

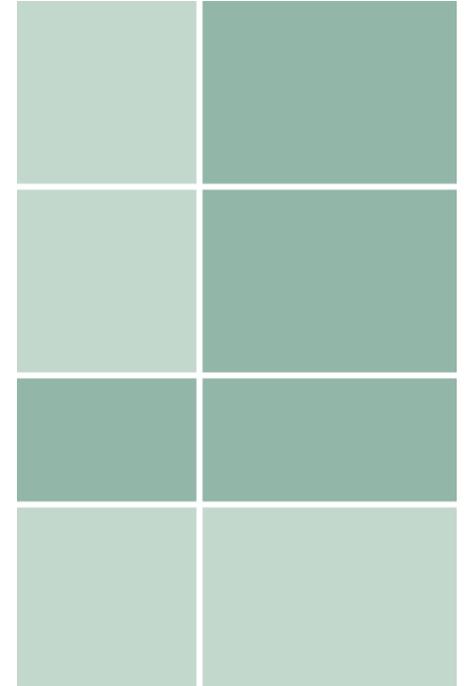
What does it take to culminate? Morphological directionality and semantics of the psych-alternation

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Linguistic Variation at the Interfaces

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The psych alternation

- Psych verbs participate of a well-known alternation between Stimulus (STM) and Experiencer:

- (1) a. *We puzzled over Sue's remarks.*
b. *Sue's remarks puzzled us.*

(Landau, 2010:68)

Morphological structure of experiencer verbs

- (2) transitive EO basis → intransitive ES derivation
angustiar 'distress' *angustiar-se* 'distress-REFL'
(Spanish)
- (3) intransitive ES basis → transitive EO derivation
koylopta 'be.distressed' *koylop-key hata* 'be.distressed-ADVR do'
(Korean)

The psych alternation

– Directionality has an impact on the semantics:

- Korean:

ES

ADJ./VERB

kippu-ta ‘

‘happy’

INCH.

kipp-e-ci-ta

‘become happy’

nolla-ta

‘get surprised’

EO

CAUS.

kippu-key hata

‘make happy’

nolla-key hata

‘make get surprised’

ES basic items can be classified in 2 groups: *pure states and inchoative states*.

- Spanish

EO

(NON-)CAUS. VERB →

divertir

‘entertain’

sorprender

‘surprise’

ES

REFL. =

divertir-se

‘be/get entertained’

sorprender-se

‘get surprised’

INCH./PUNCT

divertir-se

sorprender-se

ES REFL items can be classified in 2 groups: *inchoative states and punctual states*.

Research Questions

– Verbal aspectual ambiguities of psych verbs:

- **Type of psych verb:**

- a) Spanish: Inchoative States vs. Punctual States
- b) Korean: States vs. Inchoative States

- **Type of STM**

Agent vs. Causer

Considering the properties of the target languages:

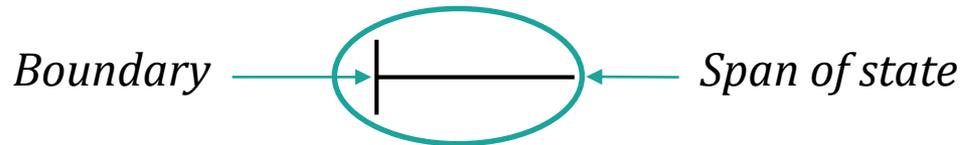
1. Is the event structure of the psych verbs in Spanish and Korean similar in both alternants; i.e. ES and EO?
 2. Does the morphological realization of psych verbs in Spanish and Korean have an impact on their event structure?
- **General idea:** causativity implies agentivity (i.e. agentive human subject).
- Then, overtly causative EO verbs of transitivity languages (Korean) are potentially agentive.
- And intransitivity languages (Spanish) can be semantically (non-) causative.

Outline

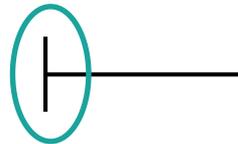
1. Psych verbs in Spanish
2. Psych verbs in Korean
3. Non-culmination readings
4. Methodology
 - Semantic diagnostics on event structures
 - Culminativity test
5. Results and Discussion
6. Summary
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1. Psych verbs in Spanish

- Two types of Spanish Reflexive Psych Verbs (SRPV) (Marín & McNally, 2011):
 - a) INCHOATIVE STATES: include **both** the onset of the state (i.e. *left-boundary*) and part of the state; e.g.: *divertirse* ‘to be/get entertain’



- b) PUNCTUAL STATES: include only the onset of the state; e.g. *sorprenderse* ‘to be/get surprised’



- Inchoativity **also** has an impact on the transitive alternants of the verbs (Marín, 2011):
 - Initial left-boundary +
 - Causative factor
 (see Section 4 – Semantic tests).

1. Psych verbs in Spanish

– DAT-ACC Experiencer alternation: *inchoative state reading* or and *punctual state reading* in EO verbs.

– **DAT constructions**

- Nominative argument ([+/-animante]) = T/SM
- STM = not volitional
- Agentivity restriction (no volitional agents)

(4) * *A María le asustó una vez Juan.*
to María CL.DAT frighten.PRT.3S one time Juan
'Juan frightened María once.'

(Fábregas et al., 2017:33)

– **ACC constructions**

- Animate external argument
- Causer (agent)
- No agentivity restriction

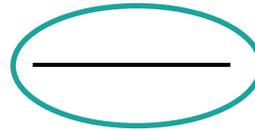
(5) *A María la asustó una vez Juan.*
to María CL.ACC frighten.PRT.3S one time Juan
'Juan frightened María once.'

(Fábregas et al., 2017:33)

2. Psych verbs in Korean

a) STATES: genuine adjectives (i.e. pure gradable states); e.g. *kipputa* ‘happy’

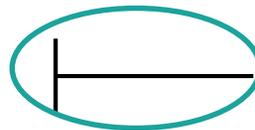
(6) *Mina-nun/ka (Minho-lul manna-se) kipp-ess-ta.*
 Mina-TOP/NOM Minho-ACC meet-because happy-PST-DECL
 ‘Mina was happy because she met Minho.’



b) INCHOATIVE STATES: inherently inchoative; e.g. *nollata* ‘get surprised’

(7) *Mina-nun/ka (Minho ttaymwuney) nolla-ss-ta.*
 Mina-TOP/NOM Minho because surprised-PST-DECL
 ‘Mina got surprised because of Minho.’

(Section 4 – Semantic tests, for details on ‘inherently inchoative states’)



– Two types of change of state (CoS) verbs - inchoativity (Choi, 2015; Choi & Demirdache, 2014).

a) Pure States: atelic items.

b) Inchoative States: inception of the CoS with no inherent culmination in aspectual meaning.

2. Psych verbs in Korean

– ACC-CAUS constructions:

- Periphrastic structure *-key hata*
- Typically agentive.
- Animate STM = volitional acting agent
- Inanimate STM = Causer

(Temme & Verhoeven, 2016)

(8) *Mina/soli-nun/ka Minho-lul nolla-key hay-ss-ta.*
Mina/noise-TOP/NOM Minho-ACC get.surprised-ADVR do-PST-DECL
'Mina/the noise made Minho get surprised.'

– DAT EO constructions:

- case alternation between:
 - (a) EXP-DAT and STM-NOM
 - (b) NOM-NOM

(not included in this study; for more details, see B-S. Yang, 1994; I-K. Kim, 2008).

3. Non-culmination readings

- AGENT CONTROL HYPOTHESIS (ACH):
 - Agentive external argument allow a *non-culmination* (NC) reading in CoS verbs (i.e. *intentional agent*).
 - Inanimate Causers force a *culmination* (CoS) reading.

(for Mandarin: Lin, 2004; Demirdache et al., 2017; Korean: Beavers & Lee, in prep; Choi & Demirdache, 2014; German: Martin & Schäfer, 2017; among others).

- In the psych domain: default interpretation = culmination.

(9) a. The teacher annoyed Anne, but she didn't notice it.

b. The report annoyed Anne, #but she didn't notice it.

- In (9a): CoS is only *implied* to satisfy the property in the base world W_0 . Negation is not a contradiction.
- In (9b): CoS has already happened with a causer. Negating the CoS generates a contradiction.

3. Non-culmination readings

- Semantics of the verb have an impact on the CoS:
 - Inchoativity correlates with changes along a gradable scale.
 - Punctuality refers to a non-gradable (binary) scale (Beavers & Lee, in prep.).

- In the psych domain:
 - INCHOATIVE/PURE STATES:
 - Gradable scale: various possible states the Experiencer could end up in.
 - Gradable scale allows a cancelation of the CoS.

 - PUNCTUAL STATES:
 - Binary scale: just two states $\neg\emptyset$ and \emptyset .
 - Only possible change from state $\neg\emptyset$ is \emptyset .
 - Culmination cannot be cancelled (Experiencer saturates the verb).

3. Non-culmination readings

- SPANISH
 - INCHOATIVE STATES: agenthood of STM relevant for the NC of the CoS.
 - PUNCTUAL STATES: agenthood of STM not relevant factor for the NC of the CoS. Aspect of the lexical item cancels NC.
- KOREAN
 - STATES/INCHOATIVE STATES: agenthood of STM relevant for the NC of the CoS.
- Why?
 - STATES are gradable.
 - INCHOATIVE STATES refer to the onset of the state and some part of that state as well. (More details in Section 4)

4. Methodology

- Items from an inventory of alternating psych verbs.
- Inventory created by a survey for each language featuring the basic emotion domains (i.e. happiness, sadness, anger, fear and disgust).
- **Semantic diagnostics on event structures**
- Tests on inchoativity/punctuality, telicity, dynamicity and stativity (Dowty, 1979; for Spanish, Fábregas & Marín, 2015; Marín & McNally, 2011; for Korean, Beavers & Choi forthc.; Choi 2015; Choi & Demirdache 2014).
- All tests were conducted with several native speakers of the languages.

4. Methodology-Semantic Tests

– Inchoativity

SPANISH

Quantificational adverbial *siempre que* ‘whenever’: reference time interval for interpretation of the clause they modify.

- (10) *Siempre que la llamo, mi llamada divierte/sorprende a Luisa.*
Whenever that her call, my calling entertain-PRS.3S/surprise-PRS.3S to Luisa
‘Whenever I call her, my call entertains/surprises Luisa.’

KOREAN

Inchoative marker –e ci: OK with State (St) verbs.

Inchoative states (InSt): initial zero-marked BECOME operator; do not allow addition of extra inchoative marker.

- (11) a. *Mina-ka icey-nun kippe-ci-n-ta.*
Mina-NOM now-TOP happy-INCH-PRS-DECL
‘Mina is getting happy now.’
b. **Mina-ka icey-nun nolla-ci-n-ta.*
Mina-NOM now-TOP surprise-INCH-PRS-DECL
‘Mina is getting surprised now.’

(cf. Section 2 – Korean)

4. Methodology-Semantic Tests

– Telicity

- For/in-adverbials acceptability: *in x time* = telic; *for x time* = atelic.

SPANISH

InSt & Punctual states (Pst): *for*-adverbial compatibility. Typical and iterative reading, respectively.

(12) *Juan/la película divirtió/sorprendió a Luisa durante/*en toda la tarde.*

Juan/the movie entertain-PRT.3S/surprise-PRT.3S to Luisa for/in all the afternoon

'Juan/the movie entertained/surprised Luisa during all the afternoon.'

KOREAN

St: only *for*-adverbial (13a). InSt: compatibility with both *in/for*-adverbials (13b), due to BECOME factor (modeling CoS) (Choi & Demirdache, 2014).

(13) a. *Mina-nun sip-pwun tongan/*maney kipp-ess-ta.*

Mina-TOP ten-mins. for/in happy-PST-DECL

'Mina was happy for 10 minutes.'

b. *Mina-nun sip-pwun tongan/maney nolla-ss-ta.*

Mina-TOP ten-mins. for/in surprise-PST-DECL

'Mina was surprised for/in 10 minutes.'

4. Methodology-Semantic Tests

– Dynamicity

SPANISH

Compatibility with *stop*: only with dynamic verbs.

- (14) ?*Juan/la película ha parado de divertir/sorprender a Luisa.*
Juan/the movie has stopped of entertain-INF/surprise-INF to Luisa
'Juan/the movie has stopped entertaining/surprising Luisa.'

KOREAN

Progressive/Continue marker *-ko iss*:

St: unacceptable (15a); InSt: acceptable due to their dynamicity (i.e. [+stages]) (15b) (Choi, 2015).

- (15) a. **Mina-ka cikum kippu-ko iss-ta.*
Mina-NOM now happy-PROG-DECL
'Mina is being happy now.'
- b. *Mina-ka cikum nolla-ko iss-ta.*
Mina-NOM now surprise-PROG-DECL
'Mina is being surprised now.'

4. Methodology-Semantic Tests

– Stativity

- Progressive Tense: with eventive predicates, not with stative ones.

SPANISH

InSt: unacceptable; PSt: preliminary circumstance reading.

(16) *Juan/la película está divirtiéndolo/sorprendiéndolo a Luisa*

Juan/the movie is entertaining/surprising to Luisa

¿y ella se va a divertir/sorprender.

and she REFL goes to entertain-INF/surprise-INF

‘Juan/the movie is entertaining/surprising Luisa and she will get entertained/surprised.’

KOREAN

Progressive *-nun-cwung* not compatible with St or InSt.

(17) **Mina-ka ku sanghwang-ey tayhay kippu/nolla-nun-cwungi-ta.*

Mina-NOM the situation-DAT about happy/surprise-PROG-DECL

‘Mina is getting happy/surprised about the situation.’

Table 1: SUMMARY OF SPANISH VERB INVENTORY BY EMOTIONAL DOMAIN AND VERB TYPE

EM. DOMAIN	INCHOATIVE ST.	ENG. TRANSLATION	PUNCTUAL ST.	ENG. TRANSLATION
HAPPINESS	<i>divertir</i>	entertain, amuse	<i>sorprender</i>	surprise
	<i>contentar</i>	please, make happy	<i>impresionar</i>	impress
SADNESS	<i>amargar</i>	depress	<i>desalentar</i>	demotivate
	<i>deprimir</i>	depress	<i>conmocionar</i>	affect deeply
ANGER	<i>molestar</i>	bother	<i>alterar</i>	agitate, upset
	<i>disgustar</i>	annoy, upset	<i>enloquecer</i>	drive crazy
FEAR	<i>preocupar</i>	worry	<i>asustar</i>	frighten
	<i>inquietar</i>	make uneasy, worry	<i>espantar</i>	scare away
DISGUST	<i>confundir</i>	confuse	<i>ofender</i>	offend
	<i>incomodar</i>	disturb	<i>escandalizar</i>	scandalize

Table 2: SUMMARY OF KOREAN VERB INVENTORY BY EMOTIONAL DOMAIN AND VERB TYPE

EM. DOMAIN	PURE ST.	ENG. TRANSLATION	INCHOATIVE ST.	ENG. TRANSLATION
HAPPINESS	<i>kipputa</i>	happy	<i>nollata</i>	get surprised
	<i>culkepta</i>	pleased	<i>sinnata</i>	get excited
			<i>selleyta</i>	get fluttered
			<i>hungi nata</i>	get pleased
SADNESS	<i>koylopta</i>	painful to		
	<i>sulphuta</i>	sad		
ANGER	<i>wenmangsulepta</i>	resentful	<i>michita</i>	drive crazy
	<i>himtulta</i>	hard to	<i>ccacungi nata</i>	get irritated
			<i>hwanata</i>	get angry
FEAR	<i>twulyepta</i>	afraid	<i>sosulachita</i>	get frightened
	<i>mwusepta</i>	scared	<i>kepi nata</i>	get scared
DISGUST	<i>anthakkapta</i>	pitiful to	<i>cichita</i>	get tired
	<i>honlansulepta</i>	confused		

4. Methodology-Culminativity Test

- Based on the ACH (Demirdache & Martin, 2015): parallel experimental design on Spanish and Korean to identify:
 - CoS in the EO
 - Availability of an agentive interpretation of the STM:
 - *Agentive* subjects allow for a *non-culmination reading*.
 - *(Inanimate) Causers* allow a *culmination reading*.
- EXPECTATIONS:
 - Spanish: InSt + [+animate] = NC ; InSt + [-animate] = C
PSt + [+/-animate] = C
 - Korean: St/InSt + [+animate] = NC ; St/InSt + [-animate] = C
- 40 sentences:
 - Dependent variable
 - CULMINATIVITY: Culmination reading (CR) vs. Non-culmination reading (NCR)
 - Fixed factors
 - STIMULUS: animate (agentive) vs. inanimate (causer)
 - VERBAL ASPECT:
 - SPANISH: Inchoative state vs. Punctual state
 - KOREAN: Pure state vs. Inchoative state
- 10 verbs: VERBAL ASPECT factor.
 - 20 Spanish & 20 Korean items.
 - Each appeared twice (STIMULUS factor).
 - No fillers included.

4. Methodology-Culminativity Test

- Spanish: n. 27 (6 f., 21 m.; age $M = 34,02$)
- Korean: n. 28 (13 f., 15 m.; age $M = 35$)
- *Sample of sentences:*

SPANISH

(18) *Juan/la película sorprendió a María, #pero ella no se dio cuenta y siguió indiferente.*
John/the movie surprise-PRT.3S to Mary but she not REFL gave account
and remained indifferent
'John/the movie surprised Mary, but she didn't realize it and remained indifferent.'

KOREAN

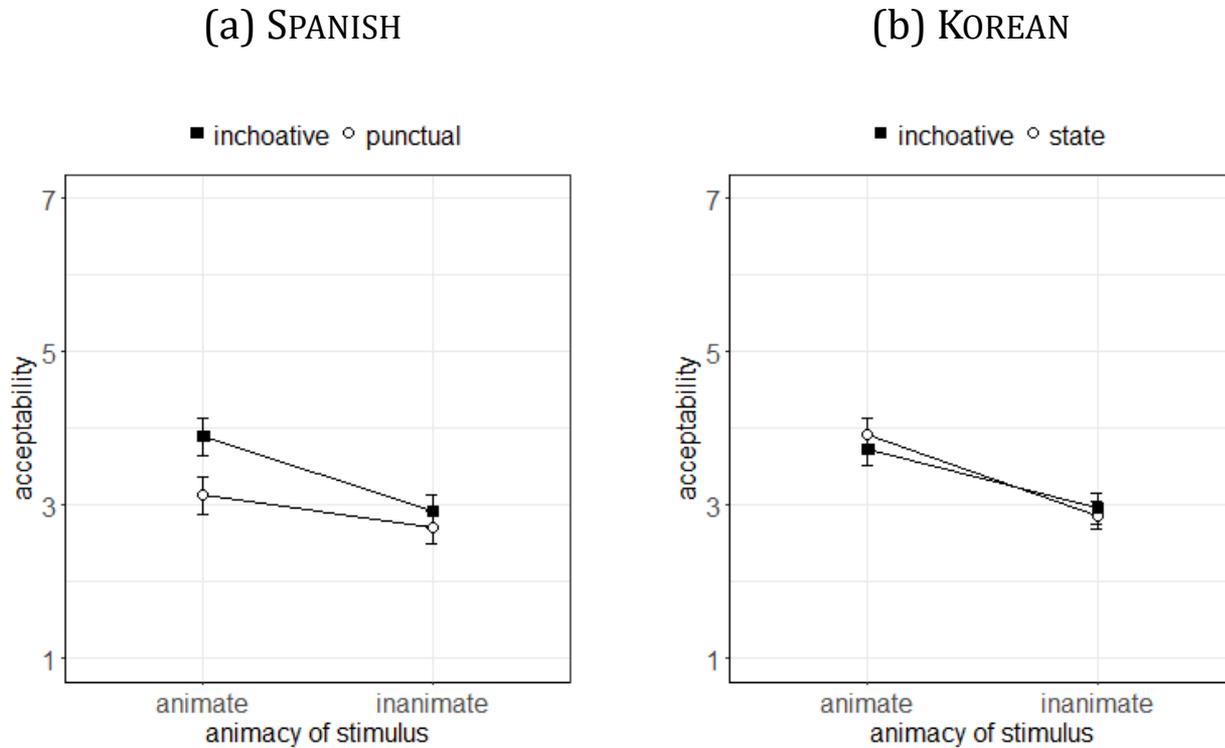
(19) *Minho/ku yenghwa-ka Mina-lul nolla-key hay-ess-ciman,*
Minho/the movie-NOM Mina-ACC get.surprised-ADVR do-PST-but
#ku-nye-nun ku-kes-ul alachay-ci mos-hay-ss-ta.
that-girl-TOP that thing-ACC realize-NEG cannot-do-PST-DECL
'Minho/the movie made Mina get surprised, but she didn't realize it.'

- Likert Scale sentence evaluation: 1 (very bad) to 7 (very good).
- Survey implemented on OnExp (CRC Text Structures at the Georg-August University Göttingen).

5. Results & Discussion



Figure 1: EFFECTS OF 'VERBAL ASPECT' AND 'ANIMACY' OF THE STIMULUS ON 'CULMINATIVITY'



5. Results & Discussion-General Effects

Table 3: LINEAR MODEL FIT ON 'CULMINATIVITY' IN KOREAN (RANDOM FACTORS: 'SPEAKERS' 'VERBS')

effect	estimate	st. error	t-test		model comparison (LogLikelihood)	
			t-value	p	χ^2	p
INTERCEPT	3.7	.2	17.8	< .001		
ASPECT (state)	.2	.1	1.5	.1	.2	.6
STIMULUS (inanimate)	-.8	.1	-6.2	< .001	100.5	< .001
ASPECT^STIMULUS	-.3	.2	-1.6	.1	2.5	.1

Table 4: LINEAR MODEL FIT ON 'CULMINATIVITY' IN SPANISH (RANDOM FACTORS: 'SPEAKERS' 'VERBS')

effect	estimate	st. error	t-test		model comparison (LogLikelihood)	
			t-value	p	χ^2	p
INTERCEPT	3.0	.2	15.9	< .001		
ASPECT (state)	-.8	.1	-5.6	< .001		
STIMULUS (inanimate)	-.9	.1	-7.2	< .001		
ASPECT^STIMULUS	.6	.2	2.9	< .01	8.4	< .01

- Statistic inferences based on generalized linear mixed-effects models. Random factors: SUBJECTS and ITEMS.
- Significance of fixed effects estimated with a log-likelihood test on model comparison.

5. Results & Discussion-General Effects

STIMULUS:

- Both languages:
 - Agenthood of subject make a NCR possible.
 - Inanimate causer cannot cancel culmination.
- In line with ACH Hypothesis (cf):

(20) a. *Juan divirtió a María, pero ella no se dio cuenta y siguió indiferente.*

‘John entertained Mary, but she didn’t realize it and remained indifferent.’

b. *La película divirtió a María, #pero ella no se dio cuenta y siguió indiferente.*

‘The movie entertained Mary, but she didn’t realize it and remained indifferent.’

(20a): Entertaining *y* does not necessarily imply that *y* gets entertained (to a positive degree $d < 1$). No contradiction.

(20b): Inanimate STM fulfills the ϕ -CoS of ‘getting entertained = Contradiction (Demirdache & Martin, 2015; Martin & Schäfer, 2017).

5. Results & Discussion-General Effects

ASPECT:

- Spanish:
 - Punctuality overrules the ACH .
 - PSt: binary scale (CoS from $\neg\emptyset$ to \emptyset) (Beavers & Lee, in prep.).
 - Initial left-boundary: instantaneous CoS.

(21) *Juan/la película sorprendió a María, #pero ella no se dio cuenta y siguió indiferente.*
'John/the movie surprised Mary, but she didn't realize it and remained indifferent.'

- Korean:
 - Agentivity of the subject **strongly** correlated with intentionality:

"In Korean, there seems to be a strong grammatical constrain that the intentions must be associated with the intuitive referent of the grammatical subject" (Beavers & Lee, in prep.: 25).

- Cancellation of culmination allowed.

(22) *Minho-ka Mina-lul nolla-key hay-ess-ciman, ku-nye-nun ku-kes-ul alachay-ci mos-hay-ss-ta.*
'Minho made Mina get surprised, but she didn't realize it.'

5. Results & Discussion-General Effects

STIMULUS^ASPECT:

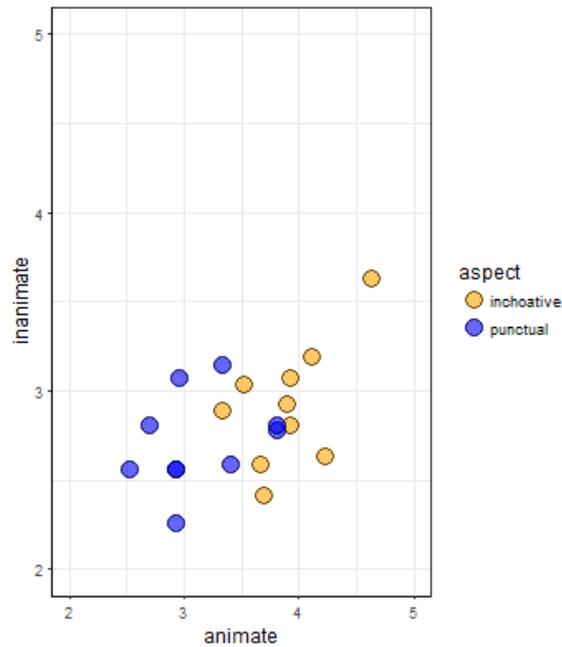
- The type of verb plays a role only with potential agents and not so with causers.
- ASPECT is not just cumulated to the effect STIMULUS, but it only applied in the level of 'animate' of the factor STIMULUS.
- This is the source of the interaction effect for Spanish.

5. Results & Discussion-Lexical Variation

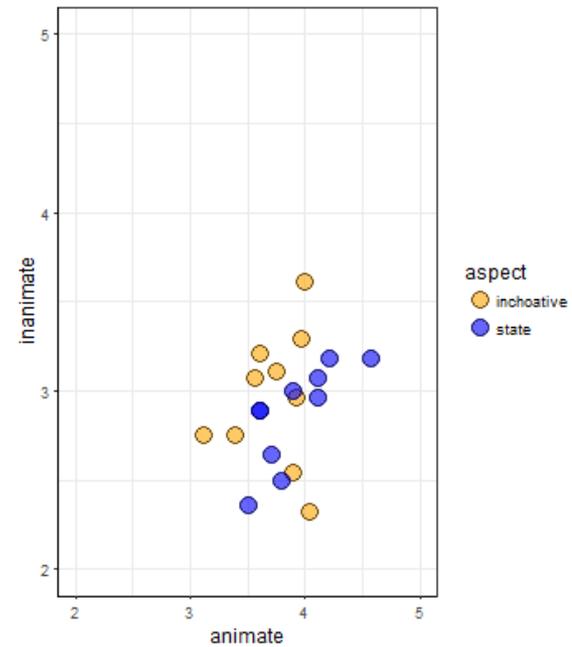


Figure 2: CANCELATION OF CULMINATIVITY PER VERB

(a) SPANISH



(b) KOREAN



5. Results & Discussion-Lexical Variation

- Spanish lexical items: Gradation of verbs; i.e. some more prototypical agentive.
- Extra analysis on agentivity (semantic tests based on Marín, 2011).

Table 5: AGENTIVITY TESTS FOR EO PSYCH VERBS IN SPANISH

TESTS	NON-AGENTIVE	AGENTIVE
<i>¿Qué ha hecho X?</i> 'What has X done?'	–	+
<i>Intencionalmente</i> 'intentionally'	–	+
Imperative	–	+
Complement of place	–	+
<i>Ser</i> or <i>estar</i> 'to be' verb	estar	estar/ser

- InSt.: *molestar*, *confundir*, *incomodar* = prototypically agentive (Table 6 – Appendix)

6. Summary

– ACH

STM

[+animate] → Non-Culmination Reading

[-animate] → Culmination Reading

– Psych domain: aspect of verbs (i.e. inchoativity) seem to play a role on culminativity. This turns to be language specific:

SPANISH			KOREAN		
INCHOATIVE ST.	[+animate]	+/- NC	INCHOATIVE ST.	[+animate]	+/- NC
	[-animate]	- NC		[-animate]	- NC
PUNCTUAL ST.	[+animate]	- NC	STATES	[+animate]	+/- NC
				[-animate]	- NC

6. Summary

- Spanish:
 - Inchoative states: in line with ACH.
 - Punctual states: punctuality overrules ACH due to the binary scale.
- Korean:
 - State and Inchoative states: in line with ACH.
 - Require *intentionality of the subject* by direct causation (Beavers & Lee, in prep.)
 - Both types of verbs: gradable scale.
 - Inchoative states: not the same as Spanish.
 - Spanish InSt.: non-dynamic (Marín, 2011, 2014; Marín & McNally, 2005, 2011)
 - Korean InSt: dynamic (onset + ongoing/dynamic state) (Choi & Demirdache, 2014.)

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Appendix

Table 6: AVERAGES OF THE INDIVIDUAL VERBS IN KOREAN



aspect	verb	animate	inanimate
inchoative	make get frightened - <i>sosulachita</i>	3.11	2.75
	make get tired - <i>cichita</i>	3.93	2.96
	drive crazy - <i>michita</i>	4.04	2.32
	make excited - <i>sinnata</i>	3.57	3.07
	make get fluttered - <i>selleyta</i>	4.00	3.61
	make get angry - <i>hwanata</i>	3.96	3.29
	make get scared – <i>kepi nata</i>	3.39	2.75
	make get irritated – <i>ccacungi nata</i>	3.75	3.11
	make get pleased – <i>hungi nata</i>	3.61	3.21
	make get surprised - <i>nollata</i>	3.89	2.54
	state	make afraid - <i>twulyepta</i>	4.11
make confused - <i>honlansulepta</i>		4.57	3.18
make happy - <i>kipputa</i>		3.71	2.64
make hard - <i>himtulta</i>		3.79	2.50
make painful - <i>koylopta</i>		3.89	3.00
make pitiful - <i>anthakkapta</i>		3.61	2.89
make pleased - <i>culkepta</i>		4.21	3.18
make resentful - <i>wenmangsulepta</i>		3.50	2.36
make sad - <i>sulphuta</i>		4.11	3.07
make scared - <i>mwusepta</i>		3.61	2.89

Appendix

Table 7: AVERAGES OF THE INDIVIDUAL VERBS IN SPANISH



aspect	verb	animate	inanimate	
inchoative	depress - <i>amargar</i>	3.33	2.89	
	confuse - <i>confundir</i>	4.63	3.63	
	please - <i>contentar</i>	3.89	2.93	
	depress - <i>deprimir</i>	3.52	3.04	
	annoy - <i>disgustar</i>	3.70	2.41	
	entertain - <i>divertir</i>	3.93	3.07	
	disturb - <i>incomodar</i>	3.93	2.81	
	worry - <i>inquietar</i>	4.11	3.19	
	bother - <i>molestar</i>	4.22	2.63	
	worry - <i>preocupar</i>	3.67	2.59	
	punctual	upset - <i>alterar</i>	2.93	2.56
		frighten - <i>asustar</i>	2.93	2.56
affect deeply - <i>conmocionar</i>		2.70	2.81	
demotivate - <i>desalentar</i>		3.81	2.78	
drive crazy - <i>enloquecer</i>		2.52	2.56	
scandalize - <i>escandalizar</i>		2.96	3.07	
scare away - <i>espantar</i>		2.93	2.26	
impress - <i>impresionar</i>		3.41	2.59	
offend - <i>offender</i>		3.81	2.81	
surprise - <i>soprender</i>		3.33	3.15	