Modifying result states in Turkish

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Problem. Turkish has a morphologically complex[†] temporal modifier, which we call RSM for ease of reference. We gloss over the internal complexity of RSM, and focus on its distribution. RSM occurs in a proper subset of the environments in which the *for*-adverbial in English can occur (cf. Vendler 1957; Dowty, 1979; Smith, 1997; Ramchand, 2008). In particular, RSM naturally targets **result-states** (1a) but is unacceptable with activities (1b). Accordingly, RSM is acceptable when an activity is delimited by a PP, entailing a result-state (see Tenny, 1994). Compare (2a) and (2b).

(1) a. YouTube iki saat-**liğ+in+e** çök-tü.
YouTube two hour-RSM   crash$_{\text{inchoative}}$-PST.3SG
'YouTube crashed for 2 hours.'   † liğ+in+e = MEASURE-3SG.POS-DAT

 b. Selin (#iki saat-**liğ+in+e**) koş-tu.
Selin   two hour-RSM   run-PST
'Selin ran (for two hours)$_{\text{intended}}$.'   [intended reading expressible by "iki saat **boyunca**"]

(2) a. Kutu-yu (#iki saat-**liğine**) taşı-dı-lar.
box-ACC   two hour-RSM carry-PST-3PL
'They carried the box (for 2 hours)$_{\text{intended}}$.'

 b. Kutu-yu iki saat-**liğine** oda-n-a   taşı-dı-lar.
box-ACC two hour-RSM root-2SG.POS-DAT carry-PST-3PL
'They carried the box to your room for 2 hours.'
⊨ the box ended up in the addressee's room

Here is the problem: RSM informs us about the **actual duration** of the result-state in an inchoative sentence like (1a); but only the **intended duration** of the result-state in a causative sentence like (2b). We observe this to be a general pattern that arises with result-states entailed under intentional causation. Lexical ditransitives (3a) and causative change-of-state events (3b), too, entail a result state (nb: neither permits the denial of the result-state). Yet, in neither case is there an entailment about the actual duration of that result-state — it seems RSM fails to encode that. For example, (3a) can felicitously be followed up by "*but just after 5 minutes her mom took it to her room*". Similarly, (3b) can be followed up by "*but just after 3 days, there was a malfunction in the freezing cabins, so all passengers woke up!*". Importantly, RSM is still about a result-state even under causation, as shown in (3c) by the unacceptability of RSM in a causativized activity lacking a result-state.

(3) a. Melis kutu-yu iki saat-**liğine** masa-ya koy-du.
Melis box-ACC two hour-RSM attic-DAT put-PST.3SG
'Melis put the box on the table for 2 hours.'
⊨ the box ended up on the table
⊭ the box remained on the table for 2 (or more) hours.

 b. Mars yolcuların-ı   üç ay-**lığına**   don-dur-du-lar.
Mars passengers-ACC three month-RSM freeze$_{\text{intr}}$-CAUS-PST-3PL
'They (cryogenically) froze the Mars passengers for three months.'
⊨ the Mars passengers ended up frozen
⊭ the Mars passengers were in a frozen state for 3 months (or more)

 c. Selin Ali-yi   (#beş dakika-**lığına**) koş-tur-du.
Selin Ali-ACC   five minute-RSM   run-CAUSE-PST.3SG
'Selin made Ali run (for five minutes)$_{\text{intended}}$.'

What won't work. To recap, it seems that RSM has a disjunctive interpretation: when it targets a result-state S in an inchoative event, it informs us about the **actual duration** of S; whereas when it targets a result-state S entailed under intentional causation, it informs us about the **intended duration** of S. Notably, the latter is paradoxical in that a result-state *is* necessarily entailed in the examples under consideration but a modifier that talks about its duration is not — which makes it untenable to attribute the lack of duration entailment under causation to (the meaning of) causation itself. Similarly, a fine-grained approach as in Beavers & Koontz-Garboden (2020) that allows a possibility modal in CAUSE and derives result-entailments from root meaning will not by itself solve this paradox: if a root entails a result-state S, it should also entail a modifier true of S.
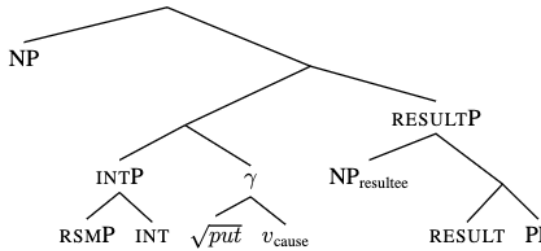
Proposal. We take RSM to combine with a time interval and return a predicate of states that can directly modify result-states in syntax, as a sub-lexical modifier (Beavers, 2010; Beavers and Koontz-Garboden 2020). This accounts for the actual duration entailment in inchoative events with RSM, as in (1a). The exact same parse is also available in causative events that entail a result-state, as evidenced by the actual duration entailment under non-intentional causation:

(4) Volkanik patlama bu şehr-i   bin yıl-**lığına**   küllerin   altına göm-müş.
     volcanic eruption this city-ACC   thousand year-RSM ashes.GEN under bury-PST.3SG
     'The volcanic eruption buried this city under ashes for a thousand years.'
     ⊨ the city remained buried under ashes for a thousand years.

How do we get the *intended* duration reading under intentional causation? We argue that this is made available by a distinct (null[1]) head INT which RSM can occur as a sister to. Informally, INT ends up having semantic access to a time interval t, a causing intentional agent a, and a result-state s, and makes a modal claim: in worlds compatible with the intentions of a at @, s is t-long. If this parse with INT is not blocked (as in (4) lacking an agent), it *can* be accessed by speakers, making it non-trivial to demonstrate an actual-duration entailment under intentional causation.

n.b: in the poster, we slightly revise the implementation given below- all thanks to the great feedback we received!

An implementation. We demonstrate our proposal on ditransitives [e.g. (3a)]. Following Beavers and Koontz-Garboden (2020) a.o., we take the result-state phrase to be in the semantic scope of a v_{cause} head — though, we put aside any entailments that come from the root itself. The denotation for the γ node is given in (6) (the $\rightarrow$ 'leads to' relation is from Ramchand (2008)). We take INTP to be intersected with the node γ below, which indirectly gives INT 'access' to both the agent and the result-state. The meaning for INT is in (7), and the truth conditions derived for (3a) in (8).

(5)

(6) $\llbracket\gamma\rrbracket = \lambda P.\, \lambda x.\, \lambda e.\, \exists s: e \rightarrow s \wedge P(s) = 1$
       $\wedge\ initiator(e,x) \wedge putting(e)$

(7) $\llbracket\text{INT}\rrbracket^w = \lambda Q.\, \lambda P.\, \lambda x.\, \lambda e.$
       $\{w': w' \text{ is compatible with } x\text{'s intentions in } w\}$
       $\subseteq \{w': \exists s: s \leq w' \wedge Q(s) = P(s) = 1\}$

(8) $\llbracket(3a)\rrbracket^w = 1$ iff $\exists e\ \exists s: initiator(e,\mathbf{m}) \wedge putting(e) \wedge e \rightarrow s \wedge on(s)(\mathbf{box})(\mathbf{table}) \wedge$
     $\{w': w' \text{ is compatible with } \mathbf{m}\text{'s intentions in } w\} \subseteq$
     $\{w': \text{there is a state } s' \text{ in } w' \text{ such that } \mathbf{box} \text{ is on } \mathbf{table} \text{ in } s' \text{ and } s' \text{ lasts for 2 hours}\}$

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[1] Though, perhaps a better alternative to positing a null head is as follows: the INT feature is part of what RSM can maximally spell-out under a phrasal spell-out approach like in Nanosyntax (Starke 2014, Wiland 2019).

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Note: This work has not been presented or published in any form, and it hasn't been submitted to any other conferences or workshops.