clearly that in the course of derivation of double passives a new causing subevent and its individual participant are introduced to the event structure. Evidence from the distribution of the passive combined with intransitives points towards the same conclusion: since intransitives fail to provide a suitable input to passivization, they need to be causativized to be able to merge with the passive. Therefore, causativization, which maps event predicates of type st to relations between events and individuals of type $\langle e, st \rangle$, is invoked whenever the type mismatch occurs between the verbal predicate and the passive morpheme. It enables the derivation of what superficially looks like a passivization of intransitive predicates and predicates that are passive already.

The only peculiarity of Karachay-Balkar is therefore as follows: causativization that feeds passivization can occur covertly, as a coercion operation. This type of causativization has indeed all the hallmarks of coercion; crucially, it only occurs whenever the verbal predicate fails to meet the requirement associated with the passive morpheme. It is not available otherwise: we do not find, say, lexically intransitive verbs that acquire three arguments by two applications of covert causativization.

Our story about causative coercion comes to the end. We believe we managed to make a case for causative coercion that enables the passive morpheme to apply more than once in languages like Karachay-Balkar. Much more work still has to be done, though. One obvious question we did not address in this paper is what makes languages like Karachay-Balkar different from languages like English where the causative coercion cannot repair ungrammaticality of sentences like *John was killeded*. For a complete and comprehensive answer we need to know much more about parameters of cross-linguistic variation in availability of various coercion operators, as well as about constraints on that variation. We hope, however, that this task will be soon accomplished.

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