

Dissecting habituality: The Croatian *know* and its kin

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- Croatian *znati* ‘know’: four basic meanings.

(1) a.	<i>Viki zna Marina.</i> Viki know.3SG Marin.ACC ‘Viki knows Marin.’	FAMILIARITY
b.	<i>Viki zna da je njezin bicikl crven.</i> Viki know.3SG that is her bicycle red ‘Viki knows that her bicycle is red.’	FACTIVE
c.	<i>Viki zna (kako) voziti bicikl.</i> Viki know.3SG how drive.INF bicycle ‘Viki knows how to ride a bicycle.’	ABILITY
d.	<i>Viki zna voziti bicikl.</i> Viki know.3SG drive.INF bicycle ‘Viki knows how to ride a bicycle.’ ‘Viki occasionally rides a bicycle.’	ABILITY HABITUAL-LIKE

- Common core: **mental acquaintance**.

– Proto-Indo-European **g’neh₃*- > Old Slavonic *znati* (cf. Lat. *co-gnoscere*, Gr. *γι-γνώσκειν*; Ge. *können*, Nl. *kunnen*, En. *can*, ...) ([The Croatian language portal](#); [DWDS](#))

- Focus today: **habitual-like/iterative** *znati* (‘from time to time’, ‘now and then’, ‘occasionally’).

- Comparison with other (complex) habitual-like expressions within and beyond Croatian.
 - Dissecting habituality into smaller components.
 - Three broad **subclasses of habituality**: aspectual, generic, iterative.
- Habitual-like *znati* is a **semi-lexical** raising verb.
 - Application to other habitual-like expressions.
- Towards relating the different *znati*’s and extensions to other languages.

1 Habitual-like *znati*: A first approximation

- Two components: *znati* ‘know’ + infinitive.
- **Raising** verb: no knowledge, (mental) ability, or (conscious) habit on part of the subject.
 - Weather predicates (2a), idiom chunks (2b), inanimate subjects (2c).

(2) a.	<i>U travnju zna sniježiti.</i> in April know.3SG snow.INF ‘It occasionally snows in April.’	WEATHER PREDICATE
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- 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
- (3) a. *Često sam znao biti optužen za nešto što i nisam napravio ...*
 often AUX.1SG know.PTCP.SG.M be.INF accused for something what and NEG.AUX done ...
 ‘I was often accused of something that I hadn’t in fact done ...’ (Hellman 2005: (76))
- b. *Znala se spotaknuti o prvu stepenicu.*
 know.PTCP.SG.F SE trip.INF over first step
 ‘She occasionally tripped over the first step.’

- Core meaning: (occasional) **event recurrence/iterativity**.
- However, a kind of knowledge on part of the speaker is involved ~ (inferential) **evidentiality**.
 - Different from *moći* ‘can’ and *morati* ‘must’: pure possibility/necessity (4) (cf. Hellman 2005: 95f.).

- (4) a. *Ovdje znaju niknuti hortenzije.*
 here know.3PL sprout.INF hydrangeas
 ‘Hydrangeas occasionally sprout here.’ ~> I have reliable evidence that they did/do.
- b. *Ovdje mogu niknuti hortenzije.*
 here can.3PL sprout.INF hydrangeas
 ‘Hydrangeas can sprout here.’ ~> The soil looks good and I judge this as likely.
- c. *Ovdje moraju niknuti hortenzije.*
 here must.3PL sprout.INF hydrangeas
 ‘Hydrangeas must sprout here.’ ~> The soil is just perfect, it has to happen.

- It **resists (immediate) negation** ~> only possible with modal ability.

- (5) a. *#Ove ladice ne znaju zapeti.*
 these drawers NEG know.3PL get.stuck.INF
 Lit. ‘These drawers don’t know to get stuck.’ #ABILITY, *HABITUAL-LIKE
- b. *Viktor ne zna zatvoriti prozore (#navečer).*
 Viktor NEG know.3SG close.PFV.INF windows (#in.the.evening)
 ‘Viktor does not know how to close the windows (#in the evening).’ ABILITY
 *‘Viktor never closes/sometimes doesn’t close the windows (in the evening).’ *HABITUAL-LIKE

- Habitual-like *znati*:
 - **Raising**: no restrictions on the subject (knowledge or other).
 - **Iterativity**/(occasional) event recurrence: the core component ~> Section 2.1.
 - **Evidentiality**: the knowledge-component is shifted to the speaker ~> Section 2.2.
 - **No immediate negation**: Positive Polarity Item ~> Section 2.3.
- The embedded verb has to be an infinitive but is free with respect to voice and may be negated.
 - **Restructuring** properties (clitic climbing, scrambling) ~> Appendix A.

2 Dissecting habituality

- The meaning of *znati* has been described as **habitual** (Hellman 2005).
 - *Know* > habitual attested diachronically (e.g., Moré (Niger-Congo)); *know* > ability > habitual common in creoles/pidgins (e.g., Haitian Creole, Negerhollands, Papiamentu, Tok Pisin) (Kuteva et al. 2019).

- Habituality is related to a number of other categories (see Boneh & Jędrzejowski 2019, Sawicki 2019):
 - **Genericity**: but habituality allows for exceptions and generalizes over situations described by an episodic predicate (Krifka et al. 1995); **Gen** ≠ **Hab** (Boneh & Doron 2010, 2013, see also Colomo 2011: 247)
 - **Aspect**: viewpoint (imperfective/progressive and perfective), retrospective, a separate kind of aspect (Comrie 1976, Tagliamonte & Lawrence 2000, Boneh & Doron 2010, 2013, Jędrzejowski 2021)
 - **Event plurality** or **iterativity**: recurrence of discrete events, but argued to be neither sufficient nor necessary for habituality (Comrie 1976: 27, Boneh & Doron 2010, Boneh & Jędrzejowski 2019)
 - **Modality**: repeated occurrences in possible worlds, but habituality usually requires actualization (Krifka et al. 1995, Boneh & Doron 2010, 2013, Jędrzejowski 2021, Boneh & Jędrzejowski 2019)
 - **Evidentiality**: requires verifying instances; may involve inductive generalizations based on limited observations (Klimek-Jankowska 2012; see also Boneh & Jędrzejowski 2019)
- Habitual-like *znati* + infinitive combines properties of some of these categories:
 - **Iterativity**: Recurrence of (discrete) events whose number is not specified.
 - * Accidental repetition possible ~> **unlike modality**.
 - * Exceptions (periods/occasions when the event does not occur) ~> **not genericity/√**.
 - **Evidentiality**: Actualization of the embedded event required, inductive extrapolation.
 - No restrictions with respect to viewpoint aspect ~> **not (viewpoint) aspect**.
 - Resists negation ~> **Positive Polarity Item** (connection to modals).
- Habituality is a very diverse category (cf. Boneh & Jędrzejowski 2019: 12, who seem to be uncertain about “the larger question of whether habituality is indeed a category in its own right”).

This section

- Comparing *znati* with other complex habitual-like expressions and dissecting habituality into smaller building blocks.
 - English *used to*, *would* (Boneh & Doron 2010, 2013), Croatian *bi* ‘would’, Hebrew *hyy* (Boneh & Doron 2008, 2010, I. Landau), German *pfliegen* ‘cultivate’ (Jędrzejowski 2021, A. Ludwig (and others)).
 - (6) a. *When I met her, Yael would sleep during the day and work at night.* (Boneh & Doron 2013: 184)
 - b. *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.’ (Boneh & Doron 2013: 344)
 - c. *Simon pflegt zu spionieren.*
 Simon PFLEG.3SG to spy.INF
 ‘Simon has the habit of spying.’ (Jędrzejowski 2021: 1480)
- Conclusion: no single universal property of habituality, but three broad subclasses of complex habitual expressions (refining and extending Boneh & Doron 2010, 2013).
 - **Aspectual** habituality (*used to*, Hebrew *hyy*)
 - **Generic** habituality (*would*, Croatian *bi* ‘would’)
 - **Iterative** habituality (*znati*, German *pfliegen*)

2.1 Iterativity & genericity

- English *used to* is compatible with (dynamic) events, states, and individual-level predicates; the habitual *would* is incompatible with states and ILPs (Boneh & Doron 2010, 2013).
- (7) a. *In the fifties, my French teacher used to know Latin.*
 b. **In the fifties, my French teacher would know Latin.* (Boneh & Doron 2013: 177)

- However, states/ILPs are fine with *would* if distributed among individuals.

(8) *In the nineteenth century, French teachers would know Latin.* (Boneh & Doron 2013: 190)

- Habitual-like *znati* patterns with *would*: no states, rules, individual-level predicates.

– See Jędrzejowski (2021) for the German *pflügen*.

- (9) a. #*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.’ STATE
- b. #*Lovac se zna kretati dijagonalno.*
 bishop SE know.3SG move.INF diagonally
 #‘The bishop moves diagonally now and then.’ RULE
- c. #*Flekica zna biti mačka.*
 Flekica know.3SG be.INF cat
 #‘Flekica is occasionally a cat.’ ILP

... unless distributed among occasions (10a) or individuals (10b), but exceptions must be possible (10c).

- (10) a. *Marin je znao voljeti kikiriki.*
 Marin AUX.3SG know.PTCP.SG.M love.INF peanuts
 *‘Marin used to love peanuts.’ ~> only: ‘Marin occasionally loved peanuts.’
- b. *Nobelovci znaju biti plavokosi.*
 Nobel.prize.winners know.3PL be.INF blond
 ‘Nobel prize winners are sometimes blond.’
- c. #*Nobelovci znaju biti uspješni.*
 Nobel.prize.winners know.3PL be.INF successful
 #‘Nobel prize winners are sometimes successful.’

- (11) *Marelice znaju koštati četiri eura po kili.*
 apricots know.3PL cost.INF four euros per kilogram
 ‘Apricots sometimes cost four euros per kilogram.’ ~> varying cost *or* different (kinds of) apricots

- Two-way split: *used to/hyy* vs. *would/znati/pflügen*.

	Hebrew	English		Croatian	German		
	<i>hyy</i>	<i>used to</i>	simple	<i>would</i>	<i>bi znati</i>	<i>pflügen</i>	
Distribution	/	/	/	yes	yes	yes	yes
States	ok	ok	ok	*	*	*	*
ILPs	*	ok	ok	*	*	*	*

- *Would* requires an overt restrictor, like generic but unlike habitual sentences (Boneh & Doron 2013).

– *Bi* ‘would’ does, but the other expressions do not require an explicit (or contextually salient) restrictor.

- (12) a. *Jack smokes.* **Hab**
 b. *Alice smokes a cigarette #(after dinner).* **Gen**
 c. (At the opera.) *Look at how sloppily people are dressed. In the good old days, people would dress elegantly #(to go to the opera).* (Boneh & Doron 2013: 177)

- *Would*: distributivity tied to its status as a special **generic** operator (see Boneh & Doron 2013).

- Gen is a universal quantifier requiring an episodic restrictor and quantifying over individuals/events in the restrictor (cf. Krifka et al. 1995: Gen needs to bind a situation variable which statives and ILPs lack).
- Statives and ILPs must be coerced into an episodic predicate or distributed among individuals.

- *Znati*: due to **iterativity** (see Jędrzejowski 2021 for *pflegen*).
 - Recurring eventualities/occasions: coercion into recurring individuals possible.

	Hebrew	English			Croatian		German
	<i>hyy</i>	<i>used to</i>	simple	<i>would</i>	<i>bi</i>	<i>znati</i>	<i>pflegen</i>
Distribution	/	/	/	yes	yes	yes	yes
States	ok	ok	ok	*	*	*	*
ILPs	*	ok	ok	*	*	*	*
Restrictor	/	/	/	yes	yes	/	/
Variable (<i>e,x</i>)	/	/	/	∇	∇	ITER	ITER

2.2 Actualization & evidentiality

- Actualization of a single **initiating event** suffices for *would*, but not for *used to* (Boneh & Doron 2013).

(13) Ruti started a new job. She decided to go to work by bus. She only went there once, and shortly after that she died. In a eulogy, one could say:

a. *Ruti was such a modest person. She would go to work by bus.* TRUE

b. *Ruti was such a modest person. She used to go to work by bus.* FALSE

(Boneh & Doron 2013: 188)
- The simple habitual is even happy with a **disposition**: the event does not need to have been instantiated (at least for machines; we may need evidence of typical behaviour for humans; Krifka et al. 1995: 54).

(14) a. *This machine crushes oranges.* \rightsquigarrow Ok even if it has never crushed an orange.

b. *Mary smokes.* \rightsquigarrow Not true if Mary has never smoked.
- Habitual-like *znati*: false in (13), but fine if recurrence in the actual world is/was in principle possible from the speaker's perspective.

(15) Ruti started a new job. She decided to go to work by bus. I know she went by bus at least once (e.g., I met her on the bus, she called me from the bus, ...), and she died shortly after that.

Ruti je znala ići na posao autobusom.
 Ruti AUX.3SG know.PTCP.SG.F go.INF on work bus.INSTR
 'Ruti (occasionally) went to work by bus.'
- One occurrence seems to be enough in principle: (15), (16).
 - More than one is better: e.g., (17) is perfect if the drawer has already got stuck twice, okay-ish if only once, but false if it got stuck many times and I had just repaired it that morning.
 - Disposition is not enough: (18) is false if the machine never crushes an orange, # if it is made for crushing oranges (*ILP/rules), but ok if it occasionally crushes oranges (and is made for something else or as an ironic comment if it is made for crushing oranges but is broken).
- (16) I'm spending my summer holiday in Spain and briefly consider taking an umbrella with me but then decide against it—Spain in the summer, why would it rain?! Upon my arrival, however, it starts to rain. I can exclaim something like:

Ups, u Španjolskoj ljeti ipak zna padati kiša!
 oops in Spain in.summer after.all know.3SG fall.INF rain
 'Oops, it does occasionally rain in Spain during the summer after all!'
- (17) A friend and I are cooking dinner at my place and he wants to fetch a knife from one of the drawers.

Pazi, ta ladica zna zapeti.
 be.careful that drawer know.3SG get.stuck.INF

‘Be careful, that drawer occasionally gets stuck.’

- (18) *Ovaj stroj zna gnječiti naranče.*
 this machine know.3SG crush.INF oranges
 ‘This machine occasionally crushes oranges.’

- Three-way split: *used to/hyy* (complete actualization), *would/bi* (a single occurrence), *znati/pflegen* (at least one occurrence and possibility of recurrence required; see Jędrzejowski 2021 for *pflegen*).

	Hebrew		English		Croatian		German
	<i>hyy</i>	<i>used to</i>	simple	<i>would</i>	<i>bi</i>	<i>znati</i>	<i>pflegen</i>
Distribution	/	/	/	yes	yes	yes	yes
States	ok	ok	ok	*	*	*	*
ILPs	*	ok	ok	*	*	*	*
Restrictor	/	/	/	yes	yes	/	/
Variable (<i>e,x</i>)	/	/	/	∇	∇	ITER	ITER
Actualization	yes	yes	INIT/disp	INIT	INIT	≥ 1	≥ 1

- Boneh & Doron (2013): *would* is a special kind of **Gen**.
 - Universal quantification over individuals in its restrictor and over (ideal) **modal worlds**.
 - In (13), *would* has access to worlds in which Ruti does not die \rightsquigarrow recurrence in these worlds possible.
- Habitual-like *znati*: **inferential evidentiality** \rightsquigarrow actualization of at least one event and nothing (that the speaker is aware of) prevents recurrence.
 - No universal quantification over individuals (only iterativity).
 - Recurrence in the **actual world** must be possible (as far as what the speaker knows is concerned).
 - In (13), only worlds in which Ruti dies can be included \rightsquigarrow no iteration possible.
- The connection between habitual-like *znati* and evidentiality is not surprising (Appendix B):
 - *Know* can develop into habitual as well as into evidential markers (Kuteva et al. 2019).
 - Relation between habituality and evidentiality in Kakua (Amazonian) (Bolaños 2016: 275).
 - Evidentiality is related to raising.
- *Pflegen* seems to be more rule-like than *znati* (see also Colomo 2011, who treats it as a stereotypical modal expressing regularities) (Appendix D).
- *Used to & hyy* (Boneh & Doron 2010, 2013): complex **retrospective** aspect (only the actual world).
 - Shifts the reference time (R) in relation to perspective time (P).

	Hebrew		English		Croatian		German
	<i>hyy</i>	<i>used to</i>	simple	<i>would</i>	<i>bi</i>	<i>znati</i>	<i>pflegen</i>
Distribution	/	/	/	yes	yes	yes	yes
States	ok	ok	ok	*	*	*	*
ILPs	*	ok	ok	*	*	*	*
Restrictor	/	/	/	yes	yes	/	/
Variable (<i>e,x</i>)	/	/	/	∇	∇	ITER	ITER
Actualization	yes	yes	INIT/disp	INIT	INIT	≥ 1	≥ 1
Extrapolation	no	no	ideal <i>w</i>	ideal <i>w</i>	ideal <i>w</i>	real <i>w</i>	real <i>w</i> ?
Perspective ¹	R < P	R < P	R ≤ P	R = P			
Viewpoint ²	IPFV	IPFV	IPFV & PFV	IPFV	IPFV	IPFV & PFV	IPFV & PFV

¹ Perspective: R < P = retrospective; R = P = internal; according to the *now* test and SOT (Boneh & Doron 2013).

² Viewpoint aspect: frame & durative adverbial tests (Boneh & Doron 2010, 2013).

2.3 Negation & Positive Polarity Items

- Habitual-like *znati* cannot be negated (19).

(19) #Irena *ne zna (za-)kasniti*.

Irena NEG know.3SG (PFV-)be.late.INF

intended: 'Irena is never/not sometimes late.'

#ABILITY, *HABITUAL

- Proposal: *znati* is a (weak) **Positive Polarity Item (PPI)** (see also Appendix C).
- PPIs may arise in three types of negative contexts (Iatridou & Zeijlstra 2013):

- Metalinguistic/contrastive negation and contrastive focus (20).
- Intervention effects (21).
- Clause-external negation (22).

(20) a. *Nije Vedranin otac znao naručiti limunadu, nego Vedrana.*

NEG.AUX.3SG Vedrana.POSS father know.PTCP.SG.M order.INF lemonade but Vedrana

'It wasn't Vedrana's father who used to order a lemonade but Vedrana.' (contrastive negation)

b. *Nije ZNALA dolaziti u ovaj restoran, ali bila je jednom.*

NEG.AUX.3SG KNOW.PTCP.SG.F come.INF in this restaurant but be.PTCP.SG.F AUX once

'She didn't USE TO come to this restaurant, but she was here once.' (contrastive focus)

(21) a. *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 eat healthily because he wants to but because he has to.' $\neg >$ because $>$ *znati*

b. *Nisu svi iz razreda znali igrati šah s nama (ali neki jesu).*

NEG.AUX.3PL all from class know.PTCP.PL play.INF chess with us but some AUX.EMPH.3PL

'Not all classmates used to play chess with us (but some did).' $\neg >$ $\forall >$ *znati*

(22) a. *Ne mislim da Vedrana zna naručiti limunadu.*

NEG think.1SG that Vedrana know.3SG order.INF lemonade

'I don't think that Vedrana has the habit of ordering lemonade.'

$\neg >$ [_{CP} ... *znati*

b. *Nije točno da Viktor zna kasniti.*

AUX.NEG.3SG correct that Viktor know.3SG be.late.INF

'It is not true that Viktor is occasionally late.'

$\neg >$ [_{CP} ... *znati*

- Incompatibility with negation is not a property of habitual-like expressions in general.

- Rare but possible with *used to* (Tagliamonte & Lawrence 2000: 337f.), possible with habitual *would* (23).
- German *pfliegen*: speaker variation; context usually helps (24).
- The Croatian *bi* 'would' outscopes negation (25) \rightsquigarrow PPI.

(23) *In these days, Mary didn't use to / wouldn't smoke.*

(Boneh & Doron 2013: 183)

(24) We are at a party and a couple of us is going out to smoke. Our friend Peter used to join us in the past and it was always fun with him, but he stopped smoking recently, so he is not joining us this time.

Schade, dass Peter nicht mehr pflegt zu rauchen.

pity that Peter NEG more PFLEG.3SG to smoke

'It's a pity that Peter doesn't have the habit of smoking anymore.'

(G. Pantillon, p.c.)

(25) *U studentskim danima Marija ne bi pušila na proslavama.*

in student days Mary NEG would smoke.PTCP.SG.F on parties

'Back then when we were students, Mary wouldn't smoke at parties.'

would $>$ \neg

- Iatridou & Zeijlstra (2013) look at **modals** (e.g., English, Greek, Dutch, Spanish *must*).

- PPI modals can escape negation by undergoing QR (e.g., Spanish *deber* 'must') \rightsquigarrow *bi* can, too.
- *Znati* cannot \rightsquigarrow not modal/quantificational.

2.4 Summary

- Three broad subclasses of complex habitual-like expressions (Table 1):
 - **Aspectual habituality**: *used to*, *hyy*
 - * Complex retrospective aspect (Boneh & Doron 2010).
 - * Recurrence/distributivity is not required, tied to the actual world.
 - **Generic habituality**: *would*, *bi* ‘would’
 - * A special case of the generic operator (Boneh & Doron 2013): universal quantification over individuals (including events), evaluated with respect to (close to) ideal modal worlds.
 - * Distributivity is a consequence of universal quantification and the obligatorily episodic restrictor.
 - **Iterative habituality** (with idiosyncrasies): *znati*, *pflegen*
 - * Distributivity is due to iterativity (multiple occurrences of eventualities).
 - * *Znati* has an evidential component and behaves like a PPI.
 - * *Pflegen* seems to require more (regular) occurrences than *znati* (Appendix D).

	Hebrew	English	Croatian	German			
	<i>hyy</i>	<i>used to</i>	<i>would</i>	<i>bi</i>	<i>znati</i>	<i>pflegen</i>	
Distribution	/	/	/	yes	yes	yes	yes
States	ok	ok	ok	*	*	*	*
ILPs	*	ok	ok	*	*	*	*
Restrictor	/	/	/	yes	yes	/	/
Variable (<i>e,x</i>)	/	/	/	∀	∀	ITER	ITER
Actualization	yes	yes	INIT/disp	INIT	INIT	≥ 1	≥ 1
Extrapolation	no	no	ideal <i>w</i>	ideal <i>w</i>	ideal <i>w</i>	real <i>w</i>	real <i>w</i> ?
Perspective	R < P	R < P	R ≤ P	R = P			
Viewpoint	IPFV	IPFV	IPFV & PFV	IPFV	IPFV	IPFV & PFV	IPFV & PFV
Negation	ok	ok	ok	ok	> ¬	*	%

Table 1. Properties of habitual-like markers

3 The syntax: semi-lexicity

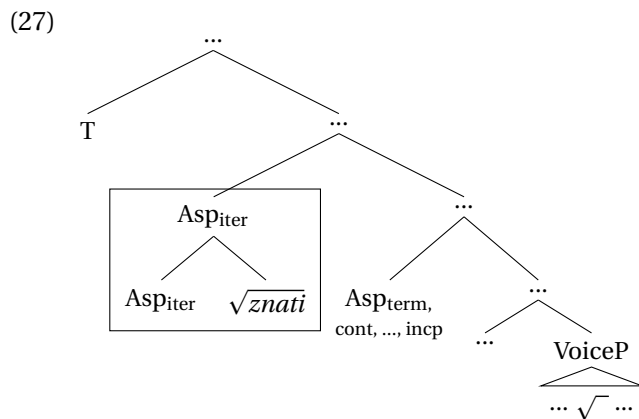
- Habitual-like *znati* is not fully grammaticalized (such as, e.g., imperfective or progressive), but has less lexical content than the attitude or ability *znati* (Hellman 2005).
- Proposal: **semi-lexical** (Emonds 1985, Corver & Van Riemsdijk 2001, Cavirani-Pots 2020).
 - **Functional** direction: iterativity, PPI-hood, (evidentiality).
 - **Lexical** direction: free with respect to tense, person, high aspect; it cannot undergo QR to outscope negation (unlike modals); evidentiality might be a remnant of the core lexical meaning of *know*.
- Advantages:
 - Deriving the two main components of habitual-like *znati*: iterativity and evidentiality.
 - Captures its inability to escape negation.
 - Extension to other complex habitual-like expressions and other meanings of *znati*.

3.1 Roots meet cartography

- Cavirani-Pots (2020): semi-lexicity as a consequence of (lexical) roots being merged into a functional head in the extended projection of another lexical root.
- Habitual-like *znati*: the result of the lexical root \sqrt{znati} merging with iterative aspect (27).

- Iterativity is not inherent in knowledge but it is compatible with it.
- A possible candidate: Cinque's (2006) $\text{Asp}_{\text{frequentative(I)}}$ (but I will rename it to $\text{Asp}_{\text{iterative(I)}}$).³
- Habitual-like *znati* is a raising verb \rightsquigarrow merged above VoiceP/the subject (not in $\text{Asp}_{\text{frequentative(II)}}$).
- Cinque (2006: 97): aspectual verbs corresponding to $\text{Asp}_{\text{frequentative(I)}}$ do not exist \rightsquigarrow *znati* fills the gap.

(26) Cinque hierarchy (Cinque 2006: 93, 175)
 Mood_{speech act} (frankly, honestly) » Mood_{evaluative} ((un)fortunately, luckily) » Mood_{evidential} (allegedly, reportedly) » Mood_{epistemic} (probably, presumably) » T_{past} (yesterday) » T_{future} (tomorrow) » Mood_{irrealis} (perhaps) » T_{anterior} » Mod_{alethic} (necessarily) » Asp_{habitual} (usually, generally) » Asp_{repetitive(I)} (repeatedly, again) » $\text{Asp}_{\text{frequentative(I)}}$ (often) » Mod_{volition} » Asp_{celerative(I)} (quickly) » Asp_{terminative} (no longer) » Asp_{continuative} (still) » Asp_{perfect} » Asp_{retrospective} (just) » Asp_{proximative} (soon) » Asp_{durative} (long, briefly) » Asp_{progressive} (usually) » Asp_{prospective} (almost) » Asp_{inceptive(I)} » Mod_{obligation} (necessarily) » Mod_{ability} (possibly) » Asp_{frustrative/success} » Mod_{permission} » Asp_{conative} » Asp_{completive(I)} (completely) » Voice (well) » Asp_{celerative(II)} (quickly, fast) » Asp_{inceptive(II)} » Asp_{completive(II)} » Asp_{repetitive(II)} » Asp_{frequentative(II)} (often) » V



- Proposal: **iterativity** comes from Asp_{iter} , and **evidentiality** from $\sqrt{\text{znati}}$.
 - Asp_{iter} : repetition of an event \rightsquigarrow **iterativity**.
 - * Possible implementation: plur(action)ality; e.g., a distributive operator (see Link 1983).
 - $\sqrt{\text{znati}}$: mental acquaintance \rightsquigarrow **evidentiality**.
 - * The root is merged above the subject and cannot affect it \rightsquigarrow knowledge shifted to the speaker.
 - * Facilitating factor: raising (Appendix B).
- Result: limited evidence allows the speaker to infer iteration (in the absence of evidence to the contrary).
 - Towards an implementation: making use of Dowty's (1979) inertia worlds or Schmitt & Sode's (2018) circumstantial possibility presupposition relativized to the speaker's knowledge.
 - Evidentiality is not (yet) grammaticalized \rightsquigarrow support from the inability of habitual-like *znati* to escape negation (Section 3.2).
- Other habitual-like expressions (29):
 - *Used to* and *hyy*: in $\text{Asp}_{\text{retrosp}}$ (following the analysis in Boneh & Doron 2013).
 - * Possibly fully grammaticalized: only past tense.
 - Habitual-like *would*: in Asp_{hab} .⁴
 - * Asp_{hab} is presumably also the locus of simple habitual aspect.

³Cinque (1999) lists *repeatedly*, *several times*, *often*, *twice* as frequentative; vs. repetitive: *again* (single repetition); "I will use *repetitive* for actions repeated once ('again') and *frequentative* for actions repeated several times." (Cinque 1999: 205)

⁴Cinque (1999: 91): *usually*, *habitually*, *customarily*, *generally*, *regularly*.

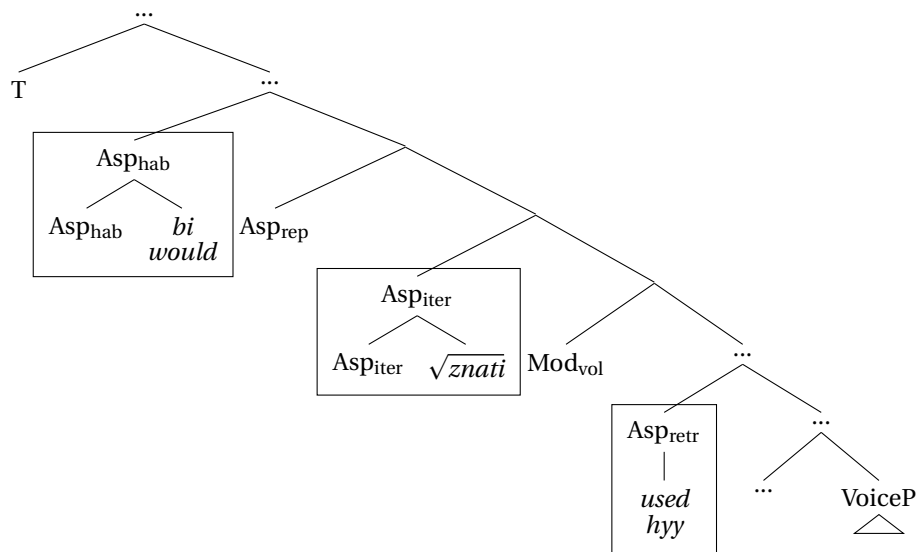
- * *Would* is a universal quantifier over events (and worlds): the habitual operator provides the restrictor, *would* states that every event that comprises the habit is also an event of the kind denoted by the lexical verb (Boneh & Doron 2013).
- * Correct ordering: *would* > *used to* (Tagliamonte & Lawrence 2000); *bi* ‘would’ > *znati*.

(28) *Rudi bi znao pričati fantastične priče.*
 Rudi would know.PTCP.SG.M tell.INF fantastic stories
 ‘Rudi would sometimes tell fantastic stories.’

– German *pflegen*: two options.

- * In ASP_{iter} , but more often than *znati* (cf. *often/repeatedly* vs. *occasionally*).
- * In ASP_{hab} (cf. Jędrzejowski 2021): iterativity comes from *pflegen*.

(29)



3.2 Negation

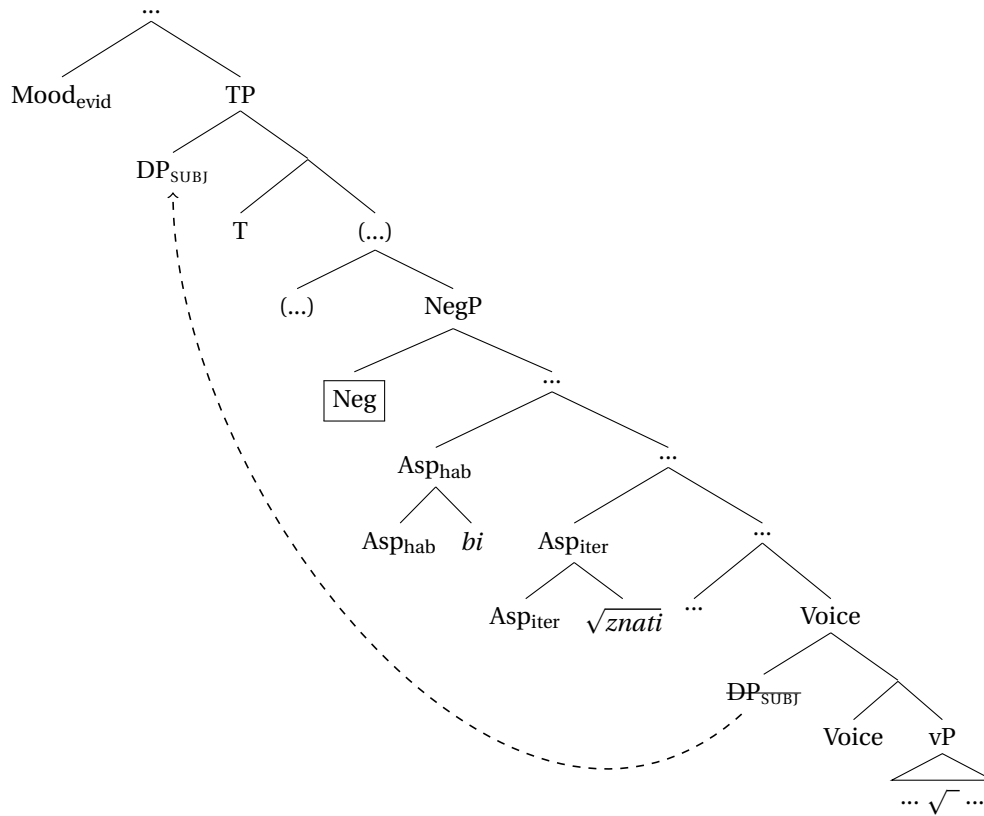
- Above *bi* and *znati* in the syntax, below the (higher) subject position (31): SUBJ > ¬ > *bi* > *znati*

- (30) a. (*Naravno da*) *Marina ne bi (nikad) zapalila nakon ručka.*
 of.course that Marina NEG would never light.PTCP.SG.F after lunch
 ‘Of course Marina wouldn’t (ever) smoke after lunch.’ ∀ > ¬
- b. (*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*
- c. #(*Zanimljivo da*) *Marina ne zna zapaliti nakon ručka.*
 nteresting that Marina NEG know.3SG light.INF after lunch
 Intended: ‘It is interesting that Marina doesn’t sometimes smoke after lunch.’ *¬ > *znati*
 #‘It is interesting that Marina doesn’t know how to smoke after lunch.’ ¬ > *znati*_{abil}

- Both *znati* and *bi* are PPIs (Section 2.3):

- *Bi* is quantificational: outscopes negation via QR (like other modal PPIs; see Iatridou & Zeijlstra 2013).
- Habitual-like *znati* cannot undergo QR \rightsquigarrow due to **semi-lexicality** (and the absence of modality).
- Evidentiality is not (yet?) fully grammaticalized \rightsquigarrow otherwise we would expect movement to Mood_{evid}.

(31)



4 All the things you can know

4.1 In Croatian

- The core meaning of \sqrt{znati} is mental acquaintance.

(32) 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.'

FACTIVE

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.*

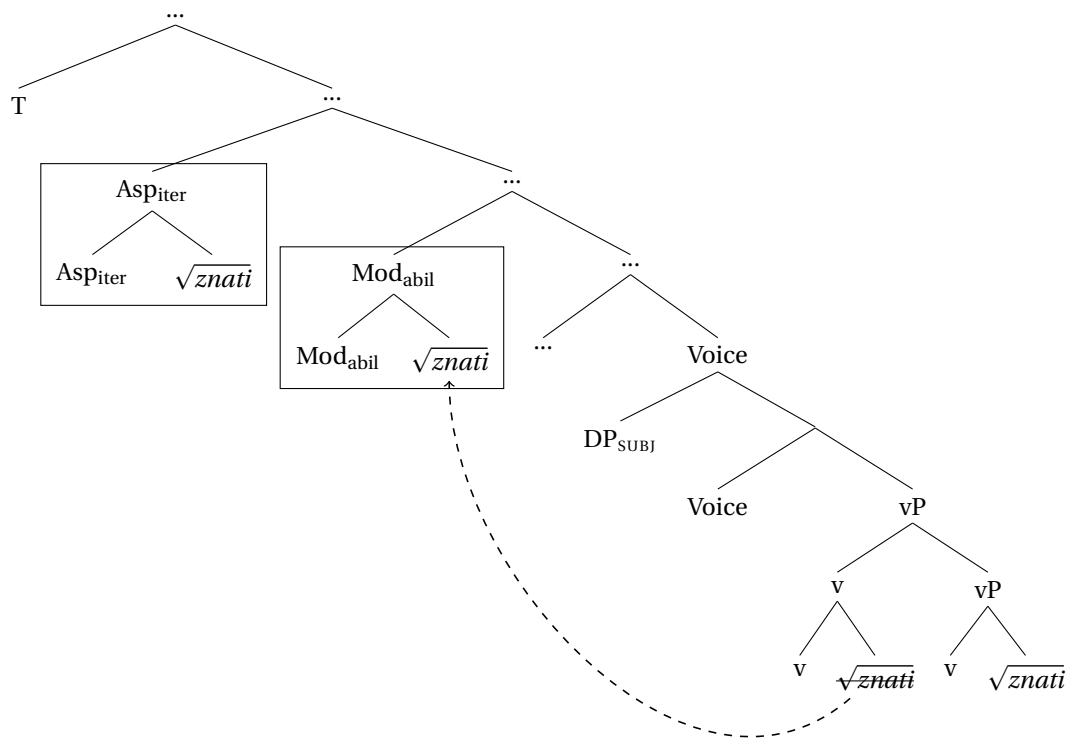
Viki know.3SG drive.INF bicycle
'Viki knows how to ride a bicycle.'
'Viki occasionally rides a bicycle.'

ABILITY
HABITUAL-LIKE

- Proposal: merging \sqrt{znati} into different positions along the clausal spine yields different meanings (33).
 - Asp_{iter}: most functional (\approx stage II in Cavirani-Pots 2020) \rightsquigarrow habitual-like *znati*.
 - * Iterativity + evidentiality.
 - Mod_{abil}: in-between (\approx transition from stage I to II) \rightsquigarrow modal ability *znati*.
 - * Restrictions on the subject: externally merged in v (cf. Wurmbbrand 2001; \approx stage I), moves to Mod_{abil}.
 - v: lexical \rightsquigarrow familiarity or factive attitude.

* Depending on whether the complement is a DP or a CP.

(33)



- (34) a. *Viki zna_{iter} znati_{abil} 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.)
 (amnesia) ITER > ABIL
 *ABIL > ITER
- b. *Viki zna_{iter} znati_v da je Zemlja okrugla.*
 Viki know.3SG know.INF that is Earth round
 'Viki occasionally knows that the Earth is round.'
 (amnesia) ITER > FACTIVE
- c. *Viki zna_{abil} ?(kako) znati_v 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 > INTERR
- d. *Viki zna_{iter} znati_{abil} *(kako) znati_v trebaju li biljke vode.*
 Viki know.3SG know.INF how know.INF need.3PL Q plants water
 'Viki occasionally knows how to know whether the plants need water.'
 ITER > ABIL > INTERR

4.2 Beyond Croatian—back to the root(s)

- Proto-Indo-European **g'neh₃-*
 - Old Slavonic *znati*, Lat. *co-gnoscere*, Gr. *γι-γνώσκειν*; Ge. *können*, Nl. *kunnen*, En. *can*, ...
 - Various meanings and connections: familiarity, habituality, ability, factivity, evidentiality, possibility, ...
 - $\sqrt{*g'neh_3}$ - might have merged into different positions and grammaticalized to different degrees.
- **Norwegian:** *vite* 'know'.

- (35) a. *Dette skal jeg egentlig ikke vite, men det gjør jeg.*
 this shall I actually not know but that do I
 'I am not actually supposed to know this, but I do.'
 (Eide 2006: 298)

- b. *Nora vet å ødelegge en fest, #men hun har aldri gjort det.*
 Nora knows to ruin a party but she has never done it
 ‘Nora has the habit of ruining a party, #but she has never done it.’ (A. Ommundsen, p.c.)

• **English:**

- ECM *know to* and *be known to*.
- *Can* (37): relation to ability, denoting sporadic action (Hellman 2005).

(36) a. *He is known to / I know him to bake fabulous cakes.*

b. *It is known to / I know it to snow here.*

(S. Bryant, p.c.)

(37) a. *He can tell awful lies.*

b. *She can be very unkind at times.*

c. *Lions can be dangerous.*

(Hellman 2005: 97)

- **Hungarian:** familiarity and habit are the same lexical item (K. Szendrői, p.c.); modal ability is different.
- **Albanian** *di* (mental ability and habituality) (Hellman 2005: 120; D. Kallulli, p.c.).

5 Conclusion

- Three subclasses of (complex) habituality:
 - **Aspectual** (e.g., *used to*), **generic** (e.g., *would*), **iterative** (e.g., Croatian *znati* ‘know’).
- **Semi-lexicality:** the habitual-like expressions are merged in different positions along the clausal spine.
 - Interaction of (lexical) roots and functional heads \rightsquigarrow different kinds of habituality.
 - Different grades of grammaticalization.
- A possible extension to *know*-denoting and related verbs in other languages.

References

- Bolaños, Katherine. 2016. A grammar of Kakua. Doctoral Dissertation, Universiteit van Amsterdam.
- Boneh, Nora, and Edit Doron. 2008. Habituality and the habitual aspect. In *Theoretical and crosslinguistic approaches to the semantics of aspect*, ed. Susan Rothstein, 321–347. Amsterdam: John Benjamins.
- Boneh, Nora, and Edit Doron. 2010. Modal and temporal aspects of habituality. In *Lexical semantics, syntax, and event structure*, ed. Malka Rappaport, Edit Doron, and Ivy Sichel, 338–363. Oxford: Oxford University Press.
- Boneh, Nora, and Edit Doron. 2013. Hab and Gen in the expression of habituality. In *Genericity*, ed. Alda Mari, Claire Beyssade, and Fabio Del Prete, 176–191. Oxford University Press.
- Boneh, Nora, and Łukasz Jędrzejowski. 2019. Reflections on habituality across other grammatical categories. *STUF – Language Typology and Universals* 72:1–20.
- Cavirani-Pots, Cora. 2020. Roots in progress: Semi-lexicality in the Dutch and Afrikaans verbal domain. Doctoral Dissertation, KU Leuven.
- Cinque, Guglielmo. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. Oxford/New York: Oxford University Press.
- Cinque, Guglielmo. 2006. *Restructuring and Functional Heads*. Oxford: Oxford University Press.
- Colomo, Katarina. 2011. *Modalität im Verbalkomplex. Halbmodalverben und Modalitätsverben im System statusregierender Verbklassen*. Bochum: Ruhr-Universität Bochum.
- Comrie, Bernard. 1976. *Aspect*. Cambridge: Cambridge University Press.
- Cornillie, Bert. 2009. Evidentiality and epistemic modality: On the close relationship between two different categories. *Functions of Language* 16:44–62.

- Corver, Norbert, and Henk Van Riemsdijk. 2001. Semi-lexical categories. In *Semi-lexical categories: The function of content words and the content of function words*, ed. Norbert Corver and Henk Van Riemsdijk, 1–19. Berlin: Mouton de Gruyter.
- Dowty, David R. 1979. *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Dordrecht: Springer.
- Eide, Kristin Melum. 2006. *Norwegian modals*. Berlin: De Gruyter Mouton.
- Emonds, Joseph E. 1985. *A unified theory of syntactic categories*. Dordrecht: Foris.
- Gnjatović, Tena, and Ranko Matasović. 2010. Evidencijalne strategije u hrvatskom jeziku (Evidential strategies in the Croatian language). In *Sintaksa padeža: Zbornik radova znanstvenog skupa s međunarodnim sudjelovanjem Drugi hrvatski sintaktički dani*, ed. Matea Birtić and Dunja Brozović Rončević, 89–99. Zagreb, Osijek: Institut za hrvatski jezik i jezikoslovlje i Filozofski fakultet u Osijeku.
- Hellman, Matias. 2005. *The verbs znati and um(j)eti in Serbian, Croatian and Bosnian: A case study in the grammaticalisation of habitual auxiliaries*. Helsinki: Helsinki University Press.
- Iatridou, Sabine, and Hedde Zeijlstra. 2013. Negation, polarity, and deontic modals. *Linguistic Inquiry* 44:529–568.
- Jeźrzejowski, Łukasz. 2021. On the habitual verb *pflügen* in German: Its use, origin, and development. *Linguistics* 59:1473–1530.
- Klimek-Jankowska, Dorota. 2012. Imperfective and perfective habituals in Polish: A bi-directional OT account of variation and ambiguity. *Journal of Logic, Language and Information* 21:31–52.
- Krifka, Manfred, Francis Jeffrey Pelletier, Gregory N. Carlson, Alice ter Meulen, Gennaro Chierchia, and Godehard Link. 1995. Genericity: An introduction. In *The Generic Book*, ed. Gregory N. Carlson and Francis Jeffrey Pelletier, 1–124. Chicago: University of Chicago Press.
- Kuteva, Tania, Bernd Heine, Bo Hong, Haiping Long, Heiko Narrog, and Seongha Rhee. 2019. *World lexicon of grammaticalization*. Cambridge: Cambridge University Press.
- Link, Godehard. 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. In *Meaning, use and interpretation of language*, ed. Rainer Bauerle, Christoph Schwarze Schwarze, and Arnim von Stechow, 303–329. Berlin: De Gruyter.
- Reis, Marga. 2005. Zur Grammatik der sog. 'Halbmodale' *drohen/versprechen* + Infinitiv. In *Deutsche Syntax: Empirie und Theorie*, ed. Franz Josef D'Avis, 125–145. Göteborg: Acta Universitatis Gothoburgensis.
- Sawicki, Lea. 2019. Expressions of habituality in Polish. *STUF – Language Typology and Universals* 72:161–184.
- Schmitt, Viola, and Frank Sode. 2018. An anti-intellectualist treatment of german wissen ('know'). In *Proceedings of sinn und bedeutung 21*, ed. Robert Truswell, Chris Cummins, Caroline Heycock, Brian Rabern, and Hannah Rohde, 1091–1108.
- Tagliamonte, Sali, and Helen Lawrence. 2000. "I used to dance, but I don't dance now": The habitual past in English. *Journal of English Linguistics* 28:324–353.
- Traugott, Elizabeth Closs. 1997. Subjectification and the development of epistemic meaning: The case of promise and threaten. In *Modality in Germanic Languages*, ed. Toril Swan and Olaf Jansen Westvik, 185–210. Berlin: De Gruyter Mouton.
- Wurmbrand, Susi. 2001. *Infinitives: Restructuring and clause structure*. Berlin, New York: Mouton de Gruyter.

A Some more data

- **Embedded negation** (possibly constituent negation).

(38) *Znao je danima ne izlaziti.*
 know.PTCP.SG.M AUX.3SG days NEG go.out.INF
 'He used to not go out for days.'

- **Restructuring** properties: scrambling, clitic climbing.

- (39) a. *Markova majka slatkiše_i zna sakriti t_i pod jastuk.*
 Marko.POSS mother sweets know.3SG hide.INF under pillow
 ‘Marko’s mother sometimes hides sweets under the pillow.’
 b. *Markova {ih_i} majka {ih_i} zna sakriti t_i pod jastuk.*
 Marko.POSS them mother them know.3SG hide.INF under pillow
 ‘Marko’s mother sometimes hides them under the pillow.’

- **Viewpoint aspect** may be both perfective and imperfective: the habit can either include the reference time (the eighties) or be included into it (as seen by ‘for some time’) (based on Boneh & Doron 2013).

- (40) *U osamdesetima je Ivan (jedno vrijeme) znao ići na posao autobusom.*
 in eighties AUX.3SG John one time know.PTCP.SG.M go.INF on work bus.INSTR
 ‘In the 80s, John had the habit of going to work by bus for some time.’

- Repetition may but need not be regular \rightsquigarrow exceptions allowed (vs. *bi*).

- (41) a. *Svake druge godine je znala svaki ponedjeljak ići u teretanu.*
 every second year AUX.3SG know.PTCP.SG.F every Monday go.INF in gym
 ‘Every second year, she occasionally went to the gym every Monday.’
 b. *Svake druge godine bi svaki ponedjeljak išla u teretanu.*
 every second year would.3SG every Monday go.PTCP.SG.F in gym
 ‘Every second year, she would go to the gym every Monday.’

B Evidentiality

- Know can develop into an **evidential** (Kuteva et al. 2019: 248) \rightsquigarrow Min dialects: Taiwanese (Southern Min), Amoy (Xiamen dialect of Min; Southern Min), Fuzhouese (Fuzhou; Eastern Min)
 - Traugott (1997: 185) on “subjectification” (in the context of epistemic modals): “meanings become increasingly based in the speaker’s subjective belief state, or attitude toward what is said”
 - N.B. evidentiality \neq epistemic modality (Cornillie 2009).
- Evidentiality is related to **raising** (cross-linguistically):
 - English and German *promise, threaten* as (direct) evidentials (Reis 2005, Colomo 2011; cf. Wurmbrand 2001): compatible with eventive but not stative predicates in German (Reis 2005).
 - Other evidential strategies in Croatian (Gnjatović & Matasović 2010): complementizer *kako* ‘how’ and raising (to object with perception verbs (marked), to subject with *činiti se* ‘seem’).

- (42) I remembered a statistics report that I read recently, according to which most suicides in Zagreb happen during the winter ...

- a. ... (*čini mi se da je prosinac najfrekventniji*).
 ... seems me.DAT SE that AUX.3SG December most.frequent
 ... it seems to me that December is the most frequent month (for suicides). (indirect evidence)
- b. ... #(*prosinac mi se čini najfrekventnijim*).
 ... December me.DAT SE seems most.frequent.INSTR
 ... December seems to me to be the most frequent month (for suicides). (direct evidence)
 (Gnjatović & Matasović 2010: 96; my judgement)

C Znati as a weak PPI

- Modal PPIs (like individual PPIs) can be weak, of medium strength, or strong (Iatridou & Zeijlstra 2013).
 - Weak PPIs: only blocked in antimorphic contexts (sentential negation) but fine in antiadditive contexts (nobody; (43a)) and other downward entailing contexts (only; (43b)); weak and medium strength PPIs:

fine under negation if negation is itself embedded in a downward-entailing context (44).

- (43) a. *Nijedan profesor ne zna dolaziti na predavanje u odijelu.*
 not.one professor NEG knows come.INF on lecture in suit
 ‘No professor comes to the lectures wearing a suit.’ (antiadditive)
- b. *Samo Marko je znao pjevati pod tušem.*
 only Marko AUX knew sing.INF under shower
 ‘Only Marko used to sing under the shower.’ (downward entailing)
- (44) a. *Samo Zrinka nije znala igrati šah s nama.*
 only Zrinka NEG.AUX knew play.INF chess with us
 ‘Only Zrinka didn’t have the habit of playing chess with us.’ only > ¬ > znati
- b. *Ako taj čovjek nije znao naručiti limunadu, onda to nije on.*
 if that man NEG.AUX knew order.INF lemonade then that NEG.is he
 ‘If that man didn’t have the habit of ordering a lemonade, then that isn’t him.’ if > ¬ > znati

D Pflegen vs. znati—a hypothesis

- *Znati*: evidence against a (default) state of affairs; exceptions vs. *pflegen*: regularities (cf. Colomo 2011).
- (45) I meet a mathematician and notice that she has green eyes. Based on this, I can conclude:
- a. *Matematičarke znaju imati zelene oči.*
 mathematicians know.3PL have.INF green eyes
 ‘Mathematicians occasionally have green eyes.’
- b. *#Mathematikerinnen pflegen grüne Augen zu haben.*
 mathematicians PFLEG.3PL green eyes to have
 #‘Mathematicians usually have green eyes.’ (A. Ludwig, p.c.)
- (46) Viki is coming over for dinner and I ask her flatmate whether it’s a good idea to prepare a meat dish.
- a. *Zašto ne, Viki zna jesti meso.*
 why NEG Viki know.3SG eat.INF meat
 ‘Why not, Viki occasionally eats meat.’
- b. *#Bolje ne, Viki se zna hraniti vegetarijanski.*
 better NEG Viki SE know.3SG feed.INF vegetarian
 #‘Rather not, Viki occasionally eats vegetarian.’
- c. *Ja klar, Viki pflegt Fleisch zu essen.*
 yes clear Viki PFLEG.3SG meat to eat
 ‘Sure, Viki usually eats meat.’ (A. Ludwig, p.c.)
- d. *Lieber nicht, Viki pflegt vegetarisch zu essen.*
 rather NEG Viki PFLEG.3SG vegetarian to eat
 ‘Rather not, Viki usually eats vegetarian.’ (A. Ludwig, p.c.)