

Exhaustification, free-choice, and additivity

Evidence from Sakha *da(yani)*

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1. Introduction

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- In Sakha/Yakut (Turkic, Siberian branch) the particle *dayani* (often reduced to *da*) appears in three main environments:

- Negative Polarity Items (NPIs) with WH-words, numeral *biir* 'one' (1):

(1) [Kim da(yani)] [biir da kinige-ni] aax-*(pa)-ta
[who da(yani)] [one da book-ACC] read-(NEG)-PST.3SG
'Nobody read any book(s)', lit: 'Anybody didn't read any book(s)'

- Full *da(yani)* or reduced *da* both acceptable with WH-NPIs. The short form is preferred following quantificational adjectives like *biir* 'one'.
- Scalar focus particle (2):

(2) [Onnooyor studjen da(yani)] iti kinige-ni aax-(pa)-ta
[even student da(yani)] that book-ACC read-(NEG)-PST.3SG
'Even the student (didn't) read that book'

- da(yani)* outside of WH-words, *biir* is not as sensitive to polarity
- (2) Expresses that it is unexpected that the student would (or would not) read the book.
- Doubled in coordination constructions (3):

(3) Djulus [kofje da(yani)] [čaj da(yani)] is-(pe)-te
Djulus [coffee da(yani)] [tea da(yani)] drink-(NEG)-PST.3SG
a. Without NEG -pe: 'Djulus drank both coffee and tea'
b. With NEG -pe: 'Djulus drank neither coffee nor tea'

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1. Introduction

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Quantifier particles generally (I)

- Quantifier particles are fertile grounds for cross-linguistic investigation (see Szabolcsi 2010, 2015, *et seq.*)
- NPIs built out of numeral 'one' and/or an existential quantifier like a WH-word (or 'some-') combined with an 'even'-like particle are well attested
 - even-some* / *even-WH* / *even-one* NPIs (Chierchia 2013)
 - Lahiri (1998) on Hindi *bhii*, Szabolcsi (2015, 2017) on Hungarian *is/sem*, Japanese *-mo*, Serbo-Croatian *i/ni*, Haspelmath (1997) on many others
- NPIs are existentials which obligatorily scope below their licenser (e.g. negation) (Fauconnier 1975, Ladusaw 1979, Progovac 1993, Chierchia 2013, Crnič 2014)
 - Why does positive *da(yani)...da(yani)* resolve to a conjunction 'both...and' meaning?

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2. Distribution: Sakha *da(yani)*, Hungarian *is/sem*, Japanese *-mo*

Role	Sakha <i>da(yani)</i>	Hungarian <i>is/sem</i>	Japanese <i>-mo</i>	see slide
NPI, <i>anybody</i>	✓— <i>kim da(yani)</i>	✓— <i>valaki is, akárki is, senki</i>	✓— <i>dare-mo</i>	(36)
<i>even X</i>	✓— (<i>onnooyor</i>) ... X <i>da(yani)</i>	✓— <i>még X is</i>	✓— X- <i>mo</i>	(37)
<i>both X and Y</i>	✓—X <i>da(yani)</i> ... Y <i>da(yani)</i>	✓— X <i>is Y is</i>	✓— X- <i>mo Y-mo</i>	(38)
<i>neither X nor Y</i>	✓—X <i>da(yani)</i> Y <i>da(yani)</i>	✓— X <i>sem Y sem, sem X sem Y</i>	✓— X- <i>mo Y-mo</i>	(39)
X <i>too/either</i>	X	✓— X <i>is, X sem</i>	✓— X- <i>mo</i>	
FCI, <i>anybody</i>	X	✓— <i>akárki is, bárki is</i>	✓— <i>dare-de-mo</i>	
∀-GQ, <i>everyone</i>	X	X	✓— <i>daré-mo</i>	

- Main sources: Szabolcsi (2004, 2015, 2017, 2018), Shimoyama (2006, 2011)
- Hun. *sem*=negative concord variant of *is*. *-ki*='who'. *senki*=*sem+ki*. JPN *dare*='who'

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1. Introduction

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Quantifier particles generally (II)

- Questions quantifier particles raise for semantic compositionality (Szabolcsi 2015: 161):
 - One single denotation? "Do the roles of each particle form a natural class with a stable semantics?"
 - For Sakha *da(yani)*, *yes*
 - Additional operators? "Are the particles aided by additional elements, overt or covert, in fulfilling their varied roles? If yes, what are those elements?"
 - Semantic alternatives of a disjunction/existential, interpreted by a covert exhaustifier (Sauerland 2004, Chierchia, Fox, Spector 2008, Crnič 2011, Szabolcsi 2017)
 - Chierchia's Grammatical Theory of Polarity Sensitivity (2004, 2013)
 - Cross-linguistic comparison? "What do we make of the cross-linguistic similarities and differences in the distribution and interpretation of the particles?"

2. Distribution

No universal quantifier uses

- (4) [Donó hito-mo] hashitta
[which person-mo] run.PST
'Everybody ran' (Japanese, Kobuchi-Philip 2009: 172)
- (5) Sakha
- [Tugu da(yani)] aax-*(pa)-t-im
[what.ACC da(yani)] read-(NEG)-PST-1SG
'I didn't read anything'
 - [Xas biirdii kinige-ni] aax-t-im
[how.much each book-ACC] read-PST-1SG
'I read every single book'
 - [Tuox baar kinige-ni bari-tii] aax-t-im
[what exist book-ACC every-ABL] read-PST-1SG
'I read all the books'

- (5-a)'s positive variant ungrammatical. Does NOT mean 'I read everything'
- Shimoyama (2011)— Japanese *-mo* quantifier particle forms universals
 - so-called NPI WH-*mo* actually PPI (i.e. [∀ < ¬] rather than [¬ < ∃])

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2. Distribution

Da(yani) lacks a basic additive reading (I)

- X *also*, X *too/either*—**additivity**. Presupposition that, in addition to the ordinary value of a proposition, ≥ 1 additional alternative is (also) true
 - (6) a. DJULUS drank coffee, too/also.
Additive presupp. = Somebody other than D. drank coffee.
 b. DJULUS didn't drink coffee, either
Additive presupp. = Somebody other than D. didn't drink coffee.
- Basic additive use possible for Hungarian *is/sem* (7)
 - (7) Bill {*is* / *sem*} ásított
 Bill {*is* / *sem*} yawmed
 a. (Positive, *is*): 'BILL yawmed, too'
 [Presupposition= Somebody other than Bill yawmed]
 b. (Negative, *sem*): 'BILL didn't yawn, either'
 [Presupposition= Somebody other than Bill didn't yawn]
 (Hungarian, Szabolcsi 2017: 461)

2. Distribution

Da(yani) lacks a basic additive re 'ading (II)

- Sakha *da(yani)* is infelicitous for such a reading.¹
 - (8) Djulus {#*da(yani)* / *emie*} kofje is-(pe)-te
 Djulus { *da(yani)* / *also*} coffee drink-(NEG)-PST.3SG
 (Positive, *emie*): 'DJULUS drank coffee, too'
 (Negative, *emie*): 'DJULUS didn't drink coffee, either'
- With *da(yani)* (8) can only mean 'Even DJULUS (didn't) drink coffee' (i.e. the scalar focus reading)
 - Part of the meaning is an additive presupposition: somebody other than Djulus (did drink/didn't drink) coffee (in addition to scalar presupposition)
 - Basic additive present in *da(yani)*'s cognates in many other Turkic languages, e.g. Turkish *da* (Kornfilt 1997: 109–14, Kamali and Karvovskaya 2013, Szabolcsi 2018). No NPI uses in Turkish (i.e. not a quantifier particle)
- Lacking a basic additive use makes *da(yani)* a unique quantifier particle

¹With *emie* (8) can also mean 'Djulus (didn't) yawn again'

2. Distribution

Da(yani) does not appear in FCIs

- (9) [Kim {**da(yani)* / *bayarar*}] alaadjı sie-n söp buoluo
 [who { *da(yani)* / PTCL}] pancake eat-CVB can maybe
 (With *bayarar*): 'Anyone can eat pancakes' (Sakha)
- (10) [Bárki (*is*)] jön meg, engedd be
 [anyone *is*] come.3SG VRB.MODIFIER let.2SG.IMP VRB.MODIFIER
 'Whoever arrives, let him in' / 'Let anybody who arrives in'
 (Hungarian, Halm 2016: 130)

2. Distribution

Da(yani)'s scalar focus reading is compatible with free-choice implicature

- (11) Sakha
 - a. Iti kinige-ni [ehe-em da(yani)] aay-ian söp
 that book-ACC [grandfather-1SG *da(yani)*] read-FUT can
 (i) 'Even MY GRANDFATHER can read that book'
 (ii) 'Anyone can read that book, even MY GRANDFATHER'
 - b. Iti kinige-ni [ehe-em da(yani)] aax-ta
 that book-ACC [grandfather-1SG *da(yani)*] read-PST.3SG
 'Even MY GRANDFATHER read that book'
 - (12) Hungarian (Szabolcsi 2017: 460)
 - a. [Akár Mari is] nyerhet
 [*akár* Mari *is*] can.win
 'Anyone can win; to pick an arbitrary example, Mari'
 - b. *[Akár Mari is] nyer
 [*akar* Mari *is*] win.PRES
 '*Anyone is winning'
- *da(yani)* does not form FCIs, unlike Hungarian *is* in (12-a). (11-a) is a free-choice implicature over the *even*-use

2. Distribution

Looking ahead

- There is a common reason that *da(yani)* does not appear in FCIs or basic additive uses
- *da(yani)* marks alternatives of its host obligatorily active (Chierchia 2013)
 - In most cases, *da(yani)* is interpreted by simple (non-recursive) exhaustification
 - Szabolcsi (2017)—additive *too* quantifier particles cause recursive exhaustification of a subset of the alternatives
 - *Da(yani)* does not do so
 - Recursive exhaustification IS responsible for the 'both...and' reading of *da(yani)*...*da(yani)*, thought it is caused by each instances of the particle activating the alternatives of its host disjunct

3. NPIs and focus

Exhaustification and The Grammatical Theory of Polarity Sensitivity

- Chierchia (2004, 2013)—
 - Polarity items (PIs) are existentials/disjunctions
 - PIs have semantic alternatives (ALTs). Licensing is the grammaticalization of a scalar implicature involving these alternatives
 - Unlike ordinary scalar implicatures (e.g. *I drank coffee or tea*, scalar implicatures=*I didn't drink BOTH*), the ALTs of PIs are not subject to Gricean Relevance. Cannot be ignored. i.e. ALTs of PIs are **obligatorily active**
 - Non-entailed alternatives must be exhaustified—non-entailed alternatives must be eliminated (negated) or else appropriately ranked
- Main exhaustifiers—covert *only* O (13), covert *even* E (defined on slide (16))
 - (13) $O_{ALT}(\phi) = \phi \wedge \forall \psi \in ALT[\psi \rightarrow \phi \subseteq \psi]$,
 where ' \subseteq ' means 'entails' (Chierchia 2013: 31)
 - O(nly) (13) asserts proposition with alternatives ϕ ("prejacent") and negates all alternatives of ϕ which ϕ does not entail. $\phi = T$, non-entailed $ALT(\phi) = F$
 - If negation of $ALT(\phi)$ contradicts ϕ : ordinary scalars prune contradiction (Relevance); PIs become uninterpretable (ALTs not subject to Relevance)

3. NPIs and focus

NPIs (I)

- First, take a positive example

(14) *Djulul [tugu da(yani)] aax-ta
 Djulus [what.ACC da(yani)] read-PST.3SG
 ‘*Djulul read anything’

(15) a. $\llbracket \text{tugu da}(yani) \rrbracket = \llbracket \text{anything}_{NPI} \rrbracket = \lambda P_{(et,t)}. \exists x [\text{THING}(x) \wedge P(x)]$
 b. $\llbracket (14) \rrbracket = \exists x [\text{THING}(x) \wedge \text{READ}(\text{djulus}, x)]$

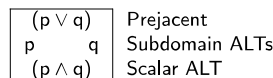
- Assume domain contains two things: *Syntactic Structures* and *Aspects*. (15-b) is equivalent to a disjunction $(p \vee q)$ where $\llbracket p \rrbracket =$ ‘Djulul read *Syntactic Structures*’ and $\llbracket q \rrbracket =$ ‘Djulul read *Aspects*’

3. NPIs and focus

NPIs (II)

- Like *anything*, *tugu da(yani)* has obligatorily active alternatives (ALT)

- In set-notation: $\text{ALT}(p \vee q) = \{p \vee q, p, q, p \wedge q\}$
 - Equivalent to $\text{ALT}(p \vee q) = (p \vee q) \wedge p \wedge q \wedge (p \wedge q)$
- As a semi-lattice:



- Because $(p \vee q)$ has active ALTs, we exhaustify with respect to them. Members of ALT that are not entailed by prejacent $(p \vee q)$ eliminated (i.e. negated)

- Non-entailed alternatives = $\{p, q, p \wedge q\}$

$$(16) \quad O_{\text{ALT}}(p \vee q) = \underbrace{(p \vee q) \wedge \underbrace{\neg p \wedge \neg q}_{\neg(p \vee q)}}_{(p \vee q) \wedge \neg(p \vee q), \text{contradiction}} \wedge \neg(p \wedge q)$$

3. NPIs and focus

NPIs (III)

- Under negation . . .

(17) a. Djulus [tugu da(yani)] aax-pa-ta
 Djulus [what.ACC da(yani)] read-NEG-PST.3SG
 ‘Djulul didn’t read anything’
 b. $\llbracket (17\text{-a}) \rrbracket = \neg \exists x [\text{THING}(x) \wedge \text{READ}(\text{djulus}, x)] = \neg(p \vee q)$

- $\text{ALT}(\neg(p \vee q)) = \{\neg(p \vee q), \neg p, \neg q, \neg(p \wedge q)\}$
 - All of these alternatives are entailed by the prejacent $\neg(p \vee q)$. None can be eliminated by exhaustification. No contradiction

(18) $O_{\text{ALT}}(\neg(p \vee q)) = \neg(p \vee q) \wedge \neg p \wedge \neg q \wedge \neg(p \wedge q)$

3. NPIs and focus

E(ven) exhaustification (I)

- Numerals like *biir* (as in *biir da N* NPIs)—rich scale of alternatives (totally ordered by entailment). Require a different exhaustifier E(ven)

(19) $E_{\text{ALT}}(\phi) = \phi \wedge \forall \psi \in \text{ALT}[\phi <_{\mu} \psi]$ (Chierchia 2013: 148)
 where ‘ $\phi <_{\mu} \psi$ ’ = ϕ is less likely than ψ w.r.t. a probability metric μ

- E(ven)-EXH (19) interpretable only if prejacent ϕ least likely alternative

(20) *Djulul [biir da kinige-ni] aax-ta
 Djulus [one da book-ACC] read-PST.3SG
 ‘*Djulul read any book’
 a. $\llbracket (20) \rrbracket = \exists x [n(x) \wedge \text{BOOK}(x) \wedge \text{READ}(\text{djulus}, \text{book}) : |n| = 1]$
 b. $\text{ALT}(20\text{-a}) = \{\text{one book} \Leftarrow \text{two books} \Leftarrow \text{three books} \Leftarrow \dots\}$

(21) $E_{\text{ALT}}(20) = \text{one book} \wedge \forall p \in \text{ALT}[\text{one book} <_{\mu} p]$
 a. i.e. one book $<_{\mu}$ two books $<_{\mu}$ three books...
 Unsatisfiable! *two* entails *one* (and so forth)

3. NPIs and focus

E(ven) exhaustification (II)

- Under negation, these entailments are reversed (22-b)

(22) Djulus [biir da kinige-ni] aax-pa-ta
 Djulus [one da book-ACC] read-NEG-PST.3SG
 ‘Djulul didn’t read any book(s)’
 a. $\llbracket (22) \rrbracket = \neg \exists x [n(x) \wedge \text{BOOK}(x) \wedge \text{READ}(\text{djulus}, x) : |n| = 1]$
 b. $\text{ALT}(22\text{-a}) = \{\neg \text{one book} \Rightarrow \neg \text{two books} \Rightarrow \neg \text{three books} \Rightarrow \dots\}$

(23) $E_{\text{ALT}}(22\text{-a}) = \neg \text{one book} \wedge \forall p \in \text{ALT}[\neg \text{one book} <_{\mu} p]$

- (23) is satisfiable. See Crnić (2011, 2014)

3. NPIs and focus

Where do quantifier particles fit in? (I)

- In languages like Sakha, Hungarian, quantifier particles are crucial to resulting meaning.
- Sakha WH-words without *da(yani)* are not NPIs (24-a). Likewise *biir* ‘one’ without *da* (24-b).

(24) a. (i) Min [tugu da(yani)] aax-*(pa)-t-im
 I [what.ACC da(yani)] read-(NEG)-PST-1SG
 ‘I didn’t read anything’
 (ii) Min [tugu] aax-(pa)-t-im?
 ‘What did I (not) read?’
 b. (i) Min [biir da kinige-ni] aax-*(pa)-t-im
 I [one da book-ACC] read-(NEG)-PST-1SG
 ‘I didn’t read anything’
 (ii) Min [biir kinige-ni] aax-(pa)-t-im
 ‘I (didn’t) read one book’

3. NPIs and focus

Where do quantifier particles fit in? (II)

- Hungarian *vala*-WH only NPIs with *is/sem*. Positive polarity items (PPIs) without *is/sem* (25-b) (Tóth 1999, Szabolcsi 2015, 2017)
 - (25) a. *(Nem) hiszem, hogy [vala-ki is] el jön
(NEG) believe.1SG that [some-who is] PRT come.3SG
'I do not think that anyone will come'
 - b. (*Nem) hiszem, hogy [vala-ki] el jön
'I think that someone will come' (Halm 2016: 144)

3. NPIs and focus

Where do quantifier particles fit in? (III)

- Where does the grammar encoded that alternatives of an element are obligatorily active?
 - Property of lexical items, more-or-less idiomatic (Chierchia 2013)
 - Individual morphemes can have the function of activating alternatives of their host (i.e. making them obligatorily) (Szabolcsi 2017: 460)
 - **Individual morphemes** can have the function of activating alternatives of their host (i.e. making them obligatorily) (Szabolcsi 2017: 460)

Quantifier particles activate alternatives

- The host independently has (non-obligatory) alternatives:
 - ▶ Existentials (e.g. *some*, WH-words) ALTs = $\langle \exists, \forall \rangle = \langle \vee, \wedge \rangle$
 - ▶ Numeral 'one' ALTs = $\{1, 2, 3, 4, \dots\}$
 - ▶ Focused element ALTs = disjunction of focus alternatives (Rooth 1992)
- Quantifier particles like *da(yani)*, *is/sem* activate these alternatives (i.e. make them obligatory)

3. NPIs and focus

Focus with E(ven)

- *even*-focus reading of *da(yani)* a product of the particle activating the alternatives of an element under focus
 - (26) [(onnooyor) Djulus da(yani)] aax-(pa)-ta
[(even) Djulus da(yani)] read-(NEG)-PST.3SG
'Even DJULUS (didn't) read'
- (26) felicitous only if Djulus is **contextually** considered to be less likely to have read (or not read, for negation) that alternatives
 - (27) a. Ordinary value of (26) = $(-)\text{READ}(\text{djulus})$ (=prejacent)
 - b. (26)'s Focus-ALTS = $\{(-)\text{READ}(\text{djulus}), (-)\text{READ}(\text{erkin}), (-)\text{READ}(\text{sardaana})\}$
- Exhaustification with E(ven)— if the ALTs in (27-b) are probability ranked and Djulus is the least likely ALT, interpretable. Pragmatically ranked
- $\{(-)\text{READ}(d) < \mu(-)\text{READ}(e), (-)\text{READ}(d) < \mu \text{READ}(s)\}$ where $X < \mu Y$ says 'X is pragmatically less likely than Y'

4. Free-choice and additivity

The signature property of free-choice

- The signature property of free-choice is a modal scoping over a disjunction of alternatives (28-a) becoming **enriched** to a conjunction (28-b), where each of the alternatives are acceptable (Chierchia 2013: 89)
 - (28) Djulus can drink coffee, tea, or water. [$\diamond < \vee$]
 - a. $\diamond(p \vee q \vee r)$
=D. can drink coffee, OR can drink tea, OR can drink water.
 - b. $\diamond p \wedge \diamond q \wedge \diamond r$
=D. can drink coffee AND can drink tea AND can drink water
- enrichment of (28-a) to (28-b) a free-choice implicature involving *or*-disjunction.
- Chierchia (2013)— meaning of FCIs like English *any*, Italian *un N qualsiasi* 'any N whatsoever', German *irgend* 'some or other' similar reasoning

4. Free-choice and additivity

- Why does *da(yani)* not appear in free-choice items?
 - Free-choice—recursive exhaustification
 - *da(yani)*...*da(yani)*'s 'both...and' reading is a free-choice-like effect
- Connection to additivity—Szabolcsi's (2017) bifurcation of focus alternatives

4. Free-choice and additivity

FCIs through recursive exhaustification (I)

- Recursive exhaustification with O(nly) (Fox 2007, Fox and Katzir 2011, Chierchia, Fox and Spector 2008, Chierchia 2013)
 - Exhaustify not only the prejacent's alternatives, but also the alternatives of the subdomain alternatives. Will require a modal to be interpretable
- Consider a prejacent with three alternatives and no modal: $(p \vee q \vee r)$
- $\text{ALT}(p \vee q \vee r) =$

$O(p \vee q)$	$O(q \vee r)$	$O(p \vee r)$	(Prejacent)
O_p	O_q	O_r	(Subdomain ALTs)
$(p \wedge q \wedge r)$			(Scalar ALT)
- (29) a. $\text{ALT}(p \vee q) = \{(p \vee q), \underbrace{p, q}_{\text{entail } (p \vee q)}, r\}$
- b. $O_{\text{ALT}}(p \vee q) = (p \vee q) \wedge \neg r$

4. Free-choice and additivity

FCIs through recursive exhaustification (II)

- After exhaustifying the subdomain ALTs, exhaustify the prejacent $(p \vee q \vee r)$ with respect to these (pre-exhaustified) alternatives:

$(p \vee q \vee r)$		
$O(p \vee q)$	$O(q \vee r)$	$O(p \vee r)$
$= [(p \vee q) = \wedge \neg r]$	$= [(q \vee r) \wedge \neg p]$	$= [(p \vee r) \wedge \neg q]$
$O(p)$	$O(q)$	$O(r)$
$= [p \wedge \neg(q \vee r)]$	$= [q \wedge \neg(p \vee r)]$	$= [r \wedge \neg(p \vee q)]$
$(p \wedge q \wedge r)$		

(30) $O_{Exh-ALT}(p \vee q \vee r) =$
 $(p \vee q \vee r) \wedge \underbrace{\neg O(p \vee q)}_{\text{Prejacent}} \wedge \underbrace{\neg O(r)}_{\text{Prejacent}} \wedge \dots \wedge \neg(p \wedge q \wedge r)$
 $\underbrace{\neg((p \vee q) \wedge \neg r)}_{(p \vee q) \rightarrow r} \wedge \underbrace{\neg(r \wedge \neg(p \vee q))}_{r \rightarrow (p \vee q)}$
 $\underbrace{\hspace{10em}}_{(r(p \vee q))}$
 a. $= (p \vee q) \wedge (p \leftrightarrow q \leftrightarrow r) \wedge \neg(p \wedge q \wedge r)$ (Contradiction!)

4. Free-choice and additivity

FCIS through recursive exhaustification (III)

- If we repeat the above steps with a possibility modal, exhaustification produces the free-choice reading.

(31) a. $O_{Exh-ALT}(\Diamond(p \vee q \vee r)) =$
 $\Diamond(p \vee q \vee r) \wedge \neg O(\Diamond(p \vee q) \wedge \dots \wedge \neg \Diamond(p \wedge q \wedge r))$
 b. $= \Diamond(p \vee q \vee r) \wedge (\Diamond p \leftrightarrow \Diamond q \leftrightarrow \Diamond r) \wedge \neg \Diamond(p \wedge q \wedge r)$

- Each alternative is acceptable in some world, so long as all alternatives are not true in any single world

Why does *da(yani)* not form FCIs?

- It only activates the alternatives of the prejacent, NOT the alternatives of the subdomain alternatives. i.e. it only forces simple exhaustification

4. Free-choice and additivity

Positive *da(yani)...**da(yani)* is free-choice like

- Positive *da(yani)...**da(yani)* coordination resembles the strengthening of a disjunction to a conjunction seen in free-choice

- (32) a. Djulus [kofje *da(yani)* čaj *da(yani)*] is-te
 Djulus [coffee *da(yani)* tea *da(yani)*] drink-PST.3SG
 'Djulus drank both coffee and tea'
 b. Djulus [kofje *da(yani)* čaj *da(yani)*] is-pe-te
 Djulus [coffee *da(yani)* tea *da(yani)*] drink-NEG-PST.3SG
 (i) 'Djulus didn't drink coffee or tea' $\checkmark [\neg(p \vee q)]$
 (ii) '#Djulus didn't drink both coffee and tea' $\# [\neg(p \wedge q)]$

- da(yani)...**da(yani)* cannot scope over negation (32-b-ii)
- No modal in required for *both...and* reading (32-a)

4. Free-choice and additivity:

Strengthening *or* to *and*

- If no stronger scalar alternative $(p \wedge q)$ is present, recursive exhaustification with *O(nly)* can strengthen *or* to *and*
- Bowler (2014) on Warlpiri *manu* 'or/and', Bar-Lev and Margulis (2014) on Hebrew *kol* 'all/any', see Szabolcsi (2017: 461) for others

(33) a. $ALT(p \vee q) = \{(p \vee q), p, q\}$
 b. $O_{Exh-DA}(p \vee q) = (p \vee q) \wedge \underbrace{\neg O(p)}_{\neg(p \wedge \neg q)} \wedge \underbrace{\neg O(q)}_{\neg(q \wedge \neg p)}$
 $\underbrace{\hspace{10em}}_{(p \leftrightarrow q)}$

Absence of stronger scalar alternative is key

- If the scalar alternative is included, we would reach a contradiction:
 $\triangleright = (p \vee q) \wedge (p \leftrightarrow q) \wedge \neg(p \wedge q) = \perp$
- Sakha *da(yani)...**da(yani)* underlyingly disjunction.** *Da(yani)* activates each disjunct's ALTs, resulting in recurs EXH. Doubling a morphosyntactic reflex of recurs EXH

4. Free-choice and additivity

Whither additivity?

- (34) [Bill is] ástított
 [Bill is] yawn.PST.3SG
 'BILL yawned, too' (Hungarian, Szabolcsi 2017: 462)
 Bill yawned AND somebody other than Bill yawned

- (35) a. Ordinary value of (34) = $Y(\text{bill})$ 'Bill yawned'
 b. Focus-ALT(34) = $\{Y(\text{bill}), Y(\text{mari}), Y(\text{katalin})\}$

- Szabolcsi (2017)—*is* bifurcates prejacent $Y(\text{bill})$ from other alternatives, producing BI-ALT (36-a). Recursively exhaustified without scalar (36-b)

(36) a. $BI-ALT(34) = \{\{b\}, \{m \vee k\}\} = [b \vee (m \vee k)]$
 b. $O_{Exh-BI-ALT}(b) = b \wedge \neg O(b) \wedge \neg O(m \vee k)$
 $= b \wedge (b \leftrightarrow (m \vee k))$

- Result (36-b) is the additive presupposition: *Bill IS yawned* = T only if one of the ALTs *Mary yawned*, *Katalin yawned* is T.

- Sakha *da(yani)* lacks basic additive reading because it does not bifurcate its alternatives**

5. Conclusion

- Sakha *da(yani)* is a particle which activates alternatives of a host disjunction
- When the host is a low-point of scale existential like a WH-word or *biir* 'one', activation of alternatives forms NPI
- When the host is a focused element, the elements are not inherently ordered, rather only being ordered by pragmatic context
- When it marks each disjunct in a disjunction phrase, *da(yani)* results in a 'both...and' reading in positive sentences, but an 'or' reading scoping under negation. The positive reading is a result of each alternative (disjunct) being marked as having obligatorily active alternatives, resulting in recursive exhaustification, strengthening the disjunction to a conjunction
- By itself, *da(yani)* does not encode that alternatives need be recursively exhaustified (i.e. it does not pre-exhaustify, nor does it bifurcate alternatives), explaining its lack of FCI, basic additive uses

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Additional notes and data

Transcription

- Native Cyrillic for the particle is <даҕаны>. Other romanizations include:
 - *daɣani* (Krueger 1962: 115)
 - *daɣani* (Stachowski and Menz 1998: 423)
 - *daqany* (Vinokurova 2005; Baker and Vinokurova 2010)

Additional notes and data

Licensing of *da(ɣani)* (I)

- *Da(ɣani)* NPIs are licensed by many negative morphemes, such as verbal negation with *-BA* (see (1)), negative copulas *suox* (37-a) and *ilik* (37-b), negative converb *-BAkka* (37-c), and the prohibitive *-ImA* (37-d)
- (37)
- [Tuox da(ɣani) siala] {suox / *baar} suruj-but-um
[what *da(ɣani)* purpose] {NEG.COP / COP} write-PST-1SG
'I wrote for no reason'
 - [Kim da(ɣani)] [biir da kinige] aax-a ilik
[who *da(ɣani)*] [one *da* book] read-CVB COP.not_yet
'Nobody has read any book(s) yet' (Lit. 'Anybody has not read any book yet')
 - [Tugu da(ɣani)] aax-pakka ereeri üören-n-im
[what.ACC *da(ɣani)*] read-NEG.CVB though study-PST-1SG
'I studied without reading anything'
 - [Tugu da(ɣani)] {aay-ima / *aax}
[what.ACC *da(ɣani)*] {read-NEG.IMP / read.IMP}
'Don't read anything!'

Additional notes and data

Licensing of *da(ɣani)* (III)

- *Da(ɣani)* NPIs are not negative-concord items. Fail main diagnostic—ability to serve as a negative fragment answer to a non-negative question (Zanuttini and Portner 2003, Chierchia 2013: 238)
- (40) Question: Tugu beyehee aax-pik-kin=ij?
what.ACC yesterday read-PST-2SG=Q
'What did you read yesterday?'
- Negative answers:
 - #Tugu da(ɣani)
what.ACC *da(ɣani)*
intended: 'nothing'
 - Tugu da(ɣani) aax-pa-tay-im
what.ACC *da(ɣani)* read-NEG-PST-1SG
'I didn't read anything'

Additional notes and data

Licensing of *da(ɣani)* (II)

- *Da(ɣani)* NPIs also licensed by the comparative case morpheme *-T̄Aɣar* (38)
- (38) Tujara [kim-neeɣer da(ɣani)] uhun
Tujara [who-CMPR *da(ɣani)*] tall
'Tujara is taller than anyone'
- Not licensed in antecedent of conditionals (39-a) or polar questions (39-b)
- (39)
- *[Tujara [tugu da(ɣani)] omɣor-doɣuna] Djulus čaj
[Tujara [what.ACC *da(ɣani)*] repair-COND.3SG] Djulus tea
kut-an bier-iexteex
pour-CVB give-FUT.3SG
Intended: 'If Tujara repairs anything, Djulus will serve tea'
 - *[Kim da(ɣani)] kofje ih-er=iɟ?
[who *da(ɣani)*] coffee drink-PRES.3SG=Q
Intended: 'Does anyone drink coffee?'
- These NPIs thus strict (or "strong") NPIs, requiring Anti-Additive licensers rather than simply Downward Entailing (Zwarts 1998, Gajewski 2011)

Additional notes and data: Sakha, Hungarian, and Japanese NPIs

- (41)
- Sakha *da(ɣani)*
 - Min [kimi da(ɣani)] kör-*(bö)-t-üm
I [who.ACC *da(ɣani)*] see-(NEG)-PST-1SG
'I didn't see anyone'
 - Hungarian *is/sem*
 - Pál *(nem) látott [sen-ki-t]
Paul (NEG) saw *sem*-who-ACC
'Paul did not see anybody' (Tóth 1999: 125)
 - Pál *(nem) mondta, hogy Mária [vala-ki-t is] látott
Paul (NEG) said that Mary [*vala*-who *is*] saw
'Paul did not say that Mary saw anybody' (Tóth 1999: 126)
 - Japanese *-mo*
 - Yoko-ga [gakusei-o dare-mo] syootaisi-*(nakat)-ta
Yoko-NOM [student-ACC who-*mo*] invite-(NEG)-PST
'Yoko didn't invite any student' (Shimoyama 2011: 417)

- (42) a. Sakha *da(yani)*
 (i) [?(Onnooyor) studjen da(yani)] iti kinige-ni aax-ta
 [(even) student *da(yani)*] that book-ACC read-PST.3SG
 'Even THE STUDENT read that book'
 (ii) [(Onnooyor) studjen da(yani)] iti kinige-ni aax-pa-ta
 [(even) student *da(yani)*] that book-ACC read-NEG-PST.3SG
 'Even THE STUDENT didn't read that book'
- b. Hungarian *is/sem*
 (i) Éva szerencsére [még János-t is] meg hívta
 Eve luckily [even John-ACC is] VRB.MODIFIER invite.PST
 'Eve luckily invited even John' (Kiss 2004: 108)
 (ii) Nem jött el [egy diák sem]
 NEG come.PST VRB.MODIFIER [one student *sem*]
 'No student came' / 'Not even one student came' (Kiss 2004: 140)
- c. Japanese *-mo*
 (i) [Sono syoonin-mo] damatteita
 [that witness-*mo*] was.silent
 'Even that witness was silent / That witness was also silent'
 (Shimoyama 2006: 145)
 (ii) John-wa [hon A -mo] yom-ana-katta
 John-TOP [book A -*mo*] read-NEG-PST
 'John didn't even read book A' (Nakanishi 2006: 142)

- (43) a. Sakha *da(yani)*
 (i) [Djulus da(yani) Tujara da(yani)] kofje is-pit-ter
 [Djulus *da(yani)* Tujara *da(yani)*] coffee drink-PST-3PL
 'Both D. and T. drank coffee'
 (ii) Min [kinige da(yani) aax-t-im] suruk da(yani) suruj-d-um]
 I [book *da(yani)* read-PST-1SG letter *da(yani)* write-PST-1SG]
 'I both read a book and wrote a letter' / 'In addition to reading a book, I even wrote a letter'
- b. Hungarian *is/sem*
 (i) [Kati is Mari is] alud-t
 [Kati *is* Mari *is*] sleep-PST.3SG
 'Both K. and M. slept' / 'K. as well as M. slept' (Szabolcsi 2018: 5)
- c. Japanese *-mo*
 (i) Takashi-wa [tyuukan-siken-ni-mo kimatu-siken-ni-mo] ukat-ta
 Takashi-TOP [midterm-exam-DAT-*mo* term.end-exam-DAT-*mo*] pass-PST
 'T. passed both the midterm and the final' (Shimoyama 2011: 439)

- (44) a. Sakha
 (i) [Djulus da(yani) Tujara da(yani)] kofje is-pe-tex-ter
 [Djulus *da(yani)* Tujara *da(yani)*] coffee drink-NEG-PST-3PL
 'Neither D. nor T. drank coffee'
- b. Hungarian
 (i) [Kati sem (és) Mari sem] alud-t
 [Kati *sem* (and) Mari *sem*] sleep-PST.3SG
 (ii) [Sem Kati sem Mari] nem alud-t
 [*sem* Kati *sem* Mari] NEG sleep-PST.3SG
 'Neither K. nor M. slept' (Szabolcsi 2018: 20)
- c. Japanese
 (i) Takashi-wa [tyuukan-siken-ni-mo kimatu-siken-ni-mo]
 Takashi-TOP [midterm-exam-DAT-*mo* term.end-exam-DAT-*mo*]
 ukara-nakat-ta
 pass-NEG-PST
 'T. didn't pass the midterm or the final' / 'For both the midterm
 and the final, T. didn't pass them' (Shimoyama 2011: 439)

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