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Connecting Events: Experienced, Narrated, and Framed

Egil Asprem and Ann Taves

We are grateful to the commentators who took the time to respond to our target article and think they raised a number of important concerns. Before discussing them, however, we were pleased to note that there was little opposition to the general idea of viewing experiences as events. Although Radvansky (as well as Zacks) did not envision this use of their theory, we were particularly gratified that Radvansky not only affirmed but offered means of extending our application of their research into the realm of experience.

Our response to the concerns raised falls under four headings: (1) opening clarifications, (2) issues related to the use of first-person narratives, (3) concerns related to extending event segmentation theory (EST) to internally experienced states, and (4) the effects of cross-event integration.

I. Opening Clarifications

Experience as Event: Kavanagh worries that our definition of events is too broad and suggests that event cognition is the "preferred analytical method to employ for all research on religious experience." We adopted the definition used in the event cognition literature (Zacks & Tversky 2001). Researchers in this field intentionally define it broadly, recognizing that people view events in multiple timeframes from the micro to the macro and can readily switch between perspectives. In referring to "experiences as events," our intention was to distinguish between *experience* as the flow of information and *experiences*, which reflect the chunking of the flow of information into events with a beginning and an end. This framework not only gave us a starting point for recasting some traditional problems in the study of "religious experience" but also, as we will discuss below, provides a means of integrating disparate lines of research. Thus, we do not view event cognition as "a tool" but as a theoretical framework that embeds the study of experience in current neurocognitive research on how people generate models of what is happening.

[Religious] Experience: Both Proudfoot and van Elk & Zwaan raise concerns about our reference to "(religious) experience" (RE). In placing "religious" in parentheses in the title, we meant to signal our embrace of an attributional approach (Taves 2009) in which we assume that no experiences are inherently religious (or spiritual) and that their characterization as such is a matter of appraisal, both conscious and unconscious. Thus, we were presupposing from the outset that there is, as van Elk

& Zwaan conclude, “no unitary predictive coding account of RE, but different aspects of experience call for specific neurocognitive explanations.” Similarly, we are not seeking – with respect to Proudfoot’s concern – “to reinstate the distinction ... between *a core experience* and its varying interpretations in different cultural traditions” (emphasis added). We would hold, however, that there are a range of internal sensations (e.g., a sense of the self leaving the body, a sense of the self dissolving, hearing voices, or vivid mental images) that may give rise to religious (or psychopathological) appraisals depending on context and previous learning.

Levels and Mechanisms: Lindahl indicates that viewing experiences as events has the potential to facilitate the project of “vertical integration” from humanistic and social scientific to neuroscientific approaches (Slingerland, 2008), but worries that “reverse engineering a CCC [complex cultural concept] such as ‘mysticism’ into BCs [basic concepts] such as ‘event’ and ‘representation’ could be misconstrued as having insufficiently disambiguated the culturally mediated level from the culturally invariable or pan-human domain.” This is an important concern that is exacerbated by the multiple meanings associated with the term “levels.” In this regard we find Craver’s “Field Guide to Levels” (2007, 163-195) immensely helpful. As Lindahl rightly notes, “events” and “representations” do not as such disambiguate culturally mediated and pan-human “levels.” For explanatory purposes, however, Craver argues that we should focus not on levels of scientific analysis (e.g., biological, psychological, socio-cultural), but on *levels of mechanisms*.

Although a variety of definitions have been proposed for mechanisms, a consensus is emerging among philosophers of science around minimalist definitions, such as this: “A mechanism for a phenomenon consists of entities (or parts) whose activities and interactions are organized in such a way that they produce the phenomenon (Glennon forthcoming, Ch. 2, cited in Craver & Tabery 2015). Relative to this definition, an “event” (that is, “a segment of time *recognized by an observer* to have a beginning and an end”) is the phenomenon of interest. Research on event cognition and more specifically on the components that are integrated into event models allows us to identify “the entities (or parts) whose activities and interactions are organized in such a way that they produce the phenomenon [i.e. the event].” Components not only interact at a given level, but each component can be viewed as a phenomenon of interest made up of components that interact to produce it. The components that interact to produce an event are, as Lindahl suggests, a mix of pan-cultural processes and culture-specific content. Given this interplay, Lindahl argues that the extent to which a basic concept, such as an “event”, is “in fact translatable across cultures should remain an open question subject to empirical research.” We agree, and note that research in progress on the relationship between language and events promises to paint a subtler picture of their interaction within an event cognition framework (see Papafragou 2015).

In sum, we are suggesting that there is value in starting with sources of data accessible to historians and ethnographers (event narratives and the social contexts in which they are generated) and using research on event cognition as a means of

identifying potential components that interact to produce the event narratives. A focus on levels of *mechanisms* rather than levels of *disciplinary analysis* in turn makes it clear that the components interacting to produce an event include pan-cultural processes, such as those that inform social communication, interaction, and learning processes; and culture-specific content (e.g., culture-specific schemas). Focusing on the components that interact to produce events thus allows us to integrate lines of research that are often pursued in disciplinary isolation. This admittedly ambitious goal leads directly into the concerns raised regarding the use of first-person event narratives.

II. Concerns related to the use of first-person narratives

Lang & Kundt, Lindahl, and van Elk & Zwaan all raise important issues regarding the use of first-person narratives. We recognize and share most of their concerns and will offer an actual application and test of the method that illustrates both the value and limits of the approach. But first, to highlight the particularity of this example, we want to stress that we are assuming (1) we can use the method to study a variety of types of experiences, (2) different types of experiences will have different causal mechanisms, and (3) the nature and extent of the sources will vary in relation to particular experiences and that this will in turn give rise to models with vastly different confidence levels. We also recognize, as Lang & Kundt point out, that the historian's access to "original cues" based on subsequent narratives is "constrained by a narrator's focus of attention." We agree that models cannot be comprehensive in this regard. With respect to the analysis of historical narratives, however, we think that it is an advance on existing practice simply to identify the cues that were the narrator's focus of attention. The identification of specific cues, e.g., visual hallucinations or a sense of the self leaving the body, in so far as they can be ascertained with a reasonable level of confidence, allows us to bring specific neurocognitive models to bear on the sensations described, in keeping with the suggestion offered by van Elk & Zwaan. Furthermore, distinguishing between cues and appraisals may allow us to identify sub-events defined by changes in cues within an event narrative and, thus, in some cases demonstrate more structure than van Elk & Zwaan are envisioning within experiences. Again, subject to determinations of confidence, we may then want to invoke specific neurocognitive models in relation to each of these unfolding sub-events.

Similarly, we agree with Lang & Kundt that ideally "we should be able to quantify the strength of an individual's predictive models (priors) and their influence on particular experiences." We recognize that "such data are difficult to acquire from a first-person narrative," but historians, as Lindahl points out, often have other "data that would facilitate a rich description of the cultural context surrounding an original event." Still, as he indicates, "mapping the precise influence of cultural inputs on the schemas recruited during real-time event modeling remains a daunting task." We agree and, as historians, we are aiming for greater precision, coupled with estimates of confidence, rather than quantitative perfection.

The example that we want to discuss – accounts of Joseph Smith’s alleged first vision -- presents many of these difficulties. We have multiple accounts of the event – at least four from Smith himself and several from contemporaries who heard Smith relate the event. All, however, were narrated more than a decade after the alleged event took place. Still, for historians and Latter-day Saints (LDS), these are important accounts, since Joseph Smith’s 1839 version has been canonized by the LDS Church and, as described in that version, is understood to depict Smith’s calling as a prophet. In order to test the method outlined here, one of the authors (Taves) approached an LDS historian who had published on the first vision with the idea of applying the methods to the narratives and then discussing what the methods revealed. In this case, the methods involved creating a chart that analyzed the first three of Smith’s narratives and the two earliest accounts of listeners, teasing apart descriptions of sub-events based on (1) what happened (whether intended or unintended) and (2) explanations of why it happened (implicit reasons or causes) that seemed integral to the narrative based on textual analysis (rather than interpolated commentary or reflection on the narrative). The first was intended to see if we could identify cues and the second appraisals. The accounts were then interleaved in the chart so that versions of each sub-event, including any embedded appraisals, could be compared between the various versions. The whole exercise was premised on the assumption that we have a new event each time an experience is recounted and that each recounting has a new event context and a new reason for recounting the event. The event could be an oral recounting or a textual recounting. In either case, the account of the event is embedded in a larger frame. We then discussed to what extent the chart allowed us to reconstruct an originary event based on a comparison of the accounts and historical evidence of the situation that prompted the recall and recounting of the original event.

In the end, we did not arrive at an agreed-upon reconstruction of a hypothetical original event and this is, thus, clearly an instance where any one reconstruction must be advanced tentatively. Nonetheless, we both felt that the method offered a significant advance over previous approaches. Here are four points from our reflections on the method (Taves & Harper 2015, 75-76, quoted with minor modifications):

- 1) Constructing the chart: The chart was easy to construct. We had no trouble distinguishing the sub-events and teasing apart cues and any embedded appraisals. While historians should test this further with more elaborate validation methods, we did not find this aspect of the analysis particularly challenging or controversial.
- 2) Discussing the chart: We discovered how important it was to surface each other’s assumptions, in our case assumptions about memory and our ability to reconstruct the way a subject most likely viewed or would have recounted an event close to the time it occurred. Until we did this, we had difficulty following each other’s arguments. Once we did, however, we were able to narrow and nuance those differences significantly by attending to the framing of narratives and specifically to the contextual factors that we thought might have cued, and thus shaped, what was recalled when the event was recounted.

- 3) Comparing accounts: Once we had our assumptions on the table, having the chart as a point of reference allowed us to identify similarities and differences between the accounts. Although our initial reading of similarities and differences differed at times, we didn't have much difficulty reaching an agreement based on the evidence in the chart. Referring to the chart allowed us to separate our *analysis* of similarities and differences between the accounts from our *explanations* of the similarities and differences.
- 4) Explaining similarities and differences: A relatively clear distinction between the evidence in the chart and our interpretations of the evidence allowed us to focus on articulating the reasons for our explanations. This was an exciting part of the back-and-forth between us.

Van Elk & Zwaan's comments on the reader's role in constructing situation models provide further insight into our test. Both of us (Taves & Harper) approached the historical texts as *readers* who formed *situation models* with respect to the events in question. Although we did not think of what we were doing in these terms, the discipline offered by the chart allowed us to surface and question some of the assumptions that governed our *situation models*.

III. Concerns related to extending EST to internally experienced states

The commentaries by Andersen and by Nielbo, Andersen & Schjoedt both raise an important methodological question that surfaces when we turn from historical to experimental applications of event cognition. While Nielbo et al. agree that humans draw on event segmentation when narrating and interpreting events, they question the capacity of this framework to say anything useful about the processing of subjective, internal events. They remind us that "EST is essentially an object perception and recognition theory that targets dynamic objects," and warn that "it is not a trivial matter to map an object perception theory onto internally experienced states that *lack external objective features*" (our emphasis).

While we certainly recognize the problem, we think that it is better expressed as a challenge to specify the "external objective features" of internally experienced states. These will *not* be the physical features of "external objects," to which internal representations "correspond," but rather a set of measurable physiological properties that are involved in the construction of the event model and thus can act as proxies for internally generated input into the event model. The key to understanding internally experienced states in terms of EST lies in the predictive coding framework in which EST is firmly embedded. Building on recent research into predictive coding in dreaming (e.g. Hobson & Friston 2012, 2014), we assume that models of internally experienced events (such as dreams) are generated through the same computational principles as models of external events – that is, through the interplay of feed-forward prediction signals, activity in the sensory system, and prediction error feedback. The methodological challenge is to triangulate physiological data and phenomenological self-report. Thus, Andersen strikes the right chord when he writes, "we desperately need measures that take us beyond mere self-report. More precisely, we need to identify reliable and

measurable proxies of individual prediction errors that can be used to analyze real-time experience and event boundaries in experimental settings.”

How can we do that? While it would certainly be premature to suggest definite answers, we wish to highlight some lines of research that give reason for being more optimistic than Nielbo et al. For example, mismatch negativity (MMN) has been suggested as a direct proxy for error signaling, and is easily measured by EEG (see Garrido et al. 2009). This measure will, however, not be available for certain internally experienced events, such as dreams, where top-down predictions (e.g., oculomotor and visual) are sequestered from sensory as well as motor constraints (i.e., there is no proprioceptive prediction error). However, we appear to have a physiological proxy for the feed-forward signaling in REM sleep through pontogeniculo-occipital (PGO) waves (Hobson & Friston 2012) – which, like MMN, are recorded by EEG. PGO activity would thus be a way to track the dreaming brain’s active and unrestrained inferences (that is, internally generated imagery). Presumably, eye-tracking measures can also be developed for this purpose, as oculomotor activity is a direct proxy of active inference in visual perception – whether internal or external. REM sleep appears to involve dishabituation of the startle response (Hobson & Friston 2012: 86), making startle response measures, such as those used to study infants, another viable physiological proxy for phenomenological changes in dreams. In addition, we should not underestimate the potential of emerging methods that combine brain-imaging techniques with machine learning and self-report data in order to model and predict the phenomenological content of the dreaming brain. Researchers at the Advanced Telecommunications Research Institute in Kyoto (Horikawa, Tamaki, Miyawaki & Kamitani 2013) recently published a promising pilot study, which heralds the eradication of the public vs. private experience distinction. The implications of such methods would clearly go well beyond the study of dreaming.

While the modeling and measurement of subjective experiences, such as visual perception in dreams or hallucinations under the influence of psychoactive agents and sensory deprivation, remains no mean task, there are (and will be) physiological proxies that experimentalists can use to take us forward. This brings us back to the point made by both Lang & Kundt and van Elk & Zwaan regarding the need for “more specific predictive neurocognitive models.” Since the study of experiences/events that are sometimes deemed religious leads us to examine a broad range of events (internal/external, spontaneous/intended, visual, auditory, somatosensory, affective, etc.), the active inferences postulated by the predictive coding framework will be implemented by a range of different mechanisms. The call for closer attention to these specific neurocognitive mechanisms is, in our view, intimately connected to the question of identifying proxies, since these will naturally vary with the relevant mechanisms involved – which, again, vary with the specific events we are studying. Thus, for dreaming we may focus on PGO waves emanating from the pons, while MMN may be crucial for studying techniques for the induction of out-of-body experiences.

IV. Cross-Event Integration

Bulkeley's question regarding dream incubation, that is, practices intended to shape the practitioner's dreams, raises important issues regarding the effect of practices that extend beyond the "dream experiences" themselves. Thus, he notes, "The causal loops between mind, body, and culture become especially complex in these situations, and perhaps event cognition can shed light on some of their features." Dream incubation is an interesting case, because it highlights the interplay between events that we normally consider spontaneous, internal, and unintended (dreams) and practices that are characterized by goal-directed actions and strong prior beliefs (rituals and prayers designed to receive revelations in dreams). In the framework that we have sketched, it is crucial to note that the phenomenon of interest in this instance is the whole practice of dream incubation. The dream itself is but a sub-event in a dream incubation event. Thus, while the dream itself may lack intentionality, its appraisal will be heavily dependent on the intentional action sequence in which it is embedded and the prior beliefs it activates, e.g., in relation to internalized event schemata, knowledge of special locations, invocation of gods, and meditation on objects and images. In other words, to have a satisfactory explanation of the practice of dream incubation, we must include the microsociological processes that *frame* individual events as a component, along with the psychological and neurocognitive processes.

Conclusion

In conclusion, we would like to return to the distinction that van Elk & Zwaan make between experiences and actions and their statement that experiences, unlike actions, are not necessarily governed by hierarchically organized event models. Here we think it is important to recognize that narrating and recounting are actions, and that narrators may recount an individual event or a series of linked events. Thus, although most experiences pass unremarked, those that are recorded or recounted are, by virtue of that fact, embedded in a recording or recounting event that hierarchically frames the initial event. People may link recounted events with other remembered events to create a larger narrative (e.g., a story, an autobiography, or an origin account). The upshot of our attributional approach is that much rests on how an event is framed and why an event is recounted. This highlights the importance of cross-events integration. As Radvansky suggests in his comment, "[t]he value and importance of [an] ... experience can be quantitatively indexed in terms of how it is viewed as being causally connected to other events in a person's life." Integration across events is key, and whether and how events are incorporated into larger narratives will be a major variable in appraisal processes.

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