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CHAPTER

Attention, Memory, and the Imagination: A Cognitive Analysis of Tantric Visualization

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Abstract

Tantric visualization practices based on specific images and sounds, as well as the philosophies behind these practices, provide a window for exploring the scope of attention, memory, and imagination in their intentional and extended forms. If ongoing research in the field of cognitive science can help us understand and contextualize these otherwise esoteric practices, then these exercises can also provide empirical evidence for extending the scope of research in these areas of cognitive research. Just as neural analysis can tell us more about a real physiological impact of extended visualization practices, the practitioners can give us their internal phenomenological account of specific experiences corresponding to those physiological states. Rather than simply understanding the neural correlates of everyday experiences, the benefit of focusing on the effects of sustained meditative practices expands the horizon of human consciousness by excavating the limits of the human mind in even its extended state.

Keywords: visualization, memory, imagination, attention, maṇḍala, neurophenomenology, Abhinavagupta

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In this chapter,[1] I explore three key tantric categories: *mantra* or specific phonetic structures with explicit or implied meaning, maṇḍala or the geometric forms, and *mūrti* or the deity image, in light of the cognitive categories of attention, memory, and imagination. We explore how an understanding of these devices, essential to *tantric* practices, can borrow insights from and enrich ongoing research. This could lead to an interdisciplinary dialogue between tantric philosophy and cognitive science. There are limitations to this type of dialogue, as cognitive science privileges empirical research, whereas the tantras are broadly theoretical and focus on practice. However, any open-minded researcher might see the benefits of advancing such dialogue, as there are compelling theoretical overlaps and the possibility of providing substantial material for empirical inquiry. And I am not the first to make this argument.

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Neurophenomenological research has revealed the significance of subjective experience in the area of cognitive research that needs to be combined with neurological research. Since the structure of human consciousness is semantically established, research in cognitive linguistics is likewise central to understanding the categories outlined above and in the theories of metaphor and cognitive blending, championed by Gilles Fauconnier and Mark Turner (2002), Mark Turner (2014), and their application in tantric studies as explored by Glen Hayes (2012, 2014, 2016, and this volume) or Timalsina (2016)—all of which offer sufficient insights to pursue the argument further. My objective here is to provide some examples in light of the latest research in these areas so that we can explore these thoughts further.

Not only are cognitive issues suffused with subjective perspectives, but also tantras are inherently private. Tantric practices are traditionally kept within the purview of a select few, and published texts and manuals resonate only in light of the preceptor's teachings and guidance. Quite apart from private experiences, we can engage what we can glean from textual sources in pursuing this conversation. Likewise, the public aspects of tantric practices provide examples that can be observed in public maṇḍala and temple rituals, or in tantric dances, such as the Aṣṭamātṛkā or Bhairava dances or in the Buddhist Caryā dances. The cultural insights we can derive from these private and public tantric domains provide the bedrock for a deeper understanding of how cultures can determine the human limits of consciousness. A common thread linking all tantric discourse is its application of metaphor in mapping reality and infusing early meanings while deriving new insights. Equally noteworthy is the application of cognitive blending, integrating different schema into the new emergent structure. Glen Hayes has extensively addressed these aspects in this volume, so I do not linger addressing the same issues. For our purpose, all that needs to be said is that these cognitive processes are integral to tantric discourse, and for us to have any meaningful conversation on tantric literature and practices, we need to read these cultural artifacts beyond what is given to the eyes. The main objective of this chapter is therefore to explore to what extent tantric literature can contribute to understanding the domains of consciousness. We can evaluate tantric practices on the basis of their applicability to understanding both the faculties of attention, memory, and imagination and exploring the possibility of cultivating these faculties to enhance the overall quality of human life. If we can learn from cognitive science how these faculties function or how they are interrelated, we can similarly deepen our knowledge of how they can be enhanced. Likewise, contemplative practices in tantras have sought to explore human cognitive faculties and thus can be considered cognitive therapeutic devices, as they are primarily concerned not with what these faculties are, but rather with how we can better enhance these faculties to maximize our full potential. Unlike behavioral psychologists, *tantrics* envision human capacities as boundless. One general tantric dictum is that individuals are bound because they are unable to unravel limitless cognitive and psychological potentials. When we seek dialogue between tantra and cognitive science, we confront the fact that central to *tantric* practices, *mantras* or maṇḍalas are used to focus and deepen attention, and these can be explained as devices for retaining certain forms in the mind (*dhāraṇā*) and concentration (*dhyāna*) practices. If maṇḍalas are spatially extended, *mantras* are temporal, as one can only explore duration and succession while focusing on the cluster of phonemes that constitute *mantras.* Tantras do not use these devices merely to extend the capacity of attention; they are also used for advancing the capacity of imagination. Tantras acknowledge the faculty of imagination (*kalpanā*) as the domain of consciousness that needs to be explored and trained in order to develop complex tantric visualization practices. And in all accounts of attention, memory, and imagination, visual images and speech forms are central: We can think, attend, remember, or imagine something even in isolation of one or the other in either image and speech, but we cannot perform any of these cognitive acts in the absence of both. If the visual devices that tantras use in the form of maṇḍalas or deity images can help us understand the role that imagery plays in human cognition, mantras or speech forms with selected phonemes having explicit or implicit meaning provide the basis for cognitive linguistics and the ways that speech acts in the above modes of cognition. Both mantras and maṇḍalas function as mnemonic devices used to organize complex items such as temporal or spatial imagery in memory formation. In all these cognitive domains, there is conscious or subconscious editing of the inputs, and the study of tantric practices illuminates how such

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devices were used to extend the limits of human attention, memory, or imagination. In every successive stage of compressing information, we also find the role metonymy or metaphor plays, and in every stage of compression, cognitive blending also plays its role. As I mentioned above, the works of Fauconnier and Turner detail the cognitive mechanisms involved in the processes of cognitive blending as well as in metaphoric thinking. Glen Hayes has studied tantric literature in light of these theories, including in this volume. Noteworthy with tantric practices is that they do not leave all the processes to the subconscious, as the manuals meticulously structure the content and progressively provide complex information that has been compressed in every new step of the practice. This is particularly vivid in the *krama* or successive initiatory rites that begin from simple deity forms and basic seed mantras and evolve into complex practices. The process of cognitive blending is vivid every step of the way, be that in ritual application of mantras or in the visualization of images or maṇḍalas. Each of these categories can occupy volumes that can be addressed extensively. This essay can only provide some preliminary insights in this programmatic chapter to encourage future research in this deserving area. Addressing three key cognitive categories of attention, memory, and imagination, analysis is in essence exploring the ways tantric practices integrate some of the processes that have recently been discovered in the field of cognitive science, and the objective is to encourage a meaningful dialogue.

Attention

The definition of attention that William James (1890, 404) gave is timeless:

> It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others.

This definition appears foundational to many of the contemporary conversations on attention. Noteworthy in the definition is the selective role of attention, as to attend to something is to not only sustain the stream of consciousness focused on a singular object, but also suspend the rest of its intentional modes. Noteworthy contemporary works in this area are those of Carrasco (2014), Theeuwes (2014), Deubel (2014), and Yu 2014. There is a limit to what everyday consciousness can process simultaneously, and the mind has devised preattentively to select and edit the content so that there is no cognitive overload (Treisman and Gelade 1980). However, attention is not a single act temporally circumscribed in an instant; it demands duration, and sustained attention facilitates making the experience more vivid. Triesman (1996) argued that serial attention is needed to integrate or "bind" features to object representation. This binding occurs when we cognize different properties and link these to a single entity. An entity established from all its horizons focuses attention and makes the object concrete. The concept of conceptual blending is the same as what Triesman argued for with binding. Extending the argument of binding further, Wolfe (2014) argued that if the observers are guided to search for specific features, this enhances attention and makes the binding process easier. The most general feature of guidance appears to be the contrast between the target of attention and its distractors. Likewise, more than a single feature can facilitate the guiding process.

Anybody with basic knowledge of tantric practices can read the above paragraph and say, yes, that is exactly what I do when I recite a mantra or visualize a maṇḍala. A collective term for visualization practices is "retention" (*dhāraṇā*). A practitioner is supposed to retain a specific object as either speech structure or visual form and pay sustained attention, making duration of the same object a primary cognitive act. The only difference is, in the cognitive analysis, the studies are making observations on the mechanisms behind attention, whereas in tantric practice, there is meticulous effort to create the field of visualization or to determine the extent of temporal object of visualization. Reciting a mantra is about not only repeating the

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same sentence again and again, but also more about suspending mental fluctuation to any other temporal object or thoughts in the form of logogens.

The same applies to maṇḍala practice or visualizing a deity form, as these require suspending the rise of any alternate imagery. But more than mentally retaining the object, the practice trains aspirants to suspend inner chatter and cancel the rise of other visual forms. Since an actual practice integrates both the image and mantra, tantric practice does not leave space for the mechanisms behind a thought process or image formation, as they seek to integrate both domains of cognitive activity. The yogic vocabulary of "suspension" or *nirodha* (e.g., *Yogasūtra* I.2) epitomizes this very process. While some forms of yoga focus on a total suspension of the stream of thought, tantric visualization practice is about suspending the rest of the chatter at the cost of the one that is being cultivated. It is evident that maṇḍalas are devices for focalization, for the spatially extended object has concentric circles or squares, progressively leading to the central focal point (Timalsina 2015b, 13–27).

Mantras demonstrate the same devices for focusing attention, but due to their temporal nature, their concentric structure is not apparent. Even when mantras have explicit reference (*bhāvārtha*), reciting mantras is not solely about making the referent present. Primary to the practice is focus on a particular rhythm, particular cluster of phonemes, or particular sentences, facilitating the subject's ability to cancel other mental chatter. Even when we focus on a single visual field, inner verbalization can continue, and mantras aim to suspend this inner or private mental conversation. The repetitive and rhythmic character of recitation makes it easy for the mind to sustain its flow, at the cost of the transient thoughts or emotional ruptures. Tantric practice of mantra recitation progresses from simple to complex structures: from the monosyllabic "heart" or "seed" mantras to successively longer mantras with hundreds or even a thousand phonemes, with combined syllabled *bīja* mantras or *kūṭa* mantras with multiple syllables.[2] More importantly, visualization practice progresses using mantras like mnemonic devices, assigning manifold meaning to be visualized mentally while counting specific syllables within mantras (Timalsina 2005). Likewise, maṇḍala practice starts from simple geometric designs, such as a triangle or square, and progresses to integrate complex geometric forms. In advanced visualization practices, the geometric structures incorporate multiple deity forms, with each deity having its own simple-to-complex structure, starting from a simple human representation to a deity with multiple arms and heads (Timalsina 2015b, 79–101).

These mechanisms are not unique to Hindu tantras alone, as the Buddhist Vajrayāna deity images and maṇḍala visualizations follow the same structure. These practices aim to achieve twofold objectives: to compress maximum content within a single cognitive field and to train sustained processing of the content with gradually increasing complexity. Most common to these practices is the consistency of one element at the cost of other devices. So if the mantra is moving, the same deity image is the constant on which the mind focuses, and if the deity forms are changing in the field of gradually progressing maṇḍala, the mantra functions as the constant due to its rhythmically repetitive character. Tantric visualization also demonstrates the role that cognitive "binding" plays, for when specific features of deities are projected in the field of perception, the narrative guidance continues with determined color prescriptions along with hand and face gestures. When different gestures are displayed while performing rituals or practicing visualizations, the meditation or ritual act becomes embodied, and some perfectly choreographed display of gestures gives the appearance of dance, as epitomized in the Vajrayāna forms of the Caryā dance.

Expanding on previous research, Lavie and Dalton (2014) demonstrated that perceptual processing becomes selective when the limits of perceptual capacity are reached, spontaneously filtering out task-irrelevant information. This filtering process also relates to "attentional biases" related to the editing of unattained objects, voluntarily or reflexively (Nobre and Mesulam 2014). Filtering of information can go both ways: One can voluntarily bracket task-irrelevant information, or the subconscious cognitive processes determine what is less relevant and leaves them out. Basically, this is to say that there are two covert and overt modes

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of attention, where we sometimes unintentionally filter information in order to make it manageable, and at other times we exercise our capacity to actively filter what endures and what is removed. Expanding on James's hypothesis, Carrasco (2014) analyzed two types of sustained and transient covert attention. Sometimes, we turn our gaze, or move our head to listen something clearly, a case of overt attention. But our cognitive life is filled with covert attention where the objects are passively presented to consciousness, leaving minimal traces for further recall. Some examples in everyday life become background noise heard when watching a show or bustling vehicles rushing every which way when we are driving. Covert attention is found to improve performance in various visual tasks. Since the filtering process could not occur prior to determining the field of visual perception, it becomes clear that within the single field of visual perception, some pieces of information are processed as "to be edited" or are less attained in contrast to others. This can be explained by use of the metaphor of spotlight, where certain parts are attained in contrast to others (Posner 1980) or where some objects are given as background for the focal object at the spotlight. The process of attentive selection is analyzed in two parts of pre-attentive and attentive stages, where the first relates to the immediate contact with the visual field, whereas the second relates to the attentive visual perception where the focal object within the field has been determined (Theeuwes 2014). In visual perception, this attentive field can shift, based on the selective mechanisms, as the subject moves his gaze from one center to the next. Selective attention is thus credited for gatekeeping what stimuli are allowed to transit from parallel to serial processing (Eimer 2014).

Every aspect of tantric visualization is selective, as the process imposes on the mind a predetermined visual field or temporal object such as mantric speech or focusing the attentive gaze on a selected object. Peculiar to visualization is its active attentive bias; that is, the subject is consciously focusing on something and bracketing something else from within the radius of attention. In a maṇḍala, the deities in the inner layers subsume aspects of the deities in external layers, progressively making the inner layers a focal object, ultimately leading to the central deity. Deities in different corners are given different colors, so it makes it easy to shift attention from one image to the next. The focal point in the temporal sequence is a bit different: The seed syllable, generally identified as the heart mantra (*hṛdaya*), is placed in the mantric sentence in such a way that it remains as if the only constant in the flux of mantric expression. For instance, *aiṃ* is considered the seed syllable for Sarasvatī, and in many of her mantras, all the other syllables are considered expendable, but not this one. *Śrīṃ*, for example, is considered the seed syllable for Lakṣmī, and while other syllables are expendable in new mantras, this syllable remains constant. And the list goes on. In many mantras, the deity name remains the focal point, eliciting a visual experience when reciting the mantra. The organization of spatiotemporal objects is one of the key elements of tantric visualization practices (Timalsina 2011). The key here in practice is about what remains constant versus what is in the flux: If the primary gaze is on visual imagery, the subject shifts his focal point from one center to the next in the maṇḍala while running the mantra in an auto-mode, but if the mantra is the focal point, the imagery remains as if in the background as the constant. In external rituals, subjects move their gaze, and voluntary filtering of the cognitive field becomes possible, determining what is filtered in the case of cognitive overload. But the idea is that repeated conscious filtering guides the subconscious to filter the imagery as anticipated. This is therefore about working within the cognitive sphere of the subconscious. This is where the reflexive system takes over conscious filtering, but in the case of visualization, what is emphasized is the reflexive mode, the body and its response to the stimuli itself, with the sought-after effect being the imagery enduring even when the active mental function is suspended. The metaphor of the spotlight is also essential in analyzing tantric visualization. Dual processing of cognitive information is vivid in Vidyāraṇya's depiction, where he compares the cognitive field to a wall seen in daylight, with the intentional object highlighted with a mirror spotlight (*Pañcadaśī* 2021; Kūṭasthadīpa Chapter, verse 1). In Vidyāraṇya's phenomenology, this is the body that is being twice projected. However, we can utilize the same metaphor for analyzing the way the tantric visualization functions by making one focal point, moving the mental gaze from one point to the next, either in the peripheral circles or from the periphery to the center. The peculiarity of tantric visualization is that there is no corporeal shift in voluntary gaze as the entire

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perception is mental. This makes a compelling case for its suitability for neurological research. In tantric visualization, the active gaze does not need to project an entity outside, as it can focus entirely on the aspirant's body, making *cakras* from the base to the crown a mental journey (Timalsina 2012). This is where mental perception becomes primary to external perception.

Tantric practices, however, are more complex and intriguing than simple cognitive experiments. In a single visualization, a practitioner tracks through different *cakras* while continually reciting a mantra. He or she may also focus on different deity images in a progressive fashion in the meditative trip from the bodily base to the crown *cakra*. As each step is made more complicated as the practice progresses, we need sophisticated experiments to contextualize such practices. Experiments revealed that the distribution of attentional cues throughout different sensory modalities is responsible in dividing attention (Spence 2014). In order to replicate real experience, tantric visualizations synchronize inputs from different sensory modalities, so the subject is not only "hearing" his own verbalization, but also visualizing the structure as directly bound with the auditory input.

Also, we cannot address tantric visualization by merely analyzing object-based attention. The deity visualization, for example, is feature based: A single maṇḍala can be populated with hundreds of deities, and they each are differentiated based on their features, such as color variations and differences in hand gestures, weapons, attire, and facial expression. Unlike attention on an external field, tantric visualization demands that these complex visual examples are mentally processed, making the act all the more challenging. There are some cues from the cognitive research in this regard. Scolari, Ester, and Serences (2014) addressed the issue of feature and object-based attentional modulation. Interestingly, tantric visualization incorporates both modulations and makes a strong case for cognitive experiments. Finally, while the objects of tantric visualization appear static, the fact of the matter is that a constant dynamism characterizes the way objects are visualized: Mantras are temporally moving objects, and visualization on *yantras* within bodily *cakra* locations requires movement from either the periphery to the center or bottom to the top during the process. Even though these movements are purely subjective, what matters to the experiments on attention is that there is a constant change to either the visualized field or the visualized object. When the field is changing, the same mantra can be visualized in different corporeal centers, and when the object is changing, the deity images are changing in the same visual field of a maṇḍala. Due to their temporal character, mantra meditation (Timalsina 2005) makes a case for dynamic attention, as can be found in the studies of Cavanagh, Battelli, and Holcombe (2014).

Memory

Central to tantric philosophy is the concept of "recognition" (*pratyabhijñā*), an infused cognition of memory and direct apprehension, and it is about regaining lost self-identity. There are several tantric premises on memory that contemporary cognitive science cannot engage, for instance:

(i) survival of memory beyond the span of lifetime; or

(ii) realized state of recall leading to pre-individuated state, a collective universal consciousness.

But these should not discourage us from exploring a common ground or space for a dialogue, for memory is what defines who we are: both individually and collectively. And if cognitive science can help us understand the mechanisms of memory, tantric practices can have therapeutic applications. Tantras utilize the faculty of memory for two different purposes: to not only enhance retaining capacity for long-term memory so complex visualizations become possible and memorized texts can be recalled, but also cultivate a desired structure of episodic memory, eventually in order to transcend our bodily identity and to shift self-consciousness from its fragmented individuated state to nondifferentiated singularity of being and

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consciousness. We need to keep some memories vivid, while we also need to edit some unnecessary experiences from the stockpile of memory. While our retention is based on task priorities (Soto and Humphreys 2014), long-term memory and cultivation of episodic memory require retaining some of the experiences that may not have any objective performance. Classical exercises on memory broadly viewed the mind as an archive, keeping alive in memory not only past events but also even the textual details. Tantric practice goes beyond Vedic modes of memorizing the texts, as in practices such as *puraścaraṇa*, when the same mantra is repeated hundreds of thousands of times.[3] Subjects performing such practices report a background presence of the mantra when awaking or when passively gazing back to one's mind in absence of any cognitive direction. This relates to intentionally planting memories, and meditation manuals give brief visualization practices wherein the aspirant recites the following text every morning:

> I remember you, the highest divinity, in the morning with the glow of the rays
>
> of the autumn moon, adorned with beads, [with] earrings shaped as
>
> crocodile and decorated with gems, having one thousand arms [shining] blue,
>
> distinguished with divine weapons.
>
> (Timalsina 2015a, 34)[4]

Bringing something to mind, to give attention to something, to visualize, or to imagine, all cognitive aspects fall under this remembering (*smaraṇa*).[5] This begs the question whether or not this active insertion of memory results in subjects actually organizing experiences in the fold of memory also thus replaces some undesired memories. Conversely, are there actual therapeutic applications to these transplanted memories? This makes a potential field for cognitive research, as the issue is not any more what memory is or its veracity, but about *engineering* memories. Since the publication of Freud's *Beyond the Pleasure Principle* in 1920, trauma has remained one of the key issues of psychological research. Any traumatic experience repeatedly returns the subject to the original event's situation. What if this pattern can be altered by planted memories? Ethnographic research suggested this is the case, and this makes a compelling case for neurological research. While we have a plethora of fictions in our generation that center planted memory (films such as *Inception* or the TV series *Doll House*, e.g.), we have yet to develop a scientific system of replacing memories. Setting aside its frightening aspects, altering traumatic memories with some pleasant memories has the potential of enhancing the quality of our life, and it is worth exploring how tantras have explored this possibility.

Anyone familiar with sequential Krama Śākta practices[6] knows that tantric practices are not about holding on to one image on face value: These practices demand a systemic progression in retention from simple to complex imagery. The practice, then, is more about retention and not about reserving the content to only a specific object; it is not about *what* to retain, but more about *how* to retain. This implies that visualization practices cultivate new skills of remembering that also allow the subjects to filter, replace, and consciously bind different memories as desired. If we read the practice of retention in light of attention practices and engage cognitive studies of attention and memory, we learn further that closer attention gives intensity to experiences, that experiences have their depth, and intense experiences are woven into deeper fabric of our being, shaping our episodic memory and bodily response. From the tantric perspective, attention is similarly an acquired skill, and one can expand its capacity through a sustained visualization practice, as is the capacity or content of remembering.

This is not just about retaining information that requires attention, as it is evident that even the act of recall is actively infused with the act of focus on something while at the cost of filtering some other events or objects. This is what makes it possible to remember specific events or objects from the past (Kuhl and Chun 2014). Basically, even remembering is infused with the act of attention, and what we attend to during the

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mode of recall is brought to the fore with vivacity and force, while unattended content is suppressed, even when temporally or spatially interlinked. In essence, the act of remembering is also the act of generating a new incarnation, making something new, modifying not only past events but also the subject's relation with the situation. This is about freedom from "memory, I hate you,"[7] and about "I make my own memories." Tantric visualizations are dedicated practices to enhance positive experience and repress and reject negative memories. These visualization practices are meant to constitute new pathways for brain activities. In order to understand the complex mechanism that is in play during or after the course of meditation, we need a collaboration with cognitive and neuroscientists to determine the scope of such practices. By all accounts, tantric *sādhanā* or practice rests on our ability to create new structures, and it is worth saying in this context that the memories cultivated through these practices are overall pleasant. In a voluntary formation and organization of memory, visualized objects such as a maṇḍala or a mantra function as mnemonic devices, assisting the subjects in remembering specific situations or events or conceptual objects. The core of these visualizations is to infuse attention and memory, as the practice is not about the content but about the capacity to attend or recall. This will be clear with a simple example of the course of mantra repetition. First, the subject memorizes the mantric sentence. He then uses beads to repeat the same mantra, for hundreds to several thousand times each day. And then he uses the fifty Sanskrit phonemes as the beads, mentally inserting a new syllable with each repetition. And when this practice comes to maturity, the aspirant learns to insert three syllables that in themselves are progressively revolving, such as "*a-kā-ī*," "*a-khā-ī*," and the like. And at this stage, subjects also learn to insert different deity names with each revolving set of phonemes. If the repetition of mantra is automated, the attentive gaze on phonemes as they progress makes practice complex and demands a total fusion of the faculty of memory with that of attention. These practices also push the boundary of what can be retained within the capacity of short-term memory.

The underlying strategy of visualization practices is thus to actively educate our mind-body in all tasks of memory: It trains subjects what and how to "encode" the desired information from among its chaotic flow; it seeks to maximize the potential of retaining essential information for long-term availability, ultimately archiving essential information. But more than these, memory allows us to retain our self-identity and relate us to our world of things and other subjects, helps us regulate emotion, and motivates us for future action (Alea and Bluck 2003). When reflecting on the above roles given to memory, what remains "essential" is not what the mind reflexively selects but what the subject educates the mind to determine as essential. Finally, it provides subjects with a bigger role in determining where to focus in a recall and how to organize the recalled pieces of information within the purview of a given teleology. And this active encoding, organization, and retrieval rests on a reconstitution of space and time. Tantric visualization in a sense is therefore a process of creating a mental space and constituting mental objects within the limits of mental time. These reorganizations of time and space broadly follow the principle that time is structured vertically, with the bottom layers in the imagery representing shorter cycles and the higher layers, longer. And the organization of space follows the principle that the center in a maṇḍala is where the subject is seated and its external horizons are the external limits of conceived space (Timalsina 2015a, 73–112). Just like Deleuze (1989, 81) came up with "crystal image" for imagining time, the maṇḍala becomes a visual image in order to conceptualize time in tantras, and in the similar vein of Bergsonian time,[8] tantrics constitute the past not after it once was present but at the same time. Every point in a maṇḍala depicts both the past and present instants, as if the same instant was splitting into two. Borrowing one more category from Deleuze, we can also explain that tantric visualization of time and space is a journey through the virtual that is nonetheless real; as for tantric practitioners, the reality of an entity is determined primarily on not only its efficacy, but also the basis of it being given to consciousness as real. This helps organize the mythical events that are woven in the loop of time that fail to be chronologically organized. Things remembered as relating to the past, a chronological structuring of past events, and the events that we recalled as specifically linked with specific locales do not therefore rest on actual time, and this does not mean that their virtual presence makes them somewhat unreal. Time and space constituted in a maṇḍala are the ways that time and space can be imagined and do not need to correspond to what we call actual. On the

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other hand, our corporeality is grounded on the sense of space and time that we regularly call real. This, however, is not the case that our limits to reshaping mental space and reorganizing temporal structure are biologically restricted—at least tantras claim that this is not the case.

Primary cognitive processes in organizing events as temporal are the concepts of succession and simultaneity (Block 1990). We organize events in our memory as either happening one after another or as simultaneous. Tantras engage with memory by reverse engineering these mechanisms: By means of visualization practices, the practitioner exercises the freedom to choose the organization of succession and simultaneity. What seems to be a meticulously observed ritual order becomes arbitrary when we confront higher stages of practices: The succession from center to periphery identified as the order of creation (*sṛṣṭi-krama*) now reverses, and we follow the reverse order, from the periphery to the center, the order of dissolution (*saṃhāra-krama*). And even this new order shifts when the texts prescribe fivefold orders of succession. While retaining the sequence, meaning becomes less and less primary, and subjects can shift these orders so that the ritual of visualization does not become a routine act. In all accounts, there are some entities given as simultaneous, whereas others are successive. But the focus here is on infusing memory and attention, rather than simply recalling things. At this point of the conversation, cognitive research demonstrated that our experience of temporal depth and the sense of duration rests on both attention and memory (Zakay and Block 1997). Deeper experiences endure over time, and when we recall, they shimmer with higher intensity than some less potent experiences. These experiences not only capture temporal extension but also retain the sense of depth. From the tantric perspective, even this cognitive faculty can be trained, enabling subjects to have deeper and more meaningful experiences. Visualization practices demand a meticulous observation of the passing instants, with repetition required at certain intervals or with a shift of phonemes in accordance with the temporal gaps. These repetitions aim to cultivate a broader sense of felt time, the way time is experienced. Time consciousness is often conflated with space consciousness, where space and spatial metaphors[9] become the placeholders for communicating time experience. Here, temporal markers are imagined as a container, and the reality is mapped by eons of this spatialized notion of memory and time. Tantric visualization exploits these aspects, primarily in a bottom-up model of image visualization, considering different strata with each having a different temporal order. Particularly noteworthy in this regard is the Guhyakālī visualization (Timalsina 2015a, 73–112). Her image, as well as her mandalic representation, aspires to integrate different divinities within a single maṇḍala, and so invoking Kālī becomes very complex. Even the most common visualization is overwhelmingly staggering, with the deity having ten heads and fifty-four arms, with layered seats of divinities constituting her shrine. For instance, the deity Kṛṣṇa is always invoked with a discus, whereas Rāma is popularly depicted with his bow. In the visualization of Guhyakālī, she carries both gestures and many more. In order to integrate fifty-four deities into a single deity image of Guhyakālī, all independent meanings are present, displayed and commingled as her powers. Basically, even when these practices retain their originality and independence, tantric texts and practices constantly seek a deeper understanding for such complex images.

While memory processes underlie our chronological sense of the past (Friedman 2001), the organization is not entirely objective, and imagination, yet another cognitive faculty, plays a crucial role in the organizational process. Research on self-knowledge helps us bind both memory and imagination, as they both play roles in shaping self-experience. If cognitive research considers the self as an organizing construct (Leary and Tangney 2014) or the self as a psychosocial processing system (Morf and Mischel 2014), tantras seek to analyze and deconstruct phenomenal self-identity, assuming a transcendental self within which all constructed identities are subsumed. In other words, tantric metaphysics rests on a twofold subjectivity where the embodied subject is cultivated and modified by the transcendent subject.[10] It is not the case that the transcendent self is changeless. Nevertheless, it is seen as if changeless in relation to the everyday ego that is exposed to the worldly affairs and is subject to change and suffering (*saṃsāra*) as a result of its engagement with positive and negative experiences. If the premise of tantras is that this subject can be cultivated and modified and that *tantric* practices are meant to cultivate the anticipated sense of

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subjectivity, this process cannot be evaluated without engaging tantric practitioners, cognitive scientists and neurologists, and tantric philosophers. While behavioral sciences stress the embodied ego, tantric practices underscore the primacy of base consciousness that transcends phenomenal subjectivity and makes the case for active engineering of the phenomenal self that, as a consequence, reorganizes the sense of the other. Since these processes of memory editing and organization rely mainly on the faculty of the imagination, it is contextual to address the ways that imagination plays a role in tantric visualization practices.

Imagination

From the cognitive perspective, imagination is linked mainly with the ability to form and manipulate mental representations in the total or partial absence of corresponding stimuli, visual or otherwise (for discussion, see Ganis and Schendan 2011). Rather than endorsing whether mental images that we play with are pictorial or analogue or whether they have semantic structure, tantric visualization seeks to exploit both the image-like and speech-like properties intrinsic to imagination, activating both domains with the aid of mantra speech and maṇḍala image. Imagining here is not a passive formation of mental images but rather an active process of consciousness expressing one of its most intrinsic properties. Hayes, in this volume, addresses these concepts, analyzing selected examples to explain tantric metaphors. In all accounts, Kosslyn compared mental constructs to visual images, as both are embodied as spatially extended patterns of neural excitation caused either with or without sensory input, first in the case of visual experience, or the lack thereof, and secondarily in the case of imagination (Kosslyn 1981, 1983, 1994). In order to avoid the dichotomy of internal and external, Pylyshyn (1973, 1981, 2003) argued that mental imagery is a form of description. These insights not only help us locate the classical debate on mental imagery in tantric literature, but also these insights from visualization practices further aid in cultivating a theory of mental images and the imagination. For starters, tantras engage the visual domain of language (Timalsina 2015a, 16–20) and break down imagery into speech by establishing correspondence between form versus speech. Similar to the case of attention and memory, tantras are more concerned with "how" rather than what for they aspire to cultivate the faculty of imagination, rather than simply describe what it is.

Imagination makes things whole, and imagining makes life complete. Epistemically, our judgmental consciousness infuses horizons that include memory and fantasy, constituting an object of consciousness. Teleologically, our real life is composed of both actual events and what is fantasized; lived virtually, we can select one possibility among endless counterfactual alternatives.[11] And the self we believe ourselves to be is a narrative we tell to ourselves. We live in two different narratives: one a personal narrative and another that seeks its space in our collective narrative (Reese 2013). Without imagination, we cannot turn events that occur in actual time and space into a coherent narrative. Both the personal and collective narratives integrate memories from the past, and while doing so, they consciously or subconsciously blend the fantastic, when discrete facts are woven to make a meaningful narrative. Even without our conscious effort, imagination fills the lacunae, as in a gestalt, and horizons not immediately given to direct apprehension are infused from memory, or are part of pure imagination, with the potency to constitute the whole. This approach provides a wider space for imagination, even though it is historically viewed with suspicion because of its unreliability. The more that psychological and cognitive studies on imagination emerge, the more we recognize the centrality of imagination in human cognitive life.

One of the most common features of tantric practices is its play with visual images. Any tantric ritual begins with visualization (*dhyāna*), where an image of the deity is presented to the fore of the mind. Different attire and ornaments are closely seen in the course of visualization, as are the hands and weapons, as well as the seat of the deity and the background wherein the deity image is placed, such as Mount Kailash, a cremation ground, or a sacred grove. As the practice intensifies, the image is brought to life, and the ritual

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visualization directed to the image is the same as the host attending to a guest by welcoming, offering food, and bidding farewell. I have argued elsewhere (Timalsina 2020b) that these tantric visualizations have tremendous similarities with everyday imagination, but with some differences. Just like in everyday imagination, the practitioner plays with images in visualization practices; the visualized object is given primarily a visual or auditory sensory presence; the images are also presented as imagined or as real while in the mode of imagination; and the imagination can be guided following a text, ritual instruction, or spontaneous imagination. These visualization practices can be synthetic, borrowing inputs from multiple sources, or they can involve episodic content, engaging the subject's personal life account as part of the object of visualization. These practices stretch the faculty of imagination to its outer limits. The manuals of Abhinavagupta (ca. 950–1016 CE) and Maheśvarānanda (thirteenth century), for example, demonstrate a layered imagination with hierarchical structure, where the very initial act of imagination becomes the platform for another, making the act of imagination primary to actual external rituals (Timalsina 2020b, 784–789).

A valid question arises: Is there any practical application of these ritual fantasies in our everyday life? Recent studies also revealed that imagination can play a crucial role in coping with chronic illness (Clark 2013), for healthy imagination is a requirement to live a normal life. Ironically, new psychological studies have introduced a category, "imagination disorder" (Crespi 2020), for too little or too much imagination. This has been discussed above—that imagination is essential to establishing a narrative, and we now know that narratives can be tools to psychotherapy (Steele 2013). Most importantly, our personal identity rests on imagination, as it is by means of imagination that we find our personal identity, similar to but still distinct from other social agents. If bereft of the faculty of imagination, we would not be able to recognize other subjects as subjects like us, capable of being happy or feeling pain. Most importantly, our sense of personal identity, the sense of temporal continuity, cannot be solely constituted if bereft of imagination. In this regard, imagination is central to the recognitive mode of consciousness that not only creates the narrative self but also gives the sense of the duration of the lived time (Moore and Barresi 2013).

Tantras complement studies of the imagination in two essential ways: One, its epistemology provides a philosophical background for engaging imagination in everyday modes of consciousness, and two, the manuals for visualization practices and the exalted experience of enhanced practitioners provide subjective accounts for the phenomenology of imagination. The theory of recognition (*pratyabhijñā*) provides the groundwork for the ways imagination is infused in both direct apprehension and from memory, making it possible for the integral mode of consciousness in recognition to remain veridical consciousness, even while integrating not only memory but also fantasy in constructing the judgmental mode of consciousness. But tantra is more than a mere philosophical reflection, as its central focus is application. Both through philosophical reflection and visualization practices, tantra encourages the aspirants to transform both their subjective and objective affirmations: Subjectively, individuals are all powerful and absolutely free, and objectively, the world of everyday experience is joyous, and our being in the world is to savor the lived moments. Grounded on these philosophical maxims, tantric manuals teach aspirants to cultivate objects of imagination. One needs to note that these visualizations are not episodes of random daydreaming: These rely on a system of meticulous construction of the object of imagination, similar to the way Jorge Louis Borges (1899–1986 CE) captured imagination in his story, *The Circular Ruins.* Any tantric visualization, be it Śrīyantra, Guhyakāli, Kālacakra, or Cakrasaṃvara practices, demands that imagination lays the spatiotemporal foundation on which subjects layer multiple structures, both geometric shapes and deity images, pushing the boundary of what can be imagined. During the mode of cultivation, these visualizations progress gradually, but on completion, an aspirant is trained to have a sudden and simultaneous gaze of all the objects within the field of attention. Yet again, what is evident is the centrality of attention during the mode of imagination. The mental journey through the landscape of maṇḍala does not just demand viewing hundreds of deities, with each deity image having a lengthy description, with multiple hands, and carrying different weapons, since the practices do not stop there. The central deity image becomes progressively

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more complex, and the same deity with four arms and a single head is visualized in advanced stages with hundreds or thousands of arms and heads. But what is imagined in the process occurs not only through images but also mantric speech, which remains central to these visualization processes, and mantras act as active devices in encapsulating all that ought to be remembered during the course of recitation. The meaning of mantra here is not a linear sign reference-based system, for mantras act as mnemonic devices to summon complex entities. At the same time, mantras act as the speech act, so when the subject recites the visualization verses, the act of visualization simultaneously occurs. Therefore, the medieval Śākta texts such as *Yoginīhṛdaya* outline a sixfold meaning of mantras (Timalsina 2005). Even when we encounter complexity in these manuals, which makes us wonder whether these are humanly possible, the manuals are meticulous on starting from the simplest of the forms and progressively adding aspects and nuances to give rise to the complex structure.

Every step of tantric visualization is simultaneously suggesting new cosmologies while reconfiguring the subject's place in the new paradigm. While directed toward altering the human ego, these practices transform the modes of the subject's engagement in society. As a consequence, it serves to alter the way the subject recognizes his or her own being in the world: The practice aims to uplift the subject's assessment of the world of beings and things and make everyday experience as integral to the realized modes of experience. The ways fantasy and memory are integrated in visualization practices are vivid even in the most common invocations, where they take the term for visualization (*bhāvanā*, *bhāvayet*) as synonymous to remembering (s*maret*, *smaraṇa*). Strikingly, several experiments showed neural and cognitive similarities in remembering the past, imagining or simulating the future, or playing with fantasies (Tulving 1985; Klein, Loftus, and Kihlstrom 2002). Tantras therefore not only explore the scope of imagination but also instruct how to imagine or draw the limits of positive imagination. One of the objectives of tantric practices is to cultivate exotic mystical experiences. The objective of visualization in particular is supposedly to give an aspirant a direct encountering with the deity being visualized. Oriented toward actualizing this goal, tantric practice of imagination seeks to train subjects to be able to explore all the counterfactual possibilities necessary for practical judgment. While the higher goal in tantras is oriented toward self-realization, there are immediate applications that need to be further explored. Do these exercises have an application in training subjects for complex imagination, like in imagining a complex building or imagining the interaction of subparticle structures in the dynamic field? We need empirical and neurological research to make any such claim toward this direction. What we can say theoretically is that learning to take control over the faculty of imagination is synonymous to bestowing power over self-identity and self-relatedness, having the ability to reshape memories and being able to edit the memories that are traumatic or undesirable. These arguments are in agreement with what Abraham (2020, 812) outlined: "Regardless of how transitory or enduring the imaginings, they can evoke emotional responses, action tendencies, and conceptual insights, which are instantiated in the present, in the here and the now."

It is worth wondering if there is any practical application to these esoteric practices. New research demonstrated that some individuals have no experience of imagery at all, that their mind is completely blank of images: aphantasia (Pearson 2020). This lack of the capacity of imagination has a direct consequence to our mental health. Studies revealed that imagery can play a crucial role in many psychological and neurological disorders (Pearson et al., 2015). Additional findings showed that visual imagery is found to function as a weak form of visual experience, and that visual imagery can have a facilitative effect on visual experience (Pearson 2020). These examples are not meant to suggest that the objective of tantric visualization is restricted to these goals. These exercises are more focused on gaining freedom over the faculty of imagination, about not only being able to imagine complex objects but also refining the objects of imagination or gaining control over what comes to occupy the space of our imagining mind. If an aspirant learns to create and maintain the landscape of his imagination, he also maintains his freedom to dissolve his fantasy world at will and come back to everyday life. If visualization practices have the potential to make an educated imagination, it likewise can combat hyperphantasia. From the tantric

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perspective, to not have the capacity to build images, living with aphantasia with no ability of constituting an image-like representation of reality (Zeman 2020) is a result of not awakening the dormant faculty of imagination. In all accounts, tantras maintain that just like the skill of language, we need to learn the skill of imagination.

Conclusion

From within the parameters of cognitive research, we now have a better understanding of attention, memory, imagination, and the ways these faculties of consciousness interact with each other. Tantric visualization practices suggest that these meticulous protocols in training our mind to be more attentive and better able to attend to what is more meaningful can also train the faculties of memory and imagination for maximizing the capacity of human consciousness. The above theoretical arguments are sufficient to emphasize that serious cognitive and neurological research is the need of the hour, as these practices appear to have therapeutic applications. If the field of tantric studies and in particular tantric practices can benefit by allowing objective evaluation of these practices, cognitive science and cognitive therapy also benefit by learning how these practices cultivate the faculties of attention, memory, and imagination, with an underlying assumption that these cognitive faculties are not predetermined or biologically fixed but are subject to cultural construction. What I find inspirational is, when reading many of the thought experiments for objective evaluation in cognitive research, I can see several parallels with the tantric visualization practices. The only difference is that tantric manuals do not present what is there but teach what *can* be there. In other words, if cognitive science can teach us about the mechanisms behind the processes involved in attention, memory, or imagination, tantric visualization practices can give us a way to expand and structure these faculties.

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Notes

1 I would have never written this chapter if Glen Hayes had not encouraged me to read cognitive science materials a decade ago.

2 Tantric texts broadly distinguish *bīja* mantras or the seed syllables such as *aiṃ, hrīṃ*, and so on, which are considered the primary basis for the designated deity. For instance, *aiṃ* relates to the goddess of speech, Sarasvatī, or *śrīṃ* for Lakṭṭṣmī, or *Hūṃ* for the ferocious deities such as Bhairava or Kālī. *Kūṭas*, on the other hand, have more compression. *Khphreṃ*, for example, is the seed *mantra* for Kālī. These *kūṭas* are sometimes made as an acronym for the cluster of deities, for example, *ḍa-ra-la-ka-sa-ha-yūṃ* stands as a single *kūṭa* related to the Yoginīs: Ḍākiṇi, Rākiṇī, Lākinī, Kākinī, Śākinī, Hākinī, and Yākinī.

3 One of the most common courses of tantric practice is *puraścaraṇa*, the acts dedicatedly performed in front of the deity. A general *puraścaraṇa*, for example of a nine-letter mantra, equals a nine hundred thousand times repetition of the mantra, and accordingly, ninety thousand libations into fire, nine thousand times offerings of water while reciting the mantra, the act of washing the mantra, a ritual performance of writing the mantra in leaves and offering them into the stream of water, and finally giving donations or feeding nine Brahmin priests.

4 This visualization of the goddess is available in the last page of the Durgāsaptaśatī, in the Gorakhpur 2021 publication.

5 Not just the classical tantras, even *tantras* in the vernacular have maintained the centrality of *smaraṇa* practices. Hayes (2012), for example, detailed its application in the Gauḍīya Vaiṣṇava Sahajiyā practices.

6 Let me offer two examples from most widely performed Śākta tantric rituals. First, from the *Devīmāhātmya*: The book rests on three primary goddesses and expands on some canonized goddesses within the rubric of eight Mātṛkās (mothers) and others, such as Śivadūtī or Cāmuṇḍā, who are epitomized in the ritual practices during the nine nights (*navarātra*) where nine different forms of Durgā are successively worshipped. Second, the practice of Tripurasundarī: The goddess is worshipped in the visual diagram of the *Śrī Yantra*, with over one hundred associate deities completing the successive wheel. The goddess herself emanates into sixteen deities, confirming the sixteenfold order of succession. These are just two examples of how Śāktism functions in practice, always in a group of deities and always in successive order.

7 Deleuze and Guattari (1991, 168) cited Désormière for the statement: "Memory, I hate you."

8 I am referring to the concept of *duree*, or duration, in contrast to the time that we measure. The measured time is not the real time for Bergson, as the moment we attempt to measure a moment, it is gone. Duration as such, for Bergson, is incomplete and continuously growing as its states are intermingling, and therefore they lack any clear beginning or ending. For further conversation, see Lawlor and Moulard-Leonard 2022.

9 We need a bigger platform for addressing such technical aspects. For grounding metaphor theory in light of cognitive neuroscientists, consult works such as Turner 2014.

10 *Trika* metaphysics makes the issue of subjectivity complex, integrating seven stages of subjectivity. The phenomenal subject or the daily ego that is encountered in *ahaṃkāra,* the transmigrating subject that maintains the embodied ego, and the absolute subjectivity that transcends all forms of manifest subjectivity cannot be glossed in a single concept of subjectivity. For discussion of this issue, see Timalsina 2020a, 767–789.

11 For the analysis of metaphors in the cluster of the counterfactuals, see Mark Turner 2011.

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