25

EVENTS, PROCESSES, AND PROPERTIES

Carlo Rossi

25.1 Introduction

Talk about properties pervades the contemporary debate about the nature of events and processes. Much of that debate follows the view developed by Jaegwon Kim, according to which events are exemplifications of properties at times (Kim 1966, 1969, 1973, 1976). Here it is most obvious that properties play an intimate role in a theory of events by properties serving as an important constituent of events. Yet, it has been objected that Kim's fine-grained criterion of identity results in an overabundant ontology of events and that his account treats events as structured particulars, making them almost indiscernible from states of affairs (Bennett 1984; Dodd 2009; Steward 1997).

Given that problematic result, in this chapter, I will discuss for the most part different approaches that also have an important place for properties in a theory of events and processes. Many of them follow a line of argument that can be traced back to Alexander Mourelatos (1978) and has received renewed attention recently (Galton and Mizoguchi 2009; Steward 2013; Stout 1997, 2015). According to this line of thought, certain properties can be used to draw a distinction between mass-noun and count-noun expressions that allows us to articulate the ontological divide between events and processes. Thus, in virtue of such properties, events are regarded as countable and temporally bounded entities, whereas processes are regarded as closer to massy non-countable entities, making them similar in some aspects to properties (Crowther 2018; Seibt 2018) but also similar to continuants in some others (Stout 2015).

Accordingly, this chapter has the following structure. In Section 25.2, I introduce Kim's theory and some of its shortcomings. In Section 25.3, I briefly present the distinction between continuant and occurrent entities. Then, I turn my attention to Mourelatos's argument, which draws on issues of aspect and the nominalization of sentences that refer to events and processes. Mourelatos's argument will be relevant later for a number of discussions examined in Sections 25.4 and 25.5. In Section 25.4, I discuss some recent proposals that attempt to draw a distinction between processes and events on the basis of their modal properties, such as the property of being modally robust in virtue of form (Steward 2013, 2015). Finally, in the last section, I explore certain consequences of what has been

said about events and processes in Sections 25.3 and 25.4, particularly the alleged status of events as falling under the category of particulars and processes under the category of non-particulars. Special attention will be paid to the implication that if processes are non-particulars, then they turn out to be closely similar to universal properties.

25.2   Events as Property Exemplifications

Kim's account of events is a paramount example of the role that properties play in accounting for the nature of events and other temporally extended entities. The canonical notation stipulated by Kim for representing events is triples of the form of

   [s, P, t],

where *s* stands for a substance, *P* for a property, and *t* for a time or an interval of time. The identity condition that Kim proposes for events is, unsurprisingly, the following:

   [s, P, t] = [s*, P*, t*] iff s = s*, P = P* and t = t*.

Lastly, given that not every triple that could represent an event actually exists and events are supposed to be represented by triples of some sort, they have the following existence condition (Kim 1976):

   [s, P, t] exists or occurs iff s has P at t.

Now, it is difficult not to regard events as some form of state of affairs if we follow this account. Kim seems not too bothered by this charge, as he explicitly admits that he uses the term 'event' as a blanket term not only to refer to events but also to states, states of affairs, phenomena, and conditions, among other entities (1969: 213). Yet, such an admission would hardly persuade those who consider events to be temporal particulars and not some sort of abstract entity.

Whether it is ultimately successful or not, Kim postulates the following central features for the view. First, events are non-repeatable concrete particulars, with a single spatiotemporal location. Second, events may exemplify a wide array of properties, but there is only one property – what Kim calls the constitutive property – which individuates an event. Third, event-types are obtained by regarding the constitutive property as a generic event, whereas event-tokens are obtained by the exemplification of the constitutive property by an object at a time or period of time. Lastly, events are not meant to be taken as identical to triples or to any other set-theoretic construction, but rather they are represented by them in Kim's theory.

Reading Kim as charitably as possible, the first and fourth features should distinguish events from other types of entities which also fall under the blanket term 'event' but have more dubious credentials as particulars. On the other hand, the second and third feature attempt to address a concern raised by Kim's fine-grained criterion of identity that results in an overabundant ontology. For example, given that the event of Brutus killing Cesar is individuated by a different property than the event of Brutus stabbing Cesar multiple times in the Theatre of Pompey on the Ides of March, both events, which plausibly are identical, are two different ones. Yet, Kim would reply that we could still regard them as identical as long as they possess the same constitutive property. According to Kim, we may refer to an event with descriptions that involve different properties, such as taking place in the Theatre

of Pompey or during the Ides of March. What cannot be the case in Kim's view is to refer to the same event with descriptions that involve different constitutive properties, that is, the property of which events are an exemplification.

Notwithstanding all these caveats, Kim's view looks ill-suited for providing us with a proper understanding of the categories of events and processes and the role that properties would have in drawing a distinction between them. Besides the notorious difficulties of not regarding events as abstract entities, it is not clear how to account for processes on this view. Are processes a peculiar kind of event? If not, which identity conditions are we meant to stipulate for them? In the next few sections, I will explore a different path to answer some of these questions, a path not exempt from shortcomings but arguably more promising than the framework provided by Kim.

25.3   Occurrence, Aspect, and Nominalizations

According to W.E. Johnson (1924: xx–xxi), continuants exist over extended periods of time and may change their properties, whether intrinsic or extrinsic, while occurrents need not continue to exist over periods of time, that is, they may be instantaneous existents, and are not capable of undergoing change. Looking at the temporal character of particular entities, i.e., the way in which the entity in question fills a period of time, this category distinction gives us a way to distinguish between substances, events, and processes. Substances such as dogs, trees, and cars exist throughout extended periods of time and change their properties and mereological configuration while they exist. Events and processes, in contrast, sometimes exist for not more than a moment (think, for instance, of an explosion or the reaching of a mount summit) and their static nature makes them unfit to count as proper subjects of change.

However, such a preliminary result has been contested at different levels. Some have argued that it is obvious why processes should not be counted amongst continuant entities (Stout 1997, 2015), or at least be thought of as belonging to a category of their own. Others (Steward 2013, 2015) have argued that processes display certain structural properties that make them similar to substances, although strictly speaking they should be regarded as a peculiar kind of occurrent. And then there are those who question not only that processes are continuants but also whether processes should be regarded as particulars at all (Crowther 2011, 2018; Seibt 1997, 2010, 2018). Their arguments attempt to show that processes have a distinctive way of recurring in time and that they are not countable entities. In fact, their view would turn processes into something similar to universal properties, for they would not be particulars given their non-countability and they would be repeatable or multi-located across space (for more on universals and location, see Chapter 13, this volume). I will examine these arguments in more detail in this and the coming sections. But for now, I want to emphasize that in each of them, properties play a crucial role in articulating our understanding of the categories of event and process.

Let us look at the arguments that support the view that processes, unlike events, share some attributes with properties and continuants. The first sort of argument, already mentioned in the Introduction, is put forward by Mourelatos (1978) and later by Rowland Stout (1997, 2015), and it draws on the linguistic properties of sentences that report the occurrence of events and properties. Roughly speaking, Mourelatos's argument proceeds from a categorization of different types of predication to a categorization of the referents that we get from nominalization transcriptions. A nominalization transcription allows one

to reformulate a certain predication to explicitly quantify over its verbal expression, now transformed into a kind of noun. In other words, nominalizations make explicit the hidden quantificational commitments behind the structure of sentences that apparently do not have a quantificational form. The crucial matter is that the different predicative character of a certain type of sentence might give rise to nominal expressions that quantify over different types of entity. Take the examples below to illustrate the point (Mourelatos 1978, Steward 2013). The nominalization of the sentence

(1) 'Jones pushed the cart to the top of the hill'

gives us

(2) 'There was a pushing of the cart to the top of the hill by Jones',

while the nominalization of the sentences

(3) 'Jones pushed the cart for hours' and

(4) 'Jones was painting the Nativity'

give us respectively

(5) 'There was pushing of the cart for hours' and

(6) 'There was painting of the Nativity by Jones'.

Sentences (2), (5), and (6) offer us nominalization examples that refer to events and processes. In the case of such nominalizations, differences seem to be grounded on an aspectual matter, since it is the aspectual character of predications that determines the categories of the nominals that we obtain. Aspect expresses how an occurrence takes place. We use the progressive aspect if we want to describe an occurrence as ongoing or repetitively, whereas we use the perfective aspect if we want to describe an occurrence as completed and bounded. Typically, the former is used to describe processes and the latter to describe events. Given that the activity described in (1) does have a clear end, this implies for Mourelatos that the nominal we find in (2) refers to an event. Sentence (3), in contrast, is determined by the imperfective aspect of the verbal expression it contains ('pushed for hours') and (4) is a sentence constructed with a progressive tense, so Mourelatos argues that the nominals found in (5) and (6) refer to processes.

Furthermore, Mourletatos points out that the activities described by (3) and (4) do not have a terminus or a closure, which he thinks does not allow us to talk about a pushing or painting, just like we can talk about a pushing of the cart in (2). That conclusion differs from the one drawn by Stout from similar examples (1997: 19), for Stout holds the view that we can infer from sentences like (5) and (6) that there is a particular that we may identify with a certain process. But that inference is contested by other supporters of the ontological distinction between processes and events. For the time being, I will only flag the source of this disagreement, although I will return to it in Section 25.5 to explore its implications for the categories of event, process, and property.

One last point that Mourelatos draws from these examples – and which will be important for our discussion later – is that the parallel of (5) and (6) with simple nouns must not be thought of in terms of sentences such as 'There is at least one F', that is, quantificational count-noun sentences, but rather sentences such as 'There is snow on the roof', or 'There is gold in this mountain', which quantify over mass-nouns. This caveat again eventually pinpoints an important ontological difference between the categories of process and event, highlighting the massy nature of the former and the countable nature of the latter.

25.4   The Modal Profile of Events and Processes

The second sort of argument draws a distinction between events and processes appealing in a more straightforward metaphysical manner to the properties that constitute each of these ontological categories. The first case is the argument from the interruption of processes (Stout 1997, 2015). This argument can be understood by analogy with the argument offered in the spatial coincidence debate to account for the non-identity of a material substance and its matter. Usually, those who deny that a substance is identical to the material components that constitute it at a given time would justify such a distinction by appealing to the differences we find in their respective modal profile. It is often argued that substances can survive certain changes that material components cannot and vice versa. Thus, a clay statue can survive the gain or loss of minor bits of matter but the lump of clay that constitutes it cannot remain identical if it gains or loses parts. Conversely, the lump of clay can change its shape – for instance, it could be squashed – and still survive through change, whereas a statue cannot survive after being squashed.

In a similar fashion, proponents of the argument from the interruption of processes argue that for any pair of events and processes that temporally coincide, it is possible that the process could still remain identical even if some of its parts are subtracted or some further parts are added to it, whereas in the case of the event that does not seem to be possible. Stout provides here the example of the process of the decaying of an apple (1997: 21). Such a process may have a temporal duration in the actual world that entirely coincides with the decay of the apple. Yet, it is possible that the process of the decaying of the apple might have stopped by freezing the apple for a period of time, and then the very same process resumed after unfreezing the apple. That does not seem to be possible in the case of events, for events that do not possess the same temporal parts cannot be identical. That property of processes would account for the fact that processes, unlike events, go on and cease or fail to cease, or can be intermitted. Some have even referred in this regard to a certain flow-like character that processes have (Steward 2013: 809), which allows us to make sense of these temporal verbs and phrases.

The second case is the argument from the persistence of processes (Steward 2013; Stout 2015). According to this argument, if a process is indeed something that is/was/will be happening and not something that has occurred, then it seems that what goes on at any moment during which a process lasts is the whole process, not a part or a stage of it. So, to pick up an example from Stout, the hurtling of a comet is present at each point of its temporal trajectory and it would not make sense, according to the argument, to claim that it is only partly present at each of those times. On the other hand, the event of the comet hurtling into the sun persists only in virtue of the temporal parts that it possesses at every time at which it is located, but none of those parts are identical to each

other. In other words, events are never wholly present (at most, they are so in the totality of their temporal path), whereas processes are wholly present at each moment of their existence.

Now, it could be argued that the conclusion of both arguments can also be explained in a unifying manner by the obtaining of the property that Helen Steward (2013: 807) calls Modal Robustness in Virtue of Form (hereafter, MRVF). MRVF is a property not possessed by events, but only by processes and substances, and in the case of the former, it would account for the priority of a processual whole over its temporal parts. Properties play a crucial role, therefore, in developing Steward's theory of events and processes. According to Steward, processes have 'a certain distinctive form by means of which they are singled out in thought and which underwrites their relative independence from the actual parts of which they consist in any particular' (2013: 807).

The notion of form can be understood here not necessarily as an Aristotelian form. While it is true that MRVF seems congenial to hylomorphic accounts of substances and processes,[1] one need not be committed to such a metaphysics of properties and particulars to ascribe MRVF to them. Rather, I propose we understand MRVF as a structural property possessed by entities that fall under such categories. In Steward's words, MRVF implies that both substances and processes are independent of the actual parts that compose them (2013: 807). Hence, the claim that an entity that possesses MRVF is not individuated or singled out by the parts – either spatial or temporal – that compose such an entity in a given world, but by something that is prior to those parts (2013: 808). That something prior would be its form, but such a property does not need to be an Aristotelian form or, in general, a property that inheres in the whole of which it is a form. In a further effort to clarify the view, Steward claims that 'there are entities which are non-identical with the sums of their parts, entities concerning which form predominates over matter in the account we are to give of what it is that they essentially are' (2013: 810–811). Thus, saying that an entity has the property of being modally robust amounts to saying that an entity in virtue of the form it possesses takes precedence over its parts.

Accepting that processes exemplify MRVF implies thinking of processes as a type of cross-world identifiable entity that, for instance, could be made larger or shorter by adding or subtracting parts, or that they could display different properties than the ones they actually do. This is permitted because, on this view, processes are only contingently composed of the temporal stretches they possess. In contrast, given the dependence of events on their temporal parts, they cannot display this mereological and modal flexibility. Events could not have begun to exist earlier or cease to exist later than they actually do: their spatiotemporal boundaries fix their identity.

There are two crucial points, nonetheless, that we need to bring up at this stage. The first one is that accepting that processes exemplify MRVF gives us the following taxonomy for the categories of process, event, and substance: on the one hand, processes and events share the property of being extended over time; on the other, processes and substances possess a certain form or structure that makes them prior to their component parts in virtue of exemplifying the property of being MRVF. The second is that Steward's argument in support of processes exemplifying MRVF entails treating processes as countable particulars. I noted in Section 25.3 that that was already a conclusion drawn by Stout from the line of argument presented by Mourelatos. But, at the very least, that constitutes a controversial move, since the properties that processes possess by exemplifying MRVF are ultimately explained in virtue of them having the same properties as mass-quantifiable

entities. In the last section of the chapter, I will examine recent arguments in the literature that in some way or other exploit this tension.

25.5   Occurrents, Properties, and Particularity

Not everyone agrees with the way in which one could articulate the difference between the category of event and process in terms of the property of being MRVF. In this final Section, I will discuss two different antagonistic takes on the matter. These rival takes stress that processes cannot share structural properties with substances given that they are not particulars. If anything, it is events that come out closer to substances, whereas processes resemble in some important respects to universal properties.

The first of the two takes comes from Thomas Crowther (2011, 2018). Crowther explicitly aims at reversing the approach from Stout and Steward regarding substances and processes. In particular, he argues that the mode of existence in time of processes is that of unfolding over periods of time, whereas the one of substances is simply to exist over periods of time. This unfolding of processes might be captured if we treat processes as time-occupying stuff governed by the conceptual resources of temporal mass quantification. Crowther's move, then, is a plausible extension of Mourelatos's argument from Section 25.3.

Let us take an example from Crowther to that effect (2018: 79). If there is some running that goes from time t_1 to t_{10}, that means that progressively there would be more running from t_1 to t_{10}. In other words, the unfolding of said process over a stretch of time entails that we have more and more of the process as we progress over that temporal stretch. Following Brian O'Shaughnessy (2000: 42), Crowther calls this persistence phenomenon 'occurrent renewal', which is distinctively different from the simple occurrence of events in time. The occurrent renewal contrasts with the way substances persist over periods of times. It seems odd to say of the person who runs t_1 to t_{10} that we have more of her as running incrementally occurs over that temporal period. A person simply continues to exist over such a period, hence we regard her as a continuant.

Events, on the other hand, can be count-quantified. There could be two, three, or more 400-meter runs, but not more or less of a 400-meter run. Thus, according to Crowther, events are picked out by terms that refer to quantities of space-filling stuff with limited boundaries. Mass quantification, in contrast, seems not to imply the existence of such boundaries. Therefore, the countability of events on Crowther's account makes them more similar to substances than processes, which are picked out by mass-quantificational expressions. Drawing on that analogy, Crowther further understands the relation between events and processes in terms of the relation between countable material objects and space-filling stuff (2018: 80). The example below illustrates this:

> If an event, say, the complete temporal particular which was the sinking of the Titanic, occurred from t_1 to t_{10}, then the occurrence of that event consisted, over that time, in an iceberg tearing a hole in the bow of the boat, water flooding into the hull and across the top of bulkheads, and so on. But it is the tearing and flooding—the processive constituents, or the 'temporal stuff' of the event—of which there can be more and more, and which exist by being occurrently renewed, the complete sinking.
>
> *(Crowther 2018: 80)*

Pursuing an even more critical line than Crowther, Johanna Seibt advances an objection from an unresolved tension in the picture presented in Section 25.4. The tension, claims Seibt (2018: 135–137), comes from their particularity and claiming that processes have MRVF. Put in more perspicuous terms, her criticism is that one cannot have temporal entities that both extend through the temporal dimension and possess MRVF, as it allegedly would be the case for processes.

Seibt defends the view that particularity amounts to non-repeatability in space. A particular, for Seibt, is something that necessarily exists in a single spatial location at any time at which it exists. There cannot be a particular located at two or more distinct spatial regions at the same time. As I noted in Section 25.3, we get a useful contrast with the spatiotemporal profile of universal properties. Typically, a universal property is located at several spatial regions at the same time,[2] thus contrasted with substances, which are only located at one spatial location at a time. In the case of particulars with temporal extension, Seibt holds that they necessarily have a single spatial and temporal location. They are non-repeatable entities in space and time. Yet, supporters of the view that processes exemplify MRVF are forced to accept that processes have a recurrent existence at least in time. They cannot accept that, as a particular in time, a process is non-repeatable, that is, it has a determinate unique temporal extent and therefore can only perdure in time.

Now, Seibt further develops her objection claiming that an entity can be modally robust regarding its spatial extension iff it is the sort of entity that has a unique determinate spatial extent in the actual world (2018: 135). Given that biconditional, it would make perfect sense for Seibt to say that material objects such as the Taj Mahal could have been bigger or had a different spatial location, whereas it would sound odd to say the same about mass entities such as gold or water. At most, Seibt concedes that it is permissible to claim that there are possible worlds where the scattered spatial region occupied by mass entities in the actual world is larger or smaller, something weaker than claiming that such entities are modally robust regarding their spatial extension. Given that the same holds for temporal extension, namely, that a temporally extended entity can be modally robust with respect to its temporal extension iff it has determinate duration in the actual world, processes must be treated as particulars in time. But such particularity, according to Seibt, does not allow for recurrence in time. What recurs, as in the earlier example, between t_1 and t_{10} is the running, but to ask whether the running could have lasted longer is as meaningless as asking whether gold or water could have been bigger. The upshot of this is that for anything that is extended and exists in time as an enduring continuant, we must either reject that it is a particular or that it exemplifies MRVF.

One way out Seibt devises for particularists about processes such as Stout and Steward is to introduce a further notion of particularity: particularity$_1$ is a predicate that stands for non-repeatability in space and it belongs to the categories of substance and process; particularity$_2$ belongs to the category of event and it stands for non-repeatability in space and time. Take this example from Stout to illustrate the latter point:

A fight between two men may have very stable boundaries distinguishing it from any other fighting that is going on. There is no difficulty in counting instances of such fighting. Other fighting pairs may arrive on the scene, but we can still individuate the original fighting from everything else that is going on.

(Stout 2015: 55)

Using Seibt's distinction, Stout resists the idea that processes are ultimately of a mass-like nature because the fighting between two men persists over time by enduring – it is the same fighting that we are able to identify at earlier or later times – and it seems perfectly distinguishable from other instances of fighting that may be taking place in its vicinity. But at most, the example only supports the view that processes exemplify particularity$_1$ in virtue of their temporal recurring, which somehow makes processes similar to substances. In fact, Seibt presents two further problems to Stout's rejoinder. The first problem is that it is debatable that all processes can be classified even as displaying particularity$_1$, that is, as non-repeatable in space. To stick to Stout's example, one could retort that it seems correct to affirm that fighting occurs in many locations throughout a street at the same time. If that is so, processes cannot be particulars$_1$, for particulars$_1$ are only located at one spatial location at each time of their existence. Moreover, it seems that from their pattern of temporal occurrence, processes are closer to universal properties than to substances.

The second problem is that one might dispute the move from the possibility of counting processes to the fact that processes are particulars. Processes, according to Seibt, might be enumerable and individuated under certain identity conditions, but that does not necessarily imply that they are particulars as she describes above. The move is somehow analogous to what Gareth Evans (1985: 257) and Steward (2013: 793) note regarding the reidentification of processes. While it is true that there is a sense in which a process can be reidentified over time, that does not imply that it is exactly the same sense in which we say a substance can be reidentified. Now, in the case of Seibt, this compels us to engage in a larger revision of the category of particular, which for independent reasons has proven to be a problematic ontological category to characterize (for more on the universal/particular distinction, see Chapter 5, this volume).

25.6   Concluding Remarks

Kim's well-known account of events is a clear example of how properties play a central role in a theory of events and other occurrents. However, Kim's account has problems that prompted a discussion about other work on theories of events and processes. One key debate in this literature is the question of how to distinguish between events and processes. How do properties figure in this debate? We found that the path opened up by the argument from nominalizations from Mourelatos offered us a more fruitful starting point to inquire about the interplay between the category of property and the categories of event and process. Yet, this framework is not free from trouble. Even though processes having the property of being MRVF allow us to draw a sharp metaphysical difference with events, it is not clear that processes possessing MRVF are compatible with their mass-like nature or that processes can both exemplify MRVF and display features of non-particular entities such as universal properties. All things considered, this debate remains open on an important number of fronts.

Notes

1 For an example of this, particularly in the case of substances and their parts, see Fine (1999), Schaffer (2009), Marmodoro (2013), and Inman (2018), among others.
2 By location, I mean to imply that universal properties are exactly located at multiple spatial regions at the same time. Although some have rejected this assumption (Effingham 2015; Gilmore 2003), it

remains the default position in the debate (see Chapters 12 and 13, this volume). Also, the issue brings up the question of whether universals could fall under the category of particular on the count of having spatiotemporal locations. Such a claim is far from being free of controversy, but it somehow sidesteps much of Seibt's consequent attack on the idea of treating processes as particulars.

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