Sinn und Bedeutung 16
September 8, 2011

Telicity, measures, and endpoints

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1. The problem

(1) Krifka's (1998) movements

(2) a. Telicity through specifying a source and goal of manner of motion

Mary walked from the university to the capitol in an hour || *for an hour. <telic>

b. Telicity through specifying the length of the path
Mary walked two kilometers in an hour || *for an hour. <telic>

(3) "Change of qualities is structurally similar to movement in space. For example, the change of temperature of an object can be seen as a movement in temperature space. When we assume a linear directed path structure to model temperature, then we can treat sentences like the following in the same way as we treated *Mary walked from the university to the capitol* and *Mary walked two kilometers*. (Krifka 1998)

(4) a. Mary heated the water to 90°C in an hour || *for an hour. <telic>

b. Mary heated the water by 60°C in an hour || *for an hour. <telic>

(5) ` Specifying source and goal locations leads to quantized event predicates:

(6) a. $\lambda e \exists x[\text{WALK}(M, x, e) \wedge \text{SOURCE}(x, U, e) \wedge \text{GOAL}(x, C, e)]$

b. $\lambda e[\text{HEAT}(M, W, e) \wedge \text{SOURCE}(e, 30\ °C) \wedge \text{GOAL}(e, 90\ °C)]$

(7) No proper part of an event in which the path from the university to the capitol has been walked is an event in which the path from the university to the capitol has been walked, hence the event predicate in (6a) is quantized; similarly for (6b)

(8) Extensive measure functions for events lead to quantized event predicates:

(9) a. $\lambda e \exists x[\text{WALK}(M, x, e) \wedge \text{KM}'(e) = 2]$

b. $\lambda e[\text{HEAT}(M, W, e) \wedge \text{CENTIGRADE}'(e) = 60)]$
where KM′ and CENTIGRADE′ are extensive measure functions for events based on corresponding functions KM and CENTIGRADE for paths.

(10) No proper part of an event of walking 2 km is an event of walking 2 km, hence the event predicate in (9a) is quantized; similarly for (9b)

(11) Turkic languages, Karachay-Balkar and Chuvash, differ systematically from English.

(12) **Karachay-Balkar: degree achievements**

a. Degree of change: telic only

kerim	suw-nu	{ eki	minut-xa	||	*eki	minut}	on	gradus-ta	
K.	water-ACC	2	min-DAT		2	min	10	degree-LOC	

zylyt-xan-dy.
heat-PFCT-3SG

'Kerim heated the water by 10 degrees {in two minutes || *for two minutes}'.

b. Endpoint of change: telic **or atelic**

kerim	suw-nu	{ eki	minut-xa	|| eki	minut}	alty	on	gradus-xa	dere
K.	water-ACC	2	min-DAT	2	min	6	10	degree-DAT	to

zylyt-xan-dy.
heat-PFCT-3SG

1. 'Kerim heated the water to 60 degrees {in two minutes }.'
2. Lit. Kerim heated the water to 60 degrees {for two minutes}, (but stopped when the water was 50 degrees).

(13) **Karachay-Balkar: manner of motion predicates**

a. Length of the path: telic only

kerim	züz	meter	{ eki	minut-xa	|| *eki	minut}	cap-xan-dy.	
K.	100	m	2	min-DAT	2	min	run-PFCT-3SG	

'Kerim ran 100 m {in two minutes || *for two minutes}.'

b. Goal of motion: telic **or atelic**

b.

kerim	šqola-Ra	{eki	minut-xa	||	eki	minut}	cap-xan-dy.
K.	school-DAT	2	min-DAT		2	min	run-PFCT-3SG

1. 'Kerim ran to the school in two minutes.'
2. Lit. 'Kerim ran to the school for two minutes (but then changed his mind and went to the cinema).

(14) **Chuvash: degree acievements**

a. Degree of change: telic only

maša	šywa	alla	gradus	čuxle	{ike	minut	xuššanče	||	*ike	minut}
M	water-ACCC	50	degree	by	two	minute	within		two	minute

ašat-r-e
heat-PST-3SG

'Masha heated the water by 50 C {in two minutes || *for two minutes}.'

b. Endpoint of change: telic **or atelic**

maša	šywa	alla	gradus	tarat	{ike	minut	xuššanče	||	ike	minut}
M.	water-ACC	50	degree	to	two	minute	within		two	minute

ašat-r-e
heat-PST-3SG

1. 'Masha heated the water to 50 degrees {in two minutes}.'
2. Lit. Masha heated the water to 50 degrees {for two minutes}, (but stopped when the water was 40 degrees).

(15) **Chuvash: manner of motion predicates**

a. Length of the path: telic only

samalot	pin	šʲuxram-a	{ike	sexet	xuššanče	||	*ike	sexet}
plane	thousand	km-ACC	two	hour	within		two	hour

vešʲ-r-e

fly-PST-3SG

'The plane flew 1000 km {in two hours || *for two hours}.'

b. Goal of motion: telic **or atelic**

samalot	muskwa-na	{ike	sexet	xuššanče	||	ike	sexet}	veš^{j}-r-e
plane	Moscow-DAT	two	hour	within		two	hour	fly-PST-3SG

'The plane flew to Moscow in two hours.'

'The plane was in flight to Moscow for two hours.'

(16) Degree achievements like 'heat' and manner of motion verbs like 'run'/'fly' form a natural class as to how their telicity interacts with expressions that

- measure the *degree of change* (e.g, 'by 10°C' in (12a)) / *length of the path* (e.g., '100m' (13a)); *measure of change expressions* henceforth
- define the *endpoint of change* (e.g., 'to 60°C' in (12b)) / *goal of motion* (e.g., 'to the school' in (13b)); *endpoint expressions* henceforth

(17) a. Like in English, if the degree of change/length of the path is specified by a measure phrase, the verbal predicate is *obligatorily telic*.

b. Unlike in English, *both telic and atelic interpretations* are compatible with an overt specification of the endpoint, either of motion or of change in a gradable property.

(18) **Explananda**

❶ Why are endpoint expressions compatible with both telic and atelic interpretations in Turkic, while measure expressions necessarily create telic predicates?

❷ How can the difference between languages like English and Karachay-Balkar/Chuvash be accounted for?

(19) **In brief:**

Re ❶: In Turkic, measure expressions saturate the degree argument position, but endpoint expressions modify a scale.

Re ❷: unlike in Turkic, both measure and endpoint expressions appear in the degree argument position

2. Semantics for degrees and endpoints of change in Turkic

2.1. Outline

(20) Degree-based approach to telicity (Hay et al. 1999; Kennedy, Levin 2002, 2008; Winter 2006, Kennedy 2010, Piñon 2008, a.o.)

(21) Measure expressions and endpoint expressions in Turkic languages are integrated into semantic representations of event predicates in considerably different ways.

(22) Measure expressions saturate the degree of change argument positions, hence obligatorily lead to quantized event predicates.

(23) Endpoint expressions modify a scale from which measure of change functions take their values by determining a maximal value on that scale. Variable telicity of derived event predicates then follows independently given the semantics of the positive form and Interpretive Economy.

2.2. Measure of change functions

(24) **Semantics of verbs based on gradable properties**

a. Hay et al. 1999, Kennedy, Levin 2002: the INCREASE relation

c. Piñon 2008: incremental degree functions

b. Kennedy, Levin 2008, Kennedy 2010: measure of change functions

(25) **Measure of change functions**

For any measure function **m**, $\mathbf{m}_{\Delta} = \lambda x \lambda e.\mathbf{m}\uparrow_{\mathbf{m}(x)(\mathit{init}(e))}(x)(\mathit{fin}(e))$
where $\mathbf{m}\uparrow_{\mathbf{m}(x)(\mathit{init}(e))}$ is a difference function based on a measure function **m**, of type <e, <i,t>>, and *init(e)* and *fin(e)* are initial and final temporal intervals of an event e, respectively.

(26) $\mathbf{m}_{\Delta}$ takes an object x and an event e and returns the degree that represents the amount that x changes in the property measured by **m** as a result of participating in e.

(27) **Difference functions**

For any measure function **m** from objects and times to degrees on a scale S, and for any d ∈ S, $\mathbf{m}\uparrow_d$ is a function just like **m** except that:
i. its range is $\{d' \in S \mid d \leq d'\}$, and
ii. for any x, t in the domain of **m**, if $\mathbf{m}(x)(t) \leq d$ then $\mathbf{m}\uparrow_d(x)(t) = d$.

(28) A difference function $\mathbf{m}\uparrow_d$ that is just like **m** except that the degrees it returns for objects in its domain represent the difference between the object's projection on the scale and an arbitrary degree d (the comparative standard): a positive value when there is a positive difference, and zero otherwise.

(29) || wide ||: $\lambda x \lambda t.\mathbf{wide}(x)(t)$, a function from individuals and times to:

(WIDTH: min ⟶ max)

where $\mathbf{wide}(a)(t) = \iota d.$ a is d-much long at t

(30) a. || widen ||: $\lambda x \lambda e.\mathbf{wide}_{\Delta}(e)(t)$, a function from individuals and events to a bracketed part of:

(WIDTH: min ⟶ [⟶ max])
wide(x)(init(e))

where the value returned by $\mathbf{wide}_{\Delta}$ is the width of x at *end(e)*;

(31) a. The gap between the boats widened.

b. $\lambda e.\mathbf{wide}_{\Delta}(\text{gap})(e)$, a function from events to degrees (of change).

(32) Functions from events to degrees participate in the further derivation in two ways, by merging with the positive morpheme pos_V, of type <<v,d>, <v,t>>, or with the degree morpheme μ, of type <<v,d>, <d, <v,t>>>.

(33) **Positive morpheme**

$\| \text{pos}_V \| = \lambda g_{<v,d>} \lambda e.g(e) \geq \text{stnd}(g)$

(34) **Degree morpheme**

$|| \mu || = \lambda g_{<v,d>} \lambda d \lambda e.g(e) = d$

(35) $|| pos_V$ [gap widen] $|| \quad \lambda e.\mathbf{wide}_{\Delta}(gap)(e) \geq stnd(\mathbf{wide}_{\Delta})$.

(36) Any scales from which a measure of change functions take their values are at least lower closed, by virtue of having a minimal degree. That is, for any $\mathbf{m}_{\Delta}$, its minimal degree is **m**(x)(init(e)). If **m** is also upper closed, so is $\mathbf{m}_{\Delta}$.

(37) Due to Interpretive Economy (Kennedy 2007) that maximizes the contribution of conventional meanings to the computation of truth conditions, for measure functions associated with closed scales, endpoints on these scales are used to fix the standard of comparison.

(38) If a scale S associated with a measure function g is lower closed, $stnd(g) = d_{min}(S)$
If a scale S associated with a measure function g is upper closed, $stnd(g) = d_{max}(S)$

(39) For *widen* (as for any other predicate based on a measure of change function) the analysis predicts (40):

(40) $|| pos_V$ [gap widen] $|| = \lambda e.\mathbf{wide}_{\Delta}(gap)(e) \geq 0$

(41) The event predicate in (40) fails to be quantized and is cumulative. One can show, specifically, that if the gap widens by some positive degree in an event e and in an event e', it also widens by some positive degree in $e \oplus e'$.

(42) The degree morpheme μ turns a function from events to degrees into a relation between events and degrees.

(43) $|| \mu$ [gap widen] $|| = \lambda d \lambda e.\mathbf{wide}_{\Delta}(gap)(e) = d$

(44) Degree expressions like *3 meters* saturate the degree argument of the derived relation, yielding an event predicate.

(45) a. The gap widened 3 m.
b. $||$ 3m μ [gap widen] $|| = \lambda e.\mathbf{wide}_{\Delta}(gap)(e) = 3m$

(46) The event predicate in (45) is quantized, since no proper part of an event of widening of the gap by 3m is an event of widening by 3m.

2.3. Turkic measure expressions: derivation by μ.

(47) **Karachay-Balkar: degree achievements**

kerim	suw-nu	{ eki	minut-xa	||	*eki	minut}	on	gradus-ta
K.	water-ACC	2	min-DAT		2	min	10	degree-LOC

zylyt-xan-dy.
heat-PFCT-3SG
'Kerim heated the water by 10 degrees {in two minutes || *for two minutes}'.

(48) **Karachay-Balkar: manner of motion predicates**

kerim	züz	meter	{ eki	minut-xa	|| *eki	minut}	cap-xan-dy.
K.	100	m	2	min-DAT	2	min	run-PFCT-3SG

'Kerim ran 100 m {in two minutes || *for two minutes}.'

(49) (47)-(48) are exactly like their English counterparts; Kenndy and Levin's (2008) and Kennedy's (2010) analysis applies straightforwardly.

(50) Measure expressions like '(by) ten degrees' and '100 m' saturate the degree of change argument position created by the application of μ.

(51) 'Kerim heated the water by 10 degrees.'

a. || heat || = $\lambda x \lambda e.\mathbf{hot}_{\Delta}(x)(e)$

b. || heat water || = $\lambda e.\mathbf{hot}_{\Delta}(\text{water})(e)$

c. || μ || = $\lambda g_{<v,d>} \lambda d \lambda e.g(e) = d$

d. || μ [heat water] || = $\lambda d \lambda e.\mathbf{hot}_{\Delta}(\text{water})(e) = d$.

e. || 10C μ [heat water] || = $\lambda e.\mathbf{hot}_{\Delta}(\text{water})(e) = 10C$.

(52) The event predicate in (51e) is true of an event e just in case the temperature of the water has increased in e by 10C.

(53) 'Kerim ran 100m'

a. || run || = $\lambda x \lambda e.\mathbf{path}_{\Delta}(x)(e)$

b. || Kerim run || = $\lambda e.\mathbf{path}_{\Delta}(\text{Kerim})(e)$

c. || μ || = $\lambda g_{<v,d>} \lambda d \lambda e.g(e) = d$

d. || μ [Kerim run] || = $\lambda d \lambda e.\mathbf{path}_{\Delta}(\text{Kerim})(e) = d$.

e. || 100m μ [Kerim run] || = $\lambda e.\mathbf{path}_{\Delta}(\text{Kerim})(e) = 100m$.

(54) The event predicate in (53e) is true of an event e just in case the length of the path covered by Kerim is 100 m.

(55) Predicates in (51e) and (53e) are quantized, hence telic: no proper part of an event of heating the water by 10 degrees is an event of heating the water by 10 degrees; similarly for running 100 meters.

2.3. Endpoint expressions: change in the scale plus pos_V

(56) Endpoint of change: telic **or atelic**

kerim	suw-nu	{ eki	minut-xa	|| eki	minut}	alty on	gradus-xa	dere
K.	water-ACC	2	min-DAT	2	min	6 10	degree-DAT	to

zylyt-xan-dy.
heat-PFCT-3SG

1. 'Kerim heated the water to 60 degrees {in two minutes }.'
2. Lit. Kerim heated the water to 60 degrees {for two minutes}, (but stopped when the water was 50 degrees).

(57) Endpoint of motion: telic **or atelic**

b.

kerim	šqola-Ra	{eki	minut-xa	||	eki	minut}	cap-xan-dy.
K.	school-DAT	2	min-DAT		2	min	run-PFCT-3SG

1. 'Kerim ran to the school in two minutes.'
2. Lit. 'Kerim ran to the school for two minutes (but then changed his mind and went to the cinema).

(58) (56)-(57) are unlike their English counterparts in that they are not necessarily telic.

(59) **The hypothesis**
Endpoint expressions in Turkic languages produce derived measure of change functions, which are exactly like measure of change functions in the initial denotation of verbs of gradual change except that they take their values from (upper) closed scales. The maximal value on a scale is determined by the endpoint expression.

(60) Upper limited difference functions
For any measure of change function $\mathbf{m}_\Delta$ from individuals and events to degrees on a scale S, and for any $d \in S$, $\mathbf{m}_\Delta{\downarrow_d}$ is a function just like $\mathbf{m}_\Delta$ except that:
i. its range is $\{d' \in S \mid d' \leq d\}$, and
ii. for any e in the domain of $\mathbf{m}_\Delta$, if $\mathbf{m}(e) > d$ then $\mathbf{m}_\Delta{\downarrow_d}(e) = 0$.

(61) $\mathbf{heat}_\Delta$ is a function from individuals and events to a bracketed part of the temperature scale:

(TEMPERATURE: min ——————— [——————————→ max])
hot(x)(init(e))

(62) $\| \mathbf{heat}_\Delta{\downarrow_{60C}} \|$, based on $\| \text{heat}_\Delta \|$, is a function from individuals and events to:

(TEMPERATURE: min ——————— [————————] ——————→ max)
hot(x)(init(e)) 60C

(63) || heat the water to 60C || = $\lambda e.\mathbf{hot}_\Delta{\downarrow_{60C}}(\text{water})(e)$

(64) $\| pos_V$ [heat the water to 60C] || = $\lambda e.\mathbf{hot}_\Delta{\downarrow_{60C}}(\text{water})(e) \geq \text{stnd}(\mathbf{hot}_\Delta{\downarrow_{60C}})$

(65) Upper limited degree of change functions, e.g., $\mathbf{hot}_\Delta{\downarrow_{60C}}$, are totally closed. They are lower closed since degree of change functions they are based on, e.g., $\mathbf{hot}_\Delta$, are. They are upper closed due to the endpoint expression.

(66) Since upper limited degree of change functions take their values from totally closed scales, the Interpretive Economy predicts two standards determined by the minimal and maximal values.

(67) If a scale S associated with a measure function g is lower closed, stnd(g) = $d_{min}(S)$
If a scale S associated with a measure function g is upper closed, stnd(g) = $d_{max}(S)$

(68) a. || pos_V [heat the water to 60C] || = $\lambda e.\mathbf{hot}_{\Delta}\downarrow_{60C}(water)(e) \geq 0$ (minimal standard)
b. || pos_V [heat the water to 60C] || = $\lambda e.\mathbf{hot}_{\Delta}\downarrow_{60C}(water)(e) = d_{max} = 60C$

(69) By the same reasoning as in (41), (68a) is cumulative and not quantized.
(68b), to the contrary is quantized and not cumulative: with minimal additional assumptions, one can show that if the water has been maximally hated to 60C in e, in has not be maximally heated in any of proper subparts of e.

(70) In Turkic, predicates like 'heat the water to 60C' show variable telicity for exactly the same reason as non-derived predicates like *straighten* based on at least upper closed gradable adjectives like *straight* in English.

(71) The scale of straightness associated with **straight** and $\mathbf{straight}_{\Delta}$ is lexically upper closed. For $\mathbf{straight}_{\Delta}$, its also lower closed. Hence, stnd($\mathbf{straight}_{\Delta}$), according to Interpretive Economy, yields two values (maximal and minimal) which give rise to telic and atelic readings, respectively.

(72) The only difference between $\mathbf{straight}_{\Delta}$ in English and $\mathbf{hot}_{\Delta}\downarrow_{60C}$ in Turkic is that in the latter case the endpoint is specified by the endpoint expression rather than lexically provided.

(73) Extension to manner of motion predicates is straightforward.

3. Cross-linguistic variation

(74) Where does the difference between languages like English and languages like Karachay-Balkar come from?

(75)

	Degrees of change	Enpoints of change
English	telic	telic
Balkar	telic	telic, atelic

(76) **Generalization**:
In Karachay-Balkar degrees and endpoints of change do not pattern together as to their telicity. The account proposed above relies on the hypothesis that the difference manifests different ways in which they are integrated into the event structure.
By the same reasoning, a natural suggestion would be that in English, where degrees and points are both lead to obligatory telicity, their contribution to the internal make-up of event predicates is essentially the same: both are involved in determining the value of the degree of change argument.

(77) Measures of change in English, as in Turkic, provide the value of this argument directly:

(78) a. The gap widened 3 m.
b. || **3m** μ [gap widen] || = λe.**wide$_{\Delta}$**(gap)(e) = **3m**

(79) Endpoint expressions accomplish the same task indirectly, by submitting a degree from which the measure of change can be calculated:

(80) a. The gap widened to 10m.
b. || to 10 m [ν [gap widen]]]] || = λe.**wide$_{\Delta}$**(gap)(e) = **10m** –′ **d**
where
ν = λgλdλe.g(e) = d –′ **d**,
"–′" is a subtraction of positive degrees,
and **d** a free variable over degrees representing a contextually salient initial width of an object.

(81) The predicate in (80b) is quantized, as required: no proper part of an event in which the width of the gap increases by d –′ **d** is an event that falls under the same event description.

(82) **Prediction about cross-linguistic variation**
If two distinct mechanisms of integrating endpoint expressions into the event structure are empirically real, one can expect to find a language where both are operative.

(83) A possible example: Russian; delimitative verbs; *po*-prefixation; atelic

(84) In both English and Turkic degree achievements and manner of motion verbs form a natural class as to how degrees and endpoints of change interact with telicity. In Russian, they do not.

(85) **Russian: manner of motion verbs**
a. Endpoint expression
*Vasja po-pribega-l v školu.
V. DLM-run.IPFV-PST in school
'Vasja spent some time running to the school.'

b. Measure expression
*Vasja po-probega-l 10 km.
V. DLM-run.IPFV-PST
'Vasja spent some time running 10 km.'

(86) **Russian: degree achievements**
a. Endpoint expression
?Vasja po-nagre-va-l rastvor do 60 gradusov.
V. DLM-heat-IPFV-PST solution to degrees
'Vasja spent some time heating the solution to 60 degrees.'

b. Measure expression
??Vasja po-nagre-va-l rastvor na 60 gradusov.
V. DLM-heat-IPFV-PST solution on degrees
'Vasja spent some time heating the solution by 60 degrees.'

(87) Manner of motion part of the system resembles that of English: all atelic predicates are ungrammatical. Degree achievements are more like in Turkic: endpoint expressions are compatible with atelicity, measure expressions do not.

4. Summary

Measure expressions and endpoint expressions make different contribution to the semantics of the whole event predicate. Measure expressions saturate the degree of change argument position, hence lead to quantization. Endpoint expressions are subject to cross-linguistic variation. In Turkic, they modify a scale from which a measure of change function takes its values. Modified scales possess a maximal value, hence give rise to the telic reading. Since they also have, for independent reasons, a minimal value, the atelic reading obtains. In this way, variable telicity of Turkic verbal predicates based on endpoint expressions is correctly predicted. In English, endpoint expressions do not modify a scale, but rather determine, although indirectly, the degree to which an object changes with respect to a relevant gradable property in the course of an event. For this reason, endpoint expressions yield invariably telic predicates.

References

Bertinetto, P.M., M. Squartini. 1995. An attempt at defining the class of 'gradual completion' verbs. In Temporal reference, aspect, and actionality: Semantic and syntactic perspectives, P.M. Bertinetto, V. Bianchi, J. Higginbotham, M. Squartini (eds). Torino: Rosenberg and Sellier, pp. , 11–26.

Bar-el, L., H. Davis, and L. Matthewson 2005. On non-culminating accomplishments. Proceedings of the North Eastern Linguistics Society 35. Amherst, MA: GLSA.

Caudal, P. and D. Nicolas. 2004. Types of degrees and types of event structures. In Event arguments: Foundations and applications, ed. Claudia Maienborn and Angelika W¨ollstein-Leisten. T¨ubingen: Niemeyer.

Dowty, D.R. 1979. *Word meaning and Montague grammar.* Dordrecht: Reidel.

Hay, J., C. Kennedy, and B. Levin. 1999. Scale structure underlies telicity in 'degree achievements'. In T. Matthews and D. Strolovitch (eds.) *SALT 9.* Ithaca: CLC Publications.Kennedy, C. and B.Levin. (2002). Telicity corresponds to degree of change. Handout. UCLA.

Ivanov, M. and S. Tatevosov. 2009. Event structure of non-culminating accomplishments. In Hogeweg, L., and H. de Hoop (eds.) *Cross-linguistic semantics of Tense, Aspect, and Modality.*

Kearns, K. 2007. Telic senses of deadjectival verbs. *Lingua* 117:26–66

Kennedy, C. 2001. Polar opposition and the ontology of 'degrees'. *Linguistics and Philosophy* 24:33–70.

Kennedy, C. 2007. Vagueness and grammar. Linguistics and Philosophy 30:1–45.

Kennedy, C. 2010. The composition of incremental change. Ms. University of Chicago.

Kennedy, C. and B. Levin. 2002. Telicity corresponds to degree of change. Unpublished ms., Northwestern University and Stanford University.

Kennedy, C. and B.Levin. 2008. Measure of Change: The Adjectival Core of Degree Achievements. In McNally, In L. McNally, C. Kennedy (eds.) *Adjectives and Adverbs: Syntax, Semantics and Discourse*. Oxford: Oxford University Press.

Kennedy, Ch. and L. McNally. 2005. Scale structure and the semantic typology of gradable predicates. *Language* 81:345–381.

Koenig, J.-P., and N. Muansuwan. 2001. How to end without ever finishing: Thai semi-perfectivity. *Journal of Semantics* 17(2): 147–184.

Krifka, M. 1992. Thematic relations as links between nominal reference and temporal constitution. In Lexical matters, ed. Ivan Sag and Anna Szabolcsi. Stanford: CSLI, pp. 29–53.

Krifka, M. 1998. The origins of telicity. S. Rothstein (ed.) *Events and Grammar,* Dordrecht: Kluwer.

Piñón, C. 2008. Aspectual composition with degrees. In L. McNally, C. Kennedy (eds.) *Adjectives and Adverbs: Syntax, Semantics and Discourse*. Oxford: OUP.

Rothstein, S. 2004. *Structuring events: a study in the semantics of lexical aspect*. Malden (Mass.): Blackwell publishing.

Rothstein, S. 2008. Telicity, Atomicity and the Vendler Classification of Verbs. In S. Rothstein (ed.) *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*. Amsterdam: John Benjamins.

Svenonius, P. and Ch. Kennedy. 2006. Northern Norwegian Degree Questions and the Syntax of Measurement.

Vendler, Zeno. 1967. Linguistics in philosophy. Ithaca, N.Y.: Cornell University Press.

Winter, Y. 2006. Scale Closure and Telicity. Presented at the Workshop on Scalar Meaning, University of Chicago.