

## Measured properties in Ukrainian

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**Introduction.** Degree operator analysis is a common approach to measure phrases and adjective semantics, with degrees being measures of some properties, and adjectives denoting a relation between individuals and degrees (that is, they denote measure functions, functions from individuals to degrees) (Morzycki, 2015). However, in Ukrainian measure phrases do not combine with adjectives, and degree phrases in this language have not been formally described before. **Data.** There are a few ways in which DegPs with measures can be constructed in Ukrainian, which are shown in examples (1)-(5). There is also variation within these types of structures, but we skip them due to the lack of space here.

- (1) Lavrin                    buv                    dva                    metry                    zavvyshky  
Lavrin.MASC.NOM be.PAST.MASC. two.NOM. meters.GEN. tall.ADV  
'Lavrin was two meters tall'.
- (2) a. Lavrin                    maje                    dva                    metry                    zrostu  
Lavrin.MASC.NOM have.PRES.3.SING. dva.ACC. meters.GEN. height.GEN  
'Lavrin is 2 meters tall'.
- (3) a. Lavrinu                    (je)                    visim                    rokiv  
Lavrin.MASC.DAT (be.PRES.3.SING.) eight.NOM. years.GEN.  
'Lavrin is eight years old'.
- b. V Lavrina/Lavrinovi bulo                    dva                    metry                    zrostu  
in Lavrin.GEN./LOC. be.PAST.NEUT. two.NOM. meters.GEN. height.GEN  
'Lavrin was two meters tall/in height'.
- (4) Lavrin                    buv                    dva                    metry                    zrostom  
Lavrin.MASC.NOM. be.PAST.MASC. two.NOM. meters.GEN. height.INSTR.  
'Lavrin was two meters in height'.
- (5) Lavrin                    buv                    dva                    metry                    na zrist  
Lavrin.MASC.NOM. was.PAST.MASC. two.NOM. meters.GEN. on. height.ACC.  
'Lavrin was two meters in height'.

**Measure phrase combined with an adverb.** There is a special class of adverbs in Ukrainian which appear with measure phrases formed with a prefix *-za* and *-v* and suffix *-shky* / *-zhky*. Morphological and syntactic evidence suggest that these indeed are adverbs: in the (1) dropping the measure phrase would yield an ungrammatical sentence; one cannot modify a noun with *zavvyshky* like with any other adjective (*\*zavvyshky Lavrin*); adjectives in Ukrainian agree with nouns in gender, number and case, but words like *zavvyshky* never change their form (and neither do adverbs). It should be noted that comparatives allow for adjectives; in a comparative though the adjective does not have to combine with the MP directly, but with the PP. So why cannot an adjective combine with an MP? As adjectives in Ukrainian agree with a noun, both an adjective and MP would modify *Lavrin* on equal terms as homogeneous elements, yielding something like *Lavrin was 2-meter & tall*, and such phrase would

fail to deliver the meaning *his height was two meters*. So Ukrainian had to find other ways to construct meaning when measures are involved, and one of such ways is an adverbial degree phrase. Our account of the semantic composition in such phrases builds on work of Svenonius&Kennedy (2005); MP is introduced by a Deg head (Meas), which combines only with adjectives that denote functions that map their arguments onto measurable degrees. We extend this view to other heads found in adjective position in English, such as adverbs here. Thus the structure of the Ukrainian DegP is the same as of English:  $[[\text{Meas}]] = g$ :  $g$  is a function from objects to measurable degree  $\lambda d : \lambda x : \lambda g(x) \succcurlyeq d$ . Further I suggest, drawing on Grano&Kennedy (2012) and their analysis of Mandarin comparative structures (in Ukrainian too when there is a defined measurement system involved, a special kind of structure is allowed), that the Deg head in adverbial degree phrases is realized through the suffix *-shky/zhky*, which all of these adverbs share (the distribution of the prefix *za-* and *v-* is not limited to MPs). I propose that it is this suffix that occupies the Meas (Deg head).

**Measure phrase combined with a noun in instrumental case/PP.** The role of the PP in the DegP, as in sentence (5) is similar to that of the adverb: PPs are viewed as adverbials and are considered to be governed by the same rules as adverbs (Ernst, 2014). I also suggest that sentences of the kind in (4), in which the measure is combined with the noun in instrumental case, are built following the same pattern of semantic composition too since normally the numeral phrase in Ukrainian assigns the genitive case to the noun it combines with; the Deg head then is occupied with an unpronounced lexical affix, which assigns the instrumental case, similarly to the adverbial suffix discussed in the previous section. This being said, it appears that the adverb such as *zavvyshky*, PP such as *na zrist* and the noun in instrumental case all point to the dimension of the measurement; grammatically the Deg head and Deg' can be realized in a number of ways, but this does not change the meaning of the maximal projection of the DegP.

**Possessive structures.** The sentences in (2) and in (3b) with the genitive case are indeed possessive structures, as we can see if we substitute DegPs in these sentences with any other phrases denoting objects of possession, like 'a car' etc, meaning 'Lavrin has a car'. What regards the sentences of the type in (3b) with locative, in Ukrainian these are a typical existential construction, which is known to have possessive property meaning in some languages (Freeze, 2001; Francez & Koontz-Garboden, 2015). In the analysis of the type of sentences in (2) and (3b) we follow Francez & Koontz-Garboden (2015; 2017), who note that some languages employ possessive predication for property concepts relating individuals to portions of substances that they have: for any individual  $a$  and substance  $P$ ,  $a$  has  $P$  iff  $\exists p[P(p) \& \pi(a, p)]$  (where  $p$  is a portion of  $P$ ), and assume that the denotation for the verb *maty* 'to have' and the PP with dative/genitive NP is along the lines:  $\lambda P \lambda x \lambda D. \exists^D z [P(z) \& \pi(x, z)]$  (where  $P$  is a property,  $z$  - a portion of that property,  $D$  - a set of portions). The only unsolved part of the question here remains the structure in (3a), and we are going to leave it unresolved here. Thus, when syntactically canonical predication is not allowed, the language employs the possessive one because it is accessible in the language elsewhere. **To conclude**, we need to reconsider syntax and semantics of DegPs, which cannot be associated with adjectives only, as the meaning we get at the top of their maximal projection can be realized through syntactically various heads inside their architecture. As a side note, this analysis can be extended to account for adjective-adverb distinction, also in languages other than Ukrainian.