The expression of exhaustivity and scalarity in Burmese

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1. Introducing ma

Colloquial Burmese has a particle ma which in some contexts expresses exhaustivity (1) and in some contexts expresses a scalar (‘even’-like) meaning (2). Okell’s 1969 reference grammar describes these two uses simply as “hmaA ‘even’ and “hmbB ‘only’ (pp. 284–286) but we argue that the use in (1) is a cleft.

(1) Exhaustive ma (cleft):
Aung-NOM water-ACC-MA drink-PAST-REAL
‘It’s WATER that Aung drank.’

(2) Scalar ma (‘even’-like):
Aung-NOM water-ACC-MA NEG-drink-PAST-DAR
≈ ‘Aung didn’t even drink WATER.’

We will show that the scalar use of ma (2) requires local negation and the -dar mood ending.

In addition, ma can form NPIs with wh-phrases:

(3) Wh-ma NPI:
1 which-apple-ACC-MA NEG-take-PAST-NEG
‘I didn’t take any apple(s).’

Preview:

- We propose a unified semantics for ma
  o ma is a not-at-issue scalar exhaustive, with semantics similar to Velleman et al 2012’s proposal for it-clefts.
  o ma references likelihood, but does not require the prejacent to be low or high on the scale, unlike even. The “scalar” reading comes about indirectly, when ma scopes under negation. Wide scope ma is always grammatical with cleft semantics.
- We propose that sentence-final –dar marks clauses as having a particular discourse status. This indirectly enforces ma taking scope under negation, as in (1), leading to the “scalar” reading of ma.

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2. Data

2.1. Background

Burmese (Tibeto-Burman) has many typological properties common to head-final languages: canonical SOV word order, pro-drop, scrambling, and *wh*-in-situ. One point which will be of interest is the mood suffix in the Burmese verbal complex:

(4) **Verbal complex template:**

(\text{negation}) – stem – (past/prog) – mood – (Q)

Mood suffixes include:

-\text{-de} realis/nonfuture
-\text{-bu} negative
-\text{-dar} DAR (to be discussed below)
-\text{-me} irrealis/future

(5) **Sentential negation \text{mə} is incompatible with -\text{de/me}, instead triggering -\text{bu}:**

a. Aung-ga ye-ko \theta au?-ke-\text{de}.
   Aung-NOM water-ACC drink-PAST-REAL
   ‘Aung drank water.’

b. Aung-ga ye-ko \text{mə}-\theta au?-ke-\{\text{bu}/*\text{de}\}.
   Aung-NOM water-ACC NEG-drink-PAST-NEG
   ‘Aung didn’t drink water.’

2.2. The two uses of \text{ŋa}

(6) **Exhaustive \text{ŋa} (cleft):**

A: Aung-ga ye-d\text{oṁ}əhau?-biya-ko \theta au?-ke-\text{lə}?
   Aung-NOM water-or-beer-ACC drink-PAST-Q
   ‘Did Aung drink water or beer?’

B: Aung-ga ye-ko-\text{ŋa} \theta au?-ke-\text{de}.
   Aung-NOM Water-ACC-MA drink-PAST-REAL
   ‘It’s WATER that Aung drank.’

# Aung-ga biya-ko-\text{lə} \theta au?-ke-\text{de}.
   Aung-NOM beer-ACC-also drink-PAST-REAL
   ‘Aung also drank beer.’

(6B) expresses (a) that Aung drank water and (b) that Aung drank nothing else, disallowing the continuation that ‘Aung also drank beer.’
Scalar \( \eta \):

Context: There were many drinks offered at the party and out of all the drinks, it is expected that Aung will drink water; it is less likely or more noteworthy for Aung to drink beer.

a. Aung-ga ye-ko-\( \eta \) mā-θauʔ-ke-dar.
Aung-NOM water-ACC-MA NEG-drink-PAST-DAR
≈ ‘Aung didn’t even drink WATER.’

b. #Aung-ga biyə-ko-\( \eta \) mā-θauʔ-ke-dar.
Aung-NOM beer-ACC-MA NEG-drink-PAST-DAR
Intended: ≈ # ‘Aung didn’t even drink BEER.’

The example in (7) is “scalar” in the sense that its grammatical/felicitous use is scale-sensitive: intuitively, \( \eta \) cannot be used with a prejacent which is less likely compared to its alternatives. In such contexts, speakers often use English ‘even’ in translations of sentences with \( \eta \).

Q: When is \( \eta \) interpreted as exhaustive vs scalar?
A: “Scalar” uses of \( \eta \) require both local sentential negation \( mə \) and the -dar mood morpheme.

Without the -dar mood ending, \( \eta \) with sentential negation yields exhaustive \( \eta \) scoping over negation. We return to the function of -dar in section 4.

(8) Negation without -dar: exhaustive \( \eta \) scoping over negation
Aung-ga ye-ko-\( \eta \) mā-θauʔ-ke-bu.
Aung-NOM water-ACC-MA NEG-drink-PAST-NEG
‘It is WATER that Aung didn’t drink.’

\( \eta \) with non-local negation does not yield a scalar reading; instead, it is interpreted as an embedded exhaustive expression:

(9) \( \eta \) with non-local negation: embedded exhaustive \( \eta \), not scalar \( \eta \)

\[ \text{[Aung-ga ye-ko-} \eta \text{ ŭauʔ-ke-de/dar-lo]} \text{ Su-ga mā-pyə-ke-bu} \]
Aung-NOM water-ACC-MA drink-PAST-REAL/DAR-C Su-NOM NEG-say-PAST-NEG
‘Su didn’t say that it is WATER that Aung drank.’
# ‘Su didn’t {even} say that Aung {even} drank WATER.’

Example (9) expresses (a) that Su didn’t say that Aung drank water, and (b) “Aung drank water” is a maximal answer to the question “What did Aung drink?”.

The interpretation of embedded exhaustive \( \eta \) in (9) reflects a cleft-like semantics, rather than ‘only’-like semantics (Horn 1969 a.o.).
2.3. *Wh-ŋa* NPIs

→ *Wh*-phrases with *-ŋa* form NPIs:  
  \[be\ (wh) \rightarrow (NP) \rightarrow \eta \]

(10) *Wh-ŋa* is an NPI:
  a. *ŋa-ga*  
     \[be-pən\thetai-ko-ŋa\]  
     \[yu-\k\-d\].
     1-NOM which-apple-ACC-*ŋa* take-PAST-REALIS
  b. *ŋa-ga*  
     \[be-pən\thetai-ko-ŋa\]  
     \[mɔ-yu-\k\-bu\].
     1-NOM which-apple-ACC-*ŋa* NEG-take-PAST-NEG

  ‘I didn’t take any apple(s).’

→ *Wh-ŋa* requires a **local negation**. It is not generally licensed in downward-entailing environments.

(11) *Wh-ŋa* requires a **local negation**:
  * [Aung-ga *be-pən\thetai-ko-ŋa* *yu-\k\-d\-lo*]  
    Su-ga *mɔ-pyɔ-\k\-bu*.
  Aung-NOM which-apple-ACC-*ŋa* take-PAST-REALIS-C Su-NOM NEG-say-PAST-NEG
  Intended: ‘Su didn’t say that Aung took any apples.’

(12) *Wh-ŋa* is not licensed in a **conditional clause**:
  * [Aung-ga *be-pən\thetai-ko-ŋa* *s\-r\-yin*]  
    \[\theta\-l\-ʔ-\m\].
  Aung-NOM which-apple-ACC-*ŋa* eat-if die-follow-IRR
  Intended: ‘If Aung eats any apple, he will die.’

(13) But *wh-ŋa* is **grammatical in a conditional clause with local negation**:
  [Aung-ga *be-pən\thetai-ko-ŋa* *mɔ-s\-r\-yin*]  
  \[\theta\-l\-ʔ-\m\].
  Aung-NOM which-apple-ACC-*ŋa* NEG-eat-if die-follow-IRR
  ‘If Aung doesn’t eat any apple, he will die.’

(14) *Wh-ŋa* is not licensed in **polar questions**:
  * Aung-ga *be-pən\thetai-ko-ŋa* *s\-r\-\k\-l؟*?
    Aung-NOM which-apple-ACC-*ŋa* eat-PAST-Q
  Intended: ‘Did Aung eat any apple?’

(15) *Wh-ŋa* is not licensed in **wh-questions**:
  * be-\θu-ga *be-pən\thetai-ko-ŋa* *s\-r\-\k\-lar؟*
    wh-3-NOM which-apple-ACC-*ŋa* eat-PAST-Q
  Intended: ‘Who has eaten any apple?’
3. Proposal

*ma* cliticizes to the focused constituent (or focus-containing constituent), but takes propositional scope at LF within the same clause.\(^2\) Let \(p\) be its complement with focus alternatives \(C\). \(C\) includes conjunctive alternatives and is partially ordered by \(<_{\text{likely}}\).

\[\Rightarrow \] *ma* introduces the presupposition that “no less likely alternatives are true.”

\((16)\) Presupposition of \(ma_{c}(p)(w^{*})\):
\[
\forall q \in C [(q <_{\text{likely}} p) \rightarrow \neg q(w^{*})] \quad (\approx \text{MAX}_{c}(p)(w^{*}) \text{ from Velleman et al 2012})
\]

This meaning (16) is also similar to the at-issue meaning proposed for *only* under so-called scalar analyses: see e.g. Klinedinst 2005, Beaver & Clark 2008 and Coppock & Beaver 2014’s MAX, Roberts 2011.

3.1. Wide-scope \(ma\) yields cleft semantics (exhaustive \(ma\))

Consider a context with two atomic alternatives \(A\) and \(B\) and \(A \land B\). Entailment gives us two orderings: \(A \land B <_{\text{likely}} A\) and \(A \land B <_{\text{likely}} B\). Suppose further that \(A >_{\text{likely}} B\), but we will see that the relative likelihood of the prejacent is not important for deriving the exhaustive *ma* use.

\[
\begin{align*}
A &= \text{‘that Aung drank water’} & >_{\text{likely}} & B &= \text{‘that Aung drank beer’} \\
\land_{\text{likely}} & & \lor_{\text{likely}} & \end{align*}
\]

\(A \land B = \text{‘that Aung drank water and beer’}\)

\((17)\) LF: [MA [Aung WATER\(_f\) drank]]
assertion: \(A = \text{‘that Aung drank water’} \quad \text{presupposition (16): } \neg(A \land B) \land \neg B\)

\((18)\) LF: [MA [Aung BEER\(_f\) drank]]
assertion: \(B = \text{‘that Aung drank beer’} \quad \text{presupposition (16): } \neg(A \land B)\)

In both cases, \(ma\) ensures that the conjunctive alternative(s) are false, and therefore other alternatives (\(B\) in (17), \(A\) in (18)) are false.

\[\Rightarrow \] *ma* here contributes cleft (exhaustive) semantics as in Velleman et al 2012.

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\(^2\) This can be thought of as *ma* moving from its pronounced position, in a clause-bound fashion, or as *ma* agreeing with a covert MA on the clausal spine, with this dependency being clause-bound.
In a clause with a local negation, *ma* can take scope above negation, again yielding a cleft:

\[ (19) \quad \text{ma scoping above negation yields cleft semantics > NEG:} \]

\[ \text{LF: } [\text{MA} [\text{NEG} [\text{Aung WATER}_F \text{ drank}]]] \quad \text{(example (8))} \]

\[ C = \{ A, B, A \land B \}, A = \text{‘that Aung didn’t drink water’ and } B = \text{‘that A didn’t drink beer’} \]

Entailment gives us two orderings: \( A \land B \ll \\text{likely} \ A \) and \( A \land B \ll \\text{likely} \ B \)

assertion: \( A = \text{‘that Aung didn’t drink water’} \quad \text{presupposition (16): } \neg(A \land B) \)

3.2. *ma* under negation yields “scalar” *ma*

Again consider the following context, repeated from above:

\[ A = \text{‘that Aung drank water’} \quad \gg \text{likely} \quad B = \text{‘that Aung drank beer’} \]

\[ A \land B = \text{‘that Aung drank water and beer’} \]

\[ (20) \quad \text{ma under negation, with less likely atomic alternatives:} \]

\[ \text{LF: } [\text{NEG} [\text{MA} [\text{Aung WATER}_F \text{ drank}]]] \quad \text{(example (2/7a))} \]

assertion: \( \neg A \quad \text{presupposition (16): } \neg(A \land B) \land \neg B \)

The use of *ma* with ‘water’ (20) is grammatical and requires that less likely alternative(s) (i.e. Aung drank beer) are false.

\[ (21) \quad \text{ma under negation, with no less likely atomic alternatives:} \]

\[ \text{LF: } [\text{NEG} [\text{MA} [\text{Aung BEER}_F \text{ drank}]]] \quad \text{(example (7b))} \]

assertion: \( \neg B \quad \text{presupposition (16): } \neg(A \land B) \)

Notice that the presupposition of (21) is strictly weaker than the asserted content, therefore its use is ungrammatical, ruled out for example by Crnič’s (2011) Principle of Non-Vacuity.

\[ (22) \quad \text{The Principle of Non-Vacuity (Crnič 2011: 110):} \]

The meaning of a lexical item used in the discourse must affect the meaning of its host sentence (either its truth-conditions or its presuppositions).

*ma* under negation is ungrammatical if the prejacent is lowest on the scale of likelihood (as in (21)), but grammatical with more likely alternatives. This makes *ma* appear to be “scalar,” and explains the use of (scale-reversed) *even* in English translations of examples such as (2/7a) in (20).
3.3. \(Wh-\eta a\) NPIs

We follow Ramchand (1996) and Beck (2006) a.o. in taking \(wh\)-phrases to have no ordinary semantic value:

\[(23)\]

a. \([\text{which apple}]^o\) undefined
b. \([\text{which apple}]^f = \{x : x \text{ is an apple}\}\)

\[(24)\]

a. \([\text{Aung which apple ate}]^o\) undefined
b. \([\text{Aung which apple ate}]^f = \{\text{that Aung ate } x : x \text{ is an apple}\}\)

\(\eta a\) requires a defined ordinary (prejacent) value, so it cannot combine with \([\text{[Aung which apple]]}\) in (24). We adopt the null existential closure operator in (25):

\[(25)\] **Existential operator as in Erlewine 2017:**

a. \([\exists \alpha]^o = \exists p \, [[\alpha]]^f \cdot p\)
b. \([\exists \alpha]^f = [[\alpha]]^f\)

\[(26)\]

a. \([\exists \, [\text{Aung which apple ate}]]^o = \text{that Aung ate some apple}\)
b. \([\exists \, [\text{Aung which apple ate}]]^f = \{\text{that Aung ate } x : x \text{ is an apple}\}\)

Suppose the apples in the domain are 1, 2, and 3:

\(\text{that Aung ate some apple} \quad \text{><likely} \quad \text{that Aung ate 1, that Aung ate 2, that Aung ate 3}\)

\[(27)\] **\(\eta a\) on (26) yields a systematic contradiction:**

LF: \([\text{MA} \, [\exists \, [\text{Aung which apple ate}]]]\)\) (example (10a))

assertion: \(1 \lor 2 \lor 3\) \quad presupposition (16): \(\neg 1 \land \neg 2 \land \neg 3\)

\(\Rightarrow\) This systematic contradiction is judged as ungrammaticality (e.g. Gajewski 2002, 2009).

\[(27)\] **\(\eta a\) under local negation makes the \(wh\)-NPI grammatical:**

LF: \([\text{NEG} \, [\text{MA} \, [\exists \, [\text{Aung which apple ate}]]]]\) (example (3/10b))

assertion: \(\neg (1 \lor 2 \lor 3)\) \quad presupposition (16): \(\neg 1 \land \neg 2 \land \neg 3\)

\[3\] Existential operators over Rooth-Hamblin alternatives are also invoked by Kratzer & Shimoyama (2002), Biezma & Rawlins (2012), and Uegaki (2017). However, the operators proposed by these authors also redefines the focus-semantic value; Erlewine’s (2017) formulation does not.
4. **–dar**

Recall that sentences with \( m \) and sentential negation have two different meanings, which correlate with the choice of the final mood suffix on the verb:

- -bu (regular \( \text{NEG} \)) ending: exhaustive \( m > \text{NEG} \) (8) LF in (19): \( \text{MA} > \text{NEG} \)
- -dar ending: scalar \( m \) (2/7) LF in (20, 21): \( \text{NEG} > \text{MA} \)

The –dar ending is not limited to examples with \( m \). Kato (1998: 88–89) notes that utterances with –dar are similar to Japanese –no-da propositional clefts; Andrew Simpson (p.c.) notes that it is similar to Mandarin \( shì…de \) propositional clefts.

We analyze –dar as a propositional cleft. Sheil (2016) proposes that propositional clefts are utterances where a new “line of inquiry” is created, e.g. an implicit sister/sub-question to the immediate Question Under Discussion.

(28) **–dar is inappropriate for direct answers to questions:**

A: What did Su drink?
B: Su-ga biya-ko thoʔ-ke-\( dɛ/dar \).
   Su-NOM beer-ACC drink-PAST-REAL/DAR
   ‘Su drank beer.’

(29) **–dar is appropriate for corrections:**

A: Su drank beer.
B: mə-houʔ-bu, Su-ga ye-ko thoʔ-ke-\( dɛ/dar \).
   NEG-right-NEG Su-NOM water-ACC drink-PAST-REAL/DAR
   ‘No, Su drank water.’

Discussing propositional clefts in Scottish Gaelic, Sheil (2016) proposes that in examples such as (29), the propositional cleft in B addresses a question (“Did Su drink water?”) which is a sister question to the discourse’s immediate question “Did Su drink beer?” that A was congruent to.

Finally, how does the (non-)use of –dar correlate with the different uses of \( m \)?

- **Scalar \( m \)** is felicitous in cases where the immediate QUD is a super-question (e.g. “What did Aung drink?” or “Did Aung drink anything?”) or a sister question (e.g. “Did Aung drink beer?”). (2/7) answers a new “line of inquiry” (“Did Aung drink water?”), therefore –dar is used.

- **Exhaustive \( m \) (a cleft)** resolves an existing QUD (Velleman et al 2012), therefore –dar is ungrammatical.
References:
Klinedinst, Nathan. 2005. Scales and only. Manuscript, UCLA.
The expression of exhaustivity and scalarity in Burmese

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Colloquial Burmese ရရှိ ရှိ ဖြစ်သည် ရှိ အသုံးပြုသည်။ ရရှိ လည်း သုံးထုံး လည်း ဝိ-NPIs.

John Okell's 1969 grammar gives two entries for ရရှိ, translated as English 'only' and 'even,' with no description of their distribution.

Exhaustive ရရှိ

(1) ရရှိ expresses exhaustivity:

Context: Did Aung drink water or beer?
Aung go ye-ko-ရရှိ နှင့် ကြာကြပြီးကြည့်စုံ-ပေါ်း.
’It’s WATER that Aung drank.’ #’...Aung (also) drank beer.’
Negation is expressed through မတော့- and a matching mood ending, -ဗိုက်.

(2) Exhaustive ရရှိ scopes over local negation with မတော့-:

Aung go ye/-Class-ko-ရရှိ မတော့-ဗိုက်-ဗိုက်-ဗိုက်.
Aung go ရရှိ/Water/Beef-ACC-MA နှင့် ဗိုက်-ဗိုက်-ဗိုက်.
’It is WATER/BEER that Aung didn’t drink.’

(3) Non-local negation shows that exhaustive ရရှိ has cleft semantics:

Aung go ye-ko-ရရှိ နှင့် ကြာကြပြီးကြည့်စုံ-ပေါ်း.
’So go ရရှိ/Water/Beef-ACC-MA နှင့် ဗိုက်-ဗိုက်-ဗိုက်.
’S didn’t say that it is WATER that Aung drank.’

The exhaustivity of ရရှိ is not-at-issue; ရရှိ is not an ‘only.’

Scalar ရရှိ

ရရှိ has a scalar use reflecting the relative likelihood of the prejacent:

(4) Context: There were many drinks offered at the party and out of all the drinks, it is expected that Aung will drink water; it is less likely for Aung to drink beer.
Aung go ye/Class-ko-ရရှိ မတော့-ဗိုက်-ဗိုက်.
Aung go ရရှိ/Water/Beef/ACC-MA နှင့် ဗိုက်-ဗိုက်-ဗိုက်.
’Aung didn’t even drink WATER.’

→ ရရှိ in (4) requires a relatively likely prejacent:

• Of exhaustive ရရှိ (2), ok with both less and more likely alternatives.

→ Scalar ရရှိ requires both local negation and the –ဗိုက် ending.

• (4) differs from (2) only in the verbal mood ending: –ဗိုက် in (4) but the negative ending –ဗိုက် in (2).

• (3) without local negation is exhaustive, even with –ဗိုက်.

A unified semantics for ရရှိ: ရရှိ is a scalar exhaustive, presupposing that “All less likely alternatives are false”

 Monsanto takes propositional scope at LF and does not affect the at-issue content.

For prejacent p and alternatives c, including conjunctive alternatives, Monsanto (p(v)) ~ \exists q \forall x (q \land p) \rightarrow (q(v))

(\text{Velleman et al 2012’s semantics for English it clefts; see also scalar only as in Klinedinst 2003, Beaver & Clark 2008 and Cappo & Beaver 2014’s MAX, Roberts 2011})

Sentence-final –ဗိုက်

–ဗိုက် clauses are propositional clefts, similar to Japanese –נו- (Kato 1998) or Mandarin shi...de (Andrew Simpson p.c.).

→ Sheil (2016) argues that propositional clefts are utterances where a new “line of inquiry” is created. e.g. an implicit sister/sub-question to the immediate QUD. (See handout on the distribution of –ဗိုက်)

• Scalar ရရှိ is felicitous in cases where the immediate QUD is a super-question (e.g. “What did Aung drink?” or “Did Aung drink anything?”) or a sister question (e.g. “Did Aung drink beer?”). (4) answers a new “line of inquiry” (“Did Aung drink water?”), therefore –ဗိုက် is used.

• Exhaustive ရရှိ (a cleft) resolves an existing QUD (Velleman et al 2012), therefore –ဗိုက် is ungrammatical.