

# Decomposing the Croatian 'know'

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Der Wissenschaftsfonds.

## All the things one can *znati* ‘know’ in Croatian

- (1) a. *Viki zna Marina.*  
Viki know.3SG Marin.ACC  
‘Viki knows Marin.’ FAMILIARITY
- b. *Viki zna da je njezin bicikl crven.*  
Viki know.3SG that is her bicycle red  
‘Viki knows that her bicycle is red.’ ATTITUDE
- c. *Viki zna kako voziti bicikl.*  
Viki know.3SG how drive.INF bicycle  
‘Viki knows how to ride a bicycle.’ ABILITY
- d. *Viki zna voziti bicikl.*  
Viki know.3SG drive.INF bicycle  
‘Viki knows how to ride a bicycle.’ ABILITY  
‘Viki occasionally rides a bicycle.’ HABITUAL-LIKE
- e. *Ove ladice znaju zapeti.*  
these drawers know.3PL get.stuck.INF  
‘These drawers occasionally get stuck.’ HABITUAL-LIKE

- Common core  $\approx$  mental acquaintance.

# In a nutshell

- Habitual-like *znati*: **iterativity** and **evidentiality**.
  - The speaker infers **recurrence** based on limited evidence and her or his **mental acquaintance** with the world.
- Different flavours of *znati*:
  - Lexical root  $\sqrt{zna-}$  and different functional heads (Cavirani-Pots 2020, Cinque 1999, 2006).

# The habitual-like *znati*

## What is habituality?

- (2) a. *Simon used to believe in ghosts.* (Comrie 1976, 27)  
 b. *Alice smokes.*  
 c. *This machine crushes oranges.* (Krifka et al. 1995, 54)

- Aspect, iterativity, modality, genericity, evidentiality? (Appendix)

A diverse concept encompassing (classes of) expressions which display distinct but overlapping **clusters of properties**.

- **Habituality**  $\approx$  a state of affairs holds for an extended period of time.
- A single expression may combine properties of multiple categories.
  - Iterativity, imperfectivity, modality, ...
- Habitual-like *znati*: **iterativity** and **evidentiality**.
  - Other combinations: English *would*, Croatian *bi* ‘would’, Hebrew *hyy* lit. ‘be’, German *pfliegen* lit. ‘cultivate, nurse’ (Appendix).

# Raising

- No restrictions on the subject, no ‘knowing’.

- (3) a. *U travnju zna sniježiti.*  
 in April know.3SG snow.INF  
 ‘It occasionally snows in April.’ WEATHER PREDICATE
- b. *Vrag zna odnijeti šalu.*  
 devil know.3SG take.away.INF joke.ACC  
 ‘Things occasionally get serious.’  
 (lit. The devil occasionally takes away the joke.) IDIOM CHUNK
- c. *Ove ladice znaju zapeti.*  
 these drawers know.3PL get.stuck.INF  
 ‘These drawers occasionally get stuck.’ INANIMATE SUBJECT

- Core meaning: [iteration](#) / [recurrence](#).

## Iterativity

- The embedded eventuality needs to be repeatable.

- (4) #*Dijanin hram je znao stajati u Efezu.*  
 Dijana.POSS temple AUX.3SG know.PTCP.SG.M stand.INF in Ephesus  
 Intended: 'The Temple of Diana used to stand at Ephesus.' STATIVE
- (5) a. #*Marin zna biti ljevak.*  
 Marin know.3SG be.INF leftie  
 #'Marin is sometimes a leftie.' INDIVIDUAL-LEVEL
- b. *Nobelovci znaju biti ljevaci.*  
 Nobel.prize.winners know.3PL be.INF lefties  
 'Nobel prize winners are sometimes lefties.' INDIVIDUAL-LEVEL
- (6) #*Zrinka zna maturirati s odličnim uspjehom.*  
 Zrinka know.3SG graduate.from.high.school.INF with excellent success  
 #'Zrinka occasionally graduates from high school with excellent grades.'  
 ONCE-ONLY (DE SWART 1993)

## Evidentiality

- One occurrence suffices  $\rightsquigarrow$  iteration may be inferred.
- (7) Igor is travelling to Spain for the first time for his summer holiday. Upon his arrival, it starts to rain. From this one instance of rain, he can conclude:

*U Španjolskoj ljeti zna padati kiša.*  
 in Spain in.summer know.3SG fall.INF rain  
 ‘It occasionally rains in Spain during the summer.’

- Possibility of recurrence from the speaker’s perspective is crucial.
- (8) Marina started a new job. She decided to go to work by bus. She only went there once, and then she died. (based on Boneh & Doron 2013)

*#Marina je znala ići na posao autobusom.*  
 Marina AUX.3SG know.PTCP.SG.F go.INF on work bus.INSTR  
 #‘Marina occasionally went to work by bus.’



## Actualisation

- The embedded eventuality needs to be **actualised**.
- (9) Looking at a piece of land with hydrangea-friendly conditions (but no traces of actual hydrangeas at or before the time of the utterance to the best of the speaker's knowledge).
- a. *Ovdje mogu / moraju niknuti hortenzije.*  
 here can.3PL must.3PL sprout.INF hydrangeas  
 'Hydrangeas can / must sprout here.' (based on Kratzer 1991)
- b. #*Ovdje znaju niknuti hortenzije.*  
 here know.3PL sprout.INF hydrangeas  
 #'Hydrangeas occasionally sprout here.'
- Inference based on (reliable) **evidence**  $\rightsquigarrow$  not (pure) modality.
    - Further evidence against modality: accidental recurrence, incompatibility with negation (Appendix).

## Summary: Habitual-like *znati*

- **Iterativity:** the embedded predicate has to be **repeatable**.
- **Evidentiality:** iteration may be **inferred** based on limited **evidence** and the speaker's **knowledge** about the world.
- How are iterativity and evidentiality encoded in the grammar?
- Proposal: lexical root  $\sqrt{zna-}$  and an iterative functional head.
  - **Evidentiality** reflects the core **mental acquaintance** meaning of  $\sqrt{zna-}$ .
  - **Iterativity** comes from the **iterative functional head**.

# The proposal: Roots meet cartography

## Semi-lexicity

- Lexical items: e.g., *sulk*, *cheese*, *fabulous*.
- Functional items: e.g., *-ing*, *-s*, *the*.
- **Semi-lexical** items (Emonds 1985, Corver & Van Riemsdijk 2001): e.g., raising *threaten/promise* (Verhagen 1995), durative *zitten* ‘sit’ in Dutch (Cavirani-Pots 2020).

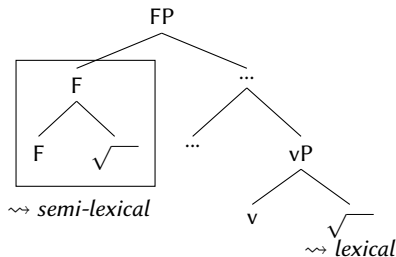
- (10) a. *It promises to be a hot and grueling day.* (Traugott 1997, 185)  
 b. *Ik heb de hele dag zitten te lezen.*  
 I have the entire day sit to read  
 ‘I have been reading the entire day.’ (Cavirani-Pots 2020, 1)

- Proposal: habitual-like *znati* is semi-lexical.

## Cavirani-Pots (2020)

- Strict division between lexical roots and functional heads.
  - ↪ No inherently semi-lexical items.
- Semi-lexicity in the syntax.

(11)



(see Cavirani-Pots 2020, 3)

- What is F?

# Cartographic clause structure (Cinque 1999, 2006)

- Cinque hierarchy (Cinque 2006, 93, 175).
- (12) Mood<sub>speech act</sub> (frankly, honestly) » Mood<sub>evaluative</sub> ((un)fortunately, luckily) » Mood<sub>evidential</sub> (allegedly, reportedly) » Mood<sub>epistemic</sub> (probably, presumably) » T<sub>past</sub> (yesterday) » T<sub>future</sub> (tomorrow) » Mood<sub>irrealis</sub> (perhaps) » T<sub>anterior</sub> » Mod<sub>alethic</sub> (necessarily) » Asp<sub>habitual</sub> (usually, generally) » Asp<sub>repetitive(I)</sub> (again) » Asp<sub>iterative(I)</sub> (repeatedly, often) » Mod<sub>volition</sub> » Asp<sub>celerative(I)</sub> (quickly) » Asp<sub>terminative</sub> (no longer) » Asp<sub>continuative</sub> (still) » Asp<sub>perfect</sub> » Asp<sub>retrospective</sub> (just) » Asp<sub>proximative</sub> (soon) » Asp<sub>durative</sub> (long, briefly) » Asp<sub>progressive</sub> (usually) » Asp<sub>prospective</sub> (almost) » Asp<sub>inceptive(I)</sub> » Mod<sub>obligation</sub> (necessarily) » Mod<sub>ability</sub> (possibly) » Asp<sub>frustrative/success</sub> » Mod<sub>permission</sub> » Asp<sub>conative</sub> » Asp<sub>completive(I)</sub> (completely) » Voice (well) » Asp<sub>celerative(II)</sub> (quickly, fast) » Asp<sub>inceptive(II)</sub> » Asp<sub>completive(II)</sub> » Asp<sub>repetitive(II)</sub> » Asp<sub>iterative(II)</sub> (often) » V
- $\sqrt{\quad}$  & F must be compatible (Klockmann 2017, Cavirani-Pots 2020).

## Habitual-like *znati*

The speaker infers **iteration** based on limited (direct or indirect) **evidence** and her or his **knowledge** about the world.

- $\sqrt{zna-}$  + Asp<sub>iterative</sub>

(13) Mood<sub>speech act</sub> » Mood<sub>evaluative</sub> » Mood<sub>evidential</sub> » Mood<sub>epistemic</sub> » **T<sub>past</sub>** » **T<sub>future</sub>** »  
 Mood<sub>irrealis</sub> » **T<sub>anterior</sub>** » Mod<sub>alethic</sub> » Asp<sub>habitual</sub> » Asp<sub>repetitive(I)</sub> » **Asp<sub>iterative(I)</sub> +  $\sqrt{zna-}$**   
 » Mod<sub>volition</sub> » Asp<sub>celerative(I)</sub> » Asp<sub>terminative</sub> » Asp<sub>continuative</sub> » Asp<sub>perfect</sub> » Asp<sub>retrospective</sub> »  
 Asp<sub>proximative</sub> » Asp<sub>durative</sub> » Asp<sub>progressive</sub> » Asp<sub>prospective</sub> » Asp<sub>inceptive(I)</sub> » Mod<sub>obligation</sub> »  
 Mod<sub>ability</sub> » Asp<sub>frustrative/success</sub> » Mod<sub>permission</sub> » Asp<sub>conative</sub> » Asp<sub>completive(I)</sub> » **Voice** »  
 Asp<sub>celerative(II)</sub> » Asp<sub>inceptive(II)</sub> » Asp<sub>completive(II)</sub> » Asp<sub>repetitive(II)</sub> » Asp<sub>iterative(II)</sub> » V

- **Iterativity:** Asp<sub>iterative</sub>.
- **Evidentiality:**  $\sqrt{zna-}$ .
  - Raising verb: above the subject (and above Voice)  $\rightsquigarrow$  mental acquaintance applied to the **speaker**.<sup>1</sup>
  - Evidentiality is not grammaticalised: evidence from negation (Appendix).

<sup>1</sup>See, e.g., Speas & Tenny (2003) for a speaker argument in the syntax (in  $\approx$  Mood<sub>speech act</sub>).

## All the things one can *znati* (again)

- (14) a. *Viki zna Marina.*  
 Viki know.3SG Marin.ACC  
 ‘Viki knows Marin.’ FAMILIARITY
- b. *Viki zna da je njezin bicikl crven.*  
 Viki know.3SG that is her bicycle red  
 ‘Viki knows that her bicycle is red.’ ATTITUDE
- c. *Viki zna (kako) voziti bicikl.*  
 Viki know.3SG how drive.INF bicycle  
 ‘Viki knows how to ride a bicycle.’ ABILITY
- d. *Ove ladice znaju zapeti.*  
 these drawers know.3PL get.stuck.INF  
 ‘These drawers occasionally get stuck.’ HABITUAL-LIKE

- Habitual-like *znati*:  $\sqrt{zna^-}$  + Asp<sub>iterative</sub>.
- Familiarity & attitude *znati*:  $\sqrt{zna^-}$  + v (lexical).
- Mental ability?



## Mental ability *znati*

- Semi-lexical:  $\sqrt{zna-}$  + Mod<sub>ability</sub>.
  - Lexical: mental acquaintance/knowledge applies to the subject.
  - Functional: ordering restrictions.

(15) *Viki zna<sub>iter</sub> znati<sub>abil</sub> voziti bicikl.*

Viki know.3SG know.INF drive.INF bicycle

‘Viki occasionally knows how to ride a bicycle.’

\*‘Viki knows how to occasionally ride a bicycle.’

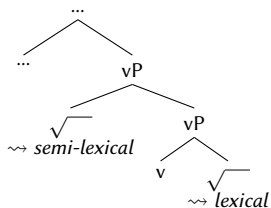
ITER > ABIL

\*ABIL > ITER

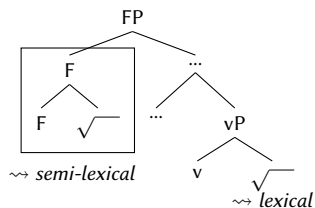
- Less lexical than familiarity / attitude but more lexical than habitual-like *znati*.

# Two stages of grammaticalisation (Cavirani-Pots 2020)

## (16) a. Stage I

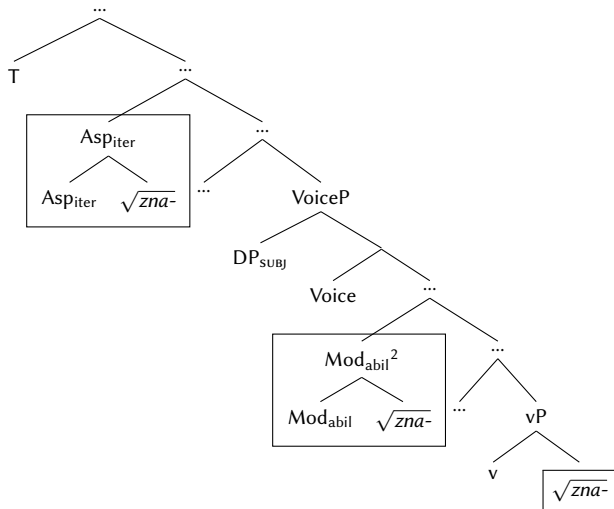


## b. Stage II



- Habitual-like *znati*: stage II.
- Mental ability *znati*: between stage I and II.
  - Merged with a functional head ( $\text{Mod}_{\text{ability}}$ ) above vP  $\approx$  stage II.
  - Within the thematic domain of another root (below Voice)  $\approx$  stage I.
  - $\text{Mod}_{\text{ability}} \rightsquigarrow$  ability;  $\sqrt{\text{zna-}} \rightsquigarrow$  mental acquaintance.

(17)



- Ordering predictions!

<sup>2</sup>See Wurmbrand (2001) on the low position of Mod<sub>abil</sub>.

# Ordering

- Habitual-like ( $Asp_{iter}$ ) > mental ability ( $Mod_{abil}$ ) > familiarity/attitude (v).

- (18) a. *Viki zna<sub>iter</sub> znati<sub>abil</sub> voziti bicikl.*  
 Viki know.3SG know.INF drive.INF bicycle  
 ‘Viki occasionally knows how to ride a bicycle.’ ITER > ABIL  
 \*‘Viki knows how to occasionally ride a bicycle.’ \*ABIL > ITER
- b. *Viki zna<sub>iter</sub> znati<sub>v</sub> da je Zemlja okrugla.*  
 Viki know.3SG know.INF that is Earth round  
 ‘Viki occasionally knows that the Earth is round.’ ITER > V
- c. *Viki zna<sub>abil</sub> ?(kako) znati<sub>v</sub> trebaju li biljke vode.*  
 Viki know.3SG how know.INF need.3PL Q plants water  
 ‘Viki knows how to know whether the plants need water.’ ABIL > V

# Conclusion & outlook

## Conclusion & outlook

- Different flavours of *znati*: decomposed into smaller building blocks.
- Common core ( $\sqrt{zna-}$ )  $\approx$  mental acquaintance.
  - $\sqrt{zna-}$  + Asp<sub>iterative</sub> = habitual-like
  - $\sqrt{zna-}$  + Mod<sub>ability</sub> = mental ability
  - $\sqrt{zna-}$  + v = familiarity / attitude
- Comparing the habitual-like *znati* with similar expressions.
  - Sporadic *can* (Boyd & Thorne 1969, Kleiber 1983), also *sometimes*.
- Combination of Cavirani-Pots' (2020) and Cinque's (1999, 2006) frameworks: applicable to other phenomena.
  - Complex **habitual-like expressions** (e.g., *would*, German *pflegen*).
  - **Modality** and X-marking (von Stechow & Iatridou 2023).
  - Polysemous verbs and **diachrony**: e.g., Proto-Indo-European  $\sqrt{*g'neh_3-}$ , 'know' in other languages  $\rightsquigarrow$  the semantics of  $\sqrt{zna-}$ .

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# Appendix

# What is habituality?

- 1 **Viewpoint aspect?** (Comrie 1976)  
... but both perfective and imperfective (Boneh & Doron 2010).
- 2 **Iterativity / event plurality?** (Van Geenhoven 2003)  
... neither sufficient nor necessary (Comrie 1976).
- 3 **Genericity?** (Krifka et al. 1995)  
≠ habituality (Lenci 1995, Boneh & Doron 2013).
- 4 **Modality?** (e.g., Boneh & Jędrzejowski 2019)  
... not necessary (Van Geenhoven 2003).
- 5 **Evidentiality?** (Carlson 1977)  
... not a defining property.

A diverse concept split into clearly definable subclasses displaying distinct but overlapping **clusters of properties**.

- **Habituality**  $\approx$  a state of affairs holds for an extended period of time.
  - Iterated events or prolonged states, real or modal worlds, ...

## Habitual-like *znati* ≠ viewpoint aspect

- Both perfective (e.g., 1984–1987) and imperfective (e.g., 1978–1996) interpretation possible.

(19) *U osamdesetima je Zrinka (pune tri godine) znala raditi u vrtu.*  
in eighties AUX.3SG Zrinka full three years know.PTCP.SG.F  
work.INF in garden  
'In the eighties, Zrinka occasionally worked in the garden (for three whole years).'

## Habitual-like *znati* is not generic

- Habituality  $\neq$  genericity (Lenci 1995, Boneh & Doron 2008).
- Generic sentences: universal quantification, require an overt restrictor.
  - Every event of Alice after dinner is an event of Alice smoking a cigarette after dinner.

(20) a. *Lewis smokes.*

HABITUAL

b. *Alice smokes a cigarette #(after dinner).*

GENERIC

- *Znati*: no restrictor required, no universal quantification.

(21) *Marina zna zapaliti.*

Marina know.3SG light.INF

‘Marina occasionally smokes.’

## Accidental recurrence $\rightsquigarrow$ not modality

- Modality: rule-like / nomic generalisations (e.g., Dahl 1975, Krifka et al. 1995, Boneh & Doron 2010).
- Iteration with *znati* can be **accidental**.

(22) Marina is coming over for dinner and Viktor asks her flatmate whether it's a good idea to prepare a meat dish for her.

a. *Zašto ne, Marina zna jesti meso.*

why NEG Marina know.3SG eat.INF meat

'Why not, Marina occasionally eats meat.'

b. *#Bolje ne, Marina se zna hraniti vegetarijanski.*

better NEG Marina SE know.3SG feed.INF vegetarian

#'Rather not, Marina occasionally eats vegetarian.'

- *Znati* is incompatible with rules.

(23) #*Lovac se zna kretati dijagonalno.*

bishop SE know.3SG move.INF diagonally

#‘The bishop moves diagonally now and then.’

The speaker may infer **iteration** based on limited (direct or indirect) **evidence** and her or his **knowledge** about the world.

- Suggestion: evidence *against* a certain (default) state of affairs—not evidence *for* a regularity.

## No escape from negation $\rightsquigarrow$ not modality

- Habitual-like *znati* resists negation: Positive Polarity Item (Appendix).

(24) #*Ove ladice ne znaju zapeti.*

these drawers NEG know.3PL get.stuck.INF

Lit. 'These drawers don't know to get stuck.' \*HABITUAL-LIKE/#ABILITY

- Modal Positive Polarity Items (Iatridou & Zeijlstra 2013): English *must*, Spanish *deber*, Modern Greek *prepi*.

(25) *Dhen prepi na to kanume afto.*

NEG must NA it do this

'We must not do this.'

$\square > \neg$  (Iatridou & Zeijlstra 2013, 530)

- Modal PPIs scope over negation by undergoing (covert) QR.
- *Znati* cannot outscope negation  $\rightsquigarrow$  no QR, not modal.



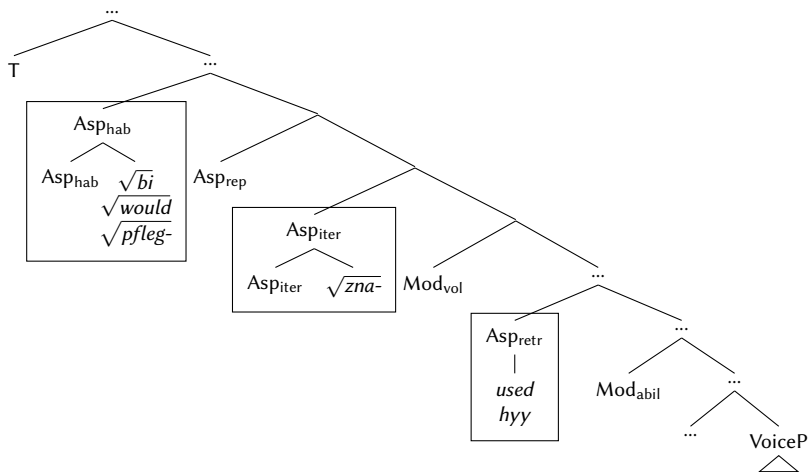
## Three types of complex habitual-like expressions

- (26) a. *ya'el hayt-a 'oved-et ba-gina*  
 Yael HYY.PST-3SG.F work-SG.F in.the-garden  
 'Yael used to work in the garden.' (Hebrew; Boneh & Doron 2013, 344)
- b. *John used to work here.* (English; Comrie 1976, 25)
- c. *And occasionally a window would get broken.* (English; Tagliamonte & Lawrence 2000, 340)
- d. *Tata bi nam prije spavanja otpjevao uspavanku.*  
 dad would us.DAT before sleeping sing.PTCP.SG.M lullaby  
 'Dad would sing us a lullaby before going to sleep.' (Croatian)
- e. *Simon pflegt zu spionieren.*  
 Simon PFLEG.3SG to spy.INF  
 'Simon has the habit of spying.' (German; Jędrzejowski 2021, 1480)

	Hebrew	English		Croatian		German
	ASPECTUAL <i>hyy</i>	GENERIC <i>used to</i>	GENERIC <i>would</i>	GENERIC <i>bi</i>	ITERATIVE <i>znati</i>	ITERATIVE <i>pflegen</i>
<b>Non-iterative</b>	ok	ok	*	*	*	*
<b>States</b>	ok	ok	*	*	*	*
<b>ILPs</b>	*	ok	*	*	*	*
<b>Viewpoint</b>	IPFV	IPFV	IPFV	IPFV	IPFV & PFV	IPFV & PFV
<b>Restrictor</b>	/	/	yes	yes	/	/
<b>Actualisation</b>	yes	yes	INIT	INIT	≥ 1	≥ 1

# The syntax of complex habitual-like expressions

(27)



## Habitual-like *znati* is a PPI

- Diagnostics adapted from Iatridou & Zeijlstra (2013).

(28) *Nije Viktor znao naručiti limunadu, nego Vedrana.*  
NEG.AUX.3SG Viktor know.PTCP.SG.M order.INF lemonade but Vedrana  
'It wasn't Viktor who occasionally ordered a lemonade but Vedrana.'

CONTRASTIVE NEGATION

(29) *Nije ZNALA dolaziti petkom; bila je samo jednom.*  
NEG.AUX.3SG KNOW.PTCP.SG.F come.INF Friday.INSTR be.PTCP.SG.F AUX only once  
'She didn't OCCASIONALLY come on Friday; she was here only once.'

CONTRASTIVE FOCUS

(30) *Ne zna Luka jesti zdravo jer želi nego jer mora.*  
NEG know.3SG Luka eat.INF healthily because want.3SG but because have.to.3SG  
'Luka doesn't occasionally eat healthily because he wants to but because he has to.'

¬ > because > *znati*

(31) *Ne mislim da Vedrana zna naručiti limunadu.*  
NEG think.1SG that Vedrana know.3SG order.INF lemonade  
'I don't think that Vedrana occasionally orders lemonade.'

¬ > [CP ... *znati*

## Habitual-like *znati* is a weak PPI

- (32) *Samo Zrinka nije znala igrati šah s nama.*  
only Zrinka NEG.AUX.3SG know.PTCP.SG.F play.INF chess with us  
'Only Zrinka didn't occasionally play chess with us.'      only > ¬ > *znati*
- (33) *Samo je Marko znao pjevati pod tušem.*  
only AUX.3SG Marko know.PTCP.SG.M sing.INF under shower  
'Only Marko occasionally sang under the shower.'      DOWNWARD ENTAILING

# Evidentiality is not grammaticalised: Evidence from negation

- Negation in Croatian: below the (high) subject position, above *znati*.

(34) (*Zanimljivo da*) *samo Marina ne zna zapaliti nakon ručka.*  
interesting that only Marina NEG know.3SG light.INF after lunch  
'(It is interesting that) only Marina doesn't sometimes smoke after lunch.'  
only > ¬ > *znati*

(35) Mood<sub>speech act</sub> » Mood<sub>evaluative</sub> » Mood<sub>evidential</sub> » Mood<sub>epistemic</sub> » T<sub>past</sub> »  
T<sub>future</sub> » Mood<sub>irrealis</sub> » T<sub>anterior</sub> » (...) » NEG » ...

- Habitual-like *znati* cannot escape negation.

↪  $\sqrt{zna-}$  does not merge with Mood<sub>evidential</sub>.

- Evidentiality is part of the lexical  $\sqrt{zna-}$ .

(36)

