



Recognizing Cognitive Models as Models: Critical Meta-Awareness as a Key to Exploring Buddhist Practices and Their Contemporary Applications

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Abstract

The soteriological path in Mahāyāna Buddhism entails a pivotal cognitive shift through which all phenomena are recognized as empty of inherent existence. This paper aims to reformulate this concept using terminology aligned with contemporary psychology and cognitive science, demonstrating how Buddhist methodologies are directed toward developing the capacity to recognize cognitive constructs as such. This capacity is referred to here as “critical meta-awareness,” a notion that closely parallels the traditional concept of wisdom (*prajñā*). Within the framework of Buddhist soteriology, wisdom plays a fundamental role in alleviating suffering—suffering that arises from identification with the notion of self and from the attribution of objectivity to the cognitive models shaping experience. Building on these premises, the paper examines recent contemplative research in order to (1) investigate the relationship between meditation and the development of skills associated with critical meta-awareness, and (2) assess the connection between meta-awareness and psychological well-being. While the existing literature indicates that mindfulness meditation can foster metacognitive abilities, it also becomes evident that the Buddhist tradition includes contemplative practices specifically designed to cultivate various forms and degrees of critical meta-awareness. These practices have received limited attention in current research, largely due to their presumed metaphysical or religious character. By analyzing three specific practices drawn from the Tibetan Buddhist tradition, this paper argues that such methods merit further investigation. Once reframed from a secular perspective, they may offer valuable contributions to research on metacognition and meta-awareness, as well as potential applications in broader societal contexts.

Keywords Meta-awareness · Metacognition · Wisdom · Tibetan Buddhism · Non-self · Emptiness

Introduction

The primary tools used in pursuing the soteriological goals of Buddhism are contemplative practices aimed at recognizing that the self—and, in Mahāyāna Buddhism, all other phenomena—are devoid of inherent existence. Philosophically, this viewpoint is articulated through two key concepts: *anātman* (no-self), concerning the insubstantial and illusory

nature of the self, and *śūnyatā* (emptiness), extending the same insight to all other phenomena. This paper argued that, when expressed in a modern context, many Buddhist spiritual practices are intended to foster the recognition of one’s cognitive constructions as such. Hereafter, this capacity—traditionally regarded as one of the highest expressions of *prajñā* (wisdom)—will be referred to as “critical meta-awareness.” In the soteriological framework of the Buddhist tradition, the significance of this particular type of meta-awareness lies in its capacity to reduce (and ultimately eliminate) the suffering caused by ignorance, which consists of identifying with the self-model and attributing an objective character to it, as well as to other cognitive models and processes that underlie the construction of experience.

Recent research on meta-awareness and metacognition, along with contemporary contemplative studies focused on mindfulness-based programs and other forms of meditation, appears to confirm a twofold correlation: first, between

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certain meditation practices and the development of processes and constructs compatible with the concept of critical meta-awareness; and second, between critical meta-awareness and increased psychological well-being. In other words, critical meta-awareness seems to manifest spontaneously through practices such as mindfulness meditation, likely as a consequence of increased familiarity with the contents and processes of experience. On the other hand, while the Buddhist tradition includes absorption-based or cessation-oriented techniques (e.g., *jhāna* leading to *nirodha-samāpatti*), which may not engage meta-awareness as understood in this framework, it also encompasses refined forms of meditation specifically designed to cultivate this metacognitive attitude through various strategies.

Many of these practices have not yet received the same attention from the scientific community as mindfulness meditation, as they are seemingly more connected to the philosophical and religious aspects of Buddhism, and thus less suited for application in the secular contexts of contemporary society. This contribution focuses on three examples from Tibetan Buddhism: analytical meditation on emptiness and non-self; meditation on the nature of the mind, as taught in the Dzogchen and Mahāmudrā traditions; and Tibetan dream yoga. The hypothesis proposed here is that these practices, far from being rooted in religious or metaphysical beliefs, serve to enhance critical awareness of the fact that the various phenomena of experience are not perceived directly in their objectivity, but are instead the result of complex cognitive constructions—a view previously argued to be highly compatible with current knowledge in psychology and the cognitive sciences. Therefore, once the function of these types of Buddhist practices is clarified, it appears advisable to further investigate their mechanisms of action and potential positive effects, particularly in relation to what has been referred to here as critical meta-awareness. Such an approach could be pursued both through experimental studies conducted on experienced meditators engaged in traditional forms of practice, and through the development of secularized meditative programs, whose effects could also be observed in novice practitioners. Such research would contribute to refining current psychological and neuroscientific knowledge concerning metacognitive abilities, their correlation with psychological well-being, and the possibility of enhancing them through targeted meditative training applicable across various societal contexts (e.g., psychotherapeutic and educational).

Prajñā (Wisdom) as Critical Meta-Awareness

The philosophy of Indo-Tibetan Buddhism revolves around fundamental concepts that draw a crucial distinction between appearance and reality. The world experienced

by sentient beings—known as “conventional reality” (Skt. *saṃvṛtisatya*), which translates in Tibetan to “obscured reality” (Tib. *kun rdzob bden pa*)—is composed of a multitude of phenomena that seem to possess inherent existence or self-identity (Skt. *svabhāva*, Tib. *rang bzhin*). In other words, according to Buddhism, everything within the scope of our experience is believed to exist in the way it appears to us, independent of how it is shaped by our sensory and cognitive faculties. However, contemplative investigation exposes the falsity of this perspective and introduces the practitioner to a more accurate view of reality, expressed by the term “ultimate reality” (Skt. *paramārthasatya*, Tib. *don dam bden pa*). According to this view, the objects of our experience lack substantial and objective reality, an idea encapsulated in the well-known concept of “emptiness” (Skt. *śūnyatā*, Tib. *stong pa nyid*). They come into being depending on one another, and most crucially, on the mind itself. This principle is explained through three levels of interdependence (Skt. *pratītyasamutpāda*, Tib. *rten cing’brel bar’byung ba*), which describe how phenomena depend on their causes and conditions, their constituent parts, and their apprehending consciousness (Hopkins, 1983). Thus, the assumed objectivity attributed to phenomena in ordinary perception and cognition, akin to the Western concept of naive realism, is challenged by a profound insight: our experiences are fundamentally projective rather than objective. Consequently, the world we navigate, the realm of experience, is unveiled as a virtual reality, co-constructed by the mind.

Epistemological Rather Than Ontological Valence of the Concept of Emptiness

How should the discrepancy between appearance and reality be understood? What value should be assigned to the ultimate truth proclaimed in the Buddhist teachings? In other words, how should assertions typical of Madhyamaka philosophy—a major Mahāyāna school, founded by Nāgārjuna, that teaches the emptiness (Skt. *śūnyatā*) of all phenomena—such as “all phenomena are empty of inherent existence” or, more significantly, “all phenomena exist only in dependence on the consciousness that apprehends them,” be interpreted? The modern debate on these issues, particularly concerning Madhyamaka philosophy, is quite rich and has seen a variety of interpretations in recent years. Many scholars attempted to assimilate Buddhist philosophical experience to the metaphysical positions that characterize the history of European thought, from idealism and negative ontology to Kantianism (Ruegg, 1981). More recently, an increasing number of scholars challenged the ontological interpretations of concepts such as “ultimate truth” and “emptiness” and advocated instead for a repositioning of these notions within a framework of critical and deconstructive philosophy

of language (akin to that of philosopher Wittgenstein) or a Pyrrhonian-style skepticism (McEvilley, 1982; Tuck, 1990). Other authors, such as Westerhoff (2016), instead focused on refuting nihilistic interpretations of the concept of emptiness, emphasizing their inconsistency with the Madhyamaka teaching.

Without delving into the details of these interpretations, it can be noted that, on one hand, this line of studies still tends to project conceptual presuppositions that are historically foreign to Buddhist philosophy. On the other hand, a positive development can be observed: the field was largely freed from its most evident misunderstandings. In many modern readings of Buddhist philosophy—particularly of Madhyamaka—the notion of ultimate truth is not to be understood as an ontological or metaphysical truth; rather, it is seen as pointing to the lack of objectivity in our representations, which do not directly correspond to the external reality they attempt to depict. Similarly, the concept that phenomena depend on consciousness should not be misconstrued as implying that the mind has a magical ability to *materialize* the external world. Rather, it highlights that all phenomena within our experiential realm, including every aspect of our world, do not exist independently of our cognition as they may appear. Instead, they are shaped through the interaction between our cognitive faculties and the environment. In conclusion, an examination of contemporary analyses of Buddhist philosophy reveals a clear shift from metaphysical to epistemological interpretations. These newer views challenged the traditional views of emptiness as a self-existent reality, seeing Madhyamaka thought instead as a critique of the claims of objectivity in our knowledge. Reflecting this paradigm shift, Garfield and Siderits (2013) succinctly articulated the concept by stating that the ultimate truth is that there is no truth, thereby emphasizing the non-substantial nature of what is perceived as real.

Buddhist Soteriology and the Critique of Metaphysical Speculation

A frequently overlooked aspect in the study of Buddhist philosophy is its distinctly soteriological purpose: from the teachings of the Buddha to the most sophisticated philosophical developments of Mahāyāna Buddhism, the focus is not on knowledge of reality per se, but on liberation from suffering (Magno, 2012). Emblematic scriptural support in this regard includes the simile of the man struck by an arrow who, before allowing the removal of the arrow, demands to know the archer's name, the type of bow used, the material of the arrow, and so on, as well as the “noble silence” with which the Buddha answers metaphysical questions about whether the universe is eternal or not, whether the soul is the same as the body or something separate, and so on, both

found in the *Cūḷamāluṅkya Sutta*, included in the *Majjhima Nikāya* (Ñāṇamoli & Bodhi, 1995).

The critical stance toward sterile speculation that characterizes Buddhist inquiry supports a non-metaphysical and deconstructive understanding of ultimate truth. It also emphasizes that this truth must be realized through experience, rather than understood in merely conceptual terms. This approach is captured by the Tibetan term *nyams su len pa*, used to describe engaging in contemplative practice, which translates as “to bring into experience.” This verb aptly describes the aim of various forms of meditation practiced within this tradition. Furthermore, the inherently soteriological, and thus in a certain sense *therapeutic*, nature of the Buddha's teachings is vividly illustrated by the simile that compares the Buddha to a physician and the dharma to medicine, as detailed in the *Sutta Nipāta* of the *Samyutta Nikāya* (Ṭhānissaro, 2016). On the other hand, according to the Buddha's diagnosis, the primary cause of suffering is ignorance concerning the nature of the self and phenomena, which gives rise to all other cognitive-emotional defilements (Skt. *kleśa*, Tib. *nyon mongs*). Despite its soteriological orientation, then, Buddhism's therapeutic approach fundamentally relies on knowledge, particularly on an understanding of the emptiness of the self and phenomena. What, then, is the nature of this transformative knowledge?

The Cognitive Rather Than Simply Intellectual Nature of Wisdom Realizing Emptiness

In Buddhist tradition, the inner faculty that enables one to comprehend emptiness is known by the term wisdom (Skt. *prajñā*). To understand what kind of comprehension this entails, it is first necessary to consider its opposite: ignorance. Ignorance is described not so much as a void to be filled, but as a fullness that must be emptied. Ignorance superimposes an additional layer onto the mere manifestation of phenomena, fostering the belief that everything perceived—from the sense of self to external objects—is real and exists exactly as it appears, independently of cognitive processes. Ignorance thus leads to mistaking conventional realities, which are valid only within the scope of experience, for absolute truths, thereby reinforcing naive realism. However, it is important to emphasize that this type of ignorance, which Buddhism regards as the primary cause of suffering, is not about the realm of beliefs and philosophical opinions. Ignorance is a more deeply rooted cognitive tendency that affects the cognitive processes of human beings (and not only) regardless of their intellectual convictions (Hopkins, 1996). Therefore, grasping emptiness merely intellectually is just the threshold of the Buddhist path of liberation, which demands deep cognitive transformation. Such re-education, facilitated by contemplative practices,

is intended to bring about a radical transformation in the way phenomena are understood—and even perceived. The ultimate goal is that every moment of experience is accompanied by wisdom; that is, the awareness that the contents of experience are devoid of objectivity. Wisdom constantly alerts us that our thoughts and perceptions do not reflect any external *reality* but are instead constructs of our minds, shaped by deep-seated psychological and motivational factors. Take, for example, attachment, one of the main cognitive-emotional defilements: this mental factor projects positive qualities, in addition to a general character of desirability, onto the objects of experience that are deemed necessary or otherwise favorable to one's well-being. Like other *kleśa*, attachment operates on the basis of ignorance, so that the positive qualities attributed to the object seem to have an objective character, rather than being projected by the subject based on personal inclinations. Similarly, the phenomena and people toward which aversion is directed appear to be intrinsically endowed with negative qualities. But when the mental factor of wisdom is present, this entire edifice of projections collapses, as its foundations are removed. Thus, Buddhist wisdom transcends mere philosophical speculation, fundamentally altering our experience and interpretation of reality.

The Contemporary Relevance of *Prajñā* as Critical Meta-Awareness

To describe wisdom in terms more aligned with modern philosophy and psychology, its role can be understood as that of correcting the naive realism that permeates every moment and level of cognition. It does so by introducing a metacognitive perspective capable of recognizing that all contents of experience are devoid of objectivity, being the result of a complex cognitive construction in which the subjective component plays a decisive role. To facilitate dialogue between Buddhism and the cognitive sciences, the faculty traditionally known in Buddhism as wisdom was referred to hereafter as “critical meta-awareness” (or “critical metacognition”). The prefix “meta” highlights that the ability in question gives rise to a second-level cognition—that is, a reflective type of knowledge that takes other cognitions as its object. The adjective “critical,” in turn, points to the distinctive feature of this faculty, which differentiates it from other forms of meta-awareness or metacognition: its function consists precisely in scrutinizing the activity of other cognitive faculties, challenging the presumed objectivity with which their contents are ordinarily presented.

In Buddhism, recognizing the illusory nature of the self, expressed by the famous concept of non-self (Skt. *anātman*), is particularly important from a soteriological perspective, since it is primarily from grasping at (or

identifying with) a self conceived as something real that the most harmful consequences of ignorance arise. The central thesis of this paper was that the Buddhist ideas discussed thus far—especially the benefits of developing a critical meta-awareness that recognizes the cognitively constructed nature of experience—transcend metaphysical or religious categorizations. Instead, they exhibit a high degree of compatibility with contemporary perspectives from psychology, the cognitive sciences, and the philosophy of mind, as will be discussed in the following section.

Transparency of Cognitive Models That Shape Our Experience

Metzinger, a renowned philosopher and cognitive scientist, delved deeply into the study of consciousness and self-awareness. His comprehensive theoretical framework offered a distinctive perspective, integrating cognitive neuroscience and philosophy to explain how the sense of self is perceived and constructed. Interestingly, while his work has been largely grounded in Western scientific and philosophical traditions, there are striking parallels between Metzinger's theories and certain foundational Buddhist tenets, particularly concerning the nature of the self. In particular, the concept of “phenomenal transparency” (Metzinger, 2003) has described the manner in which mental representations are experienced: in perceiving the world, individuals typically fail to recognize their perceptions as mere constructions or representations. Instead, they appear transparent in the sense that they are implicitly taken as direct windows onto the world. This gives rise to the intuitive and persistent impression of being in direct contact with reality, even though what is actually encountered is merely a constructed model generated by the brain.

Building on this foundation, Metzinger's idea was further explored in his book *The Ego Tunnel* (Metzinger, 2009), where the concept of “phenomenal transparency” has been examined in depth, particularly in relation to the “Phenomenal Self-Model”: the internal model responsible for generating the subjective experience of being a unique individual, of having (or being) an *I* or a *self*. In this context, the transparency of the Phenomenal Self-Model indicates a complete lack of awareness of it as a mere mental construction. As a result, individuals come to strongly identify with it, taking it to represent the true essence of their individuality. It is precisely this *transparency*, this lack of awareness, that allows the experience of self to feel so immediate and unquestionable.

Drawing inspiration from this concept, it can be suggested that Buddhist wisdom aims to *opacify* the cognitive processes involved in constructing the experience of the

world and the self, thereby rendering them recognizable. Yet one may ask: why pursue such an endeavor (assuming it is indeed possible)?

Why Opacify Cognitive Models?

If, drawing upon the soteriological dimension of Buddhism and extending its relevance to a secular context, the aim is to promote psychological well-being and reduce suffering, it must be acknowledged that this objective likely does not align with our biological programming. Many mental states and behaviors that generate suffering for oneself and others—though viewed negatively by both Buddhist thought and contemporary psychology—have likely played a crucial role in the evolutionary struggle for survival. However, our environment today differs radically from the ancestral contexts in which these traits evolved. This situation, described in evolutionary biology as an “evolutionary mismatch,” refers to the dissonance between our evolved predispositions and the conditions of modern life, where mechanisms once adaptive may now prove maladaptive (Lieberman, 2013; Wrangham, 2019).

From this perspective, the virtual reality of experience can be understood as a cognitive device shaped by natural selection, and mistaking this internal model for reality itself may have been crucial to its function. As Metzinger (2009) argued, the transparency of our cognitive models—and in particular, identification with the self-model—may be evolutionarily justified, as it motivates behavior relevant to survival and reproduction. In light of this, it appears legitimate to question the value of cultivating a metacognitive ability that seems so alien, and even contrary, to our biological imperatives. In this regard, Sarbacker (2020) suggested that Buddhist meditative practices, and those of other contemplative and ascetic traditions, can be seen as forms of pre-modern biohacking: intentional efforts to modify the mind and body in ways that diverge from their biological programming. How, then, should such an endeavor be evaluated?

While this is no doubt a matter of personal belief, it can be argued, both from within the Buddhist soteriological framework and from the perspective of contemporary liberal values, that we are not bound to preserve our biological tendencies at all costs. Indeed, we are increasingly empowered, and even ethically compelled, to transcend our evolutionary conditioning. This enables us to make deliberate choices based on principles that are not reducible to survival and reproduction, and to commit, as far as possible, to the reduction of suffering and the promotion of well-being for all sentient beings, or at least for all human beings (Tormen, 2023).

Returning to the notion of critical meta-awareness, it becomes less relevant to question its naturalness than to reflect on the substantial benefits it may offer. In discussing the benefits of critical meta-awareness, Buddhism refers to

nothing less than complete liberation from suffering. Metzinger (2009), meanwhile, argued that recognizing the constructed nature of the self carries significant philosophical and practical implications, shaping our approach to personal identity, ethics, and the very nature of consciousness. What, then, can be asserted from a scientific standpoint, based on empirical studies investigating the impact of critical meta-awareness (or other related constructs) on psychological well-being? This question will be addressed in the following section. The analysis will begin with a review of current psychological and neuroscientific research on the correlation between metacognition and psychological well-being. It will then turn to contemporary contemplative research to assess the extent to which meditative practice can effectively foster this capacity.

Confirmations From Contemplative Research

Links Between Metacognitive Abilities and Well-Being

To assess the value of delving deeper into the study of Buddhist contemplative practices related to critical meta-awareness with a view to their potential secular applications, the first question to ask is whether the development of metacognitive abilities is correlated with psychological well-being. A significant study by Bernstein et al. (2015) sought to understand the link between metacognitive capacity and mental health by critically examining various constructs related to metacognition and their established connections to mental health. After a comprehensive review of the literature, the authors proposed a metacognitive model that integrates various constructs into three interrelated processes: “meta-awareness,” “disidentification from internal experience,” and “reduced reactivity to thought content” (p. 600). “Meta-awareness” refers to the awareness of cognitive processes, such as thought processes, where specific contents like thoughts manifest. “Disidentification from internal experience” means experiencing internal states as separate from one’s self-identity. Lastly, “reduced reactivity to thought content” describes how a thought’s content less significantly affects other cognitive processes, like motivation, emotion, and attention.

The proposed triad’s applicative potential lies in identifying the underlying principles of the diverse constructs that have delineated the entire field of metacognition and meta-awareness so far, in order to better differentiate among them and transcend them. The effectiveness of this model becomes evident when considering the extensive list of metacognitive-related constructs, which includes terms and concepts such as “cognitive defusion,” “metaconsciousness,” “metacognitive awareness,” “observer perspective,”

“reperceiving,” and “cognitive distances” (Bernstein et al., 2015, p. 613, note 1; Vago, 2022, p. 184). Adopting this framework and linking each construct to its core metacognitive processes and mental health might help to advance the research that, over the last few decades, has highlighted the positive effects of various metacognitive-related constructs on psychological well-being. To see some examples of what research has already demonstrated, constructs related to changes in dis-identification from internal experience—that is, the second of the three interrelated psychological processes just mentioned—were associated with lower levels of depressive and anxiety symptoms (Bieling et al., 2012; Gayner et al., 2012; Lau et al., 2006; Teasdale et al., 2002) and decreased avoidance (Bernstein et al., 2015, p. 600). Considering another example, studies on cognitive defusion—which encompass all three processes proposed in the model—showed that this construct was associated with mental health benefits. These findings emerged from studies that implemented cognitive defusion techniques experimentally or therapeutically, such as the word repeating technique and acceptance and commitment therapy. These studies have shown, among various results, not only reduced discomfort and believability ratings of negative self-referential thoughts (De Young et al., 2010), but also superior outcomes of defusion techniques relative to other cognitive control methods such as expressive suppression or distraction, regarding pain believability and coping with experimentally induced pain (Gutiérrez et al., 2004; Healy et al., 2008). Although it is not always easy to identify the exact links between individual metacognitive processes and mental health, there are encouraging signs for future directions in the psychological science of decentering-related constructs (Bernstein et al., 2015; Lutz et al., 2015). The development of models such as that of Bernstein et al. (2015), which emphasized evaluating research in terms of variability in both scope and rigor regarding metacognitive-related constructs, can certainly contribute to deepening inquiry into the most significant areas of study and foster greater attention to the critical dimension of meta-awareness. In any case, although none of the constructs examined thus far aligned perfectly with what has been defined here as “critical meta-awareness,” the examples presented should suffice to illustrate the correlation between metacognitive abilities (broadly defined) and psychological well-being, and to encourage further research in this direction.

Finally, it is particularly noteworthy to mention two studies by Walsh (2015a, 2015b), which exemplified a distinctive perspective in the field of metacognition research. These works, among others, focused on the nuanced exploration of wisdom, a concept that aligns closely with the critical meta-awareness discussed herein. The author, in an attempt to provide a cross-cultural and cross-disciplinary overview of this notion, spanning contemporary research and traditional

sources, also suggested potential connections to well-being. He noted how various aspects related to the enhancement of wisdom ability, including, for example, the ability to integrate insights, ideas, and perspectives into increasingly complex networks of ideas and metaperspectives, may be crucial for psychological health, and discussed how certain manifestations of wisdom are intrinsically tied to ethical living and benevolence, both of which directly contribute to well-being. The path of research into critical meta-awareness using the concept of wisdom is extensive; yet, these studies serve to promote further investigation into the relationship between critical meta-awareness and mental health, potentially including ethical dimensions.

De- and Re-programming Through Meditation: Playing With One’s Own Cognitive Models

As previously noted, the study by Bernstein et al. (2015) did not thoroughly examine the critical dimension of meta-cognition or meta-awareness as defined in the present work. Although there are currently no experimental studies explicitly focused on the hypothesis outlined in this paper and derived from Buddhist tradition—which proposes a correlation between meditative practice and critical meta-awareness, and between the latter and psychological well-being—there are, however, some significant studies that provide clues in this direction. To delve deeper, it is necessary to venture into the vast interdisciplinary field of contemplative research, which is dedicated to exploring contemplative experience and its associated practices, along with the distinctive forms of knowledge and profound transformations they engender in individuals and communities.

Meditation can indeed be understood as a contemplative exercise in which phenomenological observation directly influences cognitive processes, and where “re-programming” also involves “de-programming” (Harvey, 2022, p. 118) of reactions, habitual patterns, and thought schemes. This affects not only the psychological realm but also, more profoundly, the philosophical and existential dimensions, entailing a thorough reevaluation of one’s conceptions of the self and the experiential process. It is within this field of studies that the exploration of metacognitive abilities aligns more closely with the concept of critical meta-awareness outlined herein.

Vervaeke (2022) underscored that meditation enhances a form of metacognition characterized by critical features, with its development dynamically described by the author. This capability undergoes an *ecological* evolution across multiple phases, with various interconnected cognitive processes significantly facilitated by the practice of contemplation. The first process involves removing the lenses of our habitual mental frameworks, breaking down the forms, patterns, and *gestalts* that distort our interpretation of reality.

The second process entails cleansing these lenses and reapplying them, thereby discovering new perspectives for framing reality. According to Vervaeke, these two phases of “breaking frame” and “making frame” mutually reinforce each other, leading to an ecological reframing of one’s reality conception, where these processes reciprocally influence each other (p. 196). This dynamic reframing has significant ethical implications, influencing broader behavioral patterns and self-conception in relation to various life aspects. In the present manuscript, it was proposed that the dynamic process of replacing less appropriate cognitive models with more suitable ones cultivates a critical attitude toward subjective experience, enhancing the capacity to evaluate their effectiveness and fostering awareness of their merely constructed nature.

Dereifying Experience and Opacifying Cognitive Models

Over time, increasing flexibility in altering one’s cognitive models may diminish the sensation of directly interacting with various objects of our experiences, challenging the assumption that they are *real*. This point was raised by a study on contemplative practices by Lutz et al. (2019), who, using the terminology of Metzinger (2003), associated the opacification of mental events during meditation with an increase in the *dereification* of experience. Through this process, perceptions, thoughts, and emotions are experientially seen as mental processes rather than accurate representations of reality. In other words, phenomenal opacification allows us to view our thoughts, perceptions, etc., as mental constructs that merely represent reality, not necessarily in an accurate or exhaustive manner, and thus subject to examination, criticism, and replacement. In this context, it is notable that the authors further explored dereification by distinguishing between two aspects. The first concerns the contents of experience: without dereification, thoughts appear as if the scenarios they depict are unfolding in real time. The second concerns the nature of subjective experience itself: in the absence of dereification, a specific perspective may seem entirely accurate and representationally complete. Lutz et al. (2015) incorporated dereification among the primary components in the broader context of a multidimensional phenomenological model applied to mindfulness meditation: a multidimensional phenomenological matrix that can be mapped onto a neurocognitive framework and encompasses the principal observable, teachable, and modifiable characteristics of experience during mindfulness practice. Although much remains to be understood regarding the mechanisms through which awareness is brought to habitual patterns that guide cognition, thereby fostering cognitive flexibility and creativity, the phenomenological models proposed by Lutz et al. (2015) and Bernstein et al. (2015)

make a significant contribution to ongoing research. These models seek to coordinate metacognitive aspects not as static constructs, but as dynamic operational tendencies and inter-related processes. These studies provide a solid foundation for demonstrating how meditation facilitates critical meta-awareness and how this concept could be further articulated and investigated in future research.

Meditation as a Technology of Transformation: Knowing How

Another perspective on the potential of meditative practice for critical meta-awareness views meditation as a “technology of transformation” (Kachru, 2022, p. 94) that, though frequently seen as a method for acquiring propositional knowledge, or “knowing that” (i.e., knowing that some assertions are false and others true), primarily acts as a transformative method for developing procedural knowledge, or “knowing how” (i.e., knowing how to attend to one’s own feelings with an open approach) (Gowans, 2022). Meditation can be understood in these terms, as it operates at the level of re-habitation: specific habits in the way one relates to reality are identified and gradually altered through a process of re-habitation to alternative patterns. Moreover, meditation enables practitioners to realize how this process of transformation and re-habitation occurs, even as this “metacognitive engagement” unfolds, and explores its implications for the practitioner’s personal and cognitive development. This approach also unveils a crucial metacognitive layer: the critical horizon discussed throughout this paper.

Identifying and altering patterns in our attitudes represents only the foundational level of effectiveness for meditation as a method for developing procedural skills, or “knowing how.” Gowans (2022) suggested that its full potential is substantial, encompassing the ability to learn how to live without craving and potentially leading to the state of liberation as identified in the Buddhist tradition. Furthermore, an additional perspective to consider is the enhancement of “knowing how” through the capacity to be aware of how experiences unfold during meditation. A tangible example can be found in lucid dreaming, which is characterized by sustained awareness of the dream state as events unfold. For instance, seeing the full moon may be accompanied by a distinct phenomenal quality that marks the experience as occurring within a dream (Dunne et al., 2019, pp. 309–310). This capability extends beyond lucid dreaming, serving as a crucial element for maintaining continuous engagement with the phenomenal mode through which experiences unfold. This ongoing engagement spans all its various states, even those where the dualistic structure of subject-object, perceiver-perceived, fades, giving way to non-dualistic modes of experience. The importance of training oneself to maintain “knowing how” a certain conscious state is, and

subsequently recognizing the constructs and models that typically populate our cognitive framework, points to the next step: exploring the potential of non-dual meditative states in the development of critical meta-awareness.

Critical Meta-Awareness and Non-Duality

Based on the evidence reviewed thus far, contemporary contemplative research clearly illustrates the connection between meditative practice and forms of metacognition that align with the concept of critical meta-awareness as defined in this work. In Buddhist psychology, this concept is explored in significant depth, revealing a multidimensional and richly faceted structure with various stages of development. Particularly in its most mature form, it is frequently described in phenomenological terms as a state or facet of non-dualistic consciousness. Among contemporary scholars who have addressed this topic, Spackman (2022) stood out for linking the capacity to bring awareness to a non-conceptual and non-dualistic level of the mind directly to the highest metacognitive potential of meditative practices. This perspective, building on the previous discussion of “knowing how,” suggests an observational stance that transcends the extensive and articulated dualistic level of cognition with which individuals are typically identified. Such a level of consciousness, once acknowledged, could be adopted by the experienced practitioner as a metacognitive stance capable of reinterpreting everyday experiences, usually entrenched in dualistic structures. Consistent meditation practice can foster an observational perspective from which emotions, thoughts, and perceptions are encountered non-reifyingly (Dunne, 2015). Teasdale (2022, p. 162) in this regard spoke of “holistic-intuitive knowing” and also linked this ability to the transcendence of various forms of dualism: the “subject-object duality” (which makes us feel like subjects separate from our experience); the “self-other duality” (which makes us feel separate from other beings); and the “self-God duality,” which in theistic contexts makes the believer feel separate from the divine. The same author appears to have closely associated the overcoming of dualism with what has been referred to here as critical meta-awareness, noting that all these dualities share the foundational misperception of “self as an independently existing separate entity” (Teasdale, 2022, p. 162). Thus, recognizing that the self is a mere cognitive model without real existence seems closely related to the manifestation of a form of experience which can be described in various senses as non-dual or non-dualistic. There is a growing body of research attempting to assess the effects of mindfulness and other meditation practices on non-dual awareness (Hanley et al., 2018). Yet, the notion of a state (or aspect) of consciousness that can be phenomenologically described as non-dual, and its connection to critical meta-awareness, requires further investigation in

both traditional Buddhist psychology and contemporary contemplative research. This calls for a detailed analysis that unpacks the concept into its various components, modes, and developmental stages. The following sections will review some initial steps that have been taken in this direction.

The Most Effective Meditative Practices Directly Targeting Critical Meta-Awareness

Among the models categorizing meditation modalities by their principal processes, the classification system proposed by Dahl et al. (2015) is particularly relevant to the focus of this paper. This system analyzes the primary cognitive mechanisms of specific meditation modalities, categorizing them into “attentional,” “constructive,” and “deconstructive” families. While the first family focuses on attention regulation practices (e.g., calm abiding meditation, Skt. *śamatha*, Tib. *zhi gnas*), the latter two, constructive and deconstructive, are of particular interest as they engage with aspects of meta-awareness, though in distinct ways. The second family encompasses practices that enhance psychological well-being by addressing and transforming maladaptive self-schemas—deep-seated, unhelpful beliefs about oneself—into healthier, more adaptive self-conceptions. These practices (e.g., compassion and loving-kindness) deliberately modify cognitive and affective contents and brain networks, impacting relational, ethical, and perceptual orientations. For example, a shift from a self-centered to an other-centered orientation affects both cerebral and peripheral biological functions, influencing psychological processes. While substantial progress has been made, more research is needed to explore how these changes contribute to overall well-being. In the practices of the second family, meta-awareness is implicated in targeting and modifying maladaptive schemas, focusing on transformative change. In contrast, the meditations of the third family (e.g., *kōan* meditation, *shikantaza*, Dzogchen practice, and Mahāmudrā) aim more profoundly to elicit deep insight into the dynamics and nature of conscious experience, exploring the foundational aspects of cognition and perception. The three subgroups of the deconstructive practices are “object-oriented insight,” “subject-oriented insight,” and “non-dual-oriented insight” (Dahl et al., 2015, p. 519, box 4). The first subgroup examines the objects of consciousness (e.g., physical sensations); the second investigates the dynamics, components, and nature of cognitive and affective processes; the third seeks to induce a shift into an experiential mode that transcends traditional self-other and subject-object dichotomies. Thus, based on this analysis, it is within this third family of practices, particularly in its second and third subgroups, that the continuous process of phenomenal opacification finds a central place and may unfold in its full potential. In fact, although targeting specific patterns for correction in the second family’s meditations

involves precise and effective metacognitive work, it does not yet reach the level of critical meta-awareness. It is only through deconstructive practices that the meditator becomes fully engaged in the investigation of these patterns, their processes, and their nature, gaining insight into the cognitive models of self, others, and the world through what Dahl et al. (2015) refer to as “self-inquiry.”

A deeper exploration of the relationship between diverse meditation types and meta-awareness (or metacognition), along with their impact on well-being, requires a thorough examination of the different forms of meditative insight and their neural and biological underpinnings. The escalating scientific focus on the self and self-related processes across philosophy, psychology, and cognitive science provides a significant impetus for investigating deconstructive practices, specifically targeting self-schemas and exploring how these insights relate to human health (Dahl & Davidson, 2019). Although Josipovic (2013, 2021) and Manna (2010), among others, focused on this category, a systematic methodology remains absent. This underscores the need for further research, particularly as diverse meditative traditions provide unique perspectives on the nature of the self and the world.

Studying Meditation Primarily as an Exercise in Critical Meta-Awareness

Dorjee (2016) offered a compelling perspective within contemplative research, demonstrating that meditative practices are strategically designed to facilitate progressive changes at attentional, affective, and conceptual metacognitive levels—changes that have profound implications for what is referred to in this article as “critical meta-awareness.” This approach leads to significant shifts in awareness concerning the self, others, and the broader reality. Dorjee identified these shifts as “modes of existential awareness,” capturing both the experiential and, by extension, existential dimensions. This concept encompasses modulations in self-perception and an evolved understanding of reality’s (co-)constructed nature. In essence, this extends beyond merely targeting and modifying self-schemas to also deeply understanding their inherent nature as schemas. In this perspective, decentering is nothing less than the first (and, to date, only) fully studied level of modes of existential awareness. It is also the simplest to achieve with meditative training and the most recognized among the therapeutic outcomes of mindfulness-based approaches. Shapiro et al. (2006) and Carmody et al. (2009) have associated “reperceiving” with “decentering,” describing it as a transformative shift in perspective on cognitive events. As Dorjee (2016) pointed out, it is unclear whether secular mindfulness-based approaches could elicit deeper modes of existential awareness than decentering itself, which could rightly be considered the most basic

mode. This progression from one mode to the next re-connects with the previously discussed non-dual level of meta-awareness: moving through increasingly subtle meditative absorptions, for which contemplative traditions prove to be extremely valuable sources, one would arrive at the experience of the self’s emptiness, or *anātman*, and the non-dual level of consciousness, which underpin the ordinary mind’s patterns. Notably, Dorjee (2016) specifically identifies this state as *rig pa*, employing the conceptual framework and terminology of the Dzogchen tradition in Tibetan Buddhism, which will be explored in the next section.

Meditation can essentially be viewed as an exercise in critical meta-awareness at its most expansive. It transcends merely skillfully manipulating identifiable patterns and schemas within ourselves, self-regulating emotions, thoughts, and behaviors, nor does it only concern understanding the nature of these schemas. By progressively opacifying and questioning these schemas, it becomes possible to inhabit cognitive and existential modes that continuously and directly reinforce the understanding that no observed phenomenon possesses an objective nature, but rather arises within the virtual reality of experience. To precisely map the various aspects and levels of meta-awareness (or metacognition) related to meditation, disciplines engaged in contemplative research must adopt a rigorous first-person approach in their methodologies, encompassing both intra- and interpersonal perspectives, as well as considering the impacts of ethical values, motivational aspects, and socio-cultural and interpersonal contexts (Dorjee, 2016; Goleman & Davidson, 2017; Lutz et al., 2015). While this goal surpasses the scope of this paper, which primarily seeks to underscore the rich potential of this research trajectory, to provide further impetus for its realization, the next section will examine certain contemplative practices which, within the context of Tibetan Buddhism, play a pivotal role in cultivating critical meta-awareness and could therefore serve as a foundation for further research into this not yet sufficiently explored aspect of meditative practice.

Examples of Contemplative Practices Linked to Critical Meta-Awareness and Insights for Their Secular Application

If Buddhist contemplative practices can indeed be understood as exercises aimed at developing a critical awareness of the contents and the very nature of experience—or, in other words, as trainings capable of leading to increasingly elevated modes of existential awareness (Dorjee, 2016)—then it would be highly interesting for contemplative research to explore the forms of meditation that, in their traditional context, are specifically intended to foster critical meta-awareness. The three examples that will be provided

in this section are all drawn from Tibetan Buddhism and are discussed here with a view toward their possible secular adaptation. A thorough study of these practices could prove beneficial not only for applying them in different social contexts, such as psychotherapy, education, and well-being, but also, and perhaps more importantly, for advancing experimental research on the topic addressed in this contribution.

Analytical Meditation on Emptiness and Non-Self

One of the strategies employed in Tibetan Buddhism to gain insights into the lack of inherent existence of self and other phenomena is analytical meditation on emptiness and non-self, highly regarded especially within the Gelug school. Based on the concepts introduced in the first section, these practices may be interpreted as aiming to cultivate a form of meta-awareness capable of recognizing that the contents manifesting moment by moment in the field of experience do not correspond to objective realities but are the result of complex cognitive constructions arising from the interaction between our cognitive faculties and the environment.

Successfully engaging in this practice requires, first, the development of a significant degree of concentration through practices akin to modern mindfulness meditation. Ideally, this leads to a state of meditative stabilization known as “calm abiding” (Skt. *śamatha*, Tib. *zhi gnas*), which allows the practitioner to focus intently on the meditation object for extended periods without distraction. In addition to this, it is essential to cultivate an understanding of various dialectical arguments, inspired by the treatises of renowned Madhyamaka philosophers such as Nāgārjuna and Candrakīrti (Hopkins, 1996; Tillemans, 2016; Westerhoff, 2009). These arguments all aim to demonstrate the inconsistencies inherent in the fundamental notions and relational categories that underpin the phenomenological world as it is perceived and understood, such as space, time, causality, the relationship between identity and otherness, whole and parts, and so on. The primary tool used for this deconstruction is the logical consequence (Skt. *prasaṅga*, Tib. *thal’gyur*), a method of argument fundamentally akin to the *reductio ad absurdum* of Western philosophy. Through such reasoning, the main supports that uphold our experience of the world and ourselves are thus dismantled, or rather, their implicit claim to objectivity is refuted. In other words, it is revealed that the aforementioned categories effectively operate in the virtual reality of experience but do not exist outside or independently of consciousness.

One of the most famous examples is the sevenfold reasoning elaborated by Candrakīrti, a prominent figure in Mahāyāna Buddhism’s Madhyamaka philosophy, in the seventh century in his *Madhyamakāvātāra* (Mipham & Candrakīrti, 2005). This argument examines, through a highly refined use of logic, seven different ways by which the

relationship between the self and the various psychophysical constituents on which it is imputed can be conceived, each of which is ultimately shown to be contradictory. Step by step, the reasoning leads to the rejection of all hypotheses, inexorably arriving at the only plausible conclusion: the self does not exist; or, at least, not as an objective reality. The self exists only in the virtual reality of experience; it is a useful and indeed necessary tool for our pragmatic purposes, but it does not correspond to any real entity. The same applies to all phenomena: things are perceived as individual entities endowed with objective existence and a distinct self-identity. Yet, when the probing question “What is this?” is examined deeply, it becomes evident that each phenomenon emerges from a multitude of interdependent causes and constituent parts, with nothing objective added to confer essence, unity, or a distinct identity to this complex assembly (Garfield, 2022). The identity of tables, mountains, or people—their very appearance as individual phenomena—is attributed by the mind to specific portions of experience, which are shaped in this way by our cognitive faculties but find no correspondence on an objective level.

Does this mean that this way of perceiving the world should be abandoned? Not at all: it has undeniable conventional and pragmatic value. Instead, it is important to recognize that the reality as perceived, comprising people and objects that appear as independent entities, exists solely at the level of experience, that is, within what Buddhism refers to as “conventional reality.” This highlights the active or projective role of our cognitive processes, which construct reality based on schemas aligned with our needs and inclinations, rather than merely apprehending it as it is. Recognizing these cognitive models as such, they will become more malleable and less likely to trigger afflictive states of mind and automatic reactions, thus reducing suffering; they will therefore be adopted more critically, perhaps with greater irony, and with a lesser degree of identification.

For this kind of metacognitive revolution to occur, however, it is not enough to simply know these deconstructive arguments or even to be convinced of their correctness (both of which are nevertheless necessary conditions for the practice). On this foundation, the practitioner must revisit them over and over in meditation, and then, in this state of enhanced attention, focus on their outcome: the lack of objectivity in our cognitions and perceptions (Hopkins, 1996). Only in this way, according to tradition, can the intellectual understanding of emptiness penetrate deeply into the cognitive faculties and restructure the manner in which the objects of experience are apprehended.

Building on the thesis presented in the first section, an in-depth study of these traditional practices shows that their purpose is not to lead the practitioner to some metaphysical truth but rather to facilitate the development of a form of critical meta-awareness that aligns with what cognitive

sciences reveal about our perceptual and cognitive processes. Such an interpretation of analytical meditation paves the way for its potential modern adaptations. While traditional reasoning still proves somewhat effective in deconstructing the naive realism that affects our usual way of experiencing the world, new and, for many people, more compelling evidence from contemporary sciences, including physics, psychology, and cognitive neuroscience, can enhance critical meta-awareness. A modern program inspired by analytical meditation on emptiness and non-self could thus be configured as both theoretical and practical training, where notions from contemporary sciences are first presented to practitioners through arguments aimed at eliciting insights about the illusory nature of experience, and then assimilated by them through meditation, with the targeted goal of fostering the development of a critical awareness of their own perceptual and cognitive processes, as well as of the construction of the self.

Dzogchen and Mahāmudrā

Dzogchen and Mahāmudrā, although belonging to distinct lineages of the Tibetan Buddhist tradition, manifest convergent philosophical underpinnings and praxis modalities. They represent the acme of the practice path within their respective traditions: Dzogchen in the Nyingma school and Mahāmudrā in the Kagyu and Gelug schools. Although they may appear simple, these methodologies are profoundly effective in radically dereifying experience, thus enabling practitioners to recognize all phenomena as mental constructions. This section provides a succinct overview of these two eminent *corpora* of practices without engaging in a detailed exegesis of their respective doctrines.

Unlike the analytical meditation discussed in the preceding sections, these practices, which are perhaps not too dissimilar from modern mindfulness meditation (Deroche & Sheehy, 2022), do not depend on logical reasoning. Instead, they are primarily classified as open awareness meditations, where practitioners are encouraged to remain present to any phenomena that manifest within their experiential domain. What sets these practices apart? The key lies in the conceptual framework provided through the instructions, which explicitly direct practitioners to observe the arising and dissolving of experience contents—thoughts and, in many cases, sensory impressions—within the realm of consciousness. Furthermore, these phenomena are seen as manifestations of consciousness itself, inseparable from it and fundamentally composed of the same cognitive *substance*. As a result, every experiential object, whether internal or external, is considered to be crafted from the same fundamental fabric of experience as everything else (Namgyal, 2006).

Turning to more detailed aspects, many Dzogchen practices require practitioners to meditate with open eyes, often

with the task of merging consciousness with space. This involves perceiving the space in front of oneself as the space of consciousness and, consequently, recognizing everything within it as cognitive phenomena, rather than material objects. Other practices prompt practitioners to focus on the interval between the fading away of one thought (or any other inner content) and the arising of the next, aiming to increasingly discern the empty and “luminous”—that is, aware and revealing—nature of the cognitive backdrop that envelops all and from which each originates, akin to a wave in the ocean (Longchen Rabjam, 2007). This backdrop, as tradition holds, underpins every moment of experience and is referred to by several terms, including *rig pa*, which literally not only means “knowing” but also denotes “the nature of the mind” (Tib. *sems nyid*), “the sphere of phenomena” (Skt. *dharmatā*, Tib. *chos nyid*), among others (Van Schaik, 2013). The purpose of the practices embedded in Dzogchen and Mahāmudrā teachings is to first recognize, and then abide in, this state of consciousness described as a form of non-dual self-awareness. Within this state, no distinction exists between self and other, consciousness and phenomena, or perceiver and perceived. In this form of self-awareness, it is not the individual (as a person) who is aware of themselves; rather, consciousness itself—or, alternatively, the fabric of experience—is cognizant of its contents and processes as its own manifestations. From the Tibetan Buddhist perspective, this constitutes the most profound, direct, and comprehensive expression of what is referred to in this article as “critical meta-awareness.” Dzogchen teaches that this highly refined awareness extensively permeates our cognitive activities, thereby enabling afflictive mental states to self-liberate. This process is metaphorically described as a knotted snake untying itself autonomously, without any external intervention.

It is noteworthy that, as Dunne (2015) pointed out, modern mindfulness meditation shares traits with non-dual styles of meditation. However, it is indisputable that in Mahāmudrā and Dzogchen, this characteristic is far more pronounced, and achieving such a state of self-awareness is the explicit goal of these practices. The phenomenological and, ideally, neurophenomenological investigation of such a non-dual state of consciousness undoubtedly merits further research. For the purposes of this paper, however, it suffices to briefly consider the significance of these Tibetan practices. They hold considerable potential not only for advancing experimental research into critical meta-awareness but also, possibly, for developing secular practices designed to cultivate this capability. Moreover, the language employed in these traditional teachings makes it clear that the aforementioned concepts should be interpreted phenomenologically rather than metaphysically. *Rig pa* is not a transcendent dimension accessed through meditation. Rather, it is the most direct, full-fledged, and clear realization that every object of our

perceptual and cognitive processes is a construct, a phenomenon emerging within the virtual reality of experience—an insight that aligns closely with findings from contemporary cognitive science (Metzinger, 2009). Therefore, it can be affirmed that these practices do not require specific adjustments in order to be effectively implemented in secular contexts, whether intended for practical applications or research purposes.

Tibetan Dream Yoga

While the practices discussed so far find parallels in other Buddhist traditions, dream yoga (Tib. *rmi lam rnal'byor*) is a particularity of Tibetan Buddhism. It consists of a series of practices aimed at fostering lucid dreaming—that is, dreaming while knowing that one is dreaming—and using this particular state of consciousness for various purposes related to the Buddhist spiritual path. Among the ways to use lucid dreaming (not all applicable in secular contexts), one of the most significant relates to the development of critical meta-awareness. Starting from the Mahāyāna sutras (Conze, 1958; Red Pine, 2012), in Buddhist literature, dreaming has been widely used as a metaphor for the illusory nature of experience, and in texts from the Tibetan tradition known as “mind training” (Tib. *blo sbyong*), practitioners are exhorted to train themselves to view phenomena as dreams (among others, Hor ston nam mkha' dpal ba, 2010). However, lucid dreaming allows for a deeper experiential exploration of this analogy: once the dreamer realizes that they are dreaming, they have the opportunity to observe the various appearances of the dream and recognize that, despite their vividness and detail, they lack any objectivity, being entirely produced by the mind. In doing so, they train to recognize the dream-like nature of experience even in the waking state: although in this case the sensory faculties are active, the experience continues to be constructed by the mind based on its own cognitive models. Interestingly, the continuity and relative indistinguishability between perception and dreaming, both phenomenologically and neurophysiologically, have also been highlighted in contemporary research on lucid dreaming (Hobson et al., 2014).

Thus, from both the perspectives of Tibetan Buddhism and neuroscientific research, lucid dreaming offers the rare opportunity to directly experience the projective nature of experience, leading to the insight that, in dreams as in wakefulness, we inhabit the same virtual reality (Sheehy, 2023). Consequently, according to Tibetan tradition, increasing the frequency of lucid dreaming enhances the faculty referred to here as critical meta-awareness, that is, the capacity to recognize cognitive models as such, thereby generating the benefits associated with this ability. Practitioners are also encouraged to actively transform elements of the dream, gaining flexibility from the recognition of their experiential

content's non-objective nature. This flexibility, as per tradition, is expected to extend into waking life.

An in-depth exploration of Tibetan practices for fostering lucid dreams lies beyond the scope of this article; the focus will instead be on their potential adaptation to secular contexts. As previously noted with regard to the forms of meditation discussed thus far, the dream practices of Tibetan Buddhism are not directed toward mystical or religious experiences, nor do they necessarily presuppose adherence to specific metaphysical beliefs. Instead, they aim to foster a form of critical awareness that is highly compatible with the findings of contemporary cognitive sciences and the associated concept of psychological well-being. Specifically, lucid dreaming has been systematically studied by neuroscience since the 1980s, thanks to scholars such as S. LaBerge (1981) and others. Interestingly, its scientific discovery owes much to LaBerge's encounter with Tibetan Buddhism (Tormen, 2024). As for the benefits that Tibetan Buddhism attributes to lucid dreaming, various modern studies have found a significant correlation between the frequency of lucid dreams and psychological skills and traits related to metacognition or meta-awareness, such as anxiety and stress management, emotional self-regulation, problem-solving, internal locus of control, and a positive sense of detachment that allows one to feel simultaneously as both actor and observer of one's life (Tormen, 2024). While these qualities seem to manifest spontaneously in lucid dreamers, there are still no studies focused on the development of critical awareness as a result of dream practices explicitly aimed at this purpose and inspired by those of Tibetan dream yoga—a line of research that, in light of the preceding discussion, appears to be particularly promising.

Conclusion

In their historical review of contemporary contemplative psychology, Van Gordon et al. (2022) have charted three distinct developmental phases, each marking a significant evolution in the field. The first phase, beginning in the 1980s, predominantly focused on mindfulness-based interventions, laying the groundwork for a broader acceptance of meditative practices in psychological therapy. Subsequently, the second phase, emerging around 2005, witnessed a burgeoning interest in compassion and loving-kindness meditation, reflecting a shift toward enhancing emotional and social well-being. The third phase, believed to have started in 2013, transitioned focus to Buddhist practices centered on wisdom—precisely the focus of this paper. These phases intriguingly mirror the classical tripartition of Mahāyāna Buddhist meditative practices, traditionally organized into trainings focused on concentration, ethics, and wisdom. Concentration training, the one paralleled in modern

mindfulness-based programs, aims to enhance and regulate one's attentional capabilities, facilitating sustained focus that can profoundly affect mental stability and clarity. Ethics training extends beyond personal development, promoting the constructive transformation of interactions and community engagements, and actively cultivating virtues such as compassion and loving-kindness. Lastly, wisdom training develops critical meta-awareness, which involves recognizing and understanding cognitive models as mere constructs rather than reflections of reality, thereby offering deep insights into the nature of perception and consciousness.

It is crucial to highlight two key aspects within this context: firstly, the significant interdependence among these three trainings, as recognized by the Buddhist tradition, which indicates that these trainings not only bolster each other but also are interdependent for successful completion. Such interdependence warrants careful consideration in contemporary contemplative research and the development of secular meditation programs. Secondly, it is worth noting that traditionally, only wisdom leads to liberation; thus, the development of critical meta-awareness is pivotal for profound inner transformations and effectively addressing the core issue of suffering. Within this tripartite framework, training in concentration and ethics provides essential support for the overarching objective of cultivating wisdom.

What has been discussed implies that contemporary contemplative research is just beginning to uncover the fundamental teachings of Buddhism, with its most valuable treasures still to be uncovered. Building on the historical analysis by Van Gordon et al. (2022), it could be argued that the scientific study of Buddhist contemplative practices initially focused on the most immediately accessible and empirically verifiable aspects: the positive impacts of mindfulness meditation on attention regulation and subsequent psychological well-being. Such research has helped to overcome the skepticism associated with the scientific study of meditation, a topic once confined to the domains of philosophy and religion. This shift has then facilitated a deeper exploration of the Buddhist heritage, revealing that key psychological qualities fundamental to Buddhist ethics, such as compassion and loving-kindness, not only positively affect psychological well-being but can also be developed through meditative programs directly inspired by traditional practices. Now, the current and third phase poses perhaps the most formidable challenge, as it requires a deep understanding of the Buddhist concept of wisdom. This entails engaging with complex ideas introduced in the first section, which may initially seem to belong to the religious components—elements that some contend should be removed from Buddhist practices to facilitate their integration into secular contexts.

This paper has sought to dismantle the prevailing bias by demonstrating that, despite terminological differences,

the Buddhist concepts of emptiness and non-self are deeply compatible with contemporary cognitive science's understanding of cognitive processes and the construction of the self. Furthermore, wisdom has been presented as a form of critical meta-awareness that enables the recognition that the phenomena we experience are products of cognitive processes shaped by various factors, such as psychological and motivational influences, and thus lack any objective nature. It has been noted that such critical awareness may reduce the degree of identification with, and involvement in, negative mental states, which in turn can alleviate suffering. It may also enhance flexibility and malleability in the construction of identity, allowing for the discarding of negative patterns and the cultivation of positive inner qualities. Although the capability referred to here as critical meta-awareness remains largely unexplored in current research, a review of the existing literature has highlighted a correlation between metacognitive abilities and psychological well-being. An examination of diverse studies across the various disciplinary branches of contemplative research confirms a significant link between general meditative practice and metacognition, with particular emphasis on studies that closely align with the concept of critical meta-awareness as defined in this work. In the final analysis, a brief review has also been conducted of selected practices within the specific context of the Tibetan Buddhist tradition that are explicitly aimed at cultivating this skill and applying it to positive self-transformation, with the intention of offering actionable insights for future experimental research on the effects of such practices and their potential applications in secular settings. A pivotal question to be posed to researchers in this field is the following: if simple meditation practices, such as mindfulness-based programs, can foster the development of varying levels of critical metacognitive abilities with subsequent positive effects on psychological well-being, what might be expected from contemplative practices that are explicitly designed with this aim?

What, then, are the potential next steps? Firstly, the concept of critical meta-awareness introduced in this paper necessitates a more nuanced definition, ideally leading to the identification of distinct aspects, components, types, and developmental stages within meditative practice. Theoretical refinement of this concept would benefit from an in-depth examination of Buddhist psychological literature. Additionally, beyond achieving a more precise and comprehensive theoretical definition, it is crucial that the notion of critical meta-awareness be supported and expanded through neurophenomenological studies involving practitioners skilled in the most relevant traditional practices. Concurrently, studies could explore the impacts of training novice meditators in short-term, secularly adapted meditative programs, which are crafted to resonate with contemporary mindsets and linguistic contexts. Finally, it is imperative to rigorously

examine the direct correlations between critical meta-awareness and psychological well-being, as well as to identify additional psychological benefits that may result from such training.

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Data Availability No datasets were generated or analyzed during the current study.

Declarations

Ethics Approval and Informed Consent This study did not require ethical approval or informed consent, as it did not involve clinical studies or the collection of empirical data from human participants.

Use of Artificial Intelligence Artificial intelligence tools (ChatGPT by OpenAI) were used to support the editing of language and grammar, under the supervision of the authors.

Conflict of interest The authors declare no competing interests.

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References

- Bernstein, A., Hadash, Y., Lichtash, Y., Tanay, G., Shepherd, K., & Fresco, D. M. (2015). Decentering and related constructs: A critical review and metacognitive processes model. *Perspectives on Psychological Science*, 10(5), 599–617. <https://doi.org/10.1177/1745691615594577>
- Bieling, P. J., Hawley, L. L., Bloch, R. T., Corcoran, K. M., Levitan, R. D., Young, L. T., MacQueen, G. M., & Segal, Z. V. (2012). Treatment-specific changes in decentering following mindfulness-based cognitive therapy versus antidepressant medication or placebo for prevention of depressive relapse. *Journal of Consulting and Clinical Psychology*, 80, 365–372. <https://doi.org/10.1037/a0027483>
- Carmody, J., Baer, R. A., Lykins, E. L. B., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, 65(6), 613–626. <https://doi.org/10.1002/jclp.20579>
- Conze, E. (Ed.). (1958). *Buddhist wisdom: The Diamond Sutra and The Heart Sutra*. Vintage Spiritual Classics.
- Dahl, C. J., & Davidson, R. J. (2019). Mindfulness and the contemplative life: Pathways to connection, insight, and purpose. *Current Opinion in Psychology*, 28, 60–64. <https://doi.org/10.1016/j.copsyc.2018.11.007>
- Dahl, C. J., Lutz, A., & Davidson, R. J. (2015). Reconstructing and deconstructing the self: Cognitive mechanisms in meditation practice. *Trends in Cognitive Sciences*, 19(9), 515–523. <https://doi.org/10.1016/j.tics.2015.07.001>
- De Young, K., Lavender, J., Washington, L., Looby, A., & Anderson, D. (2010). A controlled comparison of the word repeating technique with a word association task. *Journal of Behavior Therapy and Experimental Psychiatry*, 41(4), 426–432. <https://doi.org/10.1016/j.jbtep.2010.04.006>
- Deroche, M.-H., & Sheehy, M. R. (2022). The distinctive mindfulness of Dzogchen: Jigme Lingpa’s advice on meta-awareness and nondual meditation. *Religions*, 13(7), 573. <https://doi.org/10.3390/rel13070573>
- Dorjee, D. (2016). Defining contemplative science: The metacognitive self-regulatory capacity of the mind, context of meditation practice and modes of existential awareness. *Frontiers in Psychology*, 7, 1788. <https://doi.org/10.3389/fpsyg.2016.01788>
- Dunne, J. D., Thompson, E., & Schooler, J. (2019). Mindful meta-awareness: Sustained and non-propositional. *Current Opinion in Psychology*, 28, 307–311. <https://doi.org/10.1016/j.copsyc.2019.07.003>
- Dunne, J. D. (2015). Buddhist styles of mindfulness: A heuristic approach. In B. D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of mindfulness and self-regulation* (pp. 251–270). Springer. https://doi.org/10.1007/978-1-4939-2263-5_18
- Garfield, J. L. (2022). *Losing ourselves: Learning to live without a self*. Princeton University Press. <https://doi.org/10.1515/9780691220291>
- Gayner, B., Esplen, M. J., DeRoche, P., Wong, J., Bishop, S., Kavanagh, L., & Butler, K. (2012). A randomized controlled trial of mindfulness-based stress reduction to manage affective symptoms and improve quality of life in gay men living with HIV. *Journal of Behavioral Medicine*, 35, 272–285. <https://doi.org/10.1007/s10865-011-9350-8>
- Goleman, D., & Davidson, R. (2017). *Altered traits: Science reveals how meditation changes your mind, brain, and body*. Avery.
- Gowans, C. W. (2022). Meditation as cultivating knowledge-how. In R. Repetti (Ed.), *Routledge handbook on the philosophy of meditation* (pp. 161–173). Routledge. <https://doi.org/10.4324/9781003127253-13>
- Gutiérrez, O., Luciano, C., Rodríguez, M., & Fink, B. C. (2004). Comparison between an acceptance-based and a cognitive-control-based protocol for coping with pain. *Behavior Therapy*, 35(4), 767–783. [https://doi.org/10.1016/S0005-7894\(04\)80019-4](https://doi.org/10.1016/S0005-7894(04)80019-4)
- Hanley, A. W., Nakamura, Y., & Garland, E. L. (2018). The nondual awareness dimensional assessment (NADA): New tools to assess nondual traits and states of consciousness occurring within and beyond the context of meditation. *Psychological Assessment*, 30(12), 1625–1639. <https://doi.org/10.1037/pas0000615>
- Harvey, P. (2022). Differences and interaction between meditative cultivation and philosophical thought/insight in early and Theravāda Buddhism. In R. Repetti (Ed.), *Routledge handbook on the philosophy of meditation* (pp. 105–120). Routledge. <https://doi.org/10.4324/9781003127253-8>
- Healy, H. A., Barnes-Holmes, Y., Barnes-Holmes, D., Keogh, C., Luciano, C., & Wilson, K. (2008). An experimental test of cognitive defusion exercise: Coping with negative and positive self-statements. *Psychological Record*, 58, 623–640. <https://doi.org/10.1007/bf03395641>
- Hobson, J. A., Hong, C. C.-H., & Friston, K. J. (2014). Virtual reality and consciousness inference in dreaming. *Frontiers in Psychology*, 5, 1133. <https://doi.org/10.3389/fpsyg.2014.01133>
- Hopkins, J. (1983). *Emptiness yoga: The Middle Way Consequence School*. Snow Lion.
- Hopkins, J. (1996). *Meditation on emptiness*. Wisdom Publications.

- Horston nam mkha' dpal ba (2010). Blo sbyong nyi ma'i 'od zer [Mind training like the rays of the sun]. In Jo bo a ti sha et al., *Blo sbyong brgya rtsa phyogs sgrig* [Compilation of a hundred mind training texts] (pp. 476–584). Ser gtsug nang bstan dpe rnying 'tshol bsdu phyogs sgrig khang.
- Josipovic, Z. (2013). Neural correlates of nondual awareness in meditation. *Annals of the New York Academy of Sciences*, 1307(1), 1–10. <https://doi.org/10.1111/nyas.12261>
- Josipovic, Z. (2021). Implicit–explicit gradient of nondual awareness or consciousness as such. *Neuroscience of Consciousness*. <https://doi.org/10.1093/nc/niab031>
- Kachru, S. (2022). Engaging metacognitive practices: On the uses (and possible abuse) of meditation in philosophy. In R. Repetti (Ed.), *Routledge handbook on the philosophy of meditation* (pp. 91–104). Routledge. <https://doi.org/10.4324/9781003127253-7>
- LaBerge, S., Nagel, L. E., Dement, W. C., & Zarcone, V. P., Jr. (1981). Lucid dreaming verified by volitional communication during REM sleep. *Perceptual and Motor Skills*, 52(3), 727–732. <https://doi.org/10.2466/pms.1981.52.3.727>
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., & Devins, G. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology*, 62(12), 1445–1467. <https://doi.org/10.1002/jclp.20326>
- Lieberman, D. (2013). *The story of the human body: Evolution, health, and disease*. Pantheon Books.
- Lutz, A., Jha, A. P., Dunne, J. D., & Saron, C. D. (2015). Investigating the phenomenological matrix of mindfulness-related practices from a neurocognitive perspective. *American Psychologist*, 70(7), 632–658. <https://doi.org/10.1037/a0039585>
- Lutz, A., Mattout, J., & Pagnoni, G. (2019). The epistemic and pragmatic value of non-action: A predictive coding perspective on meditation. *Current Opinion in Psychology*, 28, 166–171. <https://doi.org/10.1016/j.copsyc.2018.12.019>
- Magno, E. (2012). *Nāgārjuna: Logica, dialettica e soteriologia*. Mimesis.
- Manna, A., Raffone, A., Perrucci, M. G., Nardo, D., Ferretti, A., Tartaro, A., Londei, A., Del Gratta, C., Belardinelli, M. O., & Romani, G. L. (2010). Neural correlates of focused attention and cognitive monitoring in meditation. *Brain Research Bulletin*, 82(1–2), 46–56. <https://doi.org/10.1016/j.brainresbull.2010.03.001>
- McEvilley, T. (1982). Pyrrhonism and mādhyaṃika. *Philosophy East and West*, 32(1), 3–35. <https://doi.org/10.2307/1398749>
- Metzinger, T. (2003). Phenomenal transparency and cognitive self-reference. *Phenomenology and the Cognitive Sciences*, 2, 353–393. <https://doi.org/10.1023/B:PHEN.0000007366.42918.eb>
- Metzinger, T. (2009). *The ego tunnel: The science of the mind and the myth of the self*. Basic Books.
- Mipham, J., & Chandrakirti. (2005). *Introduction to the Middle Way: Chandrakirti's Madhyamakavatara with commentary by Ju Mipham*. Translated by Padmakara Translation Group. Shambhala Publications.
- Namgyal, D. T. (2006). *Mahāmudrā: The moonlight - quintessence of mind and meditation*. Wisdom Publications.
- Ñāṇamoli, B., & Bodhi, B. (1995). *The middle length discourses of the Buddha: A translation of the Majjhima Nikāya*. Wisdom Publications.
- Red Pine. (Ed.). (2012). *Lankavatara Sutra: Translation and commentary*. Counterpoint.
- Longchen Rabjam. (2007). *The practice of Dzogchen: Longchen Rabjam's writings on the Great Perfection*. Snow Lion Publications.
- Ruegg, D. S. (1981). *The Literature of the Madhyamaka school of philosophy in India*. Harrassowitz.
- Sarbacker, R. (2020). Buddhist meditation and the ethics of human augmentation. *Journal of the Japanese Association for Digital Humanities*, 5(2), 61–83. https://doi.org/10.17928/jjadh.5.2_61
- Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62(3), 373–386. <https://doi.org/10.1002/jclp.20237>
- Sheehy, M. R. (2023). Cognitive illusion, lucid dreaming, and the psychology of metaphor in Tibetan Buddhist Dzogchen contemplative practices. *International Journal of Transpersonal Studies Advance Publication Archive*, 59. <https://doi.org/10.24972/ijts.2023.42.2.63>
- Siderits, M., & Garfield, J. L. (2013). Defending the semantic interpretation: A reply to Ferraro. *Journal of Indian Philosophy*, 41(2), 655–664. <https://doi.org/10.1007/s10781-013-9195-2>
- Spackman, J. (2022). Meditation, nonconceptuality, and the reflexive structure of consciousness. In R. Repetti (Ed.), *Routledge handbook on the philosophy of meditation* (pp. 137–149). Routledge. <https://doi.org/10.4324/9781003127253-11>
- Teasdale, J. D., Moore, R. G., Hayhurst, H., Pope, M., Williams, S., & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, 70(2), 275–287. <https://doi.org/10.1037/0022-006X.70.2.275>
- Teasdale, J. D. (2022). *What happens in mindfulness: Inner awakening and embodied cognition*. Guilford.
- Thānissaro, B. (2016). *Sutta Nipāta: The discourse group*. Metta Forest Monastery.
- Tillemans, T. J. F. (2016). *How do mādhyaṃikas think?* Wisdom Publications.
- Tormen, F. (2023). Buddhism has always been posthuman: Philosophical contributions to the transhumanist project. *Canadian Journal of Buddhist Studies*, 18.
- Tormen, F. (2024). *Con gli occhi aperti: Il sogno lucido tra neuroscienze ed esperienze contemplative*. Il Saggiatore.
- Tuck, A. P. (1990). *Comparative philosophy and the philosophy of scholarship: On the Western interpretation of Nāgārjuna*. Oxford University Press.
- Vago, D. R. (2022). How meditation changes the brain: A neurophilosophical and pragmatic account. In R. Repetti (Ed.), *Routledge handbook on the philosophy of meditation* (pp. 174–191). Routledge. <https://doi.org/10.4324/9781003127253-14>
- Van Gordon, W., Saphiang, S., & Shonin, E. (2022). Contemplative psychology: History, key assumptions, and future directions. *Perspectives on Psychological Science*, 17(1), 99–107. <https://doi.org/10.1177/1745691620984479>
- Van Schaik, S. (2013). *Approaching the great perfection: Simultaneous and gradual methods of Dzogchen practice in Jigme Lingpa's Longchen Nyintig*. Wisdom Publications.
- Vervaeke, J. (2022). How a philosophy of meditation can explore the deep connections between mindfulness and contemplative wisdom. In R. Repetti (Ed.), *Routledge handbook on the philosophy of meditation* (pp. 192–208). Routledge. <https://doi.org/10.4324/9781003127253-15>
- Walsh, R. (2015a). What is wisdom? Cross-cultural and cross-disciplinary syntheses. *Review of General Psychology*, 19(3), 278–293. <https://doi.org/10.1037/gpr0000045>
- Walsh, R. (2015b). Wise ways of seeing: Wisdom and perspectives. *Integral Review*, 11, 156–174.
- Westerhoff, J. (2009). *Nagarjuna's Madhyamaka*. Oxford University Press.
- Westerhoff, J. (2016). On the nihilist interpretation of Madhyamaka. *Journal of Indian Philosophy*, 44, 337–376. <https://doi.org/10.1007/s10781-014-9266-z>
- Wrangham, R. (2019). *The goodness paradox: The strange relationship between virtue and violence in human evolution*. Pantheon Books.