

Hungarian Nominalized Numerals are Plural Individuals

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This paper discusses the semantics of *-an/-en* attaching to Hungarian NUM, treating it as an operator that turns n type numerals into a plural set of individuals, similar to a bare plural N.

1. The puzzle. Hungarian has NUM+N(sg) combinations which induce V_{SG} (1), while NUM-*-an/-en* trigger V_{PL}. Numerals and determiners carrying the *-an/-en* suffix occur in partitive constructions (2), extended personal pronoun DPs (3) and bare numeral arguments (4). The contrast between (2) and (5), highlights the crucial role of *-an/-en* in plurality.

- (1) Három/néhány fiú ment át a vizsgá-n.
three some boy pass.PAST.3SG VM the exam-SPR
'Three/some boys passed the exam.'
- (2) A fiú-k közül **hárm-an** / **néhány-an** mentek át a vizsgá-n.
the boy-PL from.among three-AN / some-AN pass.PAST.3PL VM the exam-SPR
'Three/some of the boys passed the exam.'
- (3) Mi **hárm-an** holnap indulunk. (4) **Négy-en** mentek be a gyümölcsös kertbe.
we three-AN tomorrow leave.PRES.1PL four-EN enter.PAST.3PL VM the orchard
'We three leave tomorrow.' 'Four (people) entered the orchard.'
- (5) A fiú-k közül **három-Ø** ment át a vizsgá-n.
the boy-PL from.among three pass.PAST.3SG VM the exam-SPR
'Three of the boys passed the exam.'

-an/-en -marked numerals denote pluralities of humans with a specific cardinality. *-an/-en* has an inherent PL feature associated with it. This is shown by the facts that it triggers (i) plural marking on the V (2-4) and (ii) PL demonstrative concord (6), (iii) there is a preference for the *-an/-en* structure with PL question words (7) vs. (8); in addition it is incompatible (iv) with the numeral *egy* (9), and (v) in singular contexts (10).

- (6) Ez-ek **hárm-an**. (7) Ki-*(k) közül mentek át a vizsgá-n **hárm-an**?
this-PL three-AN who-PL from.among pass.PAST.3PL VM the exam-SPR three-AN
'These three' 'Three of whom passed the exam?'
- (8) Ki-*(k) közül ment át a vizsgá-n **három**?
who from.among pass.PAST.3SG VM the exam-SPR three 'Three of whom passed the exam?'
- (9) ***egy-en** (10) ***Néhány-an** az osztály-ból megbuktak, csak egy diák.
one-EN some-AN the class-ELA VM.fail.PAST.3PL only one student
'one (person)' 'Some (people) from the class failed, only one student.'

Despite its plural feature, *-an/-en* cannot be considered a plural marker, since it has a different interpretation than *-k*: *száz-an* (100+*-an/-en*) denotes 100 individuals, while *százak* (100-k) denotes (several) hundreds.

- (10) Száz-an jöttek el a tüntetés-re.
hundred-AN come.PAST.3PL VM the protest-SBL 'A hundred (people) came to the protest.'
- (11) Száz-ak jöttek el a tüntetés-re.
hundred-PL come.PAST.3PL VM the protest-SBL 'Hundreds came to the protest.'

The fact that *-an/-en* induces plural morphology on the verb strongly suggests that NUM-*-an/-en* is a plural N, since plural nouns, but not numbers, induce plural inflection on verbs. This is supported by (12-14) which show that bare indefinite plurals (12), like NUM-*-an/-en* in (4), are allowed in argument position, while bare numerals are not (13). Even if bare numerals are allowed in strong elliptical contexts, triggering V_{SG} (14a), many informants still prefer the NUM-*-an/-en* structure (14b).

- (12) Fiú-k mentek át a vizsgá-n. (13) *Három átment a vizsgá-n.
boy-PL pass.PAST.3PL VM the exam-SPR three VM.pass.PAST.3SG the exam-SPR
'Boys passed the exam.' 'Three passed the exam.'
- (14) a. Öt vendég-et hívtam meg. **Három-Ø** már megérkezett.
five guest-ACC invite.PAST.1SG VM three already arrive.PAST.3SG
b. Öt vendég-et hívtam meg. **Hárm-an** már megérkeztek.
five guest-ACC invite.PAST.1SG VM three-AN already arrive.PAST.3PL
'I invited five guests. Three already arrived.'

Hypothesis: *-an/-en* is a plural N predicate at $\langle e, t \rangle$. NUM-*-an/-en* are plural nouns.

2. Numerals. Rothstein (2012, 2017) argues that numbers are ambiguous between type *n* and $\langle e, t \rangle$. Numerals of type *n* denote abstract individual numbers, e.g. ‘3’. Numerals of type $\langle e, t \rangle$ denote cardinalities of sets $\lambda x. |x| = 3$. I suggest that numerals in Hungarian are born at type *n*, supported by examples such as (15).

(15) Három plusz három az hat.
three plus three that six
‘Three plus three is six.’

Numerals shift into predicates, and then to an attributive interpretation when modifying N (16). The shift is triggered by the syntactic configuration.

(16) *három N*: $3 \rightarrow \lambda x. |x| = 3 \rightarrow \lambda P \lambda x. P(x) \wedge |x| = 3$
három fiú ‘3 boys’: $3 \rightarrow \lambda P \lambda x. P(x) \wedge |x| = 3 (\lambda x. \text{BOYS}(x)) = \lambda x. \text{BOYS}(x) \wedge |x| = 3$

I suggest that *-an/-en* is a null nominal predicate with the features [+human, +plural] $\lambda x. \text{HUMANS}(x)$ which, like other nouns, triggers a shift to modifier in numerals.

(17) *hárm-an* ‘3+AN’ $\lambda P \lambda x. P(x) \wedge |x| = 3 (\lambda x. \text{HUMANS}(x)) = \lambda x. \text{HUMANS}(x) \wedge |x| = n$

3. Explanations and predictions.

i) NUM-*-an/-en* in subject position. *-an/-en* shifts the numeral into a plural common noun, thereby triggering plural V inflection. The subject of (4) denotes $\lambda x. \text{HUMANS}(x) \wedge |x| = 4$.

ii) NUM-*-an/-en* in predicative position. Bare numerals of type *n* can neither appear as subjects of non-numerical predicates (13) nor as sentential predicates (18). *-an/-en* is required to shift the numeral into the predicative type. Since NUM-*-an/-en* (17) is of type $\langle e, t \rangle$ it can occur as a sentential predicate (18). The semantics in (17) correctly predicts that NUM-*-an/-en* cannot be a sentential predicate if the subject is non-human (19) (Kenesei, Vago & Fenyvesi (2000), Csirmaz & Szabolcsi (2012), Dékány & Csirmáz (2018)).

(18) A fiú-k **hárm-*(an)** voltak.
the boy-PL three-AN be.PAST.3PL ‘The boys were three.’

(19) *A szék-ek **hárm-an** voltak.
the chair-PL three-AN be.PAST.3PL ‘The chairs were three.’

iii) Determiners and *-an/-en*. Since *-an/-en* denotes an expression at $\langle e, t \rangle$, it can combine with determiners like *néhány* ‘some’, which are of type $\langle \langle e, t \rangle, \langle e, t \rangle, t \rangle$ to produce a generalized quantifier at type $\langle \langle e, t \rangle, t \rangle$:

(20) *néhány(an)* = $\lambda P \lambda Q. \exists x. P(x) \wedge Q(x) (\lambda x. \text{HUMANS}(x)) = \lambda Q. \exists x. \text{HUMANS}(x) \wedge Q(x)$

-an/-en is incompatible with the quantifier, *minden* in (20) since *-an/-en* is [+plural] while *minden*, like ‘every’, takes a singular complement. Moreover, there is a morphological block, since for a group of humans there exists a lexicalized item: *mindenki*.

(21) *Minden-en /mindenki részt vett a verseny-en.
all-EN everyone part take.PAST.3SG the competition-SPR
‘Everyone took part in the competition.’

iv) NUM-*-an/-en* in extended personal pronoun DPs, e.g. (3), are cases of appositive predication (Doron (1992)). Appositive predicates apply directly to individuals, i.e. the pronoun. A strict appositive relation (Quirk et.al. (1985)) holds between the pronoun and NUM-*-an/-en*: e.g. VP ellipsis is allowed (22). The plurality feature associated with *-an/-en* surfaces here as well, since NUM-*-an/-en* cannot modify singular pronouns (23).

(22) Ma **mi hárm-an** jöttünk el, holnap négy-en. (23) **én hárman*
today we three-AN come.PAST.3PL VM tomorrow four-EN me three-AN
‘Today us three came, tomorrow four.’ ‘me three’

v) exactly *n* vs. at least *n* interpretations of NUM-*-an/-en*. Informants indicate ‘exactly’ readings for Num-*-an/-en* in predicate position (3), (18), while ‘at least’ readings for numerals in subject position (4). As Landman (2003) shows, this strongly supports analysing Num-*-an/-en* as a predicate.

Conclusion. NUM-*-an/-en* are plural Ns denoting pluralities of humans with cardinality *n*. *-an/-en*-suffixation is a mechanism which derives bare plurals Ns from numerals at type *n*.

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