Accounting for Some (Allegedly) Unusual Attitude Verbs[*]

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1 Forces of Attitude Verbs

"In the Hintikkan tradition, attitude verbs are treated uniformly as universal quantifiers over possible worlds, where the sole difference between various attitudes is in the accessibility relation that determines the set of worlds they quantify over." (Anand and Hacquard 2009)

1.1 Hoping, fearing, doubting? (Anand and Hacquard 2013)

- Examining Romance attitude verbs, Anand and Hacquard (2013) propose an existential force over the doxastic state for some of them.

(1) a weaker semantics for doubt, but it's not just a "plain" existential doxastic verb:

    a. Anand and Hacquard (2013, p. 36):

(63) $[\![$ a doubts$_C$ that $\phi]\!]^{c,w,S,g}$ is defined iff
ϕ-verifiers in $S' \neq \emptyset \wedge \phi$-falsifiers in $S' \neq \emptyset$.   *uncertainty condition*
If defined =1 iff
$\exists w' \in S': [[\![\phi]\!]^{c,w',S',g} = 1] \wedge$ *doxastic assertion*
p-falsifiers $>_{PROBa,w}$ p-verifiers   *preference assertion*
where $S' = DOX_{a,w}$ and ϕ-verifiers in $S' =$
$\lambda S''.S'' \subset S' \wedge \forall S''' \subset S'': [\forall w' \in S''': [[\![p]\!]^{c,w',S''',g} = 1]] = pow(S' \cap p)$
ϕ-falsifiers in $S' = \neg\phi$-verifiers in S'

    b. Heim (1992, p. 190):

That (25) doesn't make sense is predicted if we assume that *doubt* means (or at least implies) something like *not believe*. After the first conjunct in (25), we then

    c. cf. NPI licensing: *I doubt that they have ever been to Paris.*

(2) differing views on hope verbs:

    a. Anand and Hacquard (2013, p. 33):

(56) $[\![$ a hopes$_C$ that $p]\!]^{c,w,S,g}$ is defined iff
p-verifiers in $S' \neq \emptyset \wedge p$-falsifiers in $S' \neq \emptyset$.   *uncertainty condition*
If defined =1 iff
$\exists w' \in S': [[\![p]\!]^{c,w',S',g} = 1] \wedge$ *doxastic assertion*
p-verifiers $>_{DESa,w}$ p-falsifiers   *preference assertion*
where $S' = DOX_{a,w}$ and p-verifiers in $S' =$
$\lambda S''.S'' \subset S' \wedge \forall S''' \subset S'': [\forall w' \in S''': [[\![p]\!]^{c,w',S''',g} = 1]] = pow(S' \cap p)$
p-falsifiers in $S' = \neg p$-verifiers in $S' = pow(S' \cap \neg p)$

    b. If defined, $[\![$hope$]\!]^{g,c}(\geq, p, x, w) = 1$ iff $\forall w' \in \mathcal{B}_w^x : \text{SIM}(w', \mathcal{B}_w^x \cap p) >_w^x \text{SIM}(w', \mathcal{B}_w^x \backslash p)$ (Crnič 2011, p. 76)

- What about a very simple verb, like $\exists w \in DOX[p(w) = 1]$?

1.2 Slovenian existential belief (Močnik 2019a,b,c)

- Slovenian has a verb that conveys that the embedded clause is consistent with the attitude holder's beliefs. Intuitively, there is no preference component (cf. *hope*) or negative bias (cf. *doubt*).

(3) a. Othello **dopušča**, da   Desdemona ljubi Cassija. $D\varphi$
      Othello allows   that Desdemona loves Cassio
      'Othello allows for the possibility that Desdemona loves Cassio.'

    b. **Dopuščam** da je vaša laž posledica   neznanja in   ne zlonamernosti
      I.allow   that is your lie consequence ignorance and not malevolence
      'I allow for the possibility that your lie follows from ignorance and not malevolence.' (web[1])

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[1] http://www.delo.si/novice/slovenija/repe-zombiji-bodo-ukradeno-drzavo-priborili-nazaj.html (last accessed: Dec 2017)

   c. (seveda **dopuščam** da obstajajo določene izjeme. ampak jih še nisem
       of.course I.allow that exist certain exceptions but them yet not.AUX
       srečala)
       met
       '(of course I allow for the possibility that there are certain exceptions. but I haven't yet come across them)' (web[2])

   d. To je seveda le moje mnenje, nikakor ga ne vsiljujem, tudi **dopuščam**, da
       this is of.course only my opinion in.no.way it not I.impose also I.allow that
       se motim.
       REFL I.err
       'This is of course only my opinion, I definitely do not impose it, I even allow for the possibility that I'm wrong.' (web[3])

- The verb can take an optional noun *možnost* ('possibility').

(4) Tusk **dopušča** možnost, da brexita ne bo.   *D* NP CP
      Tusk allows possibility that brexit not will.be
      'Tusk allows for the possibility that there will be no Brexit.' (web[4])

- It takes declarative CPs:

(5)   a. ***Dopuščam**, če gre dež.
        I.allow if goes rain

     b. ***Dopuščam**, kdo je prišel.
        I.allow who is come

- It has a weak force:

(6)   a. **Dopuščam**, da dežuje, in **dopuščam**, da ne dežuje. $D_x p \wedge D_x \neg p$
        I.allow that rains and I.allow that not rains
        'I allow for the possibility that it's raining and I allow for the possibility that it's not raining.'

     b. ***Mislim**, da dežuje, in **mislim**, da ne dežuje.   *$B_x p \wedge B_x \neg p$
        I.think that rains and I.think that not rains
        'I think that it's raining and I think that it's not raining.'

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[2] http://maxximum-portal.com/forum/viewtopic.php?f=291&t=31344&start=3465 (last acc: Dec 2017)

[3] http://www.delo.si/kultura/knjizevni-listi/recenzija-knjige-vcasih-se-zdi-da-je-cas-za-posmeh.html (last accessed: Dec 2017)

[4] http://www.delo.si/svet/evropa/tusk-dopusca-moznost-da-brexita-ne-bo.html (last accessed: Dec 2017)

- It can be strengthened into a belief claim:

(7) In a debate with Flat-Earthers, a scientist is asked:

    Ali dopuščate, da   je Zemlja okrogla?
    Q   you.allow   that is Earth   round
    'Do you allow for the possibility that the Earth is round?'

    The scientist replies:

    Seveda   **dopuščam**, da   je -- trdno **verjamem**, da   je! $D_xp \wedge B_xp$
    of.course I.allow   that is   firmly I.believe   that is
    'Of course I allow that it is – I firmly believe that it is!'

- There can be false *dopuščati* states:

(8) Dežuje, ampak Janez ne **dopušča**, da   dežuje. $p \wedge \neg D_jp$
    rains   but   John not allows   that rains
    'It's raining but John doesn't allow for the possibility that it's raining.'

- I have been interested in its behaviour with respect to embedded epistemic modals.[5]

- There is also a permission *dopuščati* (polysemy?):

(9) Oče   (nam) dopušča, da   se   igramo zunaj.
    father (to.us) allows   that refl we.play outside
    'Our father lets us play outside.'

1.3 Koryak variable-force belief

- Variable force predicates are known from the modal domain (Rullmann et al. 2008, Davis et al. 2009 et seq.)

- We present what is, to our knowledge, the first documented variable-force attitude: Koryak *ivək*.[6]

- *ivək* can take either an indicative (10) or a counterfactual (11) complement, which trigger different readings; in this section we'll only focus on the doxastic reading

(10) meʎʎo   ∅-k-iv-ə-ŋ-∅,   (əno) ∅-ku-muq-et-ə-ŋ-∅
     Melljo.ABS.SG 2/3.S/A.IND-PRS-*ivək*-E-PRS-3.S.IND that   2/3.S/A.IND-PRS-rain-VB-E-PRS-3.S.IND
     'Melljo {says, thinks, allows for the possibility, hopes, fears, …, *knows, *imagines,*wishes} that it's raining.'

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[5]Consider, for example:

(i) You wake up and you're too lazy to open your eyes. But you can nevertheless tell that it's bright. What should you make of that? You might say to yourself:

   a. Mislim, da   utegne/mora biti sončno. $B\Diamond p$ / $B\Box p$
      I.think that might/must be sunny
      'I think it might/must be sunny.'

   b. Dopuščam, da   utegne/*mora biti sončno. $D\Diamond p$ / $*D\Box p$
      I.allow   that might/mora be sunny
      'I allow for the possibility that it might/must be sunny.'

   c. Mislim/*Dopuščam, da   ne more biti deževno. $B\neg\Diamond p$ / $*D\neg\Diamond p$
      I.think/I.allow   that not can be rainy
      'I think / *I allow for the possibility that it can't be rainy.'

[6]Koryak is a highly endangered Chukotko-Kamchatkan language with ∼600 speakers spoken in northern Kamchatka in the Russian Far East. Our transcription uses the IPA, except that we use *č* for the voiceless alveolo-palatal affricate. Our glossing schema follows the Leipzig Glossing Rules, except for: AP - antipassive, CF - counterfactual, CS - causative, E - epenthetic vowel, IRR - irrealis, RLS - realis, VB - verbalizer

(11) meʎʎo   ∅-k-iv-ə-ŋ-∅,   (iwke) n-ə-ʔ-ə-muq-et-ə-n
      Melljo.ABS.SG 2/3.S/A.IND-PRS-*ivək*-E-PRS-3.S.IND if.only 2/3.S/A.CF-E-CF-E-rain-VB-E-2/3.S/O.CF
      'Melljo wishes it would rain.'

- Upshot: the quantificational force varies due to a restriction on an underlying universal quantifier (in the spirit of Rullmann et al. 2008).

Detour: Elicitation Methodology

- We employ an elicitation technique that we call a "matching task". Unless otherwise indicated, the examples provided in this paper were obtained in this manner.

  - We provide a context (typically in Russian) and then a Koryak and a Russian sentence.
  - The speakers are first asked to provide a contextual felicity judgment on the former, and then are asked whether the two sentences can have the same meaning in the given context.[7]

- Why not just do contextual felicity judgments, as is standard (Matthewson 2004 et. seq.)?

- Previous work with our Koryak consultants showed that they are prone to ignoring salient features of the context when giving judgments, and in many cases just give syntactic wellformedness judgments on sentences.

- Asking the speaker to explain how they understood the Koryak sentence is also not sufficient because the speakers import features of Koryak into Russian, producing infelicitous Russian sentences.

  - Speakers use 'think/say if only' (Rus. *dumajet/govorit, xotja by*) to translate sentences like (11), even though this is not the locution for expressing wishes in Russian. By contrast, when asked to translate 'wish' (Rus. *želat'*) into Koryak, the speakers had no trouble using *ivək*.
  - Certain epistemic modals would appear in (claimed to be acceptable) locutions such as 'probably p and probably not p' or 'p but probably not p' (eg. 'It is raining, but it is probably not raining.'), which is reminiscent of the L2 translation issues with variable force reported in Rullmann et al. (2008, fn. 32) .

- Conclusion: best technique was to use a matching task, where the context was aided by the Russian sentence.

- Preference for a strong interpretation

(12) t-ə-k-ew-ŋəvo-ŋ-∅,   `meki   ∅-ko-n-waꞑav-aw-ŋ-ə-nen
      1SG.S/A-E-PRS-*ivək*-HAB-PRS-1SG.S who.ABS.SG 2/3.S/A.IND-PRS-CS-word-VB-PRS-E-3SG.A>3.O
      qonpəꞑ', i   vilu-t   t-ə-ku-nike-ŋ-ne-t,   tit
      always   and ear-ABS.DU   1SG.S/A-E-PRS-whatchamacallit-PRS-3.O-3DU   so.that
      m-ə-valom-ə-n,   jənnə   ∅-ko-tv-ə-ŋ-nen.
      1SG.S/A.IMP-E-hear-E-3SG.O what.ABS.SG 2/3.S/A.IND-PRS-say-PRS-E-3SG.A>3.O
      'I **thought**, "Who is he always talking to?" and [pricked up] my ears so that I might hear what he was saying.' (Golovanȋova and Mal'ceva 2015, 18)

(13) məč-čalɣəl-la-∅   teʎəčča-jtəŋ,   məjew   ečʔej-ə-k   teʔi
      1NSG.S/A-move-PL-1NSG.S/O   Tilichiki-ALL   because   Achayvayam-E-LOC   few
      ∅-nəʔal-la-j   učiteʎ-u   škola-k.   t-ə-k-iv-ə-ŋ-∅:
      2/3.S/A.IND-become-PL-AOR   teacher-ABS.PL   school-LOC 1SG.S/A-E-PRS-*ivək*-PRS-1SG.S

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[7]We don't use the word 'meaning' (Rus. *značenije*) in the elicitation, as this tends to trigger word-for-word translations. Instead, we ask if the sentences can can express the same 'thought' (Rus. *mysl'*), which our speakers seem to understand better.

'tit	metʔa-ŋ	n-ə-pʎətku-ne-w	ɣəm-nin	kəmiŋ-u,	ləɣu
so.that	beautiful-ADV	3.S/A.IMP-E-finish-3.S/O.IMP-3PL	1SG-POSS	son-3PL	better

məŋ-ɲalɣəl-la-∅	miŋkəje.'
1NSG.IMP.S/A-move-PL-1NSG.S/O	whither

'We moved to Tilichiki because in Achayvayam there came to be few teachers in the school. I **thought**: "So that my sons are educated well (lit. finish [school] beautifully), it would be better for us to move somewhere."' (Golovaniova and Mal'ceva 2015, 47)

- Weak force is also available

(14) Hewngyto says: ujŋe liɣi elŋəke metke kupiŋatəŋ ('I don't know whether it's snowing').

ʔewŋəto	∅-k-iv-ə-ŋ-∅	əno	ujŋe	a-piŋ-at-ka
Hewngyto.ABS.SG	2/3.S/A.IND-PRS-*ivək*-E-PRS-3.S.IND	that	NEG.RLS	NEG-snow-VB-NEG

∅-k-it-ə-ŋ-∅.	ʔewŋəto	ʔopta	∅-k-iv-ə-ŋ-∅
2/3.S/A.IND-PRS-be-PRS-3.S.IND	Hewngyto.ABS.SG	also	2/3.S/A.IND-PRS-*ivək*-E-PRS-3.S.IND

əno	∅-ku-piŋ-at-ə-ŋ-∅.
that	2/3.S/A.IND-PRS-snow-VB-PRS-3.S.IND

'Hewngyto **allows for the possibility** that it's not snowing. Hewngyto also **allows for the possibility** that it's snowing.'

(15) Hewngyto is walking down the street. Melljo sees him and asks: `Menno ɣənin ŋevətqet? Metke kotavareŋjaŋəŋ jajak?' (Where is your wife? Is she making jam at home?) He replies:

qoo.	t-ə-k-iv-ə-ŋ-∅	əno	∅-ko-ta-vareŋja-ŋ-ə-ŋ-∅
dunno	1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S	that	2/3.S/A.IND-PRS-make-jam-make-E-PRS-3.S.IND

jaja-k
house-LOC

'I don't know. I **allow for the possibility** that she's making jam at home.'

He continues walking. Qechghylqot sees him and asks: `Menno ɣənin ŋevətqet? Metke keluŋ umkək?' (Where is your wife? Is she picking berries in the forest?) Hewngyto replies:

qoo.	t-ə-k-iv-ə-ŋ-∅	əno	∅-k-elu-ŋ-∅
dunno	1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S	that	2/3.S/A.IND-PRS-pick.berries-E-PRS-3.S.IND

umk-ə-k.
forest-E-LOC

'I don't know. I **allow for the possibility** that she's in the forest picking berries.'

- Different from *ləmalavək* 'believe', which does not have a weak reading

(16) a.#| ʔewŋəto	∅-ko-lmal-av-ə-ŋ-∅	əno
Hewngyto.ABS.SG	2/3.S/A.IND-PRS-believe-VB-E-PRS-3.S.IND	that

∅-ku-muq-et-ə-ŋ-∅,	ʔam	ʔopta	∅-ko-lmal-av-ə-ŋ-∅
2/3.S/A.IND-PRS-rain-VB-E-PRS-3.S.IND	but	also	2/3.S/A.IND-PRS-believe-VB-E-PRS-3.S.IND

əno	ujŋe	e-muq-et-ke.
that	NEG.RLS	NEG-rain-VB-NEG

'Hewngyto **allows for the possibility** that it is raining but also **allows for the possibility** that it is not raining.' (intended)

b. | ʔewŋəto | ∅-k-iv-ə-ŋ-∅ | əno | ∅-ku-muq-et-ə-ŋ-∅, |
|---------|--------------|-----|---------------------|
| Hewngyto.ABS.SG | 2/3.S/A.IND-PRS-*ivək*-PRS-3.S.IND | that | 2/3.S/A.IND-PRS-rain-VB-E-PRS-3.S.IND |

ʔam	ʔopta	∅-k-iv-ə-ŋ-∅	əno	ujŋe	e-muq-et-ke.
but	also	2/3.S/A.IND-PRS-*ivək*-PRS-3.S.IND	that	NEG.RLS	NEG-rain-VB-NEG

'Hewngyto **allows for the possibility** that it is raining but also **allows for the possibility** that it is not raining.'

- Both readings seem available in downward-entailing contexts (below we report a strong force in an antecedent of a conditional and what looks like weak force in the restrictor of a universal quantifier).[8]

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[8]Side note: one of the locutions for 'tell the truth' in Koryak in 'correctly *ivək*', which is also found in downward-entailing contexts

(17) Kaljahang is talking on the phone with Tyngangawyt, who is supposed to fly to Petropavlovsk-Kamchatsky today from Tilichiki. Njobanga and I can tell that they are talking about heavy rains, but we don't know what exactly is going on. I ask Njobanga *jeqin kivəŋ təŋaŋawət?* 'What is Tyngangawyt saying?' Njobanga says:

quu,	ʔam	ŋeveq	təŋaŋawət	∅-k-iv-ə-ŋ-∅,	əno
dunno	but	if	Tyngangawyt.ABS.SG	2/3.S/A.IND-PRS-*ivək*-PRS-3.S.IND	that

∅-ku-mejŋ-ə-muq-et-ə-ŋ-∅	teʟʟəča-k,	amu	ečɣi	qəjəm
2/3.S/A.IND-PRS-big-E-rain-VB-PRS-3.S.IND	Tilichiki-LOC	might	today	NEG.IRR

n-ə-jet-ə-n	petropavlovska-jtəŋ.
3.S/A.IMP-E-come-E-3.S/O.IMP	Petropavlovsk.Kamchatsky-ALL

'I don't know, but if Tyngangawyt **is saying** that it is raining heavily in Tilichiki, then probably she will not come to Petropavlovsk-Kamchatsky today.'

(18) We're walking down the street and there are many people with raincoats. Melljo says:

əməŋ	ʔujemtewilʔ-u	meki-w	∅-ew-la-j	əno
all	person-ABS.PL	who-ABS.PL	2/3.S/A.IND-*ivək*-PL-AOR	that

∅-je-muq-et-iki-∅	ne-jet-ə-n-∅	muqe-ičʔ-ə-n
2/3.S/A.IND-FUT-rain-VB-IPFV-3.S.IND	INV-bring-E-3.O-SG	rain-clothes-E-ABS.SG

'Everybody who said that it will rain brought a raincoat.' [volunteered]

'Everybody who **allowed for the possibility** that it will rain brought a raincoat.' [matching task]

- Under negation, *ivək* seems to be able to express universal force, as in (19b). However, the same reading could in principle be derived with neg-raising over an existential quantification.

(19) Two balls are in a box: one white, one black. I pull out one and do not show it to you.

a.
t-ə-k-iv-ə-ŋ-∅	əno	əɲɲin	qapəl	n-ilɣ-ə-qin	to
1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S	that	that.ABS.SG	ball.ABS.SG	ADJ-white-E-ADJ.SG	and

t-ə-k-iv-ə-ŋ-∅	əno	ənno	luqi-n
1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S	that	3SG.ABS	black-ADJ.SG

'I allow that the ball is white and I allow that it is black.'

b.
ujŋe	∅-iw-ke	t-ə-k-it-ə-ŋ-∅	əno	əɲɲin	qapəl
NEG.RLS	NEG-*ivək*-NEG	1SG.S/A-E-PRS-be-E-PRS-1SG.S	that	that.ABS.SG	ball.ABS.SG

n-ilɣ-ə-qin	to	ujŋe	∅-iw-ke	t-ə-k-it-ə-ŋ-∅	əno
ADJ-white-E-ADJ.SG	and	NEG.RLS	NEG-*ivək*-NEG	1SG.S/A-E-PRS-be-E-PRS-1SG.S	that

ənno	luqi-n
3SG.ABS	black-ADJ.SG

'I **don't think** that the ball is white and I **don't think** that it is black.' (speaker comment: same thought as (19a)[9])

1.3.1 How can we account for this?

- We will borrow the proposal from Rullmann et al. (2008):

(20) "modal choice function" (2008, pp. 337–338)   (subset selection function)

a. $f_{(st)st}$ is a function s.t. for any non-empty set of worlds W: $f(W) \subseteq W$ and $f(W) \neq \emptyset$

b. $[\![\text{modal}]\!]^{c,w}$ is only defined if c provides a modal base B.
$[\![\text{modal}]\!]^{c,w} = \lambda f_{(st)st} \lambda p_{st}. \forall w'[w' \in f(B(w)) \rightarrow p(w')]$

- Thus, *ivək* will be an underlyingly universal quantifier with a domain restriction.

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in texts, e.g. 'But now you should not run away [from the dogs], if you told the truth [about them not hunting you]' (Vdovin and Jajletkan 1949, p.90).

[9]A speaker noted that (19b) also expresses "another thought" that is infelicitous in this context: namely, the one where the ball is half white and half black. This reading can be obtained if the resulting interpretation has two wide-scope necessity forces ($\Box$*black* $\wedge$ $\Box$*white*).

- Recall that we mostly had to use matching tasks. So, we have not been able to reliably test for the alleged context-sensitivity of the selection function mechanism. In particular, we have not been able to test the felicity of *ivək* in a situation where a piece of evidence is salient + *ivək* has the weak reading.

- In addition to a contextual resolution, Rullmann et al. also need the option of existential closure over the selection function.

(21) Denotation of *ivək* (to be amended for flavour)[10]

$\llbracket ivək \rrbracket^{c,g,w} = \lambda C \lambda p \lambda x :$

$C = \{f \mid f(\mathcal{B}_w^x) = \mathcal{B}_w^x\} \quad \lor \quad C = \{f \mid f(\mathcal{B}_w^x) \subseteq \mathcal{B}_w^x \land f(\mathcal{B}_w^x) \neq \emptyset\}$.

$\exists f \in C \; \forall w' \in f(\mathcal{B}_w^x) \; [p(w') = 1]$

where $\mathcal{B}_w^x$ is the set of worlds compatible with x's beliefs at w,

C is a cover that limits the choice of $f_{(st)st}$ (so that f is either the identity function or some subset selection function on $\mathcal{B}_w^x$)

We'll abbreviate $\mathcal{C}_{id}$ for the first way of resolving the cover and $\mathcal{C}_{all}$ for the second.

(22) $\llbracket (16b) \rrbracket^{c,g,w} = 1$ iff $\exists f \in g(C)[\forall w' \in f(\mathcal{B}_w^h)[r(w') = 1]] \land \exists f \in g(C)[\forall w' \in f(\mathcal{B}_w^h)[r(w')] = 0]$

Resolution to $\mathcal{C}_{id}$ (contradictory): $\forall w' \in \mathcal{B}_w^h[r(w') = 1] \quad \land \quad \forall w' \in \mathcal{B}_w^h[r(w') = 0]$

Resolution to $\mathcal{C}_{all}$ (felicitous): $\exists f \in \mathcal{C}_{all} \; \forall w' \in f(\mathcal{B}_w^h)[r(w') = 1] \; \land \; \exists f \in \mathcal{C}_{all} \; \forall w' \in f(\mathcal{B}_w^h)[r(w') = 0]$

$$\exists f \in g(C) \; \forall w' \in f(\mathbb{B})[p(w') = 1] \; \land \; \exists f \in g(C) \; \forall w' \in f(\mathbb{B})[p(w') = 0]$$

belief state

p   ¬p

✓ if g(C) is the set of all subset functions on the belief state

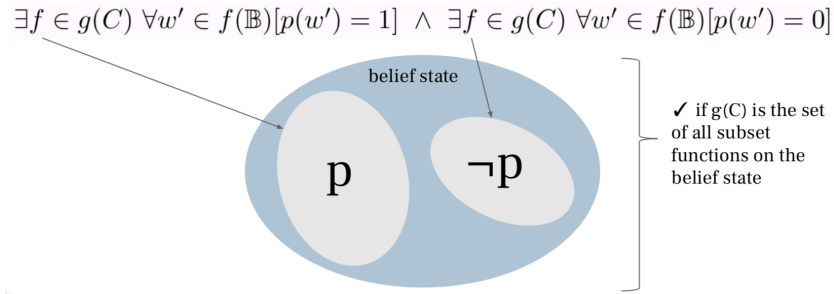Figure 1: (16b): *ivək(p)* ∧ *ivək(¬p)*

(23) $\llbracket (19b) \rrbracket^{c,g,w} = 1$ iff $\neg \exists f \in g(C)[\forall w' \in f(\mathcal{B}_w^h)[b(w') = 1]]$ and $\neg \exists f \in g(C)[\forall w' \in f(\mathcal{B}_w^h)[b(w') = 0]]$

Resolution to $\mathcal{C}_{id}$ (felicitous): $\exists w' \in \mathcal{B}_w^h[b(w') = 0] \quad \land \quad \exists w' \in \mathcal{B}_w^h[b(w') = 1]$

Resolution to $\mathcal{C}_{all}$ (contradictory): $\forall f \in \mathcal{C}_{all}[\exists w' \in f(\mathcal{B}_w^h)[b(w') = 0]] \land \forall f \in \mathcal{C}_{all}[\exists w' \in f(\mathcal{B}_w^h)[b(w') = 1]]$

$$\forall f \in g(C) \; \exists w' \in f(\mathbb{B})[p(w') = 0] \; \land \; \forall f \in g(C) \; \exists w' \in f(\mathbb{B})[p(w') = 1]$$
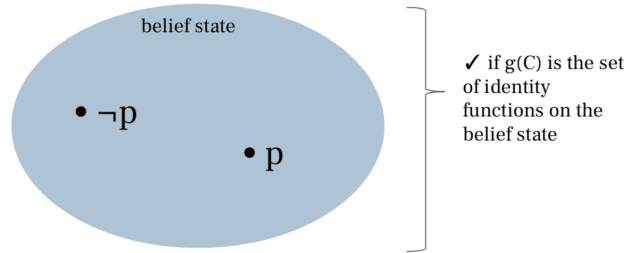

belief state

• ¬p

• p

✓ if g(C) is the set of identity functions on the belief state

Figure 2: (19b): ¬*ivək(p)* ∧ ¬*ivək(¬p)*

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[10]This alternative implementation is based on a suggestion by Roger Schwarzschild.

2 Flavours of attitude verbs and where they come from

- We want to make two points:

  - variable flavour can "come from" a separate item at LF (the bouletic flavour in Navajo and with *ivək*), but this is not always the case (the assertive flavour of *ivək*)

  - more cross-linguistic research is needed into flavour variation among attitude verbs – how (un)common is it?

2.1 Navajo and the role of the embedded clause (Bogal-Allbritten 2016)

- Another recently-discussed example of a verb with both doxastic and bouletic interpretations is the Navajo *nízin*, which can be interpreted as 'think', 'want/wish', and 'hope' (Bogal-Allbritten 2015, 2016).[11]

- Bogal-Allbritten argues that *nízin* is itself not specified for flavour, and that it is material in the embedded clause that determines the reading of this verb.

- Evidence from this comes from the fact that the various flavours of *nízin* (can) have overt correlates, but these correlates appear in the embedded clause.

- The presence of *sha'shin* results in a doxastic flavour, as in (24a), while *laanaa* is used for the bouletic one, as in (24b).

  (24)   a.   Hastiin [nahodoołțį́į́ł sha'shin] nízin.
             man   3S.rain.FUT   MODAL   3S.ATT
             'The man thinks it will probably rain.'   (2015, ex. 15a)

           b.   Alice [nahodoołțį́į́ł (laanaa)] nízin.
             Alice 3S.rain.FUT   DESIRE   3S.ATT
             'Alice wants, wishes it to rain.'   (2015, ex. 24)

- Further evidence comes from the fact that two clauses conjoined under *nízin* can have different flavours: in (25), the first clause has a doxastic interpretation, whereas the second has a bouletic one.

  (25)   Context: Alice thinks that Bill moved to Flagstaff. She wants to go visit him some time, but does not have any definite plans to do so and knows it is very likely it will not happen.
         Alice [Bill Kinłánígóó 'ííná]   'ákondi   [bich'į deesháál] nízin
         Alice Bill   Flagstaff.to 3S.move.PERF but.even.so 3O.to   1S.go.FUT 3S.ATT
         'Alice thinks Bill moved [to Flagstaff], but even so she wants to go see him.' (Bogal-Allbritten 2015, ex. 13)

- She proposes that *nízin* is only a predicate of mental attitude situations, in (26a), and that the embedded elements have meanings as in (26b).

  (26)   a. $\llbracket \textit{nízin} \rrbracket = \lambda s \lambda w.\text{mental–attitude}(s)(w)$ (2015, pp. 5–7)

           b. $\llbracket \textit{laanaa}/\emptyset_{des} \rrbracket = \lambda p \lambda s \lambda w.\forall w' \in \text{DES}(s)(w)[p(w')]$

           c. $\llbracket (24b) \rrbracket =$
              $\exists s[\text{mental-attitude}(s)(w_0) \wedge \text{experiencer}(\text{Alice})(s)(w_0) \wedge \forall w' \in \text{DES}(s)(w_0)[\text{rain}(w')]]$

- Crucially, for Bogal-Allbritten, the possible-worlds quantification lies in the embedded clause (DES abbreviates the doxastic + preference semantics).

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[11]Unlike *ivək*, it does not seem to have variability in force, having only necessity readings (Elizabeth Bogal-Allbritten, p.c. January 2019).

2.2   Koryak and the different role of the embedded clause (Močnik and Abramovitz 2019)

- In addition to the doxastic flavour, *ivək* also has some other flavours: assertive (§2.2.1), bouletic (§2.2.2), and others (see Appendix).

- Upshot: the bouletic flavour comes from the embedded clause (cf. Navajo *nízin*), but the assertive flavour does not

2.2.1   Assertive flavour

- *Ivək* is commonly used as an assertive verb meaning 'say/tell' (in fact, if you ask a speaker what *ivək* means, the answer will nearly always be 'say')

- From texts:

(27)   - tumɣ-ə-tuj-u,   ɣəm-nan   t-ə-n-toŋv-av-ə-n   oječv-at-ɣəjŋ-ə-n   -
         friend-E-2NSG-ABS.PL   1SG-ERG   1SG.S/A-E-CS-be.created-VB-E-3SG.O   play-VB-NMLZ-E-ABS.SG
       ∅-iv-i   kavaw
       2/3.S/A.IND-*ivək*-AOR   Kavaw.ABS.SG
       - miŋkəje   it-ə-lʔ-ə-n?   - na-pŋəlo-n   ənno   qaj-ə-kmiŋ-ə-jək-∅
         how   be-E-S/O.PTCP-E-ABS.SG   INV-ask-3SG.O   3SG.ABS   DIM-E-child-E-OBL.NSG-ERG
       '"Friends, I've created a game," **said** Kavaw. "What kind?" the children asked him.' (Vdovin and Jajletkan 1949)

(28)   jeq-ə-kjit   ənp-ə-qlavol-a   ∅-iw-nin   ŋavəčŋ-o,   əno
       what-E-NARR   old-E-man-ERG   2/3.S/A.IND-*ivək*-3SG.A > 3.O   woman-ABS.PL   that
       ∅-ku-leʔu-ŋ-nin   jatan   ənnen   kəmiŋ-ə-n?
       2/3.S/A.IND-PRS-see-PRS-3SG.A > 3.O   only   one   boy-E-ABS.SG
       'Why did the old man tell the women that he saw only one boy?' (Vdovin and Jajletkan 1949)

- Both the assertive and doxastic readings are found in nominalizations, suggesting that they don't require the presence of an embedded clause

(29)   ek-wəjŋ-ə-n
       ivək-NMLZ-E-ABS.SG
       'utterance, thought, something allowed'

- If we apply Bogal-Allbritten's conjunction test, we find that a single *ivək* cannot have a doxastic interpretation for one conjunct and an assertive interpretation for the other.

(30)   A principal enters the classroom of a teacher whose students are doing poorly in class and asks him how the students are doing. The teacher doesn't want to disappoint the principal, so he says 'The students are doing well'.
       #inenɣəjulevəčʔ-ə-n   ∅-iv-i   əno   ə-nine-w   jejɣučewŋəlʔ-u
       teacher-E-ABS.SG   2/3.S/A.IND-*ivək*-AOR   that   3SG-POSS-3PL   student-ABS.PL
       metʔa-ŋ   ∅-ko-ja-jɣočawŋ-ə-la-ŋ-∅   ʔam   əno   qekwa-ŋ
       beautiful-ADV   2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND   but   that   bad-ADV
       ∅-ko-jajɣočawŋ-ə-la-ŋ-∅
       2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND
       'The teacher **said** that his students are studying well but **thought** that they were studying badly.' (intended)

- The distinction between the doxastic 'think' and the assertive 'say' can be similarly specified with adverbials ('secretly', 'to oneself' vs. 'openly', 'with words'), and in some cases has to be, as in the example below. (Cf. *according to the law*, which can be used to specify the flavour of English modals like 'must'.)

(31) A teacher is always complaining to his wife about how bad his students are. One day, the principal
      asks him about his students, and he tells him that they are great.

   a. inenɣəjulevəč?-ə-n   ∅-iv-i   əno ə-nine-w   jejɣučewŋəl?-u met?a-ŋ
      teacher-E-ABS.SG   2/3.S/A.IND-*ivək*-AOR that 3SG-POSS-3PL   student-ABS.PL beautiful-ADV
      ∅-ko-jajɣočawŋ-ə-la-ŋ-∅   ?am   #(činin)   ∅-iv-i   əno
      2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND but   self   2/3.S/A.IND-*ivək*-AOR   that
      əčč-u   qekwa-ŋ   ∅-ko-jajɣočawŋ-ə-la-ŋ-∅
      3NSG-ABS.PL bad-ADV   2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND
      'The teacher said that his students studied well but thought to himself that they studied badly.'

   b. inenɣəjulevəč?-ə-n   ∅-iv-i   əno ə-nine-w   jejɣučewŋəl?-u qekwa-ŋ
      teacher-E-ABS.SG   2/3.S/A.IND-*ivək*-AOR that 3SG-POSS-3PL   student-ABS.PL bad-ADV
      ∅-ko-jajɣočawŋ-ə-la-ŋ-∅   ?am   #(?oja-ŋ)   ∅-iv-i   əno
      2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND but   open-ADV   2/3.S/A.IND-*ivək*-AOR   that
      əčč-u   met?a-ŋ   ∅-ko-jajɣočawŋ-ə-la-ŋ-∅
      3NSG-ABS.PL beautiful-ADV   2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND
      'The teacher thought that his students studied badly but openly said that they studied well.'

• Like the doxastic flavour, the assertive flavour also seems to display a weaker reading[12]

(32) Context: two people went out hunting and haven't come back. Hewngyto said that it's possible
      that they got lost, but he also said that it's possible that they hadn't.
      ?ewŋəto   ∅-iv-i   əno   taɣəjɲiŋ-ə-l?-ə-t
      Hewngyto.ABS.SG   2/3.S/A.IND-say-AOR   that   hunt-E-S/O.PTCP-E-ABS.DU
      ∅-təmŋew-ɣə?e   ənno   ?opta ∅-iv-i   əno   ət͡ɕt͡ɕ-i
      2/3.S/A.IND-get.lost-3DU.S.PST 3SG.ABS also   2/3.S/A.IND-say-AOR   that   3NSG-ABS.DU
      jatan ∅-ko-pel-aɲ-ŋ-e
      only   2/3.S/A.IND-PRS-remain-VB-PRS-3DU
      'Hewngyto suggested that the hunters had gotten lost. He also suggested that they are just late.'

2.2.2 Bouletic flavour

• The bouletic flavour, unlike the doxastic one, is not found in the nominalization of *ivək*

(33) a. ek-wəjŋ-ə-n
         ivək-NMLZ-E-ABS.SG
         'utterance, thought, something allowed, *hope, *fear, *wish'

   b. ɣajm-at-ɣəjŋ-ə-n
      want-VB-NMLZ-E-ABS.SG
      'wish/desire'

• We performed the embedded conjunction test from Bogal-Allbritten (2016). Here is how the doxastic-
bouletic conjunction differs from the doxastic-assertive one, where we could not get different flavours:

(34) a. We're talking about our mutual friend Tatiana, who lives in Novosibirsk.
         t-ə-k-iv-ə-ŋ-∅   [əno   tatjana   ∅-ko-tva-ŋ-∅
         1SG.S/A-E-PRS-*ivək*-E-PRS   that   Tatiana.ABS.SG   2/3.S/A.IND-PRS-be-PRS-3.S.IND
         novosibirsk-ə-k]   to [əno ečɣi ∅-ku-kəčviʎ?-et-ə-ŋ-∅]
         Novosibirsk-E-LOC   and that today 2/3.S/A.IND-PRS-be.happy-VB-E-PRS-3.S.IND
         'I **think** that Tatiana is in Novosibirsk and I **hope** that she is happy today.'

   b. Hewngyto and Qechghylqot are competing in a race, and I want Hewngyto to win.

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[12]Recall that this was done in a matching task; we have not tested this yet with the adverbials 'openly'/'with words'.

t-ə-k-iv-ə-ŋ-∅   [əno ʔewŋəto   ∅-j-ena-lv-at-ə-ŋ-∅]
1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S that Hewngyto.ABS.SG 2/3.S/A.IND-FUT-AP-defeat-VB-FUT-3.S.IND
ʔam [əno ewənčam   qečɣəlqot   ∅-j-ena-lv-at-ə-ŋ-∅]
but that nonetheless Qechghylqot.ABS.SG 2/3.S/A.IND-FUT-AP-defeat-VB-FUT-3.S.IND
'I **hope** that Hewngyto will win, but I **allow for the possibiliy** that nonetheless Qechghylqot
will win.'

   c. ʔewŋəto   ∅-k-iv-ə-ŋ-∅   [əno meʎʎo   mitʔa-jin]
      Hewngyto.ABS.SG 2/3.S/A.IND-PRS-*ivək*-PRS-3.S.IND that Melljo.ABS.SG beautiful-ADJ.SG
      to   [iwke n-ə-ʔ-ə-ŋawtəŋ-ə-n   ən-ə-k]
      and if.only 2/3.S/A.CF-E-CF-E-marry-VB-E-2/3.S/O.CF 3SG-E-LOC
      'Hewngyto **thinks** that Melljo is beautiful and **wishes** he would marry her.'

- The group attitude holder test from Bogal-Allbritten (2016) shows a lack of a hope/fear distinction,
though the verb does not seem to express a lack of preference

(35) Hewngyto and Vanja are in a race. Qotaw and I have bet money on the winner: I bet money on
     Hewngyto, and Qotaw bet on Vanja.
     muj-i   qotaw   mət-k-iv-ə-ŋ-∅   [amu ʔewŋəto
     1NSG-ABS.DU Qotaw.ABS.SG 1NSG.S/A-PRS-*ivək*-E-PRS-1NSG.S/O might Hewngyto.ABS.SG
     ∅-j-ena-lv-at-ə-ŋ-∅   ʔije-k]
     2/3.S/A.IND-FUT-AP-defeat-VB-FUT-3.S.IND race-LOC
     'I hope and Qotaw fears that Hewngyto will win the race.'
     (literally, Qotaw and I ***ivək*** that Hewngyto will win the race)

(36) #ɣəmmo t-ə-k-iv-ə-ŋ   metke je-muq-et-ə-ŋ   metke qəjəm
     1SG.ABS 1SG.S/A-E-PRS-say-E-PRS POL.Q FUT-rain-VB-E-FUT POL.Q NEG.IRR
     intended: 'I don't care whether or not it's raining.'

- We have not yet found a fear-version of wish: 'I *ivək* that I was sad' would presuppose that I am happy
and assert that being sad is dispreferable.

2.2.3 How can we capture this formally?

- One way to model the doxastic-assertive distinction is with underspecification (a free variable at LF):

(37) Denotation of *ivək* (final):
     $[\![ivək]\!]^{c,g,w} = \lambda i \lambda C \lambda p \lambda x :$
     $\big(i(x)(w) = \mathcal{B}_w^x \vee i(x)(w) = \mathcal{S}_w^x\big) \quad \wedge$
     $\big(C = \{f \mid f(i(x)(w)) = i(x)(w)\} \vee C = \{f \mid f(i(x)(w)) \subseteq i(x)(w) \wedge f(i(x)(w)) \neq \emptyset\}\big)$.
     $\exists f \in C[\forall w' \in f(i(x)(w))[p(w') = 1]]$

- The bouletic flavour we can model with a preference component in the embedded clause

(38) a. $[\![\cdot]\!]^{g,\langle w,\langle a,v,I\rangle\rangle}$, where w is the world of evaluation and $\langle a,v,I\rangle$ is the information state (see Yalcin
       2007) of evaluation (a is the information state holder, v is the world from which the state is
       generated and $\mathcal{I}$ (of type *esst*) is the way in which the state is generated)

    b. $\langle a,v,I\rangle$ corresponds to I_v^a

    c. Example: $\langle j,w,\mathcal{B}\rangle$, which corresponds to $\mathcal{B}_j^w$ (John's beliefs at w)

(39) $[\![ivək]\!]^{c,g,\langle w,\langle a,v,\mathcal{I}\rangle\rangle}(i)(C)(p)(x)$
     is defined only if
         $i(x)(w) = \mathcal{B}_w^x$ or $i(x)(w) = \mathcal{S}_w^x$ and
         $C = \{f \mid f(i(x)(w)) = i(x)(w)\}$ or $C = \{f \mid f(i(x)(w)) \subseteq i(x)(w) \wedge f(i(x)(w)) \neq \emptyset\}$
     and, if defined, is true iff
     $\exists f \in C \ \forall w' \in f(i(x)(w)) \ \big[p\big(\langle w', \langle x,w, \lambda y \lambda w''.f(i(y)(w''))\rangle\rangle\big) = 1\big]$

If defined, $[\![wish]\!]^{g,c}(\geq, p, x, w) = 1$ iff $\forall w' \in \mathcal{B}_w^x : \text{SIM}(w', rev_p(\mathcal{B}_w^x) \cap p) >_w^x w'$ (Crnič 2011, p. 75) (based on Heim 1992, p. 204)

issue: belief-state contingent

the goal is to abstract this out

If defined, $[\![\text{CF}]\!]^{c,g,\langle w', \langle a, v, \mathcal{I}\rangle\rangle}(p) = 1$ iff $\text{SIM}(w', rev_p(\mathcal{I}_v^a) \cap p) >_v^a w'$

- Let's illustrate with 'wish' (*ivək* + CF mood)

(40) Example (Englishized Koryak): If defined,
$[\![\text{John } [[ivək\ m]\ C]\ [\text{that CF it's raining}]]\!]^{c,g,w,\langle a,v,\mathcal{I}\rangle} = 1$ iff
$[\![ivək]\!]^{c,g,w,\langle a,v,\mathcal{I}\rangle}(g(m))(g(C))([\![\text{that CF it's raining}]\!]_{\mathbb{C}}^{c,g})(j) = 1$ iff
$\exists f \in g(C)\ \forall w' \in f(g(m)(j)(w)) : [\![\text{that CF it's raining}]\!]_{\mathbb{C}}^{c,g}(w', \langle j, w, \lambda x \lambda v. f((g(m)(x)(v))\rangle) = 1$ iff
$\exists f \in g(C)\ \forall w' \in f(g(m)(j)(w)) : [\![\text{that CF it's raining}]\!]^{c,g,\langle w', \langle j,w,\lambda x\lambda v.g(C)((g(m)(x)(v))\rangle\rangle} = 1$ iff
$\exists f \in g(C)\ \forall w' \in f(g(m)(j)(w)) : \text{SIM}(w', rev_\varphi(f(g(m)(j)(w))) \cap \varphi) >_w^j w'$ (where φ abbreviates $\lambda w.$ it's raining at w)

Suppose that $g(C)$ is $\mathcal{C}_{id}$ and $g(m)$ is $\mathcal{B}$, then this amounts to:
$\forall w' \in \mathcal{B}(j)(w) : \text{SIM}(w', rev_\varphi(\mathcal{B}(j)(w))) \cap \varphi) >_w^j w'$

(41) Example (Englishized Koryak):[13] If defined,
$[\![\text{John } [[ivək\ m]\ C]\ [\text{Melljo is pretty and CF John marry Melljo}]]\!]^{c,g,w,\langle a,v,\mathcal{I}\rangle} = 1$ iff
$\exists f \in g(C)\ \forall w' \in f(g(m)(j)(w)) : [\![\text{M is pretty and CF J marry M}]\!]^{c,g,\langle w', \langle j,w,\lambda x\lambda v.g(C)((g(m)(x)(v))\rangle\rangle} = 1$ iff
$\exists f \in g(C)\ \forall w' \in f(g(m)(j)(w)) : \text{M is pretty at } w' \text{ and } [\![\text{CF J marry M}]\!]^{c,g,\langle w', \langle j,w,\lambda x\lambda v.g(C)((g(m)(x)(v))\rangle\rangle} = 1$
iff $\exists f \in g(C)\ \forall w' \in f(g(m)(j)(w)) : \text{Melljo is pretty at } w' \text{ and } \text{SIM}(w', rev_\varphi(f(g(m)(j)(w))) \cap \varphi) >_w^j w'$
(where φ is $\lambda w.$ John marries Melljo at w)

- The hope/fear decomposition would proceed in a similar way (*ivək* + covert item DES).[14]

(42) If defined, $[\![hope]\!]^{g,c}(\geq, p, x, w) = 1$ iff $\forall w' \in \mathcal{B}_w^x : \text{SIM}(w', \mathcal{B}_w^x \cap p) >_w^x \text{SIM}(w', \mathcal{B}_w^x \backslash p)$ (Crnič 2011, p. 76); (roughly, for any belief world w': x prefers p at w')

(43) a covert preference item in the Koryak embedded clause:
If defined, $[\![\text{DES}]\!]^{c,g,\langle w', \langle a,v,\mathcal{I}\rangle\rangle}(p) = 1$ iff
$[\text{SIM}(w', \mathcal{I}_v^a \cap p) >_v^a \text{SIM}(w', \mathcal{I}_v^a \backslash p)] \vee [\text{SIM}(w', \mathcal{I}_v^a \backslash p) >_v^a \text{SIM}(w', \mathcal{I}_v^a \cap p)]]$
(roughly, a prefers p at w' or a disprefers p at w', where a's preference is set at v)

- We do not know whether *ivək* also has a 'mixed-feelings' reading (it does not seem to have the I-don't-care reading, are these different?). This reading would be one where in some some doxastic worlds p is preferred and in others $\neg p$ is preferred. If this reading turns out to not be available, one can place a homogeneity condition (as a definedness condition) on the preference ($>$) relation.

Contributions of Močnik and Abramovitz (2019)

- methodological: solution for doing semantic fieldwork when contextual felicity judgments fail

- empirical: variable-force attitude verb, variable-force-variable-flavour attitude verb

- theoretical: a new way of composing the bouletic meaning at LF (a doxastic quantifier + a preference component) [our account differs in this respect from Bogal-Allbritten (2016)]

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[13] When we see one overt *ivək*, there could be a gapped *ivək*. This would mean two instances of *ivək* at LF with $g(C)$ and $g(m)$ needing to receive identical interpretations. Notice that $g(C)$ could be $\mathcal{C}_{all}$, which would allow for variable force.

[14] Ideally, the counterfactual mood might in fact build on this covert item, cf. Iatridou (2000).

2.3 How common is variable flavour? An example from Biblical Hebrew and maybe English.

- In Biblical Hebrew, the verb *ʔ-m-r* typically means 'say' (as it does in the modern language), but also has a variety of other meanings, including 'think' (often, though not obligatorily, in the context of the PP *in X's heart*), 'promise','intend', and possibly 'hope.'[15]

(44)   a. 'think'
            way-yōmer   ʕēśāw bə-libb-ō   yi-qrə b-ū   yə mē ʔēbel   ʔāb-ī
            and-said.3.M.SG Esau   in-heart-his 3-approach-M.PL days mourning father-my
            'Esau thought to himself (lit. 'said in his heart'): the days of mourning my father approach.'
            (Gen 27.41)

       b. 'promise'
            ʔāmar-tī   li-šmōr   də bārē-kā
            promise.PFV-1.SG to-keep.INF words-your
            'I promised to keep your words' (Ps 119.57)

       c. 'intend'
            hª-lə-horg-ēnī   attā šōmēr?
            Q-to-kill.INF-me you   intend.PTCP.M.SG
            'Do you intend to kill me?' (Exod 2.14)

       d. 'hope'(?)
            way-yōmer   lə-biqʔ-ām   ʔēl-āyw
            and-hoped/intended.3.M.SG to-cut.off.INF-them for-him
            'He hoped/intended to annex them (lit. cut them off) for himself.' (2 Chr 32.1)

- The English expression *be like* also seems to be either doxastic or assertive: the person who holds the attitude can, but does not have to, have expressed it out loud.

  (45)   I was like, that's a bad idea.

  Caveat: *be like* is obligatorily quotative:

  (46)   a. John$_j$ was like, he$_{i/*j}$ is tall
         b. *Who was John like Mary saw __?

- formal/archaic Slovenian *meniti* ('think', 'say')?

  (47)   a. Menim, da   dežuje.
              I.think   that it's.raining
              'I think it's raining.'

         b. lahko greste, meni zaničljivo,   toda prej   plačajte
              can   you.go says contemptibly but   before pay
              'You can go, he said contemptibly, but pay first.' (example from SSKJ)

2.4 How do we express attitudinal flavour in natural language? Some preliminary thoughts.

- lexically encoded: *wish, say, think, order,…*

- separate material in the embedded clause (not flavour variation per se):
  Navajo *nízin* to obtain the bouletic flavour,
  Koryak *ivək* to obtain the bouletic flavour (see Appendix for the directive flavour with an embedded imperative)

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[15]Thanks to Matthew Hewett for providing us with these data.

- (optional) adverbial specification:
  Koryak *ivək*: 'openly'/'with words' (assertive flavour) vs. 'secretly'/'to self' (doxastic flavour)
  Biblical Hebrew: 'in my heart' (doxastic flavour)

- "reflexive" clitics:
  Slovenian *meniti* ('think') vs. *meniti se* ('talk about'), *spraševati se* ('wonder') vs. *spraševati* ('be asking')
  [marks a transition between the doxastic-assertive domains – private vs. public?]

3   Mixing force and flavour: attitudes vs. modals

Comparison of force:

	fixed force	variable force
universal base	*must*	*k'a* (St'át'imcets)
existential base	*may*	*oq'a* (Nez Perce)

Figure 3: Typology of force variation in the modal domain (some examples)

	fixed force	variable force
universal base	*know, believe,…*	*ivək* (Koryak)
existential base	*dopuščati* (Slovenian)	?

Figure 4: Typology of force variation in the attitudinal domain (some examples)

Comparison of flavour:

fixed flavour	variable flavour
k'a (St'át'imcets)	*must*

Figure 5: Typology of flavour variation in the modal domain (some examples)

fixed flavour	variable flavour
know	*ivək* (Koryak)

Figure 6: Typology of flavour variation in the attitudinal domain (some examples)

Mixing force and flavour, against Nauze (2008):[16]

	fixed flavour	variable flavour
universal	*mesthi* (Javanese)	*must*
existential	*might*	*may*
universal + weakening	*k'a* (St'át'imcets)	*-eʔ* (Washo)
existential + strengthening	*oq'a* (Nez Perce)	?

Figure 7: Typology of force-flavour combinations in the modal domain (some examples)

	fixed flavour	variable flavour
strictly universal	*know, believe, …*	*ʔ-m-r* (Biblical Hebrew)?
strictly existential	?	*dopuščati* (Slovenian)
universal + weakening	?	*ivək* (Koryak)
existential + strengthening	?	?

Figure 8: Typology of force-flavour combinations in the attitudinal domain (some examples)

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[16]"Modal elements [...] either vary on the [flavour] axis and thus are polyfunctional in the original sense of expressing different types of modality or they vary on the [force] axis and can express possibility and necessity, but they cannot vary on both axes." (p. 222)

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16

Appendix: Various further empirical points

- *ivək* is not factive, by contrast to *liɣi ləŋak* 'know'

(48) Hewngyto silently leaves his room with a rain jacket. I know that it is not raining and that it won't. I say:

    a. ujŋe   e-muq-et-ke   ∅-k-it-ə-ŋ-∅,   ʔam   ʔewŋəto
       NEG.RLS   NEG-rain-VB-NEG   2/3.S/A.IND-PRS-be-E-PRS-3.S.IND   but   Hewngyto.ABS.SG
       ∅-k-iv-ə-ŋ-∅,   əno   ∅-ku-muq-et-ə-ŋ-∅
       2/3.S/A.IND-PRS-*ivək*-E-PRS-3.S.IND   that   2/3.S/A.IND-PRS-rain-VB-E-PRS-3.S.IND
       'It is not raining but Hewngyto **thinks** that it's raining.'

    b.#ujŋe   e-muq-et-ke   ∅-k-it-ə-ŋ-∅,   ʔam
       NEG.RLS   NEG-rain-VB-NEG   2/3.S/A.IND-PRS-be-E-PRS-3.S.IND   but
       ʔewŋəto-na-k   liɣi   ∅-ku-lŋ-ə-ŋ-nin,   əno
       Hewngyto-OBL.SG-ERG   know?   2/3.S/A.IND-PRS-consider-E-PRS-3SG.A>3.O   that
       ∅-ku-muq-et-ə-ŋ-∅
       2/3.S/A.IND-PRS-rain-VB-E-PRS-3.S.IND
       'It is not raining but Hewngyto knows that it is raining.'

- adverbials like *amu* ('might'; it is also used to form *wh*-indefinites) facilitate the weaker reading:[17]

(49) ɣəmmo t-ə-k-iv-ə-ŋ-∅,   amu   ∅-je-muqe-juʔ-ə-ŋ-∅
     1SG.ABS 1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S might 2/3.S/A.IND-FUT-rain-INCH-E-FUT-3.S.IND
     'I **allow for the possibility** that it will rain.' [translation to Koryak task]

Amu also preferably appears with 'hope' and 'fear':

(50) ʔewŋəto   ∅-k-iv-ə-ŋ-∅,   əno   (amu)
     Hewngyto.ABS.SG   2/3.S/A.IND-PRS-*ivək*-PRS-3.S.IND   that   might
     qoja-wjep-ə-lʔ-o   vəʔajok   ∅-ja-pkej-ʎa-ŋ-∅
     reindeer-herd-E-S/O.PTCP-ABS.PL   soon   2/3.S/A.IND-FUT-arrive-PL-FUT-3.S.IND
     ənək-nəmnəm-etəŋ
     3SG.POSS-village-ALL
     'Hewngyto **hopes** that the reindeer herders will soon arrive to his village.'

(51) ŋeveq   ʔewŋəto   n-ə-ʔ-iv-ə-n,   amu
     if   Hewngyto.ABS.SG   2/3.S/A.CF-E-CF-*ivək*-E-2/3.S/O.CF   might
     ∅-j-ena-lv-at-ə-ŋ-∅   ʔije-k,   ənnenu
     2/3.S/A.IND-FUT-AP-defeat-VB-E-PRS-3.O.IND   race-LOC   constantly
     n-aʔ-ə-t͡ɕot͡ɕt͡ɕəm-av-eke
     2/3.S/A.CF-CF-E-prepare-VB-IPFV
     'If Hewngyto **hoped** to win the race, he would be constantly training.'

- not disjunctive ('think or say') truth-conditions[18]

(52) Context: The school principal goes into the classroom of a teacher whose students are doing poorly in class, and asks the teacher how the students are doing. The teacher doesn't want to disappoint him, so he says, 'The students are doing well'.

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[17]Speakers have occasionally insisted on using *amu*, though no generalization as to when it is obligatory is forthcoming. We suspect that the weaker reading is simply harder to access, and that adverbs like *amu* facilitate it. This may be related to Rullmann et al. (2008)'s observation that St'át'imcets *sxek* ('maybe') is frequently used in clauses with variable-force modals when the possibility reading is intended.

[18]If *ivək* asserted a disjunction ('The teacher thought or said that the students studied badly'), negating *ivək* would rule out both thinking and saying, which would be inconsistent with the continuation that the teacher believed that the students studied badly (thanks to Roger Schwarzschild for the suggestion).

inenɣəjulevəč?-ə-n   ujŋe   ∅-iw-ke   ∅-itt-i,   əno   ə-nine-w
teacher-E-ABS.SG   NEG.RLS   NEG-say-NEG   2/3.S/A.IND-be-AOR   that   3SG-POSS-3PL
jejɣučewŋəl?-u   qekwa-ŋ   ko-jajɣočawŋ-ə-la-ŋ,   ?am   ŋanko
student-ABS.PL   bad-ADV   2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND but   then
∅-ləmal-av-e,   əno qekwa-ŋ ∅-ko-jajɣočawŋ-ə-la-ŋ-∅.
2/3.S/A.IND-believe-VB-AOR   that bad-ADV 2/3.S/A.IND-PRS-study-E-PL-PRS-3.S.IND
'The teacher did not **say** that his students studied badly, but he believed then that they studied badly.'

• adverb *wəjinvan* 'fortunately' is only acceptable with the 'hope' reading

(53) a. t-ə-k-iv-ə-ŋ   wəjinvan   mitiw   t-ə-je-pʎətku-ŋ-ə-n
          1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S   fortunately tomorrow   1SG.S/A-E-FUT-finish-FUT-E-3SG.O
          wuččin   vet-ɣəjŋ-ə-n
          this.ABS.SG work-NMLZ-E-ABS.SG
          'I **hope** that I will finish this work tomorrow'

      b. t-ə-k-iv-ə-ŋ   (#wəjinvan)   mitiw   qəjəm
          1SG.S/A-E-PRS-*ivək*-E-PRS-1SG.S   (fortunately)   tomorrow   NEG.IRR
          m-ə-pʎətku-n   wuččin   vet-ɣəjŋ-ə-n
          1SG.S/A.IMP-E-finish-3SG.O this.ABS.SG work-NMLZ-E-ABS.SG
          'I **fear** that I will not finish this work tomorrow'

• some other flavours of *ivək*

(54) t-ik-wi   {jən-nəm-at-ə-k   / q-ə-n-nəm-at-ɣ-ə-n}   təll-ə-təl
      1SG.S/A-ivək-2SG.O CS-close-VB-E-INF   2.S/A.IMP-E-CS-close-VB-2A.IMP-E-3SG.O   door-E-ABS.SG
      'I **told** you to close the door.' [translation from Russian to Koryak]

(55) ɣəm-nan t-iw-ne-w   tumɣ-u   qət-ə-k   ŋanen-awje-ja-jtəŋ
      1SG-ERG 1SG.S/A-ivək-3.O-3PL friend-ABS.PL go-E-INF   that-eat-house-ALL
      'I told the friends to go to that restaurant.' [Koryak to Russian translation]
      'I {**advised**/**recommended**/**proposed**/**suggested**} (to) the friends to go to that restaurant.' [matching]

(56) ɣəm-nan t-iv-ə-n   ?ewŋəto   əno qəjom   m-ə-tul?-et-ə-n
      1SG-ERG 1SG.S/A-say-E-3SG.O Hewngyto.ABS.SG that NEG.IRR 1SG.S/A.IMP-E-steal-VB-E-3SG.O
      ə-nin   milɣ-ə-?əj
      3SG-POSS   fire-E-bow.ABS.SG
      'I **promised** Hewngyto that I would not steal his gun.'

(57) ujŋe   iw-ke   ∅-itt-i,   əɲŋə?an ∅-j-it-ə-ŋ-∅
      NEG.RLS   *ivək*-NEG 2/3.S/A.IND-be-AOR   thus   2/3.S/A.IND-FUT-be-E-3.S.IND
      'I did not **expect** that that would happen.'