Moksha "definite" declension, D-linking, and global choice functions

Daria Bikina

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1 Background

In Moksha Mordvin, there is a so-called definite declension. While indefinite declension distinguishes for more than 10 case forms, the definite declension paradigm includes only three cases: nominative, genitive=accusative, and dative. Only definite declension distinguishes for plural forms in genitive and dative.

	Indefinite declension		Definite declension	
	SG	PL	SG	PL
Nom	z'epə	z'ep-t	z'ep-s'	z'ep-n'ə
	pocket	pocket-PL	pocket-DEF	pocket-DEF.PL
Gen	z'epə-n'	-	z'ep-t'	z'ep-n'ə-n'
	pocket-GEN		pocket-DEF.GEN	pocket-DEF.PL-GEN
Dat	z'epə-n'd'i	-	z'ep-t'i	z'ep-n'ə-n'd'i
	pocket-DAT		pocket-DEF.DAT	pocket-DEF.PL-DAT

Table 1: Partial nominal paradigm

However, "definite" declension does not encodes definiteness in general sense - e.g., "definite" nouns are not obligatorily unique:

(1) a. urok jotk-sə   kol'ɛ suva-s'   klaz-t'i   i toka-z'ə
         lesson between-IN Kolya enter-PST.3[SG] classroom-DEF.DAT and hit-PST.3SG.S.3SG.O
         s't'ər'-n'ɛ-t'
         girl-DEF.GEN

     b. urok jotk-sə   kol'ɛ suva-s'   klaz-t'i   i toka-s'   s't'ər'-n'ɛ
         lesson between-IN Kolya enter-PST.3[SG] classroom-DEF.DAT and hit-PST.3SG girl-DIM
         'During the lesson, Kolya ran into the classroom and hit a girl.'

The "definite" marker can be used as a demonstrative:

Context: there is a bunch of flowers and the speaker points to one of the flowers in the bunch:

(2) mon s'ɛv-sa   pančf-kɛ-t'
     I   take-NPST.1SG.S.3.O flower-DIM-DEF.GEN
     'I'll take this flower.'

It even can introduce referents:

Context: I was walking through a forest and got lost. I was walking for a while and saw a house.

(3) a. val'mɛ lank-sə ašč-əs' ozadə katə-n'ɛ
         window surface-IN be-PST.3SG sitting cat-DIM

     b. val'mɛ lank-sə ašč-əs' ozadə katə-n'ɛ-s'
         window surface-IN be-PST.3SG sitting cat-DIM-DEF
         'A cat was sitting on the window.'

2 "Definite" properties of the "definite" marker

- Does not have an anti-uniqueness implicature (=not a real demonstrative)

(4) saranskɛj-t'i   sa-s'   pr'ez'id'ent-c'
     Saransk-DEF.DAT come-PST.3[SG] president-DEF
     'The President came to Saransk.' (=Putin)

(5) saranskɛj-t'i   sa-s'   pr'ez'id'ent
     Saransk-DEF.DAT come-PST.3[SG] president
     'A president came to Saransk.' (of any country)

- Can refer to something already introduced (anaphoricity)

Context: A boy and a girl went into the room.

(6) a. s't'ər'-n'ɛ-s' ul'-s'   jakstər' plat'je-sə, a   c'ora-n'ɛ-s' akša panar-sə
         girl-DIM-DEF   be-PST.3[SG] red   dress-IN   and boy-DIM-DEF white shirt-IN
     b. *s't'ər'-n'ɛ ul'-s'   jakstər' plat'je-sə, a   c'ora-n'ɛ akša panar-sə
         girl-DIM   be-PST.3[SG]   red   dress-IN   and boy-DIM white shirt-IN
         'The girl was wearing a red dress, and the boy was wearing a white shirt.'

- With respect to 'twice' - "definite" can be only interpreted as unique in any syntactic position, bare objects and indirect objects can only be interpreted as non-unique

Context: There is a pie on the table. A girl took a bite of it, then waited a bit, then took another bite of the same pie.

(7) a. s't'ər'-n'ɛ-s' kafkst' sus'k-əz'ə   per'aka-t'
         girl-DIM-DEF twice   bite-PST.3SG.S.3SG.O pie-DEF.GEN
     b. *s't'ər'-n'ɛ kafkst' sus'k-əz'ə   per'aka-t'
         girl-DIM   twice   bite-PST.3SG.S.3SG.O pie-DEF.GEN
         'The girl bit the pie twice.'

Both can't be used in the context where two different children took a bite.
Context A: I read a book and liked it, so I re-read it later.

(8) a. mon kafkst' luv-in'ə   kn'iga-t'
         I   twice   read-PST.1SG.S.3.O book-DEF.GEN
     b. #mon kafkst' luv-ən'   kn'iga
         I   twice   read-PST.1SG book
         'I read the book twice.'

Context B: I read a book in the morning and read another book in the evening.

(9) a. mon kafkst' luv-ən'   kn'iga
         I   twice   read-PST.1SG book
     b. #mon kafkst' luv-in'ə   kn'iga-t'
         I   twice   read-PST.1SG.S.3.O book-DEF.GEN
         'I read a book twice.'

- Referential anchoring

(10) mon luv-əz'ə   kn'iga-t'.   son pɛk int'er'esnaj
      I   read-PST.3SG.S.3SG.O book-DEF.GEN
      s/he very interesting

      'I read a book. It is very interesting.'

(11) d'ɛd'ɛ-z'ə   kaz'-s'   mond'ejən panar, son   t'aftəmə mazi!
     mother-1SG.POSS.SG gift-PST.3SG I.DAT   dress s/he such   beautiful
     'My mother gifted me a dress, it is so beautiful!'

[Toldova 2018]

2.1 Distributivity

(12) d'ɛd'ɛ-s'   maks-əz'ən'   id'-ənzə-nd'i   t'ɛ vet'ə mar'-n'ə-n'
     mother-DEF give-PST.3SG.S.3PL.O child-3SG.POSS.PL-DAT this five apple-DEF.PL-GEN
     'Mother gave five apples to her children' (non-distributive interpretation)

[Sidorova 2018]

(13) Marina i   Andrej kas-ft-ij-t'   vet'ə it-t'
     Marina and Andrej grow-CAUS-NPST.3-PL five   child-PL
     'Marina and Andrej raised five children.' (non-distributive interpretation)

[Mokshen Pravda]

(14) d'ɛ'd'ɛ-s'   maks-s'   kolmə it-t'n'ə-nd'i   n'il'ə-n' mar'
     mother-DEF give-PST.3[SG] three child-DEF.PL-DAT four-GEN apple
     'Mother gave three children four apples each.' (distributive interpretation)

[Sidorova 2018]

2.2 Scopal properties

- Objects with respect to universal quantifier - "definite" have obligatory wide scope, bare NPs have narrow scope

(15) ɛr'   s't'ər'-n'ɛ luvə-z'ə   kn'iga-t'
     every girl-DIM   read-PST.3SG.S.3.O book-DEF.GEN
     a. 'There exist a book such that every girl read it.'
     b. *'For every girl, there exist a book such that the girl read it.'

(16) ɛr'   s't'ər'-n'ɛ luvə-s'   kn'iga
     every girl-DIM   read-PST.3[SG] book
     a. 'For every girl, there exist a book such that the girl read it.'
     b. *'There exist a book such that every girl read it.'

- Objects with respect to negation - "definite" objects have obligatory wide scope, bare NPs can have both wide and narrow scope

Context: There are no books on the table.

(17) a. maša iz'   n'ɛjə kn'iga-t morkš lank-sə
        Masha NEG.PST.3SG see.CN book-PL table   surface-IN
     b. maša iz'   n'ɛjə kn'iga morkš lank-sə
        Masha NEG.PST.3SG see.CN book   table   surface-IN
   'Masha didn't see books on the table.'

Context: There is a book on the table, but Masha didn't see it.

(18) a. maša iz'-əz'ə   n'ɛjə kn'iga-t'   morkš lank-sə
        Masha NEG.PST-3SG.S.3SG.O see.CN book-DEF.GEN table   surface-IN

b. maša iz' n'ɛjə kn'iga morkš lank-sə
   Masha NEG.PST.3SG see.CN book table surface-IN
   'Masha didn't see the book on the table.'

2.3 Partitive specificity

Context A: There are no other children in the room.
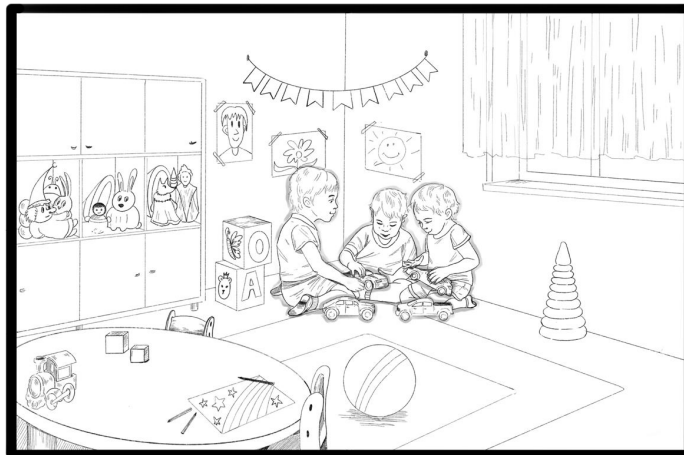
Context B: There are many children in the room.

Context C: There are many children in the room, but all the other children are girls.

In all the contexts:

a. c'ora-n'ɛ-t'n'ə   ugəl-sə   kol'ən'd'-ij-t'   mašina-sə
   boy-DIM-DEF.PL corner-IN play-NPST.3-PL car-IN

b. c'ora-n'a-t ugəl-sə   kol'ən'd'-ij-t'   mašina-sə
   boy-DIM-PL corner-IN play-NPST.3-PL car-IN
   'In the corner, boys are playing with a car.'

2.4   Interim summary

	Bare NPs	"Definite" NPs
Uniqueness	*	✓ (not obligatory)
Anaphoricity	*	✓
Referents introduction	✓	✓
Referential anchoring	✓	✓
Wide scope	✓ / *	✓
Narrow scope	✓	*
Distributivity	✓	*
Non-distributivity	✓	✓
Partitive specificity	✓	✓

Table 2: Properties of definite and bare NPs in Moksha

3   The direction of analysis

Toldova 2017 on differential object marking in Moksha: "definite" objects are D-linked

(19)   a.   What is your plan?
        b.   Which is your plan?

[Pesetsky 1987]

- Unlike the answer to (a), the answer to (b) is "supposed to be drawn from a set of individuals previously introduced into the discourse, or ... part of the 'common ground' shared by speaker and hearer" (Pesetsky 2000)
- Sometimes is defined syntactically, e.g. as local binding by a null interrogative operator (Hirose 2003)

- D-linking as partitive specificity (Enç 1991). Partitive indefinites are discourse anchored by their super-set and are distinct from specific indefinites (von Heusinger 2019)

- But we have to deal with something very broad in Moksha

3.1 "Definite" NPs as global choice functions

In theory, there are not so many options for NP interpretation:

- $\exists$ quantifier, as for an indefinite article

- ι operator ("the unique x")

- ε operator (Hilbert & Bernays 1939, von Heusinger 2004) ("the selected x") or a choice function (Reinhart 1997)

(20)   A function f is a choice function ($CH(f)$) if it applies to any non-empty set and yields a member of that set.

<div align="right">[Reinhart 1997]</div>

(21)   Every lady read some book
a. $\exists f[CH(f) \land \forall z[\text{lady}(z) \to z \text{ read } f(\text{book})]]$
b. $\forall z[\text{lady}(z) \to \exists f[(CH(f)) \land z \text{ read } f(\text{book})]]$

It is possible to represent definite NPs by epsilon terms which are interpreted by a global choice function representing the salience structure of the discourse. Thus we subsume the anaphoric use under the situational or salience use of definite NPs. Uniqueness is understood as "unique avail- ability" of the referent rather than as a requirement that the corresponding descriptive material have a singleton set.

(22)   cat-DEF $= ||\varepsilon x.\ \text{cat}(x)||^{M,g,CH_c} = CH_c(||\text{cat}||)^{M,g,CH_c}$
an individual with the property *cat* selected in a situation c

3.2 Context change potentials

In Moksha, both "definite" and bare NPs have the same context change potential:

(23)   mon luv-əz'ə   kn'iga-t'.   kn'iga-s' pɛk int'er'esnaj
    I   read-PST.3SG.S.3SG.O book-DEF.GEN book-DEF very interesting
    'I read a/the book. The book is very interesting.'

(24)   mon rama-s'   kn'iga. kn'iga-s' pɛk int'er'esnaj
    I   buy-PST.3SG book   book-DEF very interesting
    'I bought a book. The book is very interesting.'

- Option 1: the indefinite updates the salience structure while the definite does not

- Option 2: both definite NPs (in the second sentence) refer to the same individual due to the salience structure and establish coreference due to the same contextual parameters

Context change potentials can be approached as functions from contexts to contexts.

- Discourse Representation Theory (DRT) (Kamp, 1981; Heim, 1982)

- The meaning of a sentence is identified with its context change potential

- Meanings are updates of such information states and interpretation of sentences creates context

- Information states contain two kinds of information: information about the world, and discourse information
- The information about the world is relevant for the truth conditions, while the information about the discourse restricts anaphoric relations

In a dynamic semantics with choice functions, the information states are sets of choice functions. The discourse meaning of linguistic expressions (not only sentences) updates this information, which means that it potentially restricts the set of (possible) choice functions, which stand for the (possible) discourse structures.

Following Peregrin and von Heusinger (1995), we introduce update functions for choice functions. A cf-update is an operation that takes three arguments: a choice function, an element of the universe, and a subset of the universe; it yields a new choice function. The basic cf-update upd_1 applied to an choice function f, an individual d, and a set s, yields the choice function f' which is identical with f except for the assignment d for the set s:

(25) $upd_1(f, d, s) = f'$ such that $f'(s') = d$ if $s' = s$ and $d \in s$
and $f'(s') = f(s')$ otherwise

4 Problems

- See the uniqueness test with 'twice' again. Should we analyze NOM and GEN differently?
- Sometimes DEF just is a kind marker. I would like to think that this is an operation making e^k out of $\langle e, t \rangle$ (Nominalize operation as in Dayal (2004)). How can it be combined with the choice-functional approach?
- HOW EVERYTHING IS COMPUTED, if there are at least 2 types of object marking (definite and bare, and bare objects are not pseudo-incorporated - see Toldova 2018), and there are bare subjects, too?

(26)   c'ora-s'   sa-s'
        boy-DEF come-PST.3[SG]
        'The/a boy came.'

(27)   sa-s'   c'ora
        come-PST.3[SG] boy
        'A boy came.'

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