

*for*-adverbials quantify over  
subintervals, not subevents

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**Temporal *for*-adverbials** are incompatible with telic predicates:

- John ran towards the store for five minutes                      *atelic*
- \*John ran (all the way) to the store for five minutes              *telic*

(e.g. Vendler, 1957; Verkuyl, 1972; Zwarts, 2005)

**Spatial *for*-adverbials** exhibit a similar behavior:

- John ran towards the store for five miles
- \*John ran (all the way) to the store for five miles

(Moltmann, 1991; Gawron, 2005)

# What this talk is and is not about

- This talk is about the following question:

Which aspectual property must predicates have in order to combine with *for*-adverbials?

- The traditional answer is: they must be atelic. But as we will see, this notion is imprecise. We will improve on it, without rejecting it. (Basically we'll end up with temporally vs. spatially telic.)
- This talk does **not** address the problem of aspectual composition (e.g. why is *run towards the store* atelic and *run all the way to the store* telic)
  - But this talk is compatible with mereological theories of aspectual composition like Krifka (1998); Zwarts (2005)

# What are subevents and subintervals?

- Both theories presuppose a mereological theory of events as in Krifka (1998).
  - Actually, Dowty (1979) doesn't, but Moltmann (1991) reformulates him into such a theory.
- An **interval** is just a stretch of time, or a path through space.
  - An interval is always one-dimensional.
  - Its shorter parts are called **subintervals**.
  - e.g. "an hour", "two days", "five meters"
- An **event** is an entity that can be described as a state, activity, accomplishment or achievement.
  - An event typically has an extent in space and/or a duration in time. So it can be four-dimensional.
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# Previous answers

What constraint do *for*-adverbials impose on their predicate?

[[S for INTERVAL]] requires [[S]] to hold ...

Dowty (1979); Moltmann (1991)

... at each subinterval of INTERVAL:

[[for five minutes]] =

$$\lambda P \lambda e. \exists t [runtime(e) = t \wedge duration-in-minutes(t) = 5 \\ \wedge \forall t' [t' < t \wedge moderate-size(t) \\ \rightarrow \exists e' [e' < e \wedge P(e') \wedge runtime(e') = t']]]$$

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... of each (shorter) subevent of the event in question:

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# Contribution of this talk

[[S for INTERVAL]] requires [[S]] to hold . . .

Dowty (1979); Moltmann (1991)

at each subinterval of  
INTERVAL ✓

Krifka (1998); Kratzer (2007)

of each (shorter) subevent of  
the event in question ⚡

- As long as only one dimension is considered, the two options are hard to tell apart.
- Unlike previous work, this talk considers several dimensions at once: time, space
- Quantification over subintervals checks for atelicity along only one dimension – exactly what is needed
- Quantification over subevents (shorter or not) checks for atelicity along all dimensions – too strict!

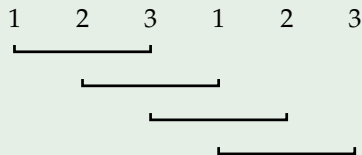
# Outline of the talk

- Give two qualifications that both theories need in order to get off the ground
- See how the theories work by looking at cases where both work well
- Look at cases where the subevent theory fails
- Refute arguments that led Krifka (1998) to adopt it

# Qualification I: The minimal-parts problem (Dowty, 1979)

## Example

*The couple waltzed for an hour.*



- Waltzing involves sequences of three steps
- Unclear whether *x waltzes* is true at intervals  $< 3$  steps
- Also unclear whether events of performing those steps count as subevents of a waltzing event
- So, can't use the problem to decide between both accounts

## Qualification II: Not literally universal quantification

### Example

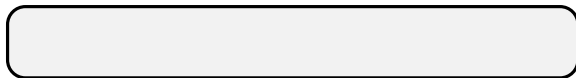
- *Last week, Tai always ate Chinese food with CHOPSTICKS.*
  - *Last week, Tai always ate CHINESE FOOD with chopsticks.*
  - *For a week, Tai ate Chinese food with CHOPSTICKS.*
  - *For a week, Tai ate CHINESE FOOD with chopsticks.*
- 
- Does not entail that Tai did nothing but eating throughout a week (Rooth, 1992; von Stechow, 1994, MacDonald and Ürögdi today)
  - As with other quantifiers, unfocused material gets copied into the restrictor of the universal quantifier of *for an hour*
  - Won't use this to decide between theories

# The subinterval theory (Dowty, 1979; Moltmann, 1991)

*run towards the store for five minutes* – OK

How the subinterval theory explains this judgment

- 1 Take an event that qualifies as “run towards the store”



= an event of running  
towards the store

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## How the subinterval theory explains this judgment

- 1 Take an event that qualifies as “run towards the store”
- 2 Measure it along the dimension “time”



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- 1 Take an event that qualifies as “run towards the store”
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time = 5 minutes



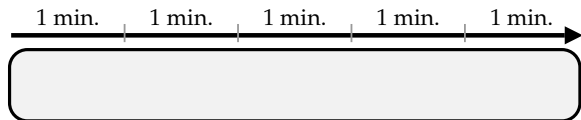
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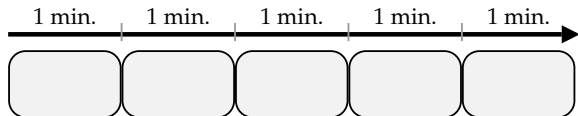


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- 5 For each subinterval, consider the corresponding subevent



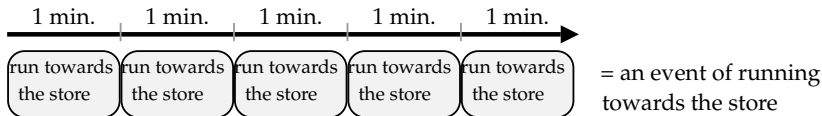
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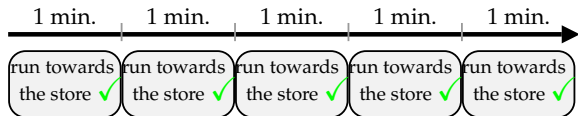


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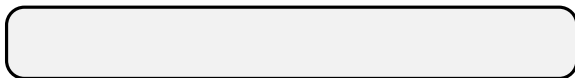
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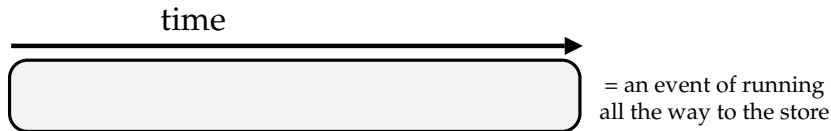
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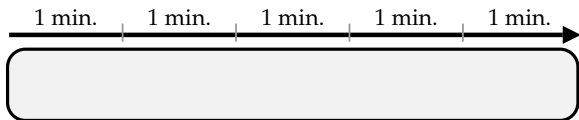
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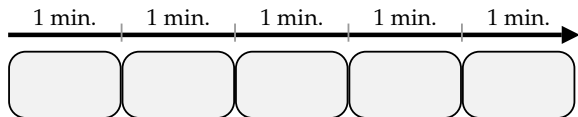
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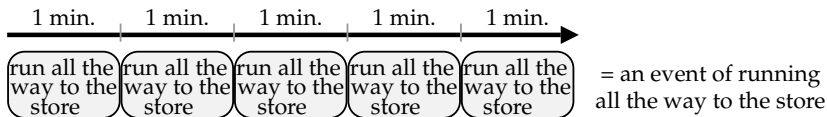


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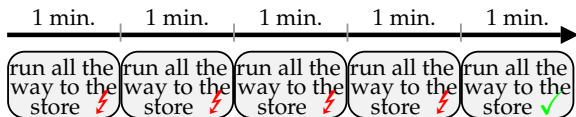


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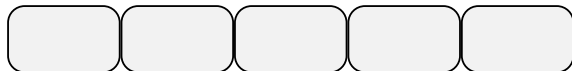


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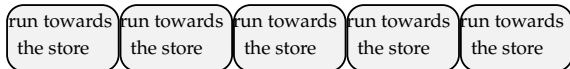
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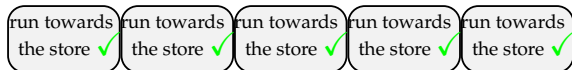


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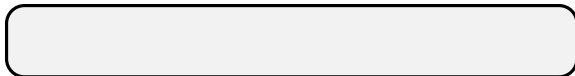
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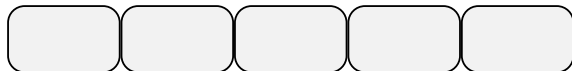
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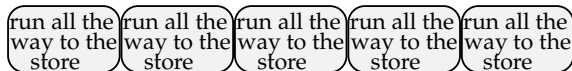
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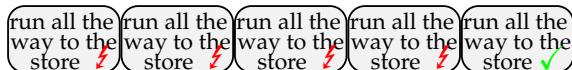
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# The crucial difference

## Subinterval theory



Subdivide the event so that for each moderately sized part of the arrow there is a part of the event

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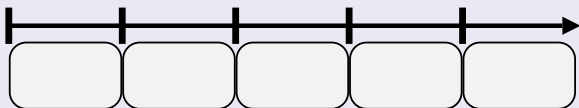
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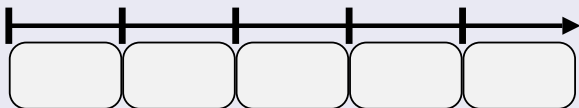
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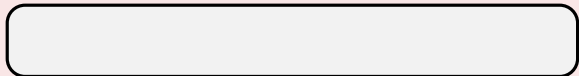
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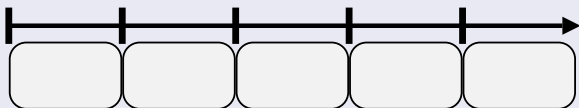
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Subdivide the event into moderately sized parts, ignoring the arrow

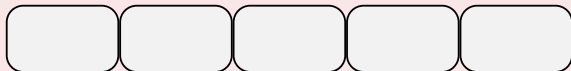
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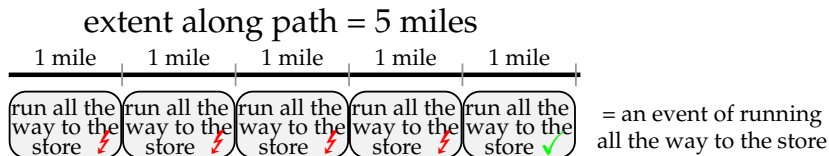


Subdivide the event into moderately sized parts, ignoring the arrow

# Both theories can be extended to the spatial case

\*run all the way to the store *for five miles* – bad

- The subinterval theory divides the event into subevents along a spatial instead of a temporal dimension
- The subevent theory still performs a check on all moderately sized subevents (as before)
- So far, the results seem to be the same in all cases.



# Beyond previous analyses

Putting space and time together

- Moltmann (1991) adopts the subinterval theory. She notes that it predicts that spatial *for*-adverbials don't require events to be homogeneous with respect to the relation 'is a temporal part of', and vice versa.
- We will use this observation to distinguish between subinterval and subevent theories.

# Beyond previous analyses

Putting space and time together

*John pushed carts all the way to the store.*

True in these two scenarios (among others):

## All-at-once scenario



- Just one trip to the store
- All carts in question at once
- Takes 5 minutes in total

## Little-by-little scenario



- Several trips back and forth
- A few carts at a time
- Takes 5 minutes in total



## Where spatial and temporal *for*-adverbials differ

- *John pushed carts all the way to the store for fifty meters.*
  - All-at-once: ⚡
  - Little-by-little: ⚡

## Where spatial and temporal *for*-adverbials differ

- *John pushed carts all the way to the store for fifty meters.*
  - All-at-once: ⚡ Little-by-little: ⚡
- *John pushed carts all the way to the store for five minutes.*
  - All-at-once: ⚡ Little-by-little: ✓

## Where spatial and temporal *for*-adverbials differ

- *John pushed carts all the way to the store for fifty meters.*
  - All-at-once: ⚡
  - Little-by-little: ⚡
- *John pushed carts all the way to the store for five minutes.*
  - All-at-once: ⚡
  - Little-by-little: ✓

We will focus on the contrast in the little-by-little scenario.

# The subinterval theory predicts the contrast

## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subinterval theory

Assume that events are closed under sum (standard assumption, e.g. Bach, 1986; Krifka, 1998).

# The subinterval theory predicts the contrast

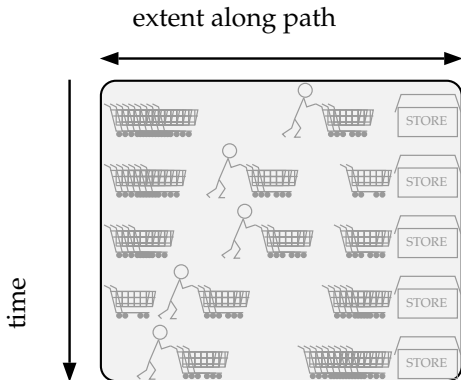
## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subinterval theory

**Step 1:** Take a sum event that qualifies as “push carts all the way to the store”

- We choose the sum event that represents the little-by-little scenario



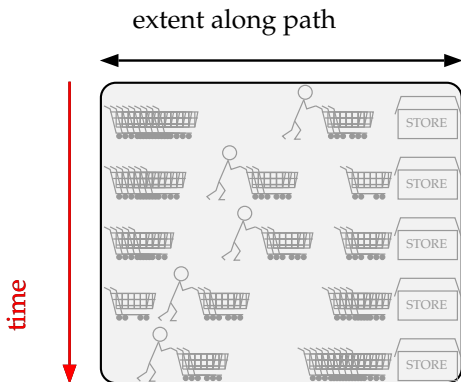
# The subinterval theory predicts the contrast

Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

Subinterval theory

Step 2: Measure it along  
the dimension “time”



# The subinterval theory predicts the contrast

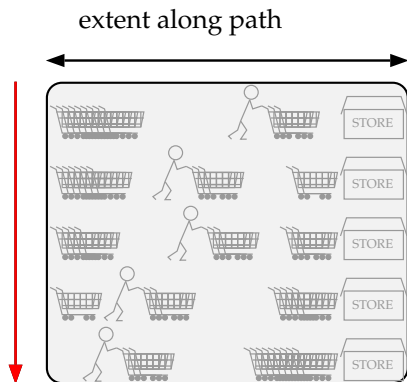
Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

Subinterval theory

Step 3: Check that its duration is a five-minute interval

time = 5 minutes



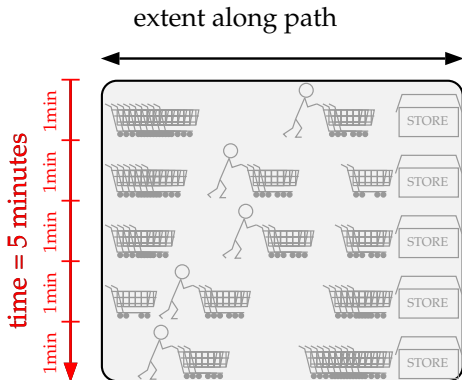
# The subinterval theory predicts the contrast

Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

Subinterval theory

**Step 4:** Take all the moderately sized subintervals of that interval





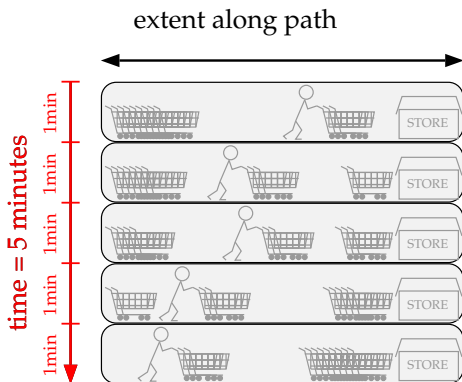
# The subinterval theory predicts the contrast

Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

Subinterval theory

**Step 5:** For each subinterval, consider the corresponding subevent



# The subinterval theory predicts the contrast

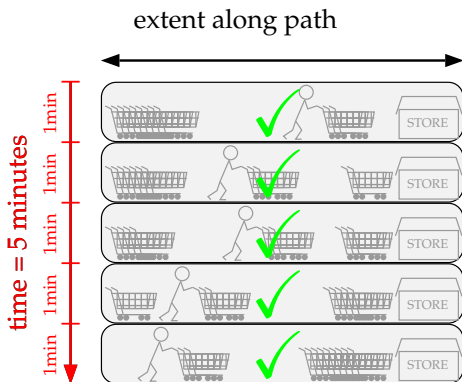
## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subinterval theory

**Step 6:** Check if each of them qualifies as “push carts all the way to the store”

... correctly predicts the sentence is **OK**



# The subinterval theory predicts the contrast

## Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

## Subinterval theory

Assume that events are closed under sum (standard assumption, e.g. Bach, 1986; Krifka, 1998).

# The subinterval theory predicts the contrast

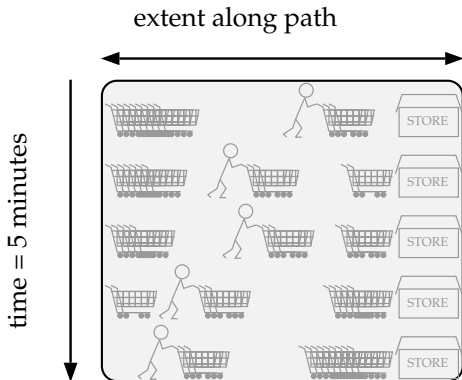
## Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

## Subinterval theory

**Step 1:** Take a sum event that qualifies as “push carts all the way to the store”

- We choose the sum event that represents the little-by-little scenario



# The subinterval theory predicts the contrast

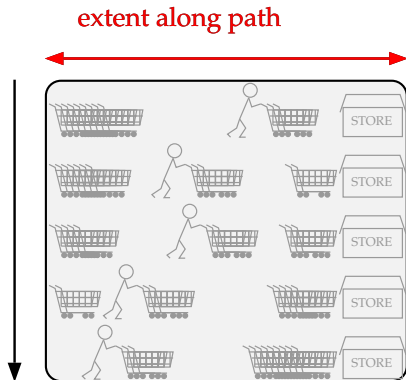
Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

Subinterval theory

Step 2: Measure it along the dimension “space”

time = 5 minutes



# The subinterval theory predicts the contrast

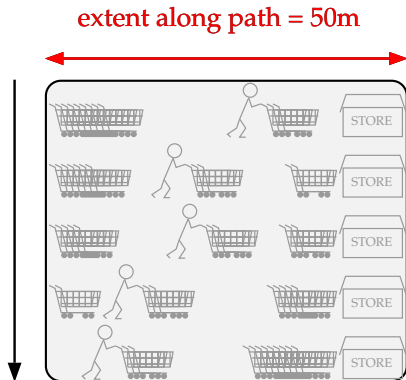
Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

Subinterval theory

Step 3: Check that its spatial extent is a fifty-meter interval

time = 5 minutes



# The subinterval theory predicts the contrast

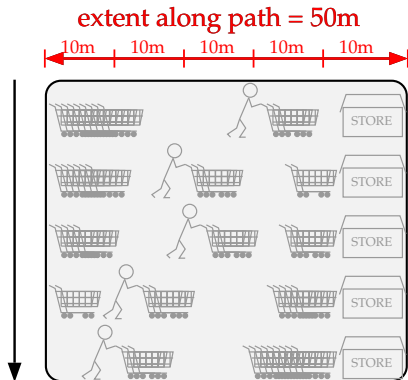
Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

Subinterval theory

Step 4: Take all the moderately sized subintervals of that interval

time = 5 minutes



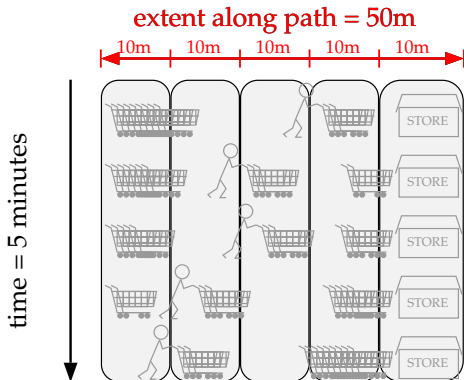
# The subinterval theory predicts the contrast

## Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

## Subinterval theory

**Step 5:** For each subinterval, consider the corresponding subevent





# The subinterval theory predicts the contrast

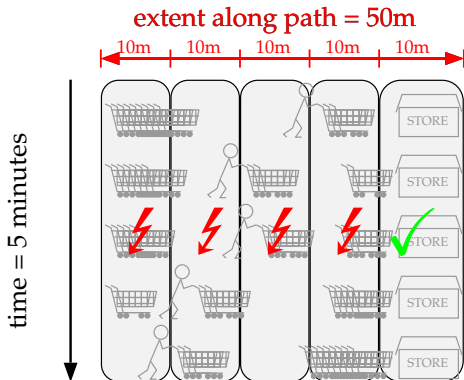
## Judgment to be predicted

\*John pushed carts all the way to the store for 50 meters. – Bad

## Subinterval theory

**Step 6:** Check if each of them qualifies as “push carts all the way to the store”

... correctly predicts the sentence is **unacceptable**



# The subevent theory fails

## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subevent theory

Assume that events are closed under sum (standard assumption, e.g. Bach, 1986; Krifka, 1998).

# The subevent theory fails

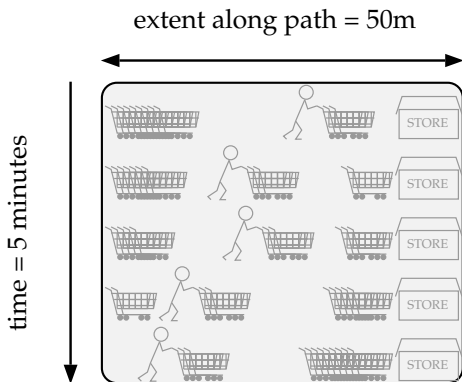
Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subevent theory

**Step 1:** Take a sum event that qualifies as “push carts all the way to the store”

- We choose the sum event that represents the little-by-little scenario



# The subevent theory fails

Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

Subevent theory

Step 2: Measure it along  
the dimension “time”



# The subevent theory fails

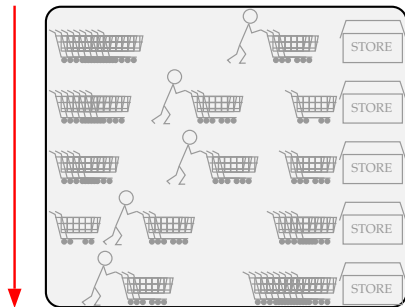
Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

Subevent theory

Step 3: Check that its duration is a five-minute interval

time = 5 minutes



# The subevent theory fails

## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subevent theory

**Step 4:** Take all the moderately sized subevents of the event

- Krifka takes only those whose duration is less than 5 min.



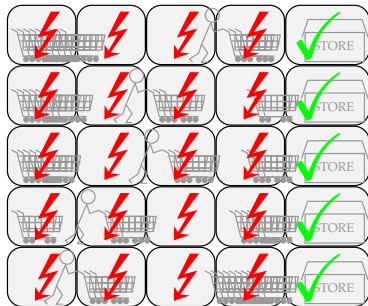
# The subevent theory fails

## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subevent theory

**Step 5:** Check if each subevent qualifies as “push carts all the way to the store”



# The subevent theory fails

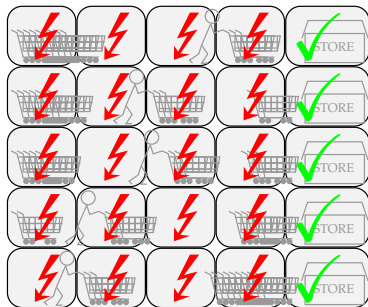
## Judgment to be predicted

John pushed carts all the way to the store for five minutes. – OK

## Subevent theory

**Step 5:** Check if each subevent qualifies as “push carts all the way to the store”

... wrongly predicts the sentence is unacceptable





# Other cases in which the subevent theory fails

## Example

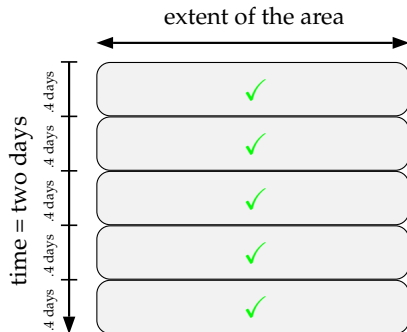
Snow fell throughout the area for two straight days. – OK  
*(attested example, via Web search)*

Subinterval theory says: OK

because at each time there  
is a subevent of which P  
holds

Subevent theory says: bad

because P fails to hold of any  
subevent that doesn't extend  
throughout the whole area



# Other cases in which the subevent theory fails

## Example

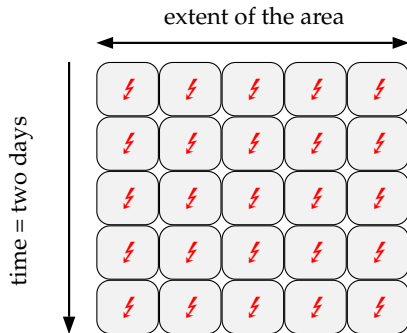
Snow fell throughout the area for two straight days. – OK  
*(attested example, via Web search)*

Subinterval theory says: OK

because at each time there is a subevent of which P holds

Subevent theory says: bad

because P fails to hold of any subevent that doesn't extend throughout the whole area



# Other cases in which the subevent theory fails

## Example

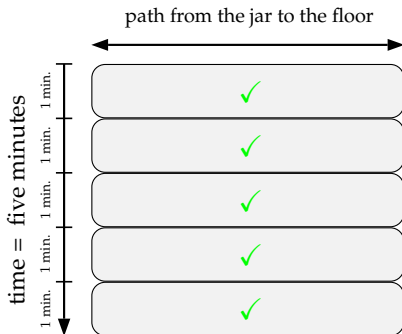
Wine flowed from the jar to the floor for five minutes. – OK  
(Beavers, 2008)

Subinterval theory says: OK

because at each time there  
is a subevent of which P  
holds

Subevent theory says: bad

because P fails to hold of  
any subevent that doesn't  
extend along the whole path



# Other cases in which the subevent theory fails

## Example

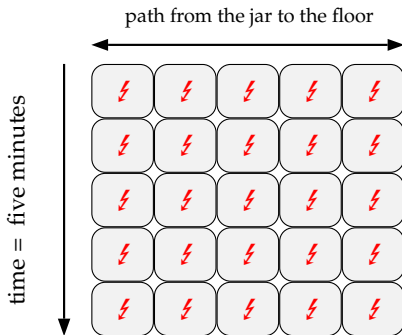
Wine flowed from the jar to the floor for five minutes. – OK  
(Beavers, 2008)

Subinterval theory says: OK

because at each time there is a subevent of which P holds

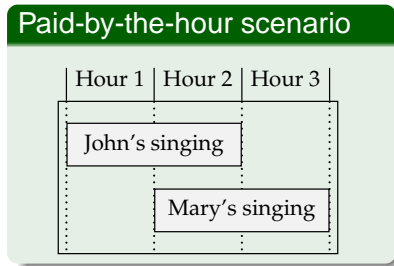
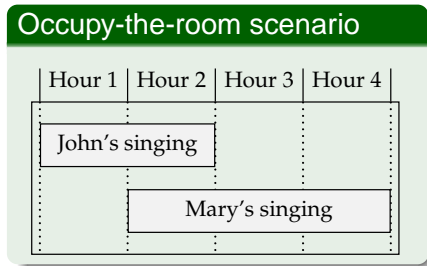
Subevent theory says: bad

because P fails to hold of any subevent that doesn't extend along the whole path



# Why Krifka prefers the subevent theory

- There is some leeway in how *for*-adverbials can be understood.
- *John and Mary sang for four hours* is true in these two scenarios:



- Krifka accounts for this by deliberately leaving open how the function that maps events to their duration in hours is defined in detail when it comes to sums of events.

# Krifka misses a generalization

## Object- and event-related readings

As Krifka himself observes in a separate context (Krifka, 1992), measure expressions in nominal constituents can delimit either the noun phrase denotation or the sum event.

### Example

Last year, 4000 ships passed through the lock.

- **Object-related reading:** If some ship took part in two subevents (i.e. it passed the lock twice), it is counted only once.
- **Event-related reading :** If some ship took part in two subevents (i.e. it passed the lock twice), it is counted twice.

# *John and Mary sang for 4 hours*

follows the same pattern

There is no need to resort to a special mechanism to explain the leeway, contra Krifka. So it is not an argument for the subevent theory.

## Example

John and Mary sang for four hours.

- **Occupy-the-room reading**: If some stretch of time was the duration of two subevents (e.g. by John and by Mary), it is counted only once.
- **Paid-by-the-hour reading** : If some stretch of time was the duration of two subevents (e.g. by John and by Mary), it is counted twice.

- This talk has shown that *for a minute/mile* means roughly *at all subintervals* or *at each subinterval of a minute/mile*.
- “For” individuates subevents along the named dimension. The subevent theory doesn’t get this.
- *all* and *each* are distributive quantifiers. This suggests applying methods from the study of distributivity to *for*.
- Telicity is usually thought of as a property of predicates (or events). Better to think of temporal telicity and spatial telicity etc. (in support of Gawron (2005))
  - push carts all the way to the store for 5 min. / \*for 50 meters



# Thank you!

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