Deadjectival and denominal derivation in the composition of scalar change in Persian

Introduction: Degree achievements (henceforth DAs) are known to be able to measure scalar change across a variety of dimensions. In addition to measuring change over time (Hay et al. 1999; Kennedy & Levin 2008), DAs can be used to measure change over spatial extent, over spatiotemporally scattered instances of a kind, and over individuals more generally in "functional" readings (Gawron 2009; Koontz-Garboden 2010; Deo et al. 2013).

(1) a. The river widened (temporal)
b. The road narrows at the end (spatial extent)
c. The strobiformis cones in Mexico lengthen as you go south (kind)
d. Fish ears grow with increased CO_2 (functional)

While the range of readings available to DAs is well-studied in English, their status cross-linguistically is understudied. In this paper, I show that the range of readings available to translational equivalents of DAs in the Iranian language Persian depends on the category from which the DA is derived: DAs derived from comparative adjectives display the same range of readings available to their English counterparts, while DAs derived from nouns may only measure change over time. I relate this to independent semantic properties of the object from which the DA is derived: comparative adjectives allow for internal readings (Deo et al. 2013; Tabatowski 2019), while nouns encoding change of state are predicates of events that entail change in a single individual (Smith 2025).

DAs in Persian: In Persian (Southwestern Iranian), verbs form a closed class of about 115 members (Khanlari 1973; Mohammad & Karimi 1992). To compensate for this relative paucity of verbs, Persian makes heavy, productive use of *complex predicates*, a combination of a limited set of *light verbs* and some *non-verbal element* (Karimi-Doostan 1999; Folli et al. 2005; Megerdoomian 2012, a.o.). Among these complex predicates, Persian possesses two primary classes of translational equivalents of English degree achievements. The first class, what I will call the *deadjectival* class, is constructed out of the light verb *šodan* 'become' and an adjective in the comparative (2). The second class, which I will term *denominal*, is constructed from the light verb *kardan* 'do' and a noun encoding change of state (3).

(2) Deadjectival DAs
bozorgtar šodan 'become bigger'
behtar šodan 'become better'
badtar šodan 'become worse'

(3) Denominal DA
rošd kardan 'to grow' (lit. growth do)
pišraft kardan 'to improve' (lit. improvement do)
oful kardan 'to decline (lit. decline do)

Both deadjectival and denominal DAs may be used to express change over time, as (4)-(6) demonstrate. Judgments come from 3 native speakers of the Tehrani dialect of Iranian Persian.

(4) Context: You are observing a group of wolves over time, and see that they are larger now.
Gorg-ā bozorgtar šodan / rošd kardan
wolf-pl bigger became.pl growth did.pl
'The wolves have gotten bigger/grown.'

(5) Context: The last time you saw the student, he was quite inexperienced. Now that you see him after a few years, you notice that he has become very competent.
Dānešju behtar šod-e / pišraft kard-e
Student better became-ptcp improvement did-ptcp
'The student has gotten better/improved.'

(6) Context: The road's quality has worsened over time.
keyfiat-e jādde badtar šod-e / oful kard-e
quality-ez road worse became-ptcp decline did-ptcp

'The quality of the road has gotten worse/declined.'

The two classes of DAs come apart with respect to the other readings available to English DAs. In particular, deadjectival DAs can be used to express extent, kind and functional readings, denominal DAs are infelicitous in the same contexts.

(7) Context: You are driving east, and notice that the road is getting worse as you drive.

Be samt-e šarq ke miri, keyfiat-e jādde badtar miše / #oful mikone
to direction-ez east that go.2.sg quality-ez road worse become / decline do
'As you go toward the east, the road's quality gets worse/declines.' (Extent reading)

(8) Context: The area you live in has a lot of wolves. If you're far from the mountains, the wolves are small and don't pose much of a threat, but the wolves near the mountain are much larger and more dangerous. In general, there is a connection between how close you are to the mountain and how big the wolves are.

be samt-e kuh ke miri, gorg-ā-š bozorgtar mišan/#rošd mikonan
to direction-ez mountain comp go.prs.2.sg wolf-pl-3.sg bigger become / growth do
'The wolves get bigger/grow as you go toward the mountains.' (Kind reading)

(9) Context: When we first admitted students to our program, they were relatively poor students. The following year, our new students were better than the last ones. This year, the new students are even better than the last two years' of students.

Dānešju-hā sāl be sāl behtar mišan /#pišraft mikonan
Student-pl year to year better become / improvement do
'The students get better/improve year by year.' (Functional reading)

Analysis: My analysis of the two classes of Persian DAs draws on semantic properties independently available to the structures from which they are derived. First, comparative adjectives are known to possess *internal readings* measuring change in an individual concept (*the road is wider over there*, *fish ears are bigger when they're exposed to CO_2, etc.*). Following Tabatowski (2019), an internal reading of a comparative takes an individual concept f and two points of evaluation. *Šodan* serves to supply the beginning and endpoints of a contextually specified dimensional axis. The derived DA can thereby express change over a variety of dimensions, which may be temporal, spatial, kind-related, or a more general ordering on individuals, corresponding to the range of readings discussed above.

(10) a. $[[\textit{bozorgtar}]] = \lambda f.\lambda i.\lambda j.\max(\lambda d.\text{size}(f(i)) \geq d) > \max(\lambda d.\text{size}(f(j)) \geq d)$

b. $[[\text{šodan}]] = \lambda g.\lambda f.\lambda a.g(f)(\text{end}(a))(\text{init}(a))$

As for denominal DAs, I analyze the noun as a predicate of events, building on Smith's (2025) analysis of nouns encoding partial change. The verb *kardan* serves simply to relate the noun to its theme.

(11) a. $[[\textit{rošd}]] = \lambda e.\text{size}(\text{theme}(e)(\text{end}(\tau(e)))) > \text{size}(\text{theme}(e)(\text{beg}(\tau(e))))$

b. $[[\text{kardan}]] = \lambda V.\lambda x.\lambda e.V(e)$ & $\text{theme}(e) = x$

Here, the only reading is one in which a single theme argument changes over time.

Implications: In addition to noting a distinction in the behavior of Persian DAs relating to the lexical category of the expression from which the DA is derived, this research lends cross-linguistic support to the idea that comparative semantics is closely connected to the range of readings available to DAs (Kennedy & Levin 2008; Tabatowski 2019). The analysis also contributes to theories of the range of possible semantic values available to different lexical categories (Francez & Koontz-Garboden 2015; Bowler et al. 2025): comparative adjectives have relational meanings, while nouns may only be predicates of individuals of certain sorts (entities, events, states, etc.).

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