Threefold Ambiguities between Permission, Weak Necessity, & Strong Necessity in Bengali

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1 Introduction

1. Strong necessity (SN): The Bengali modal [ɦɪɲo̯a] is reported to express only SN (1).

(1) ṭo-ke e-ṭa kor-ṭe ɦɪɲ-e̯.
you-DAT this-CLF do-INF COP-PRS.3
One of the possible readings:
"You have to do this." (✓□, ✗◇)

2. Permission: But (2) shows that ◇*p* can be the presupposition and (3b) shows that ◇*p* can arise in a polar question (only in present habitual).

(2) ***Context:*** The addressee is an engaged woman in a conservative society where a woman is allowed to wander around only until she is engaged; she never used to wander around before.
ṭo-ke ar ʃara-d̪in ṭo-ṭo
you-DAT any.longer whole-day ONOMAT
kor-e gʱur-ṭe ɦɪɲ-e̯ na.
do-GER travel-INF COP-PRS.3 NEG
"You {are no longer {supposed/allowed} to/no longer have to} wander around all day." (✓◇)

(3) a. ***Context:*** Inside a possibly off-limits area.
A: ṭo-ke ki ekʰane aʃ-ṭe ɦɪɲ-e̯?
you-DAT POL here come-INF COP-PRS.3
"Are you supposed to come here?" (✓◇)
b. B: ɦæ̃, ṭʰik aʧʰe. c. B′: #ɦæ̃, ɦɪɲ-e̯.
yes right exist.PRS.3 yes, COP-PRS.3
"Yes, it's okay." "Yes, I am."

3. Weak necessity (WN): It can also express WN (only in present habitual).

(4) a. # You should always do this, but right now, you shouldn't do this.
b. # You always have to do this, but right now, you don't have to do this.
c. You should always do this, but right now, you don't have to do it.

(5) ṭo-ke e-ṭa ʃɒb.somɒe̯-i kor-ṭe
you-DAT this-CLF all.time-FOC do-INF
ɦɪɲ-e̯, kiṇṭu ækʰon ṭo-ke e-ṭa
COP-PRS.3 but now you-DAT this-CLF
kor-ṭe ɦɪɲ-e̯ na.
do-INF COP-PRS.3 NEG
"You should always do this, but right now, you don't have to do it."

2 Not QR of modals

1. No QR, not scopal ambiguity between negation and the SN modal. Only ¬ > modal.
2. QR predicts the reading "□ > no longer > *p*" in (2), from □ QRing over *no longer*. That would predict that a prior instance of *p* is the presupposition, not "□*p*", because "□" is not in the scope of "no longer".

3 The Analysis

3.1 Ambiguity between SN and WN

1. Ambiguity between SN and the weak, base reading of WN.
2. **WN** arises from a exhaustifying a weaker permission reading. This is only possible in upward-entailing (UE) environments.
3. **The permission reading** is the base reading for WN. Therefore, it can't arise in UE environments, and only arises in non-UE environments, that is, under negation and in polar questions.
4. **SN** is the other meaning available from [hɒe̯].

3.2 Relation between SN and WN

1. Following Staniszewski (2022): A morpheme I will call *the χ-marker* is put on top of the SN modal [ɦɪɲe̯].

(6) $[\![\chi]\!] = \lambda H_{\langle s,\langle \mathbb{N},st\rangle\rangle} . \lambda M_{\langle\langle s,\langle \mathbb{N},st\rangle\rangle,t\rangle} . \exists H' \in sup(H) . M(H') = 1$ [Staniszewski (2022)]

(7) $sup(H,w) = \{H'(w) : H' \supseteq H\}$, where H is an ordering source sequence. [Staniszewski (2022)]

2. The existential reading derived by the χ-marker is exhaustified into the SN reading by the EXH operator (Bar-Lev and Fox (2020); "IE" = innocently excludable, "II" = innocently includable).

(8) $[\![\text{EXH}]\!](C)(p)(w) = \forall q \in IE(p,C)[\neg q(w)] \wedge \forall r \in II(p,C)[r(w)]$

(9) a. $IE(p,C) = \bigcap\{C' \subseteq C : C' \text{ is a maximal subset of } C, \text{ s.t. } \{\neg q : q \in C\}' \cup \{p\} \text{ is consistent}\}$
b. $II(p,C) = \bigcap\{C'' \subseteq C : C'' \text{ is a maximal subset of } C, \text{ s.t. } \{r : r \in C''\} \cup \{p\} \cup \{\neg q : q \in IE(p,C)\} \text{ is consistent}\}$

3. Exhaustification happens over **the subdomain alternatives (all II) obtained from the supersets of the ordering source sequence generated by *sup*.** The more the supersets restrict, the smaller the subdomains get.
4. The weakness of $\Box_{WN}$ by **pruning all the irrelevant II alternatives,** *i.e.*, all those II alternatives that are not in the set of relevant alternatives, *R* (Staniszewski (2022)).
5. No exhaustification in non-UE environments since it results in a weaker meaning (Fox and Spector (2018)).
⇒ Only permission and no WN under negation except "metalinguistic negation".
6. **Therefore,**

Structure of the analysis

Level 1 → Level 2 → Level 3: $\Box_{SN} \rightarrow (\Box_{SN}\text{-}\chi \equiv \Diamond) \rightarrow (\text{EXH}(\Diamond) \equiv \Box_{WN})$

3.3 UE environments

1. **SN:** Exhaustification is vacuous (EXH > $\Box_{SN}$).
[EXH [[[have-to H_6] f_9] [you do this]]]
2. **Permission:** Not possible, given obligatory exhaustification (Magri (2011)).
3. **WN:** Exhaustification yields WN (EXH > $\Box_{SN}$-χ).
[EXH [[χ H_6]$_1$ [λ_1 [[[have-to t_1] f_9] [you do this]]]]]

3.4 Under negation

1. **SN:** Exhaustification isn't vacuous (EXH > ¬ > $\Box_{SN}$).
[EXH [¬ [[[have-to H_6] f_9] [you do this]]]]
2. **Permission:** Possible; exhaustification above negation is vacuous(EXH > ¬ > $\Box_{SN}$-χ).
[EXH [¬ [[χ H_6]$_1$ [λ_1 [[[have-to t_1] f_9] [you do this]]]]]]
3. **WN:** "Metalinguistic negation" of WN from exhaustification below negation (¬ > EXH > $\Box_{SN}$-χ).
[¬ [EXH [[χ H_6]$_1$ [λ_1 [[[have-to t_1] f_9] [you do this]]]]]]

3.5 Polar Questions

1. **Guerzoni (2004), Staniszewski (2022):** Polar questions are sets of an affirmative and negative proposition.
(10) $[\![\text{whether}]\!]^{g,w} = \lambda f_{\langle\langle st,st\rangle,t\rangle} . \exists h[(h = \lambda p_{st} . p \vee \lambda p_{st} . \neg p) \wedge f(h) = 1] \approx$ *which of "yes" or "no"*
(11) Did John leave? ⇝ [whether$_{\langle 1,\langle\langle\langle st,st\rangle,t\rangle,t\rangle\rangle}$ [λ_1 [Q [$t_{\langle 1,\langle st,st\rangle\rangle}$ [John left]]]]]

2. **The EVEN operator (Karttunen and Peters (1979), Staniszewski (2022)):**
(12) $[\![\text{EVEN}]\!]^{g,w,c} = \lambda R_{stt} . \lambda C_{stt} . \lambda p_{st} : \forall q \in (C - (IE(p,C) - R))\ [q \neq p \rightarrow p <_c q] . p(w)$

3. **The $\Box_{SN}$ reading:**
(13) [whether$_1$ [Q [EVEN [EXH [t_1 [have-to p]]]]]]
a. *Yes:* EVEN EXH have-to *p*
b. *No:* EVEN EXH ¬ have-to *p*

4. **The $\Box_{WN}$ reading:**
(14) [whether$_1$ [Q [EVEN [EXH [t_1 [have-to-χ p]]]]]]
a. *Yes:* EVEN EXH have-to-χ *p*
b. *No:* EVEN EXH ¬ have-to-χ *p*

5. **The ◇ reading (rhetorical):**
(15) [EVEN [whether$_1$ [Q [t_1 [have-to-χ p]]]]]
a. *Yes:* have-to-χ *p*
b. *No:* ¬ have-to-χ *p*

4 The Problem of Alternatives

1. This analysis goes through only if the $\Box_{SN}$ proposition is not an alternative to the $\Box_{SN}$-χ proposition. Otherwise, the $\Box_{SN}$ would be IE and negated, and the II alternatives wouldn't be able to be affirmed, since that would contradict the negation of the IE $\Box_{SN}$ alternative.
2. But the $\Box_{SN}$ proposition should be an alternative to the $\Box_{SN}$-χ proposition, given the former is structurally simpler than the latter (Katzir (2007), Fox and Katzir (2011)).
3. This problem wasn't handled by Staniszewski (2022).
4. A very preliminary, perhaps descriptive, proposal:

(16) **Logical Parallelism (LP)**
If an LF has the schema [$_X$ *O* [$_Y$ Z]], then [$_Y$ Z] can't be an alternative of this LF, if *O* is a projection of a logical word (in the sense of Gajewski (2002), Chierchia (2021)), unless the logical word at that node is what EXH associates with.

5. LP prevents the removal of the χ-marker in the $\Box_{SN}$-χ proposition to generate the $\Box_{SN}$ alternative with the substitutions described above because the χ-marker is a logical word that is not the associate of EXH; in that case, $\Box_{SN}$ is the associate of EXH. This modal — the associate of EXH — is what generates the subdomain alternatives.
6. This doesn't prevent the generation of disjunct alternatives from a disjunction, which would require the removal of a logical word *or*, because, whenever that array of alternatives is to be generated, *or* is the associate of EXH.

5 Conclusions

★ **Take-away:** The threefold ambiguity can be explained systematically, without positing lexical stipulation, under an EXH-based account of WN, where the weakness of WN comes about through the pruning of irrelevant ordering source sequences.

★ **Open issues:** What is the χ-marker? Is it tied to something else in the grammar? Why is this threefold ambiguity found only in the present habitual form of [ɦɪɲe̯]? Another thing found in temporal bare habituals is homogeneity; are there links we can make between WN and homogeneity?

Selected references: Bar-Lev, M. E. & Fox, D. 2020. Free choice, simplification, and Innocent Inclusion. • Fox, D. & Katzir, R. 2011. On the characterization of alternatives. • Guerzoni, E. 2004. *Even*-NPIs in yes/no questions. • Staniszewski, F. 2022. *Modality and Time in Logical Context*.