Constructing causative-inchoative alternation in Ossetian

PROBLEM. In this paper we examine the causative-inchoative alternation in Ossetian displayed by complex predicates consisting of an adjectival stem and the light verb kənɪn 'do, make'. Unlike in Persian (Folli et al. 2005), in Ossetian this type of CP can yield both causative and inchoative construals, as shown in (1a-b).

The problem is that (1b) is the only intransitive configuration where kən-ɪn 'make' occurs. (2a-b) show that kən-ɪn can only be transitive if used as a lexical verb. Combining with the unaccusative verb in (3a), kən-ɪn 'make' derives a causative construction in (3b). Crucially, native speakers consisntently judge ungrammatical a corresponding intransitive structure in (3c), parallel to (1b). Therefore, given (2)-(3), availability of the inchoative interpretation in (1b) comes out as a surprise and calls for an exaplanation.

ANALYSIS AND DISCUSSION. We suggest that in (1)-(2) we are dealing with a derived alternating verb, parallel, e.g., to a non-derived alternating verb in (4a-b). We assume, with Rappaport Hovav & Levin 1995, Levin & Rappaport Hovav 1998, Reinhart 2002 and Chierchia 1989/2004, a.m.o., that alternating verbs like 'melt' in are inherently causative. We propose that their semantics is along the lines of (5). Saturating the internal argument position yields a VP that denotes a two-place relation between individuals and events in (6). Causative and inchoative interpretations are produced when VP merges with the *v* head. Following much current work on event structure (e.g.. Arad 1999, Folli & Harley 2005, Harley 2006, Harley & Noyer 1998,) we assume that *v* comes in at least two flavors, transitive and inchoative. We propose semantics for these 'flavors' of *v* in (7a-b).

The inchoative *v* creates a property of events by existentially binding the external argument and introducing the additional requirement that the argument does not stand in the Agent thematic relation to an event. In this way, we capture the fact frequently mentioned in the literature that inchoative predicates can only be associated with non-agentive causers, e.g., with narutal forces (cf. Alexiadou et al. 2006). If we are right in assuming that $\{<x, e> \mid \text{Agent}(x,e)\} \subset \{<x', e'> \mid \text{Causer}(x',e')\}$, natural forces will be in the set $\{<x', e'> \mid \text{Causer}(x',e')\} \setminus \{<x, e> \mid \text{Agent}(x,e)\}$. We analyze the transitive *v* as essentially an equivalence function. Combining (7a-b) with the denotation of VP in (6) yields (8a-b); the latter obtains when the external argument is merged as Spec, vP.

We propose that the derivation of (1a-b) goes in the same way, the only difference being that the causative event structure associated with the single verb in (5) is derived in (1a-b) by combining information from two separate sources — AP headed by the adjective 'broken' and the verb 'make' that takes that AP as a complement. We suggest that 'make' in (1a-b) and is a causative morpheme $make_{CAUS}$ in (9) that merges as the V head. The adjective 'broken' is analyzed as a relation between individuals and states in (10). Structure of (1a-b) is shown in (11), and their derivations come in (12)-(16).

Our next essential assumption is that 'make' is associated with two separate lexical entries, one of which is the causative morpheme in (9), another one being a lexical verb of creation $make_{LEX}$ in (17). Unlike the causative morpheme but like any other lexical verb, $make_{LEX}$ denotes an event predicate make′, not a causal relation, and wants its internal argument to be a normal individual, not an event predicate. Furthermore, its external argument must be Agent, not a Causer. Structure of (2a) is represented in (18a), and its semantic derivation is shown in (18c-d). If this analysis is on the right track, ungrammaticality of the inchoative sentence in (2b) follows: merging VP in (18b) with the inchoative *v* in (7a) yields (19), an event predicate that denotes an empty set of events.

Finally, consider the unaccusative verb 'move' and its causative derived by 'make' in (3). We suggest that unlike transitive verbs (both alternating and non-alternating) true unaccusatives in Ossetian lack the external argument altogether, as in (20a). As a result, VPs headed by unaccusatives, as in (20b), cannot merge with either $[_v \varnothing_{\text{INCH}}]$ or with $[_v \varnothing_{\text{TR}}]$ due to the type mismatch: both 'flavors' of *v* want complements of type <e, <s,t>> (where *s* is the type of events), whereas *v*P in (20b) only provides a predicate of type <s,t>. Therefore, verbs like 'move' in Ossetian project clauses that lack *v*P altogether. Crucially, however, VPs like (20b) can combine with $make_{CAUS}$ in (9), because logical types of VP and $make_{CAUS}$ do match: the former is of type <s,t>, the latter requires an argument of type <s,t>. The result of functional application is shown in (21). Therefore, our analysis captures the fact that alternating verbs like 'melt' in (4) do not require any morphology to produce a transitive clause, whereas unaccusatives like 'move' have to be causativized.

On the other hand, that fact that the intransitive structure with kən-ɪn in (3c) cannot be derived from an unaccusative verb like 'move' is predicted as well. Unlike in (1b), represented in (11b), where $make_{CAUS}$ is located in V and yields an inchoative predicate by merging with $[_v \varnothing_{\text{INCH}}]$, in (3b-c) $make_{CAUS}$ and $[_v \varnothing_{\text{INCH}}]$ are mutually exclusive, since $make_{CAUS}$ itself merges as *v,* as represented in (21) (cf. Folli, Harley 2006).

CONCLUSIONS. Contrary to what examples like (1a-b) might suggest, there is no intransitive 'make' in Ossetian. In our system, the range of interpretations of 'make' mostly derives from more general assumptions, required independently, about syntax of basic verb classes in Ossetian — alternating transitivies, non-alternating transitives, and unaccusatives. Two specific assumptions about 'make' we need are: (a) there are two lexical items, the verb of creation $make_{LEX}$, and the causative morpheme $make_{CAUS}$, and (b) the latter can merge either as V or *v,* provided that its complement possesses a matching logical type.

Examples

(1) a. zauɪr k'aliu c'əl kən-ɪ.
Z. branch broken make-PRS.3SG
'Zaur is breaking a branch.'

b. k'aliu c'əl kən-ɪ.
branch broken make-PRS.3SG
'The branch is breaking.'

(2) a. alan xərinag kən-ɪ.
A. food make-PRS.3SG
'Alan is cooking the food.'

b. *xərinag kən-ɪ.
food make-PRS.3SG
'The food is cooking.'

(3) a. mašinə təlf-ɪ.
car move-PRS.3SG
'The car is moving.'

b. alan mašinə təlf-ɪn kən-ɪ.
A. car move-NMN make-PRS.3SG
'Alan is moving the car (lit. is making the car move).'

c. * mašinə təlf-ɪn kən-ɪ.
car move-NMN make-PRS.3SG

(4) a. mit taj-ɪ
snow melt-PRS.3SG
'The snow is melting.'

b. xur mit taj-ɪ
sun snow melt-PRS.3SG
'The sun is melting the snow.'

(5) $\| [_{V} \text{melt}] \| = \lambda y \lambda x \lambda e \exists s[\text{melt}'(e) \wedge \text{Causer}(x)(e) \wedge \text{Theme}(y)(e) \wedge \text{cause}(s)(e) \wedge \text{melted}'(s) \wedge \text{Holder}(y)(s)]$

(6) $\| [_{VP} \text{snow melt}] \| = \lambda x \lambda e \exists s[\text{melt}'(e) \wedge \text{Causer}(x)(e) \wedge \text{Theme}(\text{snow}')(e) \wedge \text{cause}(s)(e) \wedge \text{melted}'(s) \wedge \text{Holder}(\text{snow}')(s)]$

(7) a. $\| [_{v} \varnothing_{\text{INCH}}] \| = \lambda R_{<e,<s,t>>} \lambda e \exists x[R(x)(e) \wedge \neg\text{Agent}(x)(e)]$

b. $\| [_{v} \varnothing_{\text{TR}}] \| = \lambda R_{<e,<s,t>>} \lambda x \lambda e[R(x)(e)]$

(8) a. $\| [_{vP} \varnothing_{\text{INCH}} [_{VP} \text{melt snow}]] \| = \lambda e \exists x \exists s[\text{melt}'(e) \wedge \text{Causer}(x)(e) \wedge \neg\text{Agent}(x)(e) \wedge \text{Theme}(\text{snow}')(e) \wedge \text{cause}(s)(e) \wedge \text{melted}'(s) \wedge \text{Holder}(\text{snow}')(s)]$

b. $\| [_{vP} \text{sun} \ \varnothing_{\text{TR}} [_{VP} \text{melt snow}]] \| = \lambda e \exists s[\text{melt}'(e) \wedge \text{Causer}(\text{sun}')(e) \wedge \text{Theme}(\text{snow}')(e) \wedge \text{cause}(s)(e) \wedge \text{melted}'(s) \wedge \text{Holder}(\text{snow}')(s)]$

(9) $\| \text{make}_{\text{CAUS}} \| = \lambda P_{<s,t>} \lambda x \lambda e \exists e' [\text{Causer}(x)(e) \wedge \text{cause}(e')(e) \wedge P(e')]$

(10) $\| [_{A} \text{c'əl}] \| = \lambda x \lambda s[\text{broken}'(s) \wedge \text{Holder}(x)(s)]$

(11) a. $[_{vP}$ zauɪr $\varnothing_{\text{TR}} [_{VP} [_{AP}$ k'aliu c'əl$]$ kən-ɪ$]$
b. $[_{vP} \varnothing_{\text{UNACC}} [_{VP} [_{AP}$ k'aliu c'əl$]$ kən-ɪ$]$

(12) $\| [_{AP} \text{branch broken}] \| = \lambda s[\text{broken}'(s) \wedge \text{Holder}(\text{branch}')(s)]$

(13) $\| [_{VP} [_{AP} \text{branch broken}] \text{make}] \| = \lambda x \lambda e \exists s [\text{Causer}(x)(e) \wedge \text{cause}(s)(e) \wedge \text{broken}'(s) \wedge \text{Holder}(\text{branch}')(s)]$

(14) $\| [_{v'} \varnothing_{\text{TR}} [_{VP} [_{AP} \text{branch broken}] \text{make}]] \| = \lambda x \lambda e \exists s [\text{Causer}(x)(e) \wedge \text{cause}(s)(e) \wedge \text{broken}'(s) \wedge \text{Holder}(\text{branch}')(s)]$

(15) $\| [_{vP}$ z. $\varnothing_{\text{TR}} [_{VP} [_{AP} \text{branch broken}] \text{make}]] \| = \lambda x \lambda e \exists s [\text{Causer}(\text{zauɪr})(e) \wedge \text{cause}(s)(e) \wedge \text{broken}'(s) \wedge \text{Holder}(\text{branch}')(s)]$

(16) $\| [_{v'} \varnothing_{\text{INCH}} [_{VP} [_{AP} \text{branch broken}] \text{make}]] \| = \| [_{vP} \varnothing_{\text{INCH}} [_{VP} \ldots]] \| = \lambda e \exists x \exists s [\text{Causer}(x)(e) \wedge \neg\text{Agent}(x)(e) \wedge \text{cause}(s)(e) \wedge \text{broken}'(s) \wedge \text{Holder}(\text{branch}')(s)]$

(17) $\| [_{V} \text{make}_{\text{LEX}}] \| = \lambda y \lambda x \lambda e [\text{make}'(e) \wedge \text{Agent}(x)(e) \wedge \text{Theme}(y)(e)]$

(18) a. $[_{vP}$ alan $[_{VP}$ xərinag kən$]]$-ɪ.
b. $\| \text{VP} \| = \lambda x \lambda e[\text{make}'(e) \wedge \text{Agent}(x)(e) \wedge \text{Theme}(\text{food}')(e)]$
c. $\| [_{v'} \varnothing_{\text{TR}} [_{VP} \ldots]] \| = \|\text{VP}\| = \lambda x \lambda e[\text{make}'(e) \wedge \text{Agent}(x)(e) \wedge \text{Theme}(\text{food}')(e)]$
d. $\| [_{vP} \text{alan} \ \varnothing_{\text{TR}} [_{VP} \ldots]] = \lambda e[\text{make}'(e) \wedge \text{Agent}(\text{alan})(e) \wedge \text{Theme}(\text{food}')(e)]$

(19) $\| [_{v'} \varnothing_{\text{INCH}} [_{VP} \ldots]] \| = \|\text{VP}\| = \lambda e \exists x[\text{make}'(e) \wedge \text{Agent}(x)(e) \wedge \neg\text{Agent}(x)(e) \wedge \text{Theme}(\text{food}')(e)]$: an empty set of events since $\text{Agent}(x)(e) \wedge \neg\text{Agent}(x)(e)$ is a contradiction

(20) a. $\| [_{V} \text{move}] \| = \lambda y \lambda e [\text{move}'(e) \wedge \text{Theme}(y)(e)]$
b. $\| [_{VP} \text{car move}] \| = \lambda e [\text{move}'(e) \wedge \text{Theme}(\text{car}')(e)]$

(21) $\| [_{vP}$ A. $[_{v'}$ make $[_{VP}$ car move$]$ $\| = \lambda P \lambda x \lambda e \exists e' [\text{Causer}(x)(e) \wedge \text{cause}(e')(e) \wedge P(e')](\lambda e [\text{move}'(e) \wedge \text{Theme}(\text{car}')(e)])(\text{alan}') = \lambda x \lambda e \exists e' [\text{Causer}(x)(e) \wedge \text{cause}(e')(e) \wedge \text{move}'(e') \wedge \text{Theme}(\text{car}')(e')])(\text{alan}') = \lambda e \exists e' [\text{Causer}(\text{alan}')(e) \wedge \text{cause}(e')(e) \wedge \text{move}'(e') \wedge \text{Theme}(\text{car}')(e')])$

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