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THEORETICAL/REVIEW

More than a moment: What does it mean to call something an 'event'?

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Abstract
Experiences are stored in the mind as discrete mental units, or 'events,' which influence—and are influenced by—attention, learning, and memory. In this way, the notion of an 'event' is foundational to cognitive science. However, despite tremendous progress in understanding the behavioral and neural signatures of events, there is no agreed-upon definition of an event. Here, we discuss different theoretical frameworks of event perception and memory, noting what they can and cannot account for in the literature. We then highlight key aspects of events that we believe should be accounted for in theories of event processing—in particular, we argue that the structure and substance of events should be better reflected in our theories and paradigms. Finally, we discuss empirical gaps in the event cognition literature and what the future of event cognition research may look like.

Keywords Event cognition · Memory · Attention · Prediction error · Perception · Event boundaries

Time is divided into years, which are divided into months, days, hours, and minutes. However, our experience is not represented in these arbitrary units; rather, our lives are divided into *events* which may span moments, months, or decades. This is to say that the units of *time* (months, days, hours, and minutes) are not the same as the units of *experience* ('events').

The notion that experience is subdivided into events has become a foundational idea in cognitive science. It offers a way of describing how mental representations of experience (which are often discrete) differ from reality (which is often more continuous). Once we label those mental representations (i.e., as events), we can search for them in the mind and brain (Baldassano et al., 2017; Ezzyat & Davachi, 2011; Heusser et al., 2016) and make predictions about how people will attend to and/or remember certain experiences.

But what is an event exactly? Events have been defined based on subjective ratings (e.g., Newtson, 1973), neural representational similarity measures (Baldassano et al., 2017; Geerligs et al., 2021), and by measuring the influence of temporal structure on memory (Clewett & Davachi, 2017) or perception (Liverence & Scholl, 2012; Meyerhoff et al., 2015; Sherman, DuBrow et al., 2023; Yousif & Scholl, 2019). Events have been described as discrete moments in time lasting as short as hundreds of milliseconds (Michotte, 1963) as well as extended periods of time lasting as long as centuries (Teigen et al., 2017; see also Sastre et al., 2022). They have been likened to visual objecthood and attention (see, e.g., Casati & Varzi, 2008; De Freitas et al., 2014; Ji & Papafragou, 2022; Tversky et al., 2008; Zacks & Tversky, 2001), and they have also been argued to reflect inferences about the causal structure of the world (Shin & DuBrow, 2021; see also Radvansky, 2012). They have been studied in vision (e.g., Tauzin, 2015), in memory (e.g., DuBrow & Davachi, 2013), in language (e.g., Ünal et al., 2021), and in more naturalistic scenarios (e.g., Sastre et al., 2022; Swallow et al., 2018). Boundaries between them can be triggered by anything from movement through a doorway (Radvansky & Copeland, 2006; Radvansky et al., 2010, 2011; see also Radvansky, 2012), to a change in background color (Heusser et al., 2018), to the movement of dots (Ongchoco & Scholl, 2019). This complexity has led some to avoid concrete definitions altogether; Schwartz (2008) presciently wrote that events are merely "what we make of them" (p. 1).

In some ways, it may be easy to say what an event *is*: It is any discrete experience. However, it is much harder to say what an event *is not*. If something as simple as walking

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through a doorway constitutes an event boundary (e.g., Radvansky, 2012), what actions, if any, are too small to constitute a boundary? (The waving of a hand? The blink of an eye?) If a moment as plain as one dot approaching another (e.g., Michotte, 1963) constitutes an event, what aspects of our visual experiences fail to reach this threshold? If every little change constitutes an event boundary—if every discernable moment constitutes an event—does *anything*?

Here, we will argue that, to advance our scientific understanding of event perception and memory, we need a firmer grasp on the terminology; we need to more clearly define what counts as an 'event.' Thus, the goals of this article are to discuss (1) various contemporary ways of conceptualizing events, as well as the limitations of these characterizations, and (2) some ways we should and should not think about events, highlighting a possible path forward for the cognitive science of events.

Defining events

There is no one definition of events. Here, we will discuss several ways of characterizing events, as well as the merits and limitations of those accounts (for related discussions, see also Shin & DuBrow, 2021; Shipley & Zacks, 2008; Zacks, 2020). We begin with some more general views of events and then consider some more specific views. Some of these views are also summarized in Table 1.

Defining events as discrete units

Recall your favorite childhood birthday party. This birthday party could be considered an event insofar as it is a self-contained memory; it is surely, in some sense, a meaningful 'unit' of experience. But when did this event begin—when the first guest arrived, or when the last guest arrived, or some other time entirely? When did it end—when the final guest left, or once the cleanup was completed, or at the end of the day? Guests would likely agree on a rough timeframe in which the event occurred, but the boundaries of the event may vary from person to person. Therefore, we may say that the birthday party constitutes an 'event' in that it is a unit of mental experience—even if what that unit is varies from one partygoer to another. Thinking of events as units of individual experience is the broadest—and the vaguest—way of defining events.

The idea of events as discrete units is useful: It gives us a clear sense of what we are studying (i.e., the structure of experience and memory). It also helps us to understand how the mind might leverage events to support cognition. For example, recent work has argued that events might serve as the underlying unit, or format, of memory retrieval: During memory search, event boundaries may serve as anchor points, allowing one to 'skip' forward to a new event, once a previous memory is searched (Michelmann et al., 2019, 2023; see also DuBrow & Davachi, 2016). At the same time, the vagueness of defining events as discrete units poses a challenge—namely, that it is not sufficiently specific. Virtually anything could be considered an 'event' in this view, which poses several problems.

First, there is the problem that experiences are infinitely divisible, or recursive in structure. Think about the birthday party again. Surely the entire birthday party counts as an event. But what about the cake-cutting? Is it a separate event when the knife makes contact with the cake, or when a slice is separated from the larger whole? Even the cutting of just a single slice can be separated into many distinct moments, not all of which feel like *events* in the same important way. What moments are meaningful enough to be represented as separate events?

Of course, events are not the only things that are infinitely divisible. Matter is, too (or, at least we don't yet know that it isn't). Nevertheless, we are able to decipher meaningful units of matter. We can say, for instance, that the atom is the smallest unit of matter, even though atoms are made up of smaller parts, like protons and electrons. We say that atoms are the smallest unit of matter because they are the building

Table 1 Synthesis of different event frameworks and key example references

Event framework	Description	Key references
Events as objects	Events discretize time in the same way objects discretize space; in both cases, attention is biased to discrete wholes and is 'reset' at the boundaries	Zacks & Tversky, 2001 Casati & Varzi, 2008 De Freitas et al., 2014 Yousif & Scholl, 2019
Events as the consequences of prediction error	Events are periods of perceptual or contextual stability, such that boundaries are drawn when the input is no longer predictable	Reynolds et al., 2007 Zacks et al., 2007 Rouhani et al., 2020 Antony et al., 2021
Events as inferred causal structure	Events reflect internal models of learned probabilities, with boundaries arising at transitions between these models	Zwaan et al., 1995 Radvansky, 2012 Franklin et al., 2020 Shin & DuBrow, 2021

blocks that comprise other things. We do not talk about water as being 'made' of protons and electrons; it is made of H_2O molecules, which are made of hydrogen and oxygen atoms. Those hydrogen and oxygen atoms are the parts that functionally matter (pun unintended). But experiences, unlike matter, do not compose into larger entities in the same way. There are no currently defined 'functional units' of memory; there are just events as we construe them. Water is always composed of H_2O—yet the events that make up any given person's construal of any given childhood birthday party may differ. And without functional units, it isn't clear what units are 'too small' to be considered meaningful (though this question may benefit from considering other literatures which have probed the smallest unit of experience, such as the attentional blink [Shapiro et al., 1997] and the subjective present [White, 2017]).

The field has approached this question of infinite divisibility by simply asking people to segment events in naturalistic settings, such as stories (Bailey et al., 2017; Newberry & Bailey, 2019) or movies (Newtson, 1973; Sargent et al., 2013) without any specific directions. The logic of this approach is that by having many people indicate when they perceive boundaries, it is possible to assess the consistency of event representations across people. Such consistency then provides insight into the natural 'units' of experience. Indeed, this line of work has revealed that, although there are individual differences, there is a great deal of consistency in people's segmentations. In other words, there are discernable units of experience that people agree on. These discernable units are not arbitrary; people recognize the hierarchical nature of events. That is, people are consistently able to identify both 'coarse' events (on longer timescales, like the entire birthday party) and 'fine' events (on shorter timescales, like the cutting of a cake).

On the one hand, this characterization of events at both coarse and fine timescales helps address the issue that events are infinitely divisible. Even though events exist at multiple levels, this line of work demonstrates that there is a rough accordance in the perception of events across people. On the other hand, it tells us little about what timescales of events are 'primary' in the mind. In fact, the coarse vs. fine distinction may be the product of the demands of the task, insofar as participants are often explicitly instructed to distinguish between events in this way (e.g., Zacks et al., 2001). Yet one could imagine asking people to segment events at three levels of coarseness, or four. Would people still agree about what constitutes an event in a more complex hierarchy?

In a broader sense, what constitutes an event may be flexible depending on how the question is framed or what the task is at hand. Indeed, task demands have been shown to influence segmentation; for example, when oriented to attend to spatial information, participants are more likely to draw boundaries at spatial context changes (Bailey et al., 2017). Although this highlights a potential methodological issue for studies aiming to characterize participants' event segmentation, it may also suggest something deeper about how events can be malleably defined or constructed based on one's task goals (see Radvansky & Zacks, 2011). This, perhaps, is one of the merits of this flexible definition of events. Like concepts (Solomon et al., 1999), objects (Scholl, 2001), or emotions (Scherer, 2005), events are not constituted by any specific set of properties. Events begin and end fluidly; the boundaries between them are not always clearly defined; and we can hold in mind multiple event representations at once, allowing us to segment flexibly depending on goals, prior knowledge, or subsequent experiences. Flexibility in what events 'are' may reflect the nature of the underlying representation. Nonetheless, more precise articulations of events will aid in the search for event representations in the mind and brain.

Second, and relatedly, this broad definition of events fails to specify what parts of experience actually matter. In language, we distinguish paragraphs from sentences, sentences from phrases, phrases from words, words from phonemes, and so on. In music, we differentiate verses from measures from notes. These are not arbitrary distinctions based solely on timescales. They are distinctions that map onto the organization and function of language and music (in the same way that a distinction between atoms and molecules and substances maps onto the organization and function of matter). However, some distinctions can be arbitrary. For example, in language, while subjects, objects, and verbs are all functional parts of sentences (shared across all languages), the *order* of each element is arbitrary (and there is significant variation across languages). This tells us something about what parts of language matter (i.e., what parts of language are structurally meaningful, and what parts are arbitrarily, culturally specified). So, we ask: Which aspects of events are structurally meaningful (e.g., do we distinctly represent beginnings or endings) and which are not? What are the 'sentences, phrases, and words' of experience? Or do these distinctions exist at all? After all, it is possible that events are unlike the components of language (or the components of music, or the components of matter) in that they cannot be differentiated into meaningful subcomponents.

Some empirical work has spoken to this question by considering the different kinds of event representations that exist in the brain, and how they map onto behavior. For example, Baldassano et al. (2017) applied a computational model to human fMRI data to uncover events solely from patterns of brain activity while people viewed a television episode. Using this data-driven approach, they identified a hierarchical event structure throughout the brain, with lower-level visual regions representing shorter, more perceptual events, and higher-order, multimodal regions representing longer-timescale, more abstract events—resembling the language network's hierarchical representation for words, sentences, and paragraphs (Lerner et al., 2011). To understand whether these neural event representations simply reflect intrinsic neural timescales (Wolff et al., 2022) or meaningfully relate to events in behavior, Baldassano and colleagues (2017) related the timing of boundaries from neural events to human annotations of events in the episode. Although many regions of the brain including early visual cortex showed neural boundaries that overlapped with human boundaries, the relationship was strongest in higher-order regions such as angular gyrus and posterior medial cortex (see also Geerligs et al., 2022; Sava-Segal et al., 2023).

Taken together, the available findings suggest that event representations may reflect functional 'units'—or, at least, that the mind can simultaneously represent events at different levels of granularity, and that event representations can be shaped by top-down features such as task goal. What this view fails to provide are empirical predictions. To say that the mind represents meaningful units is easy; to specify what those are is more challenging.

Defining events empirically

A different approach to defining events is to make use of the empirical measures of events that have been established by the field. Beyond explicit measures, such as pressing a button to indicate the boundaries between events, there are several known implicit behavioral and neural signatures of event representations (Fig. 1; see also Zacks, 2020). For instance, memory is negatively affected by boundaries, such that previously encountered information is forgotten when a new event begins (Radvansky, 2012)—this effect is sometimes referred to as 'flushing' (e.g., Ongchoco & Scholl, 2019), though is not the full loss of memory that this term may suggest. At the same time, memory is often *enhanced* for event boundaries themselves (Swallow et al., 2009), which may reflect heightened attention to boundaries (Pradhan & Kumar, 2021). Event boundaries also affect associative memory: Items within an event are 'bound' together such that memory for the order of those items is preserved, whereas items spanning two events are more readily confused (DuBrow & Davachi, 2013, 2016; Ezzyat & Davachi, 2011; Heusser et al., 2018; Pu et al., 2022). Indeed, items encountered within the same event exhibit greater neural representational similarity than items encountered across multiple events (e.g., DuBrow & Davachi, 2014; Ezzyat & Davachi, 2014, 2021). Finally, events influence time perception: Segmented events are perceived as shorter than equivalent continuous events after short delays (Liverence & Scholl, 2012; Sherman, DuBrow et al., 2023; Yousif & Scholl, 2019). After longer delays

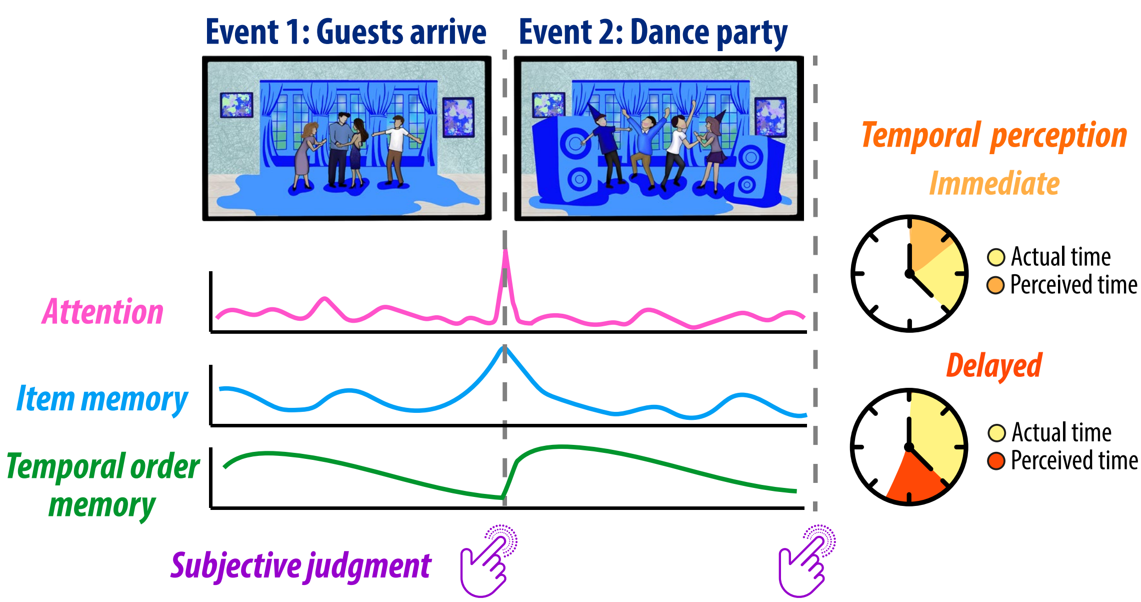

Fig. 1 A subset of behavioral signatures of events. Imagine a birthday party, in which there are (at least) two salient events: a time when guests arrive and people mingle, chat, and eat (Event 1), and then a time when the music is turned up and people begin dancing (Event 2). Throughout the birthday party, attention waxes and wanes, but there is a noticeable peak in attention at the transition between Events 1 and 2. Perhaps reflective of this, item memory also peaks, such that you better remember information that is presented at the event boundary. Meanwhile, temporal order memory (e.g., whether you talked to Cameron or Kat first in Event 1; whether you danced with Natalia or Paul last in Event 2) is highest at the start and middle of events, and is diminished across event boundaries. These event boundaries can be explicitly identified by you and others at the party, with only some individual differences in what people subjectively judge to be an event. Finally, your perception of time immediately after the birthday party is that it passed by more quickly than actual clock time. Later on, though, when recalling the birthday party, you may perceive time to have lasted longer than actual clock time. (Color figure online)

however, the presence of event boundaries increases subjective temporal duration (Ezzyat & Davachi, 2014; Faber & Gennari, 2017), and items spanning event boundaries are remembered as farther apart (Clewett et al., 2020).

Although none of these event signatures may be individually constitutive of an event, they collectively provide a set of 'tests' which can be used as evidence that event segmentation has occurred. However, we think that there are fundamental problems with using this approach alone to define events, which we reserve for a more detailed discussion throughout the subsequent sections.

Defining events as objects

A popular idea is to avoid defining events directly, and instead make an analogy to (visual) objecthood (see, e.g., Casati & Varzi, 2008; De Freitas et al., 2014; Ji & Papafragou, 2022; Tversky et al., 2008; Zacks & Tversky, 2001). Events and objects have a number of similarities that make this comparison apt and satisfying. For instance, both events and objects are discretizations of relatively continuous input. Whereas objects discretize the visual world, events discretize the experiential world. Furthermore, events, like objects, are closely related to attention: A myriad of related effects have been observed that share a strong resemblance across both spatial and temporal attention (see, e.g., De Freitas et al., 2014; Yousif & Scholl, 2019). For example, *object-based attention* describes the phenomena in which attention is allocated to discrete objects, such that, for example, if you are looking at one side of a rectangle, your attention is more likely to spread within that rectangle than to an equidistant point outside of that rectangle. A similar effect exists in temporal perception; attention appears to be automatically allocated to items from the same, versus different, events (e.g., De Freitas et al., 2014; Yousif & Scholl, 2019). Thus, it might be said that spatial attention reflects visual objecthood, whereas temporal attention reflects experiential 'eventhood.' Indeed, it is this connection that makes the analogy to objecthood so compelling: Events may be seen as the temporal side of the same 'attention-organized coin.' This object-analogy not only helps to explain the relation between the representation of objects and events, but may also help to explain the signature memory decrement effect at event boundaries: Attention is reset at boundaries, thus leading to reduced access to the prior event (and, thus, forgetting; Radvansky, 2012).

The analogy to objecthood is useful, as it implies a possible common mechanism (attention) that underlies the discretization of information in both space and time. However, this definition has some limitations.

First, if the goal is to have a *formal* definition of events, this object analogy will not get us very far. Objects, like events, suffer from a know-it-when-you-see-it problem; there is no clear definition of objecthood (for brief discussions, see Feldman, 2007; Marino & Scholl, 2005; Yousif & Scholl, 2019). Visual objects can only be defined by the attentional consequences of those objects. That is, something is an object insofar as it yields an effect of object-based attention. A similar problem exists for events: Events are often defined not by any intrinsic characteristic, but by their extrinsic behavioral effects (which may or may not reflect event representations *per* se).

Second, while the analogy to objecthood may help us to understand how memories are shaped by events, it fails to help us understand how events are shaped by memory. Our memories change over time, and we might expect those changes to reflect *and* influence event structure. What at one time may have seemed like an important life event may be reshaped by subsequent experiences: An ordinary date 10 years ago becomes more meaningful when one 'connects the dots' in retrospect to see how that event led to another which ultimately led to them finding their partner. This is true not only of how we construe the events of our experience, but also of how we construe the events of our (human) history. Even events on a historical scale mold and evolve as history writes and rewrites itself over time (Teigen et al., 2017). If we want to understand this continuous reshaping of event representations, the analogy to objecthood will not get us very far. We need a way of thinking about events that can account for changes over time.

In short: What we think the analogy to objecthood offers is a way of understanding (a) what events are, and perhaps (b) how event representations are formed (at least on shorter time scales). What it lacks is a way of explaining event representations at the scale of ordinary experience.

Defining events as consequences of prediction error

A dominant theory of event segmentation and representation has been that events are closely related to prediction and prediction error (e.g., DuBrow et al., 2017; Reynolds et al., 2007; Rouhani et al., 2020; Zacks et al., 2007; Zacks et al., 2011). Specifically, such theories argue that events are a period of perceptual and contextual stability. When there is a transition such that the input is no longer predictable (i.e., a prediction error), an event boundary is drawn and a new event begins. This theory is supported most directly by empirical work demonstrating, e.g., that event boundaries align with prediction accuracy or judgments of surprise (Antony et al., 2021; Eisenberg et al., 2018; Zacks et al., 2011). For example, in a task in which people were asked to predict what would happen next in a movie clip, people were worse at making such predictions when an event boundary occurred (Zacks et al., 2011).

On the surface, this definition of events captures most known findings. For example, a prediction error theory can explain how event boundaries arise from spatiotemporal discontinuities (e.g., Gershman et al., 2014; Huff et al., 2014; Liverence & Scholl, 2012; Magliano & Zacks, 2011; Meyerhoff et al., 2015). These effects also extend beyond perceptual prediction: Recent work has demonstrated that reward prediction errors also create event boundaries in memory, leading to characteristic effects of events on memory (Rouhani et al., 2020). Furthermore, this view may be closely related to the aforementioned view on objects and attention: Prediction errors may be the mechanism of attentional shifts which then ultimately drive the creation of an event boundary and the formation of an event representation.

That said, although prediction error may be one possible mechanism of event segmentation, it may not be the best explanation of event representations in general.

First, and perhaps most critically, event boundaries can occur even when there are no prediction errors. As the clock winds down in the final seconds of a basketball game, for instance, everyone knows that the game is about to end. But surely the blow of the final whistle constitutes a meaningful, albeit entirely predictable, event boundary (see Baldwin & Kosie, 2021). Empirical work supports the idea that predictable transitions can still result in reliable event segmentation. For example, Schapiro and colleagues (2013) demonstrated such segmentation, even when transitions between events were controlled and predictable. Other studies, too, have invoked the notion of event representations even when boundaries were predictable in both content and timing (Heusser et al., 2016; Pettijohn & Radvansky, 2016a; Sherman, DuBrow et al., 2023).

One reason why prediction errors may sometimes, but not always, result in event boundaries is that they often denote a change in context. True to this idea, a majority of studies that have linked prediction error to event boundaries have operationalized prediction error as changes in context, whether that be spatiotemporal context (e.g., Huff et al., 2014; Magliano & Zacks, 2011; Meyerhoff et al., 2015) or task/mental context (Rouhani et al., 2020; Wang & Egner, 2022). One study specifically aimed to dissociate prediction errors and context changes and found that context shifts, but not prediction error, best predicted 'event-like' memory effects (Siefke et al., 2019). This latter finding suggests that, indeed, predictions errors may be one of many cues to context changes, but are neither necessary nor sufficient to elicit an event boundary.

Second, people are confronted with unpredictable events far too often for them to serve as reliable boundaries. In controlled settings (e.g., Rouhani et al., 2020), it makes sense that surprising instances may serve as boundaries; they may be, after all, one of the only distinct cues in a highly structured environment. In the real world, however, predictions—and surprises—are rampant. Imagine crossing a busy street. In the time that you can walk from one street corner to the other, you may make dozens of prediction errors: a passerby may smile unexpectedly, a dog may begin to bark as you approach, a car may start to move sooner than you expected, someone may bump into you, or someone unexpected may call your name from afar. In the real world, too much happens too fast, and too much of it is unexpected, for expectations alone to serve as the foundation of event representations. Far from conjecture, this idea is borne out of related empirical work (see Siefke et al., 2019).

Explaining why prediction errors are a good way of defining event boundaries, Zacks and colleagues (2007) give an example of watching someone wash dishes. They write: "... as each dish-scraping comes to an end there is a small, brief increase in prediction error, and that as the dishwashing activity comes to an end there is a larger, longer increase in prediction error." (p. 5) But are the minor changes that occur between washing two dishes really sufficient to constitute a prediction error? After all, if someone is washing dishes and they set down a dish, that may be the moment one is *best* able to predict what they will do next (i.e., pick up another dish). Similarly, one may know exactly what the person washing dishes aims to do once the dishes are clean, but would this make the transition from one activity to the next less of a boundary? Would the two activities blend into a single event? This view would benefit from a more precise characterization of what constitutes a sufficient prediction error to result in an event boundary, as well as clarification about those boundaries that occur in highly stable and predictable environments.

Defining events as inferred causal structure

So far, we have talked about events as specific, one-time occurrences. Yet we also hold in our memory abstractions of what tends to happen during certain types of events (e.g., there is a typical 'script' for how a birthday party unfolds; Schank & Abelson, 1977). Some theories propose that event segmentation is an inference process over these latent, causal structures of experience (e.g., Shin & DuBrow, 2021; see also Radvansky, 2012). In this account, events are created and updated based on changes in the likelihoods that different event types gave rise to the current moment. For instance, the sound of your last party guest closing the door behind them signals the ending of the birthday party event and the onset of a new event: cleaning up. In other words, events are not merely a product of momentary shifts in attention or context; events are about what those shifts signal—that is, that there has been a meaningful change in the structure of the environment.

This framework addresses limitations in the prediction error account. Here, transitions between events could be entirely predictable (there is, or should be, a high likelihood for cleaning up following a party) but are nonetheless treated as boundaries because of the learned probabilities and features of different event types. This is noteworthy because, in our daily lives, many, if not most, event boundaries are entirely predictable: We know when meetings will begin and end, we know when we will leave the office, we know when we will have dinner, and so on. An account of event representations based on prediction errors alone cannot account for these routine shifts between events. Additionally, latent structure theories of event segmentation can account for event boundaries when there are no changes in the external environment at all, like when we mentally transition between events in our mind (Lee & Chen, 2022). That said, the inference account of event segmentation does not reject or stand explicitly in contrast to the prediction error account; prediction errors can be used as cues to changes in causal structure, driving event segmentation (see DuBrow et al., 2017; Gershman et al., 2014; Kuperberg, 2021).

Although seemingly a modern view, a version of this idea (i.e., that events arise from transitions between contexts) was present in earlier work on mental models, situation semantics, and situation/event models (Barwise & Perry, 1983; Zwaan et al., 1995; see also Johnson-Laird, 1983 for related discussions). Mental models were initially described by Johnson-Laird (1983) as 'reasoning mechanisms' that represent the external environment in working memory and guide cognition. This broad definition can be broken down into several other types of models (Radvansky & Zacks, 2011). Situation models were first used to describe the mental representations that one holds when comprehending narrative text (Zwaan, 2016), but they are also relevant to memory retrieval (Zwaan & Radvansky, 1998) and event segmentation (Zacks et al., 2009). An extension of situation models, experience models explain lived experiences (rather than focusing on language; Radvansky & Zacks, 2011). Situation and experience models (together referred to as event models) specify that events occur in a spatial-temporal framework and contain features, such as the physical characteristics of the environment, goal states, and the emotional states of the agents in the event. Event models also represent the relations among entities within an event and the causal relations among event elements. Thus, as a sentence is read, or a moment is processed, similarity to the currently active situation or event model is assessed on multiple dimensions (e.g., time, space, causality). New situation models then theoretically become active when there are enough changes along the multiple dimensions. However, with no constraints on what the priors are for different dimensions, it is unclear when exactly event segmentation would or would not occur. In other words, these theories are largely unfalsifiable. Event segmentation theory (Zacks et al., 2007) addresses this issue by having latent causal structures, or event schemas, inform the current event representation, such that discrepancies between what is expected from an event schema and what is actually happening may result in an event boundary. Early instantiations of event segmentation theory described this with appeal to prediction error (Reynolds et al., 2007), but it can also be implemented in a generative model that performs inference over learned event schemas (Franklin et al., 2020).

The idea of events as inferred structure is appealing insofar as it can account for the same types of event boundaries as the prediction error account, in addition to boundaries between events that are objectively predictable. It additionally places more emphasis on the *content* of events (what occurs in between boundaries), which is especially useful for generalizing across event instances. However, this theory too has some shortcomings.

First, this model of event segmentation intrinsically relies on some amount of prior knowledge. Although many seemingly novel events often share some properties with previous experiences, some events may be truly distinct. Theoretically, how these new events are dealt with is simple: They become their own event models or latent event structures, independent of already-stored event schemas (Shin & DuBrow, 2021). Practically, however, there are many unanswered questions, including what thresholds are used for adding to versus creating (vs. transforming or blending) a new event schema, and what the underlying (cognitive and neural) mechanisms are for this process.

Second, this question becomes even more critical when considering how event schemas are formed over development. There are a number of studies in the schema acquisition literature that describe how event schemas may be learned by adults (Gilboa & Marlatte, 2017), but comparatively little in infants and children (but see Levine et al., 2019; Pudhiyidath et al., 2020). Event segmentation is clearly important for infants to understand and predict their world, but with little prior knowledge to draw from, how exactly are boundaries perceived and events represented? Recent work has shown that infants may experience events on longer timescales than adults (Yates et al., 2022), but it is unclear how they come to develop complex, hierarchical event representations (akin to adults and older children; see Cohen et al., 2022) and what factors are most critical to their event representations. Work in younger (5–7 years) and older (7–9 years) children found that although children exhibited sensitivity to event structure, these effects were attenuated relative to adults (Ren et al., 2021; Zheng et al., 2020), suggesting a developmental trajectory for the influence of events on the organization of memory. However, more work is needed to fill in the gaps between infancy and late childhood. Modeling work may get us closer to understanding how event types could form over experience to enable inference-based event segmentation (Elman & McRae, 2019; Franklin et al., 2020), but the developmental plausibility of this framework remains untested. Perhaps the ability to learn regularities from the environment (see, e.g., Saffran et al., 1996; Sherman et al., 2020), plays a crucial role in building up event schema representations that can guide segmentation.

More than semantics: Why we should care

More than differences in terminology, the distinctions between these frameworks have meaningful consequences for how events—and the mind—are studied. There are many hard-to-reconcile notions. On the one hand, an event may be nothing but a single frame in an animation—the very instant that one disc appears to collide with another (e.g., Kominsky et al., 2017; Michotte, 1963). On the other hand, an event may be a period of time that stretches over years, or decades (e.g., Teigen et al., 2017). This leaves us with what we think is the fundamental question for the cognitive science of 'events': Is there a single, unifying theory that can account for event representations in both perception and memory, and across both short and long timescales? If not, are there multiple distinct *kinds* of events that should be studied separately?

Answering these questions, first and foremost, requires thinking more rigorously about how we use the term 'event'. Ultimately, this issue isn't about semantics; it is about carving the mind into its relevant components and processes. It is about understanding whether a temporary lapse in attention constitutes an event boundary in the same way that walking through a doorway constitutes an event boundary in the same way that starting a new job or moving to a new city constitutes an event boundary—about understanding whether all of these things ultimately reflect the same fundamental process, or whether they should be the targets of distinct research programs and theories.

How should we think about events?

In science, the birth of a new idea is sometimes arduous. Communities may spend years trying to meticulously explain their terminology, arguing back and forth over the 'truest' form of an idea. But then, inevitably, that phase passes—and we begin to accept some vague notion of the original idea. That is certainly true of the current state of event research.

At the inception of this research program, a great deal of attention was paid to the *idea* of events—what they are exactly, what they buy us, and so on (see, e.g., Schwartz, 2008; Shipley & Zacks, 2008). However, as more recent work shifted the focus to behavioral signatures of events, they have often become tacitly defined *in reference to those behavioral signatures*. In other words, there is a sense in which events have come to be circularly defined as anything that yields an event-like effect. This poses a reverse inference problem: Just because two things have the same effect does not mean they have the same cause.

To understand why this reverse inference is a problem, imagine we are interested in what types of dogs any one infant prefers to watch. Suppose that when we show the infant two different images of dogs side-by-side for 20 seconds, they look at the image on the left for 15 of the total 20 seconds. What can we infer about their preference for the dog on the left? Sometimes, infants are drawn to novelty; perhaps the child has never seen a dog that looks like that and is intrigued. Other times, however, infants are drawn to familiarity; perhaps the child has a dog that looks similar in their home. Without knowing anything else about the child or repeating the experiment, it is difficult to say whether the observed difference in looking time reflects novelty or familiarity (Aslin, 2007). Here is the danger of reverse inference: not only can an effect (e.g., a difference in looking time) result from *different* causes, it can result from fully *opposing* processes (i.e., novelty vs. familiarity). This can also be an issue for interpreting adult behavior. For example, enhanced perceptual performance on visual tasks may result from expectation (guided by priors) or attention (guided by goals; Summerfield & Egner, 2009). Without additional information, perceptual performance itself cannot be interpreted as evidence of either a change in expectation or a change in attention.

Our question, then, is whether a sort of reverse inference has caused different things to be grouped under the banner of event representations. For example, reward prediction errors (Rouhani et al., 2020) and walking through doorways both cause the hallmark across-boundary memory deficit, but do they both result in genuine event representations (i.e., events with beginnings, endings, etc.)? This has not been tested. If we assume that this memory deficit is a definitive indicator of event representations, this makes sense. But what if these sorts of boundary effects can exist *without* the formation of a substantive event representations on either side of that boundary? This logic is further complicated by recent work demonstrating that event boundaries can lead to *enhanced* across-event memory, and that such boundary effects can be modulated by simple changes in task parameters (Wen & Egner, 2022; see also Pettijohn et al., 2016).

This concern is not limited to any one behavioral marker of events; it applies in the same way to other behavioral markers, like time perception. Would we say that both blinks (Grossman et al., 2019) and changes in goal-directed actions (Jeunehomme & D'Argembeau, 2020) reflect event representations, given that they result in temporal compression of experience (just like manipulations in spatiotemporal context lead to temporal compression; see Sherman, DuBrow et al., 2023; Yousif & Scholl, 2019)? If not, what behavioral criteria should be used to define events?

In fact, we may argue that many of these canonical behavioral signatures are not signatures of events at all, but instead are signatures of a *boundary*. Here, we want to speculate about what a more principled empirical approach might look like—one that emphasizes not just boundaries, but the substantive bits between them.

First, events should contain meaningful 'parts'—a beginning, a middle, and an end (Ji & Papafragou, 2020). For instance, primacy and recency effects are foundational to the study of human memory (e.g., Kahana et al., 2022; Murdock, 1962). Although they have been most commonly observed in list-learning paradigms (Ebbinghaus, 1885/1913; Glenberg et al., 1980), primacy and recency effects have also been observed in semantic knowledge (Roediger & Crowder, 1976), and on the scale of long-term life events (Koriat & Fischhoff, 1974; Sehulster, 1989; Doolen & Radvansky, 2021). To the extent that these effects are of 'events'—that primacy and recency reflect the boosts in memory at both the start and end of a meaningful experimental unit, or event—then the presence of primacy and recency effects might be a useful criterion to define the existence of an event. In other words, rather than merely expecting that memory will be boosted for the beginning and end of an extended time period like a vacation, one might expect that memory is enhanced for the beginning and end of each *event* within that vacation (e.g., the plane ride, the museum visit, the waterfall hike).

Primacy effects have been observed in some studies on events (e.g., Polyn et al., 2009; Pu et al., 2022; Wen & Egner, 2022). However, few studies systematically look for primacy and recency effects, leaving open the possibility that some studies that seem to be about event representations on the surface may not all be tapping into substantive event representations in the same way. For example, suppose that, while watching a movie, you suddenly hear a loud burst of thunder outside, which distracts you for a moment. Surely this would influence certain metrics that have been used to study events—but is this really an event boundary in the way that a break in the story would be? Our suggestion is that by looking for additional signatures of event representations (in this case, evidence of primacy and recency effects) it may be possible to differentiate genuine event representations from mere boundary effects. In other words, we think that event representations should reflect the content of events themselves. This is not a novel idea; as referenced above, some theories posit that events are defined by their spatial-temporal context and the specific features of an experience, such as the people present, the goal states and emotions of those people, and the relationships among them (Radvansky & Zacks, 2011).

Second, in order to properly reflect the nature of our experience, event representations must be hierarchical. Our lives are made up of days contained within weeks contained within months contained within years. What would it mean for us to represent events but without sensitivity to these various temporal scales? Yet surprisingly little work has asked about the organization of events into hierarchies (but see Baldassano et al., 2017; Kurby & Zacks, 2008), even though it is commonly thought of as one of the essential characteristics of events (Zacks, 2020). This is surprising, given that hierarchical organization is perhaps the very first thing we should expect of any genuine event-like representation (whereas, in contrast, we wouldn't expect hierarchical effects if certain boundary effects reflect mere distractions, as in those cases the boundaries would not reflect any higher-order structure). Some recent work has highlighted the ways in which event hierarchy might counterintuitively influence memory: Items spanning a 'higher order' boundary (a switch in both task and context) can lead to *enhancements* in temporal memory for items spanning a boundary, whereas items spanning a 'lower order' boundary (a switch in context alone) leads to the canonical cross-boundary memory deficits that have been observed in many studies (Wen & Egner, 2022).

If events are organized hierarchically, we might begin to make predictions not only about how that information is perceived and encoded, but also how that information decays over time. For instance, perhaps the boundaries between the lowest levels of the hierarchy decay first, then the intermediate levels, then the highest levels. This would be similar to what happens for object and spatial memory, where particular information decays faster than more 'gist-like' memory (Huttenlocher et al., 1991; Zeng et al., 2021). That said, virtually no work has studied event representations on a scale that would make asking such questions possible. Of course, it is not imperative that all work on event representations concern itself with hierarchical representations. Our suggestion here is just that evidence of hierarchical representations could be one of many criteria to disambiguate genuine event representations from something like momentary distraction (if these are distinct effects in the first place).

Third, events *need not* be thought of as sequential. The vast majority of studies on event perception involve events that follow one after another. Yet in our everyday lives, this is not the case: Any one meeting may be temporarily interrupted by another meeting; any one conversation at a dinner party may blend in and out of other conversations; any one attempt to write a paper is interrupted by hopeless attempts to keep up with a constant deluge of emails. Events overlap on longer timescales, too. One might recognize their own college years as one event, whilst also representing a given presidency as its own event, even if one contains the other, or if they only partially overlap.

Indeed, this is one of the greatest challenges the mind must confront—how to delineate events or episodes from one another, and how to determine when many simultaneous events begin and end relative to each other. The 'fluidity' of experience poses a computational problem, and yet we seem to have little trouble distinguishing between overlapping events in our lives. How is that? Future work might explore this using paradigms involving events embedded within other events or extending across other events. For instance, one could imagine a task where people complete one of two tasks in one of two contexts (as both task and context have been used as event manipulations; see, e.g., DuBrow & Davachi, 2013; Wen & Egner, 2022). Task could change independently of context, giving rise to two separate kinds of events which overlap asynchronously in time. Another possibility is to alternate between different narrative storylines (Chang et al., 2021; Cohn-Sheehy et al., 2021). This then opens the door to a myriad of other empirical questions: How many overlapping events can people track at once? How many levels of embedding can people represent? Are all 'kinds' of events represented equally?

This is not an exhaustive list of characteristics we may expect from event representations. The aim here is to propose criteria that emphasize properties of the events themselves, rather than properties of the boundaries between them. We hope this serves as a blueprint for future theoretical and empirical work.

Empirical horizons

We have highlighted several potentially problematic distinctions that may complicate our understanding of what constitutes an event. In this section, we discuss several paths forward that may help to address some of the concerns that we have raised here.

First, we think that work studying events over longer time spans is crucial. Although many of the events that people experience and care about span weeks, months, or even years, the vast majority of empirical work on events occurs on time spans of seconds at the shortest (e.g., Sherman, DuBrow et al., 2023, Yousif & Scholl, 2019) and minutes at the longest (e.g., Radvansky & Copeland, 2006; Radvansky et al., 2011; Radvansky et al., 2010). Because of this, the work being done does not reflect even a fraction of human experience; indeed, using experience sampling, Sastre and colleagues (2022) showed that the average event length in a typical day is an order of magnitude longer than what is typically studied during in-lab experiments—ranging from several minutes to 6 or more hours in duration. On these longer timescales, it would be much more natural to ask questions about other features of event representations (e.g., to what extent are they hierarchical?)

Yet this is an imminently surmountable obstacle. Although it would be difficult to have laboratory tasks that span weeks or months, there are many studies that can be conducted on real world events. For instance, one could draw upon paradigms used in the autobiographical memory literature (Conway & Rubin, 1993; Fivush, 2011) to examine how events over the life span are represented. In fact, it may be important to begin to incorporate autobiographical memory phenomena (e.g., 'reminiscence bumps' that tend to occur in adolescence; Rubin et al., 1998) into our framework of event representations. Experimentally, much like how classic memory work has depended on shared, real-world experiences (see, e.g., Brown & Kulik, 1977; Chiew et al., 2022), there may be room to study event representations in real world scenarios. For example, it might be possible to study event-related representations of lengthy sports tournaments, like the FIFA World Cup or March Madness. Or it might be possible to study event representations for television shows that were watched over the span of several years, or for books that were read over many weeks (for related work assessing memory for novels, see Copeland et al., 2009; Doolen & Radvansky, 2021; Radvansky et al., 2005). There are surely stable signatures of event processing in shared experiences. This sort of real-world approach promises to enhance our understanding of events, not only by highlighting principles of event representations that are shared across people, but also by potentially revealing individual differences in how events are construed across much longer timescales than have been studied in the past.

Second, we think that research in developmental populations can inform theoretical accounts of events. Prior work has demonstrated that event representations are present throughout development: Infants recognize when events are disrupted at boundaries versus nonboundaries (Baldwin et al., 2001), toddlers show memory enhancements at event boundaries (Sonne et al., 2017), and young children can perform an event segmentation task consistently with one another (Zheng et al., 2020). Yet more can be done to leverage these crucial developmental periods to better understand the foundations of event representations. For instance, on some theories of event representation, segmentation tacitly depends on prior knowledge, insofar as existing schemas may be used to infer event structure (see Franklin et al., 2020; Shin & DuBrow, 2021). Children, however, often lack the requisite prior knowledge to make inferences about the structure of their environment. At the same time, their limited prior knowledge means that there may be less interference from learned representations. How may this lack of prior knowledge influence event representations, and how might these findings inform theories of events?

Advancements in neuroimaging have made the study of event representations across development more feasible, by allowing for common tasks across developmental populations that have different behavioral abilities. For instance, neural measures such as EEG (Pace et al., 2020) and fMRI (Yates et al., 2022) offer viable means of studying events even during more passive viewing tasks (Baldassano et al., 2017; Geerligs et al., 2022). This enables us to ask: Do event representations start out hierarchically organized, or does the hierarchy build over the course of development and learning? How fast does this occur, and how plastic are event representations once formed? Tracking the evolution of event representations over development may enhance our understanding of the mechanisms of event representations and offer insights that constrain broader theories of event representation. And beyond studying events as snapshots at different time points in development, it may also prove useful to track how event representations change longitudinally to assess how the same event representations evolve over time. Is it the case that some event boundaries 'fade away' as time passes? Do event-related effects (e.g., primacy and recency effects on memory) remain stable, or do they diminish over time, and how might developmental landmarks (e.g., beginning school, entering puberty) impact this? Note that we emphasize the value of development for answering these types of questions, but similar questions would be interesting to explore in the contexts of aging (Kurby & Zacks, 2011) and clinical populations (Pitts et al., 2022).

Third, as we have hinted throughout this review, we think it is critical to disambiguate context from attention. Although events are typically thought to reflect some sort of context representation (see, e.g., Lawrence & Peterson, 2016; Pettijohn & Radvansky, 2016a, b; Radvansky & Copeland, 2006; Radvansky et al., 2010, 2011), recent work has shown that things like surprisal (Antony et al., 2021; DuBrow et al., 2017; Reynolds et al., 2007; Zacks et al., 2007, 2011), reward prediction error (e.g., Rouhani et al., 2020), context shifts (DuBrow & Davachi, 2013; Lawrence & Peterson, 2016; Pettijohn & Radvansky, 2016a, b; Radvansky & Copeland, 2006; Radvansky et al., 2010, 2011), perceptual shifts (e.g., Sherman, DuBrow et al., 2023; Yousif & Scholl, 2019), and task shifts (Wang & Egner, 2022) all result in canonical boundary effects (Fig. 1; see also Zacks, 2020). These findings may all ultimately be effects of attention, as event boundaries tend to occur at moments when attention is re-set or drawn away from the current event. Indeed, if events are to time as objects are to space, then perhaps attention is the mechanism that unites these ideas (insofar as attention is related to the perception of objects and events in analogous ways; see De Freitas et al., 2014; Yousif & Scholl, 2019). Viewed this way, one might be tempted to ask: Are attention and events two sides of the same coin?

Yet while attention may account for effects on shorter time scales, it may not help us to understand events on longer time scales. How could it be that a representation of an event spanning several hours is explained by momentary shifts of attention? And how would we explain that events are organized hierarchically, such that some events boundaries are more significant than others? Attention alone cannot help us understand the complex organization of events representations; at best, it can only help us to understand where boundaries occur.

Perhaps for this reason, other models of event representation shift the focus away from attention. Theories that focus on context (Zwaan et al., 1995) or inferred causal structure (Radvansky, 2012; Shin & DuBrow, 2021) invoke higher-level cognition as a driving force behind event representations. In these views, shifts in attention may indicate the presence of an event boundary, but they aren't revealing anything about the events *themselves*.

We see several paths for teasing attention apart from context. For instance, one could tax participants' attention in between context shifts (see, for example, Experiment 2 of DuBrow & Davachi, 2013), thereby creating a context change that is not directly tied to a single shift in attention. Or one could manipulate attention *without* manipulating context by having participants briefly swapping to a new context before immediately returning to the previous one (see Radvansky et al., 2011; see also Rait et al., 2022). (Although some individual experiments have been conducted that are relevant to these questions, there have not, to our knowledge, been any direct attempts to tease apart attention from context as a general explanation of event representations.)

Ultimately, this is a question of whether event representations are formed from the bottom-up (as an attention account may suggest) or from the top-down (as a context account may suggest). Some theories would seem to favor the former (e.g., those that liken events to objecthood) whereas others would seem to favor the latter (e.g., those that posit event representations reflect inferences about the structure of the environment). Much would be gained, we think, from having a firmer grasp on this basic distinction.

Finally, we think that more emphasis should be placed on studying events *themselves* rather than merely the boundaries between them. As we have discussed, we might expect that true event representations should reflect not only boundaries *between* events but also the substance *within* events (as reflected, e.g., in the scaling of duration judgments with mnemonic content, Sherman, DuBrow et al., 2023; and in the form of primacy effects within an event, Pu et al., 2022). Indeed, some work has specifically argued that 'beginnings' are special—that they are prioritized in the recollection of prior events on long time scales (Teigen et al., 2017). Other work has likewise emphasized the importance of middles and endings (Ji & Papafragou, 2020; Ongchoco & Scholl, 2019). This distinction between beginnings and endings is theoretically important: Event boundaries by themselves are not meaningful if there are not complete events (i.e., ones with beginnings, endings) on either side of those boundaries. Yet by focusing too much on event boundaries, some work may lose sight of what 'events' are meant to represent in the first place. This places the field in a theoretically tenuous position: Not only are events being defined inadequately, they are, in some cases, being ignored altogether.

To say this another way: A room is more than just four walls. Characterizing a room has more to do with what exists between the walls than it does with the walls themselves. A kitchen is a kitchen because it has a sink and a stove and an oven; a bedroom is a bedroom because it has a bed and a dresser and a nightstand. Similarly, an alleyway between two buildings is clearly distinct from the buildings themselves; it is a kind of 'negative space' between other functional parts. So it is with events: They cannot be defined by appeal to 'walls' alone. Something must be said for what is happening in between.

The remedy to this problem is simple: Future work should focus less on what happens on either side of a boundary and more on what happens in between them. The fields of psychology and cognitive science should strive to define behavioral signatures of events *per se*—rather than relying on a few behavioral signatures which overemphasize boundaries and thus may not always reflect genuine event representations.

What is an event?

Our goal in this paper has not been to deride the current state of event cognition by pointing out inconsistencies in the use of the term 'event' or to present a single unifying theory of events (and in fact, we have only scratched the surface of tricky distinctions that complicate the study of events). Rather, our hope is to start a conversation about whether a unified definition of 'events' is possible. To move this conversation forward, we want to try our hand at answering the question: What is an event?

We want to suggest that events are not one thing, but (at least) two things (see also Barwise & Perry, 1983 for a similar argument). One type of event is what we would call a 'moment'—something that can be distilled down into 'a single frame in an animation.' This may include the classic 'launching event' (Michotte, 1963), a car crash, or the instant that everyone yells "Surprise!" at a birthday party. It is an instant, without any beginning or ending. These sorts of events may reveal things about the nature of perception, attention, and perhaps higher-level processes like causation (see, e.g., Kominsky & Scholl, 2020; Rolfs et al., 2013).

The other type of event is what we would call a 'period'—extended windows of time which may include numerous 'moments.' Examples of periods would include a basketball game, a class, or a meeting; they are extended bits of time with a beginning, a middle, and an end. Periods may be defined based on external structure in the world (like games, classes, or meetings) or one's own internal construal of the world (e.g., a stretch of time when one was especially happy or especially busy). Periods are the subject of most work on event representation in the study of memory (and, also, the subject of most of the events we consider in this paper). In fact, one might argue that what we've called 'moments' are not types of events at all, but instead may sometimes more closely resemble 'boundaries' (insofar as they reflect prediction errors, fluctuations in attention, or changes in context). However, we want to suggest that not all moments are boundaries, and further that not all boundaries are moments (e.g., something like walking through a doorway constitutes a meaningful boundary, even if it is not a meaningful moment). Distinguishing between moments and periods and boundaries is essential to developing a complete theory of 'events.'

As readers will have discovered by now, we are skeptical about how all of the theories discussed in this paper may co-exist. To clarify our view, we want to make one further distinction—between the 'bottom-up' processes like exogenous attention which influence how event representations are formed, and the 'top-down' processes like inferred causal structure that continuously shape and reshape event representations over time. Most contemporary work on event representations has focused on the former—that is, what factors cause event representations to be formed in the first place (as well as the consequences of those boundaries being formed). This makes sense, as these questions are of the sort that are most easily answered using short experiments conducted in the laboratory. Our worry, articulated within this framework, is that many studies which claim to study 'events' may actually be studying meaningful moments (in the form of boundaries, perhaps) without considering meaningful 'periods.' Are these boundary effects really influencing long-term representations of events? Do they influence how we construe not just moments, but periods—how we think about their beginnings, middles, and endings?

Understanding boundary effects has undoubtedly been valuable. Our view, however, is that the next phase of work on event cognition should be more about the substance and the structure of events, as well as how they are shaped and reshaped over longer periods of time. We hope that some of the thoughts offered throughout this paper can help the field to do exactly that.

Conclusion

Events are clearly a foundational part of our human experience. They reflect how we attend to the dynamic world around us; they reflect our own construal of events as they unfold; and they reflect how we organize our experiences into memories that are discrete and structured. As such, events are foundational to the study of human behavior and human cognition: They are the lens through which we come to understand how complex, dynamic, varied experiences become organized into coherent thoughts and memories. However, what remains unclear is whether events are one 'thing'—or if different areas of study are tapping into different kinds of event representations, served by distinct mechanisms, etc. Here, we have argued that there are many reasons to think that 'events' are not and could not be one thing, and that we should use more specific terminology to distinguish between the moments that may reflect drifts of attention, for instance, and the periods that broadly structure our memories. We have suggested that these distinctions are substantive and that failing to understand what counts as an event in any one domain may impede our ability to understand events in all domains. Thus, as this area of study matures and grows, it may be necessary to cast a *narrower* net (or separate nets) when talking about events. After all: If everything is an event, then nothing is.

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Declarations

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