

Events and their context

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Events, from *ex-venire*

Multiple events may emerge from a complex context



- How is an event isolated from its context?
- What is the relationship between events and their context?

Summary

- 1. Our cognitive perspective: events emerge from their context
- 2. Our position in the philosophical debate
- 3. Events, their focus, and their context
- 4. Understanding verbs' core meaning

General aim: provide a novel ontological account of events that reflects the way we *perceive* them and *talk* of them (typically by means of *verbs*), under the general approach of *descriptive ontology*

The cognitive perspective: events emerge from their context

Events are thick entities

i.e., they are amenable to be *described* at different levels of detail

- Describing an event:
 - not just saying *that* something happened...
 - ...but also adding details about the *context* of what happened
 - mentioning other things that were present besides the core participants, or other events that occurred at the same time.
- Describing a car accident:

"Well, it was raining, lot of traffic, the driver got a message on the cell phone... and suddenly we crashed against a tree to the side of the road, in front of the gas station"

Facts, on the contrary, have a thin nature

(1) John saw the car accident.

(2) John described the car accident

(3) ??John saw the fact that the car had an accident.

(4) ??John described the fact that the car had an accident.

(Moltmann 2007: Events, tropes and truthmaking)

Scenes and events

- We define a *scene* as the totality of what is *experienced* by an agent as happening in a convex interval of time.
- During each temporal part of a scene, *several* co-occurring events may be *perceived* (i.e., isolated by *focused attention*). Each of them is part of the scene.
- Due to their different individuation criteria, scenes and events are *perdurants of different kinds:*

ONE SCENE, MULTIPLE EVENTS.



Perceiving an event

- Perception is *conscious* experience. Scenes are experienced, events are perceived.
- As objects of perception, events are *situated:* when we *perceive* an event, we also *experience* the whole of its context.
- The *cognitive context* of an event emerging from a scene is the sum of all its temporally co-located events belonging to the scene.
- Perceiving an event involves a double mechanism of *selection* and *focusing*:
 - 1. *Foreground* objects are selected from the scene. Everything else is in the *background*
 - 2. *Focal qualities* inhering in them or in their parts are isolated.

A brutal simplification



- Single agent-single perspective assumption: what we experience is what actually happens in our "reality".
- So, a scene is just what happens in an interval of time, and perceived events are considered as actual events.
- Our goal is to clarify the *ontological nature* of such events and their relationship with the underline scenes.

A dramatic scene. Multiple events. What are their *participants*?

- Different events may be perceived
 - The Titanic hit the iceberg
 - The Titanic is sinking
- Different *levels of involvement* in the event (the back vs. the front of Titanic)
- Vague *minimal participants*
- Less vague *focal qualities*: Titanic's mass, shape..., Iceberg's mass...
- The core participants depend on the way we describe the scene (which event we pick up)



Borghini & Varzi (2006). Event location and vagueness. *Philosophical Studies*.

Different levels of involvement in an event

- Foreground *objects* are the main participants in the event. Since they are perceived as wholes, each of them may be called a maximal participant.
- Their proper *parts* are also participating in the event, but may be not involved in the same way.
- *Focal parts* are those to which focal qualities inhere.

The philosophical debate on events: unifiers vs. multipliers

Davidson's example



One event or two events?



Events and their definite descriptions

- Several philosophers use *definite descriptions* to characterise and uniquely identify events, without committing much on the *nature* of what such descriptions denote (MacDonald 1986: Constitutive properties, essences, and events)
- Quine, late Davidson: $e = f(\langle s, t \rangle)$ (whatever happens in a spatiotemporal region)
- Kim: $e = f(\langle x, P, t \rangle)$ (the exemplification of P by x during t)
- Lombard: $e = f(\langle x, C, t \rangle)$ (the exemplification of a change of x during t)
- Bennett: e = <p, t> (a particularised property existing at t) (one of the fews who make a clear commitment, interpreting Kim's notion of exemplification)

Exclusivity and descriptive thickness



- *Exclusivity*: "the extent an event prevents other events from occurring in the same region" (called *thickness* by Pianesi and Varzi (2000)).
- Descriptive thickness: the extent an event is amenable to be described by adding details about its context (context affects the event's intrinsic properties)
- Our approach is a kind of compromise:
 - Contra Davidson, we want to say that multiple events may occur in the same region.
 - Contra Kim (and Lombard), we want to say the *context affects events' intrinsic properties*

Bennett's radical position: events are instantiations of complex, unaccessible properties event descriptions are just names

• Kim's exemplifications are actually property instantiations, i.e., tropes (abstract particulars):

"The roundness of this pebble, unlike the property roundness, is a particular, pertaining only to this pebble; and unlike the pebble it is abstract, **involving no property except roundness**" (Bennett 2002)

- So, if an event is a trope, there is *no way to account for context*, since all the other colocated properties are excluded.
- But Bennett wants to avoid Kim's extreme multiplicativism, so he postulates that real events are exemplifications of very complex properties. Our event descriptions are just *names* that pick up just *some* of these properties, with no systematic connection between a name and the properties it picks up.

Is there a systematic relationship between events and their names?

- Bennett: the choice of a particular event's name depends on "*local choices and unprincipled intuition*" (!!).
- On the contrary, we think it is fairly obvious that different event names (lexicalised by verbs and their nominalizations) typically reflect different core aspects of what happened, so that event descriptions are not arbitrary.
- These core aspects can be captured by specifying, for each verb:
 - its cognitive *focus* (its *core meaning*)
 - the nature of its participants
 - what happens in the *background* (described by the verb's *argument realization*)

Using different verbs to describe an event

- The boy broke the window with a ball
- The boy hit the window with a ball
- The window broke
- •*The window hit

Events, their focus, and their context

We shall focus here on *qualitative events*. Existential and mereological events will not be considered.

Qualities as subjects of events



- Lombard: events are *qualitative changes* of objects (from a property to another within the same *quality space* – a maximal class of mutually incompatible properties)
- What are the *subjects* of such changes?
- Lombard: the *objects* undergoing the change.
- Cleland (1991):

...in a process of change we may distinguish three elements: That *which changes*, that *in which* it changes, and the actual *subject of change*, e.g. the man, the time, and the fair complexion (Aristotle, *Physics*)

- So, the proper subjects of change are entities *in respect to which* the change occurs
- These entities are what we called *individual qualities* in DOLCE (2003) and what Moltmann (2007, 2013) called (improperly) tropes.

Individual qualities





- Are aspects of things we use to *compare* them: they are directly comparable, while objects and events can only compared with respect to a quality kind.
- Inhere in specific individuals. A special kind of existential dependence.
- Are distinct from their values (a.k.a. *qualia*), which are abstract entities representing what exactly resembling individual qualities have in common, and organized in *quality spaces*. Each quality type has its own quality space.
- At different times, may keep their identity while "moving" in their quality space.
- Since events are described as *qualitative changes* (and unchanges) of objects, each event has some qualities as its *focus*, and can be seen as a *manifestation of qualities* (Guarino and Guizzardi 2016)
- Properties *hold*, qualities *exist*.

Guarino & Guizzardi 2016: relationships and events: towards a general theory of reification and truthmaking

Individual qualities vs. tropes

- No commitment to tropes is necessary to admit individual qualities, since there is good evidence that they deserve their own ontological status:
- [We may think] that only determinate characters could be regarded as genuinely characters of the object, *determinable characters (like 'coloured') being only indirect characterisations of objects*, and referring primarily to a characterisation of their determinate characters. But [...] *the 'respects in which objects are to be characterised'*, to which determinable adjectives refer, **are related to the objects not less but more intimately** than the determinate qualities which 'characterise' them in the strict and proper sense of the term.

(Prior 1949, Determinables, Determinates, and Determinants, our emphasis)

 This intimate connection between objects and their determinable/determinate characters is called inherence.

Linguistic evidence of qualities

- Desc: Mary is beautiful
- Individual property reification (*nominalization*)
 - As a *state* (or situation): *Mary's being beautiful*
 - As a fact: The fact that Mary is beautiful
 - As a quality: Mary's beauty
- Linguistic evidence:
 - *Mary's being beautiful is raw and wild
 - Mary's beauty is raw and wild
 - *John admires Mary being beautiful
 - John admires Mary's beauty
 - John described Mary's beauty
 - *John described Mary being beautiful
 - John remembers Mary's beauty (a)
 - John remembers Mary being beautiful (b)

Moltmann, F. (2013). Abstract Objects and the Semantics of Natural Language. Oxford University Press.

Dealing with quality change



Impact of context on the event's identity



e1 @t1

e2 @t2

e3 @t3

e4 @t4

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- sphere s is rotating (without heating up) at t1 and t2. Context does not change. At t3, while still rotating at the same speed, s is heating up. e1, e2 and e3 denote the sphere's rotation at t1, t2, and t3.
- at *t3*, while still rotating at the same speed, *s* is heating up.
- What's the relationship between *e1* and *e2? Exact resemblance*.
- Shall we say that *e1* and *e2* **exactly resemble** *e3*?
 - Davidson, Quine: NO
 - Kim, Lombard: YES under the proposed conditions for event-identity
 - Bennett: CAN'T BE DECIDED
- We want to be able to answer **NO**, and still adopt a multiplicative approach.

Events as quality manifestations in *selected objects*

- John's hands are moving
- John is gesticulating: the same event?

Aristotle again: ...in a process of change we may distinguish three elements: That *which changes*, that in which it changes, and the actual *subject of change*.

- So, an event is determined by:
 - Its maximal participant(s)
 - the time it occurs
 - its *focus* (one or more *focal qualities* inhering in the maximal participants or in their parts)
- Informally, an (atomic) event can be understood as a *quality manifestation* (*what happens to a quality during a certain time*) in an object.
- Not just changes: also *states* ('unchanges') are included.

Some definitions

- An *individual quality manifestation* is a perdurant uniquely identified by a pair *<x*, *q*, *t*>, where *x* is an object, *t* is an interval of time and *q* an individual quality inhering in *x* or in one of its parts and constantly present during *t*.
- A generic quality manifestation is identified by a pair <xs, qs, t>, where xs is a sum of objects and qs is a sum of qualities inhering in xs or in some of its parts, and constantly present during t.
- An *event* is a mereological sum of quality manifestations
- The *context* of an event is the mereological sum of all events located within its time location. Note that the context of an event includes the event itself.
- The *background* of an event is the sum of all parts of its context that are disjoint from it

Examples of quality manifestations

- Direct descriptions of simple quality manifestations:
 - the redness of this rose lasted one week
 - the medium Earth's temperature increased of 1 degree last year
 - John was in love with Mary last week (*relational quality*)
- Indirect descriptions of complex quality manifestations:
 - The conference lasted one week.
 - John's marriage lasted five years.
- The focus of complex events *needs not to be explicit!* What's important is to be able to say that certain qualities are or are not part of the focus.
- exemplifications vs. manifestations:
 - *exemplifications* only concern an object instantiating a property, abstracting from other properties and other objects
 - manifestations include the context: describing a moon shining includes describing the sky

The microscopic structure of events



John is dreaming of Mary under a tree

- Different ways of involvement
 - Focus: mental attitude (towards Mary) in John's mind
 - Maximal participant: John
 - Core participant: John's mind
 - Contextual "participants": the tree, the Sun...
 - Virtual "participant": Mary

Levels of involvement and thematic roles

- Objects "participates" to episodes by playing *thematic roles*:
 - Agent
 - Experiencer
 - Theme
 - Source
 - Goal
 - Instrument
 - Beneficiary
- Not all thematic roles describe ways of participation:
 - John dreams of Mary
 - John dreams of Mary under a tree
 - John runs from home to office

Understanding (and specifying) verbs' core meaning

Core verbs meaning and object alternations (Fillmore, Levin)

Causal agent did not actually **participate** in the event

(1) a. The boy broke the window. /The window broke.b. The boy hit the window. /*The window hit.

Material agent

This *causal agent* did participate in the event

- (2) a. The boy hit the window with a stick. *F* the stick hit the window.
 - b. Brutus stabbed Caesar with a knife. / *The knife stabbed Caesar
 - c. Brutus killed Caesar with a knife. /*The knife killed Caesar
 - d. The US sunk the ship with a torpedo. /The torpedo sunk the ship

Object alternations are allowed only if the object role is not already constrained by the core verb meaning.

Representing the core meaning of verbs

- hit:
 - Body:x; Body:y
 - inertial momentum of Body:x(/FALL
 - inertial momentum of Body:y /FALL
 - internal distance of x+y /FALL
- break:
 - Body:x
 - topology (or functionality?) of Body:x /CHANGE
- stab:
 - Agent:x; Body:y; PointedObj:y
 - force of Agent:x on PointedObj:y /RISE
 - internal distance of y+Body:z /FALL
 - topology of Body:z's surface /CHANGE

•Hit: Two bodies in foreground (no intrinsic change implied)

- •Break: only a body in foreground
- Stab: Agent, Instrument and Patient in foreground

Dynamic profile of quality manifestation

Core verbs meaning and object alternations

- (1) a. The boy hit the toddler's back.
 - b. The boy hit the toddler on the back.
- (4) a. The boy broke the cup's handle.
 - b. * The broke the cup on the handle.
- (5) a. * The boy broke at the window.
 - b. The boy hit at the window.

That's it!...

Tomorrow: relationships as the focus of events events and relationships as *truth-makers*

Perdurants: my own choices in the terminological quagmire

Perdurant (having temporal parts; spreading them in time) Period of time (whatever happens in an interval of time) [Spatially bounded period of time [Scene (whatever is perceivable/presented to our senses in a spatiotemporal region) Event (whatever happens to some *focal qualities* within a period of time) Punctual (atomic) Atomic state Atomic change Flash Beginning Ending (achievement) Durative (non-atomic, typically convex in time) Atelic State (no temporal change) - sitting Activity (some temporal change) - walking Telic Process - walking to the station Accomplishment - a walk to the station

Situations, scenes and states: some terminological clarifications

Situation semantics:

- A situation is a partial state of the world: "If a state of the world is represented by a model M, a situation is a partial submodel of M" (Barwise 1981)
- A scene is a "visually perceived situation" (i.e., a maximally *experienced* situation in our terminology):
 "When I look around I cannot see a single thing-in-itself, some sort of ideal physical object stripped of its properties and its rela- tions with other objects. What I do see is a scene, a complex of ob- jects having properties and bearing relations to one another. [...] In fact, what really counts is the **whole** complex of objects-having-properties-and-bearing-relations which constitutes the scene." (Barwise 1981, p. 389)
- Scenes and situations are not temporally located, and therefore they have no duration: they correspond to *abstract snapshots* of the world

Event semantics:

- States and processes can be understood as actual *occurrences* of situations, which are temporally located (and extended). In this view, situations are Admitting them is unavoidable to capture the semantics of certain sentences, such as "*Whenever a man rides a donkey, he gives a treat to that donkey*"
- Scenes are temporally extended, and may include dynamic events (not just states and processes)