



# Pattern Theory of Selflessness: How Meditation May Transform the Self-Pattern

Aviva Berkovich-Ohana<sup>1,2</sup> · Kirk Warren Brown<sup>3</sup> · Shaun Gallagher<sup>4,5</sup> · Henk Barendregt<sup>6</sup> · Prisca Bauer<sup>7</sup> · Fabio Giommi<sup>8,9</sup> · Ivan Nyklíček<sup>10</sup> · Brian Ostafin<sup>11</sup> · Antonino Raffone<sup>12,13</sup> · Heleen A. Slagter<sup>14</sup> · Fynn-Mathis Trautwein<sup>1,7,15</sup> · David Vago<sup>16</sup> · Ajahn Amaro<sup>17</sup>

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## Abstract

For many centuries, scholars and philosophers from wisdom traditions in different cultures have reported and discussed non-self states of consciousness. These states can be both short-term (state, transitory) and long-term (trait, lasting) conditions. However, in psychology, the importance of a healthy self is usually emphasized, and some theorists have dismissed the idea of “selfless” modes of functioning. This disagreement hinders further empirical progress in the study of self and the way it might be affected by meditation. This paper addresses this issue by providing an interdisciplinary conceptual discussion, grounded in the pattern theory of self (PTS). According to PTS, what we call “self” is a complex pattern of dynamically related constituent processes, which include embodied, experiential (prereflective), affective, psychological/cognitive, reflective, narrative, intersubjective, ecological, and normative processes. We propose that Buddhist and secular meditative practices induce a reorganization of the self-pattern, allowing individuals to experience a “selfless” state, both temporarily and persistently. We then put forward a heuristic model, the pattern theory of selflessness (PTSL), possibly experienced through meditation practices. The proposed PTSL model consists of six transformations that contribute to self-pattern reorganization in a nonlinear and iterative manner: consolidating and integrating the self-pattern; cultivating concentration and present-moment awareness; cultivating mindful awareness; self-deconstruction (non-self) states; self-flexibility; and self-liberation as a trait. This conceptual analysis and integrative view contributes to the growing field of consciousness and contemplative research by advancing the contemporary understanding of non-self experience and its relation to Buddhist and secular meditation. The proposed model serves as a basis for interdisciplinary efforts to guide empirical research in this area.

**Keywords** Self-pattern · Buddhist meditation · Mindfulness · Non-self · Selflessness

For many centuries, scholars and philosophers from wisdom traditions in different cultures have reported and discussed non-self states of consciousness (for different traditions, see James, 1958; summarized, for example in Albahari, 2011; Chadha, 2018; Dreyfus, 2019; Dreyfus & Thompson, 2007; Harvey, 2013; Metzinger, 2024; Siderits et al., 2011). More recently, cognitive researchers and neuroscientists have investigated states of selflessness during deep meditative experiences (Dambrun, 2016; Dor-Ziderman et al., 2013), or ego dissolution during deep drug-induced states (Lebedev et al., 2015; Letheby &

Gerrans, 2017; Millière et al., 2018) and near-death experiences (Martial et al., 2021). These quantitative studies were accompanied by qualitative reports of such non-self experiences (e.g., Ataria et al., 2015; Metzinger, 2024). In contrast, some philosophers of mind and phenomenologists claim that no experience can be reported if it is devoid of any, even the most minimal, aspect of the sense of self (e.g., Guillot, 2017; Zahavi, 2011). Thus, whether or not there could be a state of consciousness devoid of any sense of self, namely, a selfless consciousness is an issue that is still under debate (to clarify, what is under debate is not the existence of certain experiences subjectively perceived as selfless, but their philosophical understating and significance in relation to the concept of self and consciousness). Moreover, there is disagreement about the potentially beneficial or harmful consequences of such states (Ataria,

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Kirk Warren Brown and Shaun Gallagher contributed equally to this work

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2014a, 2014b; Dahl et al., 2015; Dreyfus, 2019; Lindahl & Britton, 2019).

Adding to the complexity of this discussion is the distinction between non-self experiences (something personally encountered, undergone, or lived through) as states (short-term, transitory), or as a trait (long-term, lasting). Thus, in the case of trait, experience is altered in such a way that some level of self is permanently relinquished. Buddhist philosophers argue for trait-forming stages of self-transformation, where the regular functioning of the self is diminished or ceases to exist; this is referred to as self-liberation, awakening, or enlightenment (Amaro, 2019; Anālayo, 2021a, 2021b; Shulman, 2010). These concepts partly align with ideas and concepts from positive psychology, where selflessness is considered a psychological trait, referred to as reduced self-centeredness (Dambrun & Ricard, 2011), hypo-egoic psychological functioning (Brown & Leary, 2016; Leary et al., 2006), and self-transcendence (Garland & Fredrickson, 2019; Vago & Silbersweig, 2012; Maslow, 1971). While these different terms have different definitions, we adopt here the conceptualization introduced by Dambrun and Ricard (2011), where selflessness is defined as a psychological mode of functioning, in which the self is experienced as a flexible and dynamic process, lacking reification, and fundamentally interconnected with other (external) processes. Selfless functioning is based on a weak distinction between self and others, and between self and the environment as a whole (e.g., Leary, Tipsord, & Tate, 2008). Thus, selflessness is intimately related to self-transcendence (e.g., Cloninger et al., 1993; Levenson et al., 2005; Piedmont, 1999), wisdom (Ardelt, 2008), and a quiet ego (e.g., Wayment & Bauer, 2008; Dambrun & Ricard, 2011, Leary, 2004). Selflessness as a trait may also take on a moral connotation, as we discuss below. In contemporary literature, however, there is little discussion on the relationship between such selflessness traits and non-self states (e.g., Davis & Vago, 2013).

Several authors have recently proposed theories attempting to integrate meditation-induced selfless states and traits on one continuum, linking phenomenological descriptions with proposed underlying neural mechanisms. These include the nondual awareness theory (Josipovic, 2019), and the minimal phenomenal experience theory (Metzinger, 2020). Other recent cognitive accounts are based on the free energy principle (FEP, e.g., Laukkonen & Slagter, 2021; Limanowski & Friston, 2020). FEP regards decision-making and action programming in any living organism as attempts to minimize prediction errors in the system (Friston, 2010). However, these theories fail to explain how the regular functioning of the self (or how selfless states) transform into a selfless trait.

This paper is the result of an extended discussion between a large interdisciplinary team of scholars and scientists in

the fields of philosophy of mind and contemplative science. The integrative view presented by this group started at the Lorentz Consortium on Mechanisms of Meditation (Leiden, Netherlands, 2019) in a 5-day workshop bringing together international leaders in the fields of philosophy, mental health, and mindfulness meditation research. Over a period of 2 years, we regularly met to discuss issues related to the self from a variety of disciplinary perspectives until we were able to bridge disciplinary differences in terminologies and perspectives and develop a heuristic interdisciplinary framework on how meditation may transform the self and cultivate selflessness as a trait. The conceptualization of self that we used to ground the paper's conceptual and empirical discussions is the pattern theory of self (PTS, Gallagher, 2013), proposing a pattern theory of selflessness (PTSL). The analysis we present contributes to a growing field of research and to the contemporary understanding of the following currently debated issues: (1) How can there be a meditative *state* of “selflessness” without losing all aspects of the self-pattern? and (2) What needs to occur in the self-pattern in order to enable meditation-induced selflessness as a *state* or *trait*? Our discussion demonstrates the relevance of the PTS as a means for understanding Buddhist and related secular styles of meditation. As background, we first introduce the PTS (“Self-patterns” section), and then briefly outline the Buddhist view of the self (“Buddhist Meditation and the (Non-)Self” section). In the “How Does Meditation Transform the Self-Pattern?” section, we introduce our novel account of the meditation-induced transformations to the self-pattern, before offering our conclusions (“Discussion” section). Thus, the “How Does Meditation Transform the Self-Pattern?” and “Discussion” sections mostly contain new discussion and arguments, while the “Self-Patterns” and “Buddhist Meditation and the (Non-)Self” sections set the stage.

## Self-Patterns

To investigate the question of the effects of Buddhist and related secular styles of meditative practices on self-experience, we need to begin with a working conception of the human self. There are numerous conceptions of the self to be found in different Western philosophical traditions, including conceptions of the soul (as in Plato), or a mental immaterial substance (as in Descartes); a psychological identity contingent on processes of consciousness or memory (e.g., Locke, 1948), or an illusion or fiction generated by one's imagination (Hume, 1739); narrative (Dennett, 1991), neuronal processes (Metzinger, 2004); or as a Buddhist perspective might claim, by all of these (Anālayo, 2010; Harvey, 1990; Sayadaw, 2016). For example, in the Buddha's primal teaching on not-self, the “Anatta-lakkhana Sutta”, the

three principal types of self-creation are defined as, “This is mine”, “This is what I am” and “This is my true self” — “*Etam mama, esoham’asmi, eso me atta*”. These can best be described as “the owning self”, “the being self”, and “the narrative self”; in addition to these can usefully be added, “the deciding self”, relating to making choices; “the somatic self”, relating to the felt sense of the body; “the questioning self”, relating to the urge to understand; “the experiencing self”, relating to the subjective sense of perceiving objects; and “the understanding/explaining self”, relating to the sense of comprehension.

In contrast to views that would reduce the self to one thing (e.g., Plato, Descartes, and other views mentioned above), there is a pluralist tradition of defining the self. William James (1890), for example, distinguished between the physical self, the social self, and the private self. Ulrich Neisser (1988) discussed five different types of self-knowledge, which he later (1991) called five aspects of the self: the ecological, the interpersonal, the conceptual, the extended, and the private self. We can find a number of other conceptions that either pluralize the self, reduce it to a minimum (see Strawson, 1999 for a summary), or provide a Buddhist-enactivist account of the self (MacKenzie, 2010; Varela et al., 1991).

For our purposes, we adopt the pattern theory of self (PTS) as a working definition of self. In this view, the human sense of self is a pattern of dynamically related processes or factors that pertain to an individual. This incorporates the pluralist view of multiple aspects or processes, understood to constitute a self-pattern, or processes that form a dynamical gestalt, i.e., processes organized in non-linear dynamical relations across a number of time scales. This is close to an enactive-process view, most closely associated with Francisco Varela and a growing number of other scholars (Di Paolo, 2005; Gallagher, 2013, 2017; Hutto & Myin, 2017; Thompson, 2007; Varela et al., 1991). On this view, the sense of self is not reducible to any one of these factors, but rather is equated with a pattern of factors/processes and their dynamical relations. The dynamic, temporal, and enactive characteristics of the self-pattern align well with the core Buddhist notion of non-self, as we discuss in more detail elsewhere (Gallagher et al., 2023).

According to PTS, a self-pattern integrates a heterogeneous set of temporally extended processes: bodily, experiential, affective, behavioral, cognitive, narrational, ecological, social, cultural, and normative processes. This is a dynamical integration of both conscious and non-conscious processes which typically brings coherence and determines how, under given circumstances, one lives and plans to live. Although it is beyond the scope of this paper to broadly address the concept of pattern, on one view, a pattern is a system of factors or processes that lacks any strictly necessary conditions but rather consists of several jointly sufficient conditions

(Newen et al., 2015). Although there may be some minimal number of characteristic features and their values that are sufficient to constitute a particular self-pattern, there may be self-patterns that lack a particular characteristic feature. For example, if episodic memory counts as a cognitive ability that is typically part of the self-pattern, the loss of episodic memory in cases of amnesia or Alzheimer’s disease still leaves other elements of the self-pattern intact, even if modified. A self-pattern may lack some typical elements, and psychopathologies may be understood as involving conflicts between, disruptions of, or the elimination of one or more of these elemental processes (Gallagher & Daly, 2018; Gallagher, 2023).

To be clear, within a self-pattern, understood as a dynamical gestalt, and much like an autopoietic (self-organizing) entity, there is no element that operates as an agent. As Kelso (1995, p. 1) indicates, “patterns in general emerge in a self-organized fashion, without any agent-like entity ordering the elements, telling them when and where to go”. This means there is no self within a self-pattern. A self, of the sort that you are, and that I am, just is a pattern.

An important question is how heterogeneous elements or processes can be coherently integrated. The idea that all of the elements or factors involve *processes* may provide a common denominator (Kelso, 1995). Elemental processes are dynamically integrated such that an intervention on any one process, above a certain threshold, will have an effect on the others and on the whole. Accordingly, the following is not meant simply as a list that lacks integration (Kyselo, 2014; Haan et al., 2017), but a set of components dynamically interrelated in a pattern or gestalt arrangement (Gallagher & Daly, 2018):

1. *Embodied processes*: These include core biological processes related to motoric, autonomic, endocrine, enteric, immune, and interoceptive functions, i.e., processes which allow the overall system to maintain homeostasis necessary for survival, and to distinguish between itself and what is not itself (Christoff et al., 2011; Legrand & Ruby, 2009) — an extremely basic set of functions that both enable and constrain all kinds of animal behavior.
2. *Prereflective experiential processes*: Includes prereflective self-awareness, a structural feature of first-person consciousness constrained by bodily factors, sometimes referred to as the minimal self (Gallagher & Zahavi, 2012; Gallagher, 2000; Zahavi, 2007). These processes involve various sensory-motor modalities (kinesthesia, proprioception, ecological aspects of touch, vision, etc.), and manifest in a sense of ownership (or “mineness” of one’s experience) and a sense of agency over one’s actions (Rochat 2011; Gallagher, 2012).

3. *Affective processes*: Ranging from basic bodily affects (e.g., hunger, fatigue, libido) to some mix of existential feelings (Ratcliffe, 2008), to more complex mood, emotional responses, and temperament (Newen et al., 2015).
4. *Behavioral/action processes*: Behavioral habits and skills reflect and are thought to contribute to the constitution of our character (Verplanken & Sui, 2019). This is a classic view that goes back at least to Aristotle.
5. *Psychological/cognitive processes*: Complex factors, which may range from explicit (reflective) self-consciousness to a conceptual understanding of self as self, to personality traits of which one may not be conscious at all. These are aspects of self that traditional philosophical theories focus on (Locke, 1948; Neisser & Jopling, 1997), and in the literature on personal identity, psychological continuity and the importance of memory are highlighted (e.g., Shoemaker, 2011).
6. *Reflective processes*: These include the ability to self-attribute and to reflect evaluatively on one's experiences and actions. Such processes are closely related to intention formation and the notions of autonomy and moral personhood, including the capacity to reflect and form second-order volitions about one's desires (Frankfurt, 1988; Taylor, 1989).
7. *Narrative processes*: Some theorists make the strong claim that self-narratives or stories about oneself are constitutive for selves (Dennett, 1991; Schechtman, 2011). For PTS, self-narrative is just one aspect in a developed self-pattern (it is absent in pre-linguistic infants, even if anchored in pre-verbal infant communication (Dautenhahn, 2002; Sparaci & Gallagher, in press), and can be lost, as in cases of dysnarrativa (Bruner, 2002).
8. *Social/intersubjective processes*: Humans are born with a capacity for attuning to intersubjective existence (Reddy, 2008; Trevarthen, 1979). Neisser (1988) calls this the interpersonal self which develops into a social self-consciousness — a self-for-others (Mead, 1913) reflected behaviorally in mirror self-recognition (Gallup et al., 2011), and neuronally involving the mirror system that activates for both self and other (Gallesse, 2014). As Charles Taylor puts it: "One is a self only among other selves. A self can never be described without reference to those who surround it" (1989, 35).
9. *Ecological (Extended/situated) processes*: Our embodied-situated actions engage with (and sometimes incorporate) artifacts, instruments, bits, and structures of the environment in ways that define us and scaffold our identities (Clark & Chalmers, 1998). Situations shape who we are (Dewey, 1922), and affordances define our possibilities (Gibson, 1977). Not only do we identify with our material belongings (James, 1890), we are dynamically related to the action possibilities afforded by the technologies we use, our professions, the groups we belong to, and the institutions we work in (Heise & MacKinnon, 2010).
10. *Normative processes*: Social and cultural practices are permeated with value-determining norms (Frega, 2015). These specify not just what we do, but also involve what we are expected to do. Often, well-defined roles imposed by social, cultural, and institutional factors shape our habitual behaviors, and our self-conceptions of who we are, and who we think we should be (Sunstein, 1996). These factors range across possibilities presented by the kind of family structure and situation in which we grew up, as well as by constraints that define our way of living, involving gender, race, and economic status.

According to the PTS, these various factors are inter-related. For example, narrative processes not only constitute one element, but reflect most of the other aspects and processes of the self-pattern. Our self-narrative reflects our corporeal anchoring in the world insofar as narrative is sometimes about action, and action is a bodily accomplishment. Narrative can track an individual's actions and experiences of agency, for example (Gallagher & Daly, 2018). I may form a reflective, retrospective narrative about whether I should have (or should not have) engaged in some action (reflecting a normative aspect), or a prospective narrative, as part of my intention to do something. Engaging in an action after reflecting on it (or forming a narrative about it) is likely to strengthen my prereflective sense of agency for that action (Gallagher, 2012). We could add to this the long-term sense of one's capacity for action over time, which Elisabeth Pacherie identifies as related to self-narrative "where one's past actions and projected future actions are given a general coherence and unified through a set of overarching goals, motivations, projects and general lines of conduct" (Pacherie, 2007, p. 6). Relative to intersubjective processes, one's self-narrative reflects practices that "are based on actions in which an agent takes into account, as a matter of principle, the actions of others" (Ricoeur, 1992, 155). Actions are often interactions that involve other agents, and precisely in this respect, the intersubjective, ecological, and normative features of the self-pattern are not isolated realms separated from embodied action. As Jerome Bruner (1990, p. 4) describes, "we organize our experience and our memory of human happenings mainly in the form of narrative — stories, excuses, myths, reasons for doing or not doing, and so on". Narrative reflects such features and allows us to frame our understanding of both our own actions and those of others in ways that recursively shape those actions and our own experiences. In the PTS, narrative thus hits on every other aspect of the self-pattern — bodily, experiential,

behavioral/action-related, intersubjective, psychological/cognitive/reflective, ecological, and normative — as well as the affective. Affect refers to valence-specific features of emotional reactivity, mood, or discrete emotion-specific features that can act as the glue in keeping the various self-pattern elements hanging together (Schechtman, 1996). Affective associations connected with past actions condition our current actions, sometimes even if we do not have explicit memories of those past actions (Colombetti, 2014). More generally, affective dimensions may contribute to our feelings of worthiness and self-esteem (Pelham & Swann 1989). Importantly, this general orientation toward the world will affect a person's interactions with others, one's choice of action, and one's specific dispositions in various situations (Blanchette & Richards, 2010). All of this, in turn, comes to be reflected in one's narrative. Thus, narrative processes are sculpted by one's past experiences in various ways and may hence in particular determine the configurations one's self-pattern can take on.

Importantly, we suggest that excessive influence of narrative processes on the other processes can lead to reduced self-pattern flexibility, described as the ability to switch between different (sometimes conflicting) experiences within any aspect of the self-pattern, as well as experience multiple aspects simultaneously. Reduced self-pattern flexibility supports perseverative mental states as in depressive or anxious episodes, as well as in states of craving, attachment or clinging. There are many pathological conditions which further hamper self-pattern flexibility, moving the system toward states of “stickiness” and “rigidity” (the relation between self-flexibility and psychopathology is discussed in Giommi et al., 2023). As we argue below, this learned and habitual inflexibility is addressed by meditation practices, which re-order and create more flexibility in the self-pattern.

One way to examine the interconnections in the self-pattern is by tracing neuronal processes that may underpin or correlate with various aspects and their interactions; another way may be to use neuroimaging, which helps visualize these connections reflected in brain patterns, which can undergo dynamical changes in pathology (Fingelkurts & Fingelkurts, 2017). Although the idea of a self-pattern supports a non-reductive approach to understanding self, this is not meant to exclude or downplay the relevance of neuroscience or brain functions that may correlate with many of the bodily, experiential, and cognitive factors that make up a self-pattern (the neuroscientific aspects of the dynamic self and the clinical and psychotherapeutic consequences are discussed in Giommi et al., 2023).

For purposes of our later analysis of the concept of non-self, we would also like to focus on *prereflective experiential processes*, sometimes referred to as the minimal self (Cermolacce et al., 2007; Ciaunica & Crucianelli, 2019; Gallagher, 2000), and contrasted to reflective narrative processes

within the self-pattern. The minimal self involves the notion of a basic prereflective self-consciousness (Zahavi, 2011). Most phenomenologists explain this as a structural feature of the flow of consciousness implicated with its intrinsic temporality (Gallagher & Zahavi 2012; Husserl, 2001). The phenomenologist Edmund Husserl, not unlike James (1890), argued that in any moment of consciousness, we are aware not only of a knife-edge present moment, but we retain a little bit of our just-past experience, and we anticipate (or “protend”) a little bit of what is just about to happen. If this were not the case, we would never be able to perceive a melody or understand a sentence (we would literally hear only one note or word at a time, unconnected with any other note or word). On this phenomenological account, the flow of experience is unified across short time periods by the retentional-protentional structure intrinsic to it (Gallagher & Varela, 2003). That is, the previous few seconds of perception of a temporal object, such as a melody, are retained in the current moment. Retention in this view does not involve an explicit act of recollection; it is distinct from episodic memory which is required to recall a melody that has faded from retentional consciousness.

Importantly, retention (as well as protention) involves a double intentionality (Husserl, 2001). Retentional consciousness of a melody, for example, retains the just-past phase of consciousness which includes the just-past awareness of the previous note. The previous notes of the melody are retained by way of retaining the previous moments of experience. This means that we are aware, not just of the melody as it develops, but of our experience as it unfolds. Retention thus constitutes a form of minimal (very short-term) self-awareness, understood not as an awareness of *a self*, but as an intrinsic awareness of one's own experience. This is a first-person prereflective self-awareness which does not take one's experience as an object, but rather is an intrinsic structural feature of one's consciousness of any object. It provides a basic sense that this experience is *my* experience (a sense of mineness, or ownership), and that this experience is distinct from what is experienced (e.g., the melody).

The analysis of this intrinsic temporal structure by Husserl was originally based on phenomenological evidence, reflecting, for example, how we experience a melody or a sentence. Empirical evidence for this view has been developed in cognitive neuroscience and has been explicated in neurophenomenological and predictive processing models (Varela 1999; Hohwy et al., 2016; Wiese, 2017). This structure of consciousness is similar to what Neisser (1988) calls the embodied ecological aspect. For example, when I move I am aware of changes in my perceptual field and at the same time, prereflectively aware that I am moving. When I am engaged in action, this structure also provides a sense that I am the one acting, a sense of agency which also involves anticipating (protending) where the action is heading.

In the following sections, we will address the question of how meditative practices, through the lens of Buddhist psychology, can influence the self-pattern, including prereflective self-awareness, during states of non-self. We also suggest a series of transformations of the self-pattern that move towards selflessness as a trait.

## Buddhist Meditation and the (Non-)Self

Here, we focus on Buddhist-related meditation practices, due to the special place the self and its transformations receive in this tradition and the highly detailed descriptions of these practices that allow for appropriation into a scientific context (Lutz et al., 2007). Particularly, Buddhism includes an analysis of human psychology, emotion, cognition, behavior, and motivation along with accounts of therapeutic practices (De Silva, 2005; Virtbauer, 2012), all of which are relevant to our discussion of different self-processes.

Our frame of reference includes the work of contemporary scholars of Buddhist psychology (De Silva, 2005; Engler, 1998; Fulton & Siegel, 2013; Olendzki, 2003) as well as the original Buddhist teachings and psychological insights about the self. We refer in particular to the *Sutta Nikayas* in the Pali Canon as transmitted by the Theravada tradition, in their earlier versions or “Early Buddhist teachings”, as we can best access them today through scholarly work (Anālayo, 2017; Gethin, 1998, 2008; Gombrich, 2006; Harvey, 1995, 2012) and their main developments as reflected in the *Abhidhamma* (Bodhi, 1993) and *Visuddhimagga* (Nyanamoli, 2011) treatises. The expression “early Buddhist discourses (or teachings)” refers to the discourses found in the Pali Canon and their parallels. Comparative study of these discourses allows us access to the earliest strata of Buddhist thought, inasmuch as this has been preserved in textual records, and thereby enables us to reconstruct the thought of early Buddhism. Parallels to Pali discourses are often found in collections called *Āgamas*, which for the most part have been preserved in Chinese translation. At times parallels are also extant in Sanskrit fragments, or in Tibetan translation, or on rare occasions in other Asian languages (Anālayo, 2017).

Yet, it should be noted that Buddhism is not monolithic and different strands hold different views on the self and value of non-self states (Dunne, 2011; Thompson, 2020). There are also nondual traditions outside of Buddhism, such as Hindu or Vedic practices that describe meditative states characterized by self-transcendence (e.g., Alexander & Langer, 1990). While we build on classic Buddhism as accessible through the “Early Buddhist Teachings” as a paradigmatic framework for understanding how selfless

states and the trait selflessness may come about from the perspective of the self-pattern theory, our framework may ultimately be extended to include other contemplative frameworks of selflessness, to come to a more generic understanding of how selflessness may emerge.

Briefly, in Buddhism, the experience of a self as permanent as well as causally separated from others and the world is regarded as a delusion (Dreyfus & Thompson, 2007). This form of delusion is described as “wrong view” (*sakkaya-ditthi*), in Buddhist teachings and psychology (Anālayo, 2010; Harvey, 1990; Sayadaw, 2016). As a remedy to this “wrong view”, the Buddhist tradition offers a systematic training. This systematic training includes three lines of training (called the threefold path, Nyanaponika and Bodhi (1999)), which together encompasses eight aspects (the Buddhist eightfold path), leading finally to the Buddha’s fourth noble truth, the full path to enlightenment, or liberation (Gombrich, 1995). In Pali, the three lines of training are *sīla* (discipline or ethical living), *samādhi* (concentration), and *paññā* (insight, intuitive comprehension, or wisdom) (De Silva, 2005; Nyanaponika & Bodhi, 1999). These trainings will be briefly described below in our discussion of how meditation transforms the self-pattern, since some of the proposed transformations follow different aspects of the classical Buddhist practice. A basic premise of Buddhist psychology is that given the deeply ingrained view about the self as a separate, continuous, permanent, and intrinsically existing entity, it is hard to break through it (De Silva, 2005). Realization of non-self may not be phenomenologically accessible in ordinary conditions (i.e., outside of meditative insight), because mechanisms of self-defense prevent the “right view” from being experienced clearly. Indeed, this insight first may cause disorientation and even outright fear. According to a Buddhist view, however, by using the threefold training, the practitioner may be able to penetrate into the true nature of reality (i.e., of self) and free herself from the fundamental ignorance that causes suffering. When experiential access to the non-self at a subtle level is enhanced, it reveals to consciousness the composite, dynamical, and ultimately empty nature of the self.

The classic Buddhist teaching on the “three fires”, i.e., greed, hatred, and delusion, points out the co-production of what are considered to be unwholesome “mental factors” (Olendzki, 2005, 2010). The self-involvement and “fueling” of drives and emotional reactivity correspond to the notion of *upadana* in Buddhist psychology, generally translated as attachment, clinging, grasping, and fueling, including the core facet of self-clinging, related to the wrong view (Gombrich, 2005). Such states are referred to in Buddhist psychology as mental elaboration (illusory, repetitive, and even obsessive) upon any

sense object that arises in experience (*papañca* in Pali), i.e., reiteration and elaboration of thoughts through many cycles of conceptualization and narration (Nyanananda, 1997).

According to classical Buddhist psychology, systematic training leads to the abandonment of the three fires. By settling and calming the mind through dedicated meditation practice, one achieves a more peaceful state and gradually is no longer controlled by one's delusions and conflicting emotions. One who is fully accomplished in this training attains total liberation (*nirvāṇa* in Sanskrit) from desire, hatred, and delusion (Gombrich, 2009). This is also called enlightenment, or realization, signified as the end of unwholesome mental factors. Once there is liberation, one does not require technique any more: it is the simple experiential knowing of the non-self, as one of three characteristics of existence (Harvey, 2013).

Buddhist psychology does acknowledge that in ordinary human experience, the mind–body pattern and its constituent processes are subject to being identified with a self to which we cling in a form of attachment, based on the wrong view that posits a permanent, intrinsically existent and separate self (Amaro, 2019; Anālayo, 2021a, 2021b; Harvey, 2013). PTS allows us to understand the self-pattern as a set of self-organizing processes extending over brain-body-environment in which no one element can be identified as an agentic self. This view closely correlates to the Buddhist psychological view of the five aggregates (for a discussion of this point, see Gallagher et al., 2023). The aggregates are considered to be impersonal psychophysical processes that in some way give rise to a sense of self and agentic control, and tend to provide a self-identity to which we cling (e.g., Bodhi 2000; Dalai Lama, 1966; Davis & Thompson 2013; Harvey, 2013). The five aggregates (*khandhas*) include:

- (1) Bodily or material forms experienced in different sense modalities (*rūpa*);
- (2) Feelings/sensations (*vedanā*);
- (3) Cognitive discernments (*saññā*, *saṃjñā*; e.g., perceptual differentiation, categories, with practical [action-related] implications);
- (4) Dispositional formations and habitual volitional states (*saṅkhārā*, *saṃskāra*); and
- (5) Consciousness (*viññāṇa*, *viññāna*), i.e., awareness of an object and discrimination of its components and aspects.

The important point emphasized by the Buddhist accounts is that one cannot find the self in any one of these aggregates; nor is there a self in the totality of the aggregates (Varela et al., 1991, p. 69).

## How Does Meditation Transform the Self-Pattern?

From a psychological perspective, Buddhist meditation can be described as a form of mental training that aims to monitor and self-regulate the body and mind, thereby affecting mental and bodily processes (perception, emotion, and homeostasis), frequently by engaging a specific attentional set (Cahn & Polich, 2006). Such practices have been developed in many different cultures, not just Buddhist cultures, yielding numerous meditation techniques (Goleman, 1988). Previous attempts to categorize this remarkable diversity of practices based on their core aims and primary mental techniques have resulted in several typologies (e.g., Dahl et al., 2015; Lutz et al., 2008; Travis & Shear, 2010). Notwithstanding some variations, there is some agreement that there are two main styles of meditation practice. The first is focused attention (FA) — sustaining one's attention on a particular object or sensation such as the breath, or bodily sensations. The second is open monitoring (OM) — engaging a non-judgmental, non-selective awareness of the present moment. Note that although FA and OM are umbrella terms that also cover concentration and insight processes outside of the Buddhist tradition (Lutz et al., 2008), we use them here to designate processes within Buddhist practices. In addition to these processes, other practices involve harnessing emotional qualities (EQ), aimed at fostering loving-kindness and cultivating compassion toward oneself and others (e.g., Dahl et al., 2015). We propose that the three practices could roughly be related to the three Buddhist lines of training, where *sīla* mainly develops EQ, *samādhi* mainly cultivates FA, and *paññā* relates to OM. These three types of practices are often combined in contemporary secular contexts, whether in a single session or over the course of a practitioner's training.

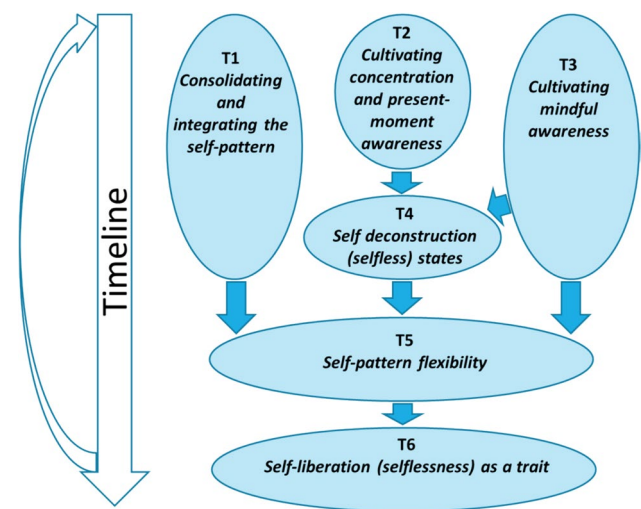
Most scientific research on meditation has focused on techniques originating in the Buddhist tradition, with a particular focus on practices often considered under the category of mindfulness meditation (Tang et al., 2015). Indeed, in the last four decades, meditation training has become popular through secular mindfulness-based interventions, aimed at fostering a non-judgmental attitude, or emotional acceptance, together with meta-awareness and associated attention to the present moment (e.g., Bishop et al., 2004; Hölzel et al., 2011; Lutz et al., 2015; Malinowski, 2013). Mindfulness meditation, while considered by some an OM practice (Lutz et al., 2008), nevertheless often combines all three practices (OM, FA, and EQ) during secular training, e.g., in the Mindfulness-Based Stress Reduction (MBSR) program (Kabat-Zinn, 2011). While there has been extensive work exploring the self

in the context of mindfulness meditation (reviewed by Shireen et al., 2022), here we focus on the effects of such Buddhist practices on the self-pattern, with some reference to relevant aspects of the threefold Buddhist training mentioned above.

We propose that these Buddhist meditative practices can induce a reorganization of the self-pattern which allows for the realization of a “selfless” condition, both as a state and a trait. We put forward a heuristic model, the pattern theory of selflessness (PTSL), summarizing details of transformations experienced through meditation practices. Specifically, following closely on the insights of Buddhist psychology (which we continue to explicate in the following analysis) (e.g., Anālayo, 2017; Dalai Lama, 1966; Gethin, 1998; Harvey, 2013; Ñāṇamoli, 2011; Sayadaw, 2016), the heuristic model suggests six psychological transformations of the self-pattern. We suggest that the interplay between the meditative practices contributes to self-pattern reorganization along several of these transformations, and we explain how these may correspond to alterations in the self-pattern. We specifically propose that EQ, FA, and OM practices play an important role in reorganizing the self-pattern, fostering consolidation, concentration, and mindful awareness, correspondingly (first three transformations). This, together with processes that can be largely characterized as “deconstructive” (fourth transformation) act together in making the self-pattern more flexible (fifth transformation) and eventually lead to self-liberation (sixth transformation).

While these transformations are not thought to occur in a stringently linear and consecutive way, following the idea of a dynamical gestalt of the self-pattern, but to rather unfold in a nonlinear and iterative process represented in our model (Fig. 1). Although the transformations are laid out in a certain order visually, they are not necessarily experienced in this order through practice or experience.

Notably, there are a few previously developed cognitive models focused on the effects of meditation on self-consciousness (e.g., Dorjee, 2016; Vago & Silbersweig, 2012). Specifically, Dorjee (2016) proposed a gradient of dereification, outlining the progression of existential awareness from immersion in phenomena, through decentering, to absorption, then experiential emptiness of the self, to pristine awareness which “experientially transcends the notions of self through the dissolution of the duality between the observer and the observed” (p. 7). While acknowledging such previous contributions, we also note that the multitude of definitions of self used in different disciplines hampers interdisciplinary agreement. Vago & Silbersweig (2012) described different resting state networks in the brain that support the different patterns of self-processing and how each is impacted by systematic mental training with mindfulness. Our heuristic model proposed herein aims to bridge Buddhist practices and an integrative



**Fig. 1** A schematic model of the pattern theory of selflessness (PTSL). A heuristic drawing for six proposed self-pattern transformations (T1–T6) following Buddhist meditative practice. The schematic timeline demonstrates that the entire process is nonlinear and iterative (curved line). The first three transformations may happen in parallel, and could roughly be related to the three Buddhist lines of training and practices, where *sīla* (discipline or ethical living) mainly develops emotional qualities (EQ) and contributes to T1, *samādhi* (concentration) mainly cultivates focused attention (FA) contributing to T2, and *paññā* (insight, intuitive comprehension, or wisdom) relates to open monitoring (OM) mainly fostering T3. These three types of practices are often combined in contemporary secular contexts, whether in a single session or over the course of a practitioner’s training, hence T1–T3 can be seen as interrelated. The possible directionality of the process is seen in the relation between deep states of absorption (T4), which mostly result from concentration training (FA, related to T2) and self-inquiry and insight (OM, related to T3). All the first four transformations contribute to achieving self-pattern flexibility (T5), which is a prerequisite to achieve self-liberation (T6). However, as self-liberation lies on a continuum of attainment levels (distinguished by a progressive abandonment of restraints), the entire process can be regarded as iterative, towards a progressive ending of suffering

enactive-phenomenological theory of the self, i.e., the pattern theory of self, where meditation-induced alterations in the sense of self (whether state or trait) could be positioned and explained.

In the following, we explain each of the proposed six transformations, and first detail the effect of the first three transformations on the specific processes of the self-pattern. In doing so, we selectively focus on only seven of the processes which pertain to the dynamics of the self-pattern (summarized in Table 1). We set aside three processes that reflect world orientation, including behavioral, ecological, and normative processes. These processes present a change of the organisms’ actions and environment which transform as a result of the accumulating transformations, and they will be discussed together, in the short summary after presenting the first three trait transformations.

**Table 1** A brief summary of the effect of the four first transformations according to the pattern theory of selflessness (PTSL). We focus on the specific processes of the self-pattern which pertain to the internal dynamics of the self-pattern, while excluding more world-involving processes (Behavioral, Ecological, and Normative processes)

Self-pattern aspects	1st transformation <i>Consolidating and integrating the self-pattern</i>	2nd transformation <i>Cultivating concentration and present-moment awareness</i>	3rd transformation <i>Cultivating mindful awareness</i>	4th transformation <i>Self-deconstruction (non-self) states</i>
<i>Embodied processes</i>	Reduced addictive behavior can improve the function of the embodied self	Focusing on sensory experience anchored within the body enhances interoceptive processing; Attentional control may be important mechanism linking mindfulness interventions with physical health	Decentering is a core mechanism mediating mindfulness interventions with physical health	Prolonged sitting reduces proprioceptive processes, and multi-sensory integration, related to self-location in space and time, and enables grosser levels of the perceived body to phenomenologically “disappear”
<i>Prereflective experiential processes</i>	The reduction of addictive or abusive behavior can strengthen sense of agency and control	Enhanced awareness of prereflective experience, e.g., sense of self-boundaries	Decentering can contribute to equanimity, which was shown to be related to more relaxed and flexible sense of body-boundaries	Prereflective processes, which involve first-person perspective (PPP) and agency over one’s embodied processes, may shift, weaken or, in the case of the sense of agency, vanish
<i>Affective processes</i>	Changing mood towards stress reduction and enhanced positive states	Reducing mind wandering is related to positive affect. Enhanced interoceptive awareness is related to reduced negative affect	Decentering or cognitive defusion reduces identification with thought contents, and in turn disentangles from self-oriented negative emotions, enhancing emotional well-being	Can lead to intense aversive emotional states. On the other hand, may support the development of transformative mental factors of positive affect
<i>Psychological/cognitive processes</i>	More coherent and positive self-concept and hence heightened self-esteem; allow painful aspects of the self-pattern to be processed; cultivation of compassion towards others	Enhanced embodied experience supports a transition from conceptual knowledge to tacit and bodily knowledge	The enhanced decentering and emotional equanimity can reduce automatic cognitive biases	Awareness is experienced as non-conceptual, empty of phenomenal content, yet reflexively aware, which functions as a witnessing-consciousness, enabling reportable content post-state (in extreme absorption cases, even this mindful nondual awareness could be lost)
<i>Reflective processes</i>	Reflecting evaluatively on one’s intentions and actions, in light of the Buddhist values	Faster to notice disengagement from the focus of attention, better at monitoring momentary experience, which supports longer concentration periods	The <i>reflective</i> experience becomes <i>reflective</i> , i.e., habitual, immediate and faster	There are very few or none in such deep states
<i>Narrative processes</i>	Suspend negative self-judgements and increase positive ones; widens the inclusiveness of one’s sense of identity	Enhancing concentrative abilities can link inner speech to the control of attention, hence enhancing coherency between different self-narratives	Enhanced decentering and cognitive defusion reduces identification with thoughts, and changes perspective about the narratives, hence reduce the rigidity and importance of the narrative processes	Impermanence-related insight breaks the underlying view of the self as a continuous entity. In this case, self-narrative should cease

**Table 1** (continued)

Self-pattern aspects	1st transformation <i>Consolidating and integrating the self-pattern</i>	2nd transformation <i>Cultivating concentration and present-moment awareness</i>	3rd transformation <i>Cultivating mindful awareness</i>	4th transformation <i>Self-deconstruction (non-self) states</i>
<i>Social/intersubjective processes</i>	Social understanding and behavior can change towards better social interaction and intersubjective existence	Giving more attention to external stimuli, including social interactions may strengthen awareness of intersubjective signals	Reduced self-identification suggests less self-biases at the level of interpersonal processes, which reduces prejudice and negative attitudes towards outgroup members	There are very few or none in such deep states

### Consolidating and Integrating the Self-Pattern

According to our account, the consolidation and integration of the self-pattern are the key to all other self-transformations, referring to ethical behaviors and practices as cultivated through constructive or ethically focused practices. It results from training in *Sīla* (discipline or ethical living), which encompasses three aspects: right speech, right action, and right livelihood (Keown, 2016). Living ethically and purely is both the ground of the Buddhist path and its result, as the five suggestions for living are to have respect for life; possessions (of others and oneself); speech (no lying, gossip, or harsh language); sexuality (without violence and within consensus); and one’s body and mind (healthy consumption). In the Buddhist eightfold path, *Sīla* is meant not as a set of abstract ethical rules that must be superimposed and enforced into the practitioner’s life: the approach is not “moralistic”. *Sīla* is applied by a number of practices (such as refraining from killing, stealing, sexual misconduct, lying, and intoxicants) to be gradually experienced, in order to observe in one’s life, how ignoring the ethical principles results in more suffering for oneself and for others. From the Buddhist perspective, “wholesome” is whatever reduces suffering over time, and “unwholesome” is whatever increases it (Germer, 2013). Hence, the idea is that without this fundamental ground, one inevitably risks experiencing detrimental effects.

Psychologically, we suggest that this transformation first consolidates the self-pattern around a positive self-conception and stabilizes the self-pattern by encouraging self-compassion, and hence a reduction in abusive behaviors towards oneself (Neff, 2003). We propose that this works to help develop a sense of stability, predictability, and self-esteem (Michalon, 2001), which is considered a crucial source of coherence and continuity, and invaluable means of defining existence, organizing experience, predicting future events, and guiding social interaction (Swann & Buhrmester, 2012). Secondly, we propose that this transformation strengthens existing aspects of the self-pattern, both via accepting aspects of the self-pattern, and via the cultivation of virtuous qualities, such as self-forgiveness or compassion towards others, which may widen the inclusiveness of one’s sense of identity towards all human (or sentient) beings (Loy et al., 2022; Vago & Silbersweig, 2012).

The meditation practices that contribute the most to fostering this transformation are EQ, i.e., loving-kindness and compassion (Dahl et al., 2015). These practices serve to (i) orient the practitioner towards values, such as being kind and compassionate to oneself and others, hence influencing one’s ethical choices (Loy et al., 2022); (ii) induce constructive and integrative process of thought and internal verbalization, tightly linked to prospective behavioral intentions (Dolcos & Albarracín, 2014); and (iii) encourage wholesome behaviors

by reducing abusive or addictive behaviors towards oneself and others (Neff, 2012).

We propose that this transformation, occurring through EQ practices, affects all aspects of the self-pattern (as supported by the cited references, summarized in Table 1):

1. *Embodied processes* — We suggest that reducing addictive behavior through EQ practices can improve the function of the embodied self, e.g., counteract sensory and motor processes which are involved in the different stages of addiction (Yalachkov et al., 2010).
2. *Prereflective processes* — The reduction of addictive or abusive behavior can strengthen the sense of agency and control (Levy, 2006). Also, the relaxed affective processes can in turn contribute to a more relaxed and flexible sense of body-boundaries (Ataria, 2014a, 2014b).
3. *Affective processes* — We suggest that reducing abusive behavior and thought through EQ practices positively affects the entire typical emotional pattern, from bodily to mental processes, gradually changing mood towards stress reduction and enhanced positive states (e.g., contentment). This is aligned with the well-documented stress reduction and emotion regulation enhancing effects of meditation (e.g., Chambers et al., 2009; Farb et al., 2012; Manzanique et al., 2011).
4. *Psychological/cognitive processes* — We propose that one's concept of oneself shifts towards maintaining a more coherent and positive self-concept and hence heightened self-esteem (Baumeister et al., 1996; Deci & Ryan, 2000). Practice of self-compassion might allow suppressed, neglected, or painful aspects of the self-pattern to emerge and be processed (Neff & Germer, 2013), as well as cultivate compassion towards others. We contend that this results in a more stable, consolidated, and integrated sense of self.
5. *Reflective processes* — During EQ practices, one starts reflecting evaluatively on one's intentions and actions, in light of the Buddhist values and wholesome conduct guidelines. We propose that this, in turn, strengthens self-reflection and alters intention formation.
6. *Narrative processes* — One's narrative and sense of personal identity will inevitably be affected by all the above alterations in thoughts, feelings, and behavior in an adaptive way, which in turn might suspend negative self-judgements and increase positive ones. Moreover, cultivation of virtuous qualities towards others widens the inclusiveness of one's sense of identity towards all human (or sentient) beings (see also the mindfulness to meaning theory, Garland et al., 2015, 2017a, 2017b).
7. *Social intersubjective processes* — By assimilating wholesome values during EQ practice, social understanding and behavior can change towards better social interaction and intersubjective existence (e.g., Eldor &

Shoshani, 2016; Moll et al., 2015). Thus, we also propose effects on social intersubjective processes.

All these processes (summarized in Table 1) contribute to consolidation of the self-pattern, and thus in the early stages of the practice might even reify the sense of a (separate) self (Gebauer et al., 2018; Vaughan-Johnston et al., 2021). Nevertheless, we propose that this transformation works to develop a sense of stability, predictability, and higher self-esteem, which are a crucial source of self-coherence needed for other deconstructive transformations, in alignment with Buddhist psychology (Engler, 1998, 2003a, 2003b). Put in Engler's (1998) words: "In developmental terms, you have to be somebody before you can be nobody. The further reaches of meditation practice require ... a relatively well-integrated sense of self" (p. 117).

### Cultivating Concentration and Present-Moment Awareness

Training in samādhi (concentration) encompasses three aspects of the Buddhist eightfold path: right effort, right mindfulness, and right concentration (Harvey, 2013; Nyanaponika & Bodhi, 1999; Prebish, 2000). By settling and calming the mind through concentration, one achieves a more peaceful and quiet state of mind. This transformation deals with training deliberate choices of attentional focus, until attention becomes effortless (Tang et al., 2022). Through dedicated meditation practice, Buddhist practitioners aim to achieve settling and calming the mind, and a more peaceful state of mind, which is less controlled by delusions and conflicting emotions (Wallace, 2006).

The meditation type that contributes the most to fostering these qualities belongs to the FA family of practices. FA practices are thought to enhance top-down control over attention and allow sustaining attention for longer periods, which has received initial empirical support (see meta-analysis by Verhaeghen, 2021). FA meditation involves repeatedly suspending mind wandering and daydreaming by continuously noticing wandering from the focus of attention and bringing back one's awareness to it (Lutz et al., 2008). The anchor for attention can be any sensory modality, either visual (in different types of visualizations), auditory (focusing on external or internal sounds), or somatosensory and kinesthetic (focusing on breath or body sensations). As a result, one potentially becomes more aware of sensory and bodily experiences happening in the present moment, as empirical work also suggests (Farb et al., 2012).

In fact, we suggest that this transition acts to bring one to the "here" (momentary sensory experience anchored in the body) and "now" (reduced mind wandering and time traveling) (Germer, 2013). Understood in terms of the self-pattern, the aspects which might be affected by this

transformation induced by FA include (summarized in Table 1):

1. *Embodied processes* — Focusing on sensory experience anchored within the body enhances interoceptive processing (Falcone & Jerram, 2018; Farb et al., 2012), and hence, FA should affect embodied processes. Notably, prominent models have posited that attentional control may be an important mechanism linking mindfulness interventions with physical health (reviewed by Creswell et al., 2019).
2. *Prereflective processes* — We suggest that FA practices can enhance prereflective awareness. For example, it has been shown to enhance volitional flexibility of sense of self-boundaries (Ataria et al., 2015; Dor-Ziderman et al., 2016).
3. *Affective processes* — We propose that FA practices also affect affective processes, as reducing mind wandering related to negative affect is thought to reduce emotional reactivity and enhanced emotion regulation (Arch & Craske, 2006; Killingsworth & Gilbert, 2010). Additionally, enhanced interoceptive awareness has been shown to relate to reduced negative affect (Farb et al., 2012).
4. *Psychological/cognitive processes* — We propose that through practical experience in body-focused FA meditative training, and enhanced embodied experience, there is a transition from relying on conceptual and explicit knowledge, to giving more weight to tacit and bodily knowledge (personally contextual and distributive, difficult to aggregate, and more ineffable) (Latimer, 2008).
5. *Reflective processes* — We suggest that with FA practice, the reflective processes become faster in noticing disengagement from the focus of attention, and better at monitoring ongoing momentary experience (Kordes et al., 2019; Lutz et al., 2015; Petitmengin et al., 2017), which would support concentration on the anchoring object for longer periods (e.g., Hasenkamp & Barsalou, 2012).
6. *Narrative processes* — Inner speech is postulated to play a key role in narrative processes (Gazzaniga, 2004; Morin, 2005). Enhancing concentrative abilities can contribute to linking inner speech to the control of attention (Clowes, 2007), and hence, we propose that FA training might contribute to enhancing coherence between different self-narratives. In addition, FA may reduce the strength of automatic self-narratives, by practicing noticing and letting go of distracting thoughts, which often may be reflected in self-narratives.
7. *Social intersubjective processes* — The reduced mind wandering and heightened weight given to sensory modalities and present-moment awareness (Farb et al., 2007) implies, in turn, giving more attention to external

stimuli, including the details of social interactions. We propose that this might strengthen awareness of intersubjective signals, enabling one to be more attuned to *intersubjective* existence, altering social self-consciousness.

Thus, we suggest that developing concentration affects all these processes, resulting in heightened attention to present-moment sensory experience, more frequent disengagement from habitual mind wandering and rigid narrative self-construction, and greater attunement to social signals.

### Cultivating Mindful Awareness

The third training of the Buddhist path is Paññā or Prajñā, which encompasses two aspects of the Buddhist eightfold path: right view, and right intention (Nyanaponika & Bodhi, 1999). This term is often translated as “wisdom”, “intelligence”, “understanding” and “intuitive comprehension”. We propose that this transformation cultivates the ability to maintain mindful awareness. The meditation types most closely related to these qualities belong to the OM family of practices, which foster mindfulness, i.e., non-judgmental, non-selective awareness of the present-moment experiences (including thoughts, emotions, and sensations), and meta-awareness (Dunne, Thompson and Schooler, 2019; Lutz et al., 2008).

The transformation induced by such practices has been described as decentering (Bernstein et al., 2015), defined as “a process through which one is able to step outside of one’s immediate experience, thereby changing the very nature of that experience” (Safran & Segal, 1990, p. 117). This psychological process is well known to result from meditative training (Hanley et al., 2020; Hayes-Skelton & Graham, 2013). It is closely related to dereification, which is a meditation-induced increase in “the degree to which thoughts, feelings, and perceptions are phenomenally interpreted as mental processes rather than as accurate depictions of reality” (Lutz et al., 2015, p. 639). A related Buddhist term is nonattachment, i.e., enhanced equanimity to one’s experience, where attachment has been described as a psychological energy that tends to attribute increased importance to particular individuals, objects, thoughts, feelings, concepts, or sensations (Sahdra et al., 2010). In philosophy of mind, a closely related term is opacity, interpreted to mean that via enhanced introspective attention at earlier processing stages, conscious experiences like thoughts and emotions are subjectively experienced as representational processes, in contrast to transparent processes, where the representational character and earlier processing phases of the contents of conscious experience are not accessible for subjective experience (Metzinger, 2003). Understood in terms of the PTS, we suggest that the cultivated skill, namely mindful

awareness, naturally emerges from further changes in the self-pattern that lead to reduced habitual judgment and reactivity in the self-pattern, especially in terms of narrative self-construction. The aspects of the self-pattern which we propose might be affected by OM training include (summarized in Table 1):

1. *Embodied processes* — Decentering, the key process suggested for this transformation, is a core mechanism mediating mindfulness interventions with physical health (Bernstein et al., 2019; Creswell et al., 2019).
2. *Prereflective processes* — Decentering can contribute to equanimity, which was shown to be related to a more relaxed and flexible sense of body-boundaries (Dor-Ziderman et al., 2013). We thus also expect OM practices to affect prereflective processes.
3. *Affective processes* — We propose that OM may also affect affective processes through emphasis on meta-awareness, as this has been related to an affect-related “cognitive defusion” or decentering process (Bernstein et al., 2019; Masuda et al., 2004). This reduces identification with thought contents, and greatly contributes to disentangling from self-oriented negative emotions. While it could be unsettling under some conditions (Lindahl & Britton, 2019), it can also contribute to an experience of equanimity. In line with this, cognitive defusion may lead to benefits in the management of depression, particularly related to the regulation of rumination (Williams et al., 2007). We also propose that as mindful awareness emerges, there is less unhealthy attachment, which plays a central role in mediating the effects of mindfulness on well-being (Ho et al., 2022).
4. *Psychological/cognitive processes* — Enhanced decentering, which in turn increases emotional equanimity, can reduce automatic cognitive biases habitually motivated by reactive affective processes (Garland et al., 2012; Gupta et al., 2022; Qiu et al., 2022).
5. *Reflective processes* — We suggest that with OM practice, the *reflective* experience becomes *reflexive*, i.e., habitual and immediate. It also becomes faster (i.e., of higher temporal resolution, perhaps on the time scale of a few hundred milliseconds; Raffone & Barendregt, 2020; Schoenberg & Vago, 2019; Slagter et al., 2009).
6. *Narrative processes* — Enhanced decentering and “cognitive defusion” can reduce the identification with thoughts and other mental contents, and thus lead to a change in perspective about the self-narrative (Farb et al., 2007; Hölzel et al., 2011; Vago & Silbersweig, 2012). This may reduce the rigidity of the narrative processes (Hadash et al., 2016; Dambrun & Ricard, 2011). As a result of observing and letting go of narration altogether during the practice, the importance of narrative processes in one’s overall self-pattern subsides.

7. *Social intersubjective processes* — Reduced self-identification suggests less self-biases at the level of interpersonal processes, and this may render social relations more sensitive, with less prejudice and reduced negative attitudes towards outgroup members (Edwards et al., 2017; Kang et al., 2014; Lueke & Gibson, 2014).

To summarize, we contend that the most important shift in this transformation occurs within the reflective aspect, transitioning from being mostly engaged with self-attributions and self-evaluations to functioning in a non-evaluative modality. This modality, termed mindful awareness, is increasingly unbound from other affective/evaluative/categorical elements of the self-pattern, and most importantly less bound to the narrative aspects.

### A Brief Summary of the First Three Trait Transformations

To summarize, we propose that the first three transformations introduce long-term changes to the self-pattern, by fostering consolidation and integration of the self-pattern, as well as cultivating concentration and mindful awareness. At early stages of the mindfulness practice, one risk is “spiritual materialism”, which is the belief that a certain temporary state of mind is a refuge from suffering, or the egoic belief that we improve ourselves. However, such peril can be overcome with more practice, with more concentration and mindful awareness, and with more surrendering to the teaching (Trungpa, 2002). In so doing, the narrative processes become less entangled with other processes in the self-pattern, especially affective processes (e.g., reward and self-oriented judgment), as described above. Hence, one can go beyond that, aided by the fourth transformation of self-deconstruction, which occurs during deep states of meditation, to the fifth transformation of enhanced self-pattern flexibility, and finally to the sixth transformation of self-liberation.

Before we continue to describe the next three transformations, we outline here the accumulated change in the three self-pattern processes which present a change to the organism’s actions and its surroundings: Behavioral, Ecological, and Normative processes. The accumulated meditative training (EQ, FA, and OM practices together), with their related experiences and knowledge gained about the benefit of mindfulness practice, sets the stage for making the practice a part of one’s present and future goals. The shift in personal goals can affect *Behavioral/action processes*, via reducing unwholesome behavioral habits and actions, including harming others and oneself (Loy et al., 2022). In addition, the enhanced awareness of bodily experience can in turn contribute to improved embodied performance (Gallagher, 2020). With prolonged practice, *Ecological*

*processes* will likely change, as the meditation practice transforms the interaction with the environment and its tools, e.g., by incorporating novel meditation-related instruments and environment, or even affects one's choice of profession and related affordances (Birnbaum, 2005). In the long run, being exposed to meditation-based ideas and a practicing community likely alters one's *Normative processes* via changes in social roles.

### Self-Deconstruction (Non-Self, or Extreme Selflessness) States

At a deep state of absorption (“*samādhi*”), meditators may experience the so-called insight knowledge of dissolution, when the apparent continuity of the stream of consciousness is broken, together with the underlying “backstage” experience of a continuous self (Barendregt, 1988; Sayadaw, 2016). Such powerful meditative absorption states can be related to nondual mindfulness practice, aimed to cultivate states that are not oriented towards a meditation object, where the subject-object duality is transcended (note that within Buddhism, there are detailed accounts of the emergence of these nondual phenomena, e.g., Dunne, 2011). However, such states can occur spontaneously, even from the beginning of mindfulness practice. They usually occur under highly concentrative efforts (Goleman, 1988), such as during retreats and FA training, as well as result from self-inquiry and insight (OM) training (Dahl et al., 2015).

Specifically, Buddhist meditation treatises (Nyanamoli, 2011) and insights of advanced insight meditation practitioners (Barendregt, 1988, 1996; Sayadaw, 2016) highlight a specific pattern of self-dissolution experiences at advanced stages of meditative insight, as follows. With enhanced concentration the acuity of mindfulness may be increased to the point of experiencing fluctuations in the stream of consciousness, corresponding to the self-related consciousness characteristic of (subtle) “impermanence” (*anicca*). These fluctuations are experienced as outside voluntary control, thus corresponding to the characteristic of “non-self” (*anatta*). By “zooming out” with mindful awareness, one observes that these fluctuations include the familiar daily intentions one has, which turn out to be conditioned by forces outside voluntary control. This makes identification with the phenomena untenable, and the idea that self has an independent existence (“wrong view”) is irreversibly hindered. Hence, one experiences a state of deconstruction of the fixed view of self.

Nevertheless, due to the ingrained attachment to the experience of self, a third fundamental aspect of self-related conscious experience appears, i.e., a deep experience of “suffering or unsatisfactoriness” (*dukkha*), in association with the realization of having taken for granted something that does not exist. The deep layer of suffering associated

with the experience of subtle impermanence and non-self can lead to very unpleasant aversive experiences, such as fear, (delusion of) danger, and disenchantment. The practitioner then feels urgency (*samvega*, Pali) to release these experiences (Barendregt, 1988). If this urgency is combined with a “serene confidence” (*passada*, Pali), the practitioner can develop equanimity towards the three characteristics of impermanence, non-self and suffering. Then, according to Barendregt (1996), after surrendering with determination, the so-called path consciousness may arise, in which the “wrong view” of the self is realized as a misunderstanding, and can thus be thoroughly relinquished. After that irreversible stage, the experience of the self still exists, although no longer as an independent entity, but as a flexible process in a constant state of creation.

Psychologically, such experiences are well documented within the altered states of consciousness (ASC) literature (Dietrich, 2003; Tart, 1972; Vaitl et al., 2005) and mystical experience literature (James, 1958; Stace, 1960)). Indeed, deep meditative states have been often related to and demonstrate typical characteristics of ASCs (Aftanas & Golocheikine, 2001; Baijal & Srinivasan, 2010; Berkovich-Ohana & Wittmann, 2017; Chowdhury et al., 2023; DeLosAngeles et al., 2016; Garland et al., 2022; Laukkonen et al., 2023; Shapiro, 1980; Sparby & Sacchet, 2024; Vaitl et al., 2005), including enhanced sense of unity, ego dissolution, loss of sense of time and space, ineffability, and sacredness.

Bridging to the PTS, these are states of disturbance, or perturbation, of the self-pattern, which we propose affect many of its processes, including the following (as summarized in Table 1):

1. *Embodied processes* — Numerous meditative practices (including FA and OM) involve experiencing bodily stillness and can thus expect to affect bodily processes. Indeed, prolonged sitting reduces proprioceptive processes, and multi-sensory integration, responsible for the experience of self-location in space and time (Park & Blanke, 2019), and enables grosser levels of the perceived body to phenomenologically “disappear”, such that these bodily boundaries either expand (i.e., a sense of unity and connectedness) or are annihilated (i.e., a sense of self-loss and emptiness) (Ataria et al., 2015; Nave et al., 2021; Yaden et al., 2017).
2. *Prereflective experiential processes* — When embodied processes are disturbed, we propose that the prereflective processes, which involve first-person perspective (FPP) and agency over one's embodied processes, may shift, weaken or, in the case of the sense of agency, vanish. In the case where the experience can be later reported, there is a retention of mineness (the sense that this is *my* experience, i.e., ownership, an awareness of the experience as my own, Gallagher, 2020) or for-me-ness (the

- awareness of the *experience* as I live through it, Guillot, 2017), the most minimal sense of ownership. However, in extreme cases of absorption even this mineness could be lost, in which case there is no reportable content (Josipovic & Miskovic, 2020; Laukkonen et al., 2023; Metzinger, 2020). In classical Buddhist understanding, however, in such states there is reportable content. For example, in the “*Meghiya Sutta*” (Ud. 4.1, A 9.3) “Perception of impermanence [should be maintained in being] for the purpose of eliminating the conceit “I am”; for when one perceives impermanence, perception of not-self becomes established in them; and when one perceives not-self, one arrives at the elimination of the conceit “I am” and that is Nibbāna here and now.” Similarly, in the “*Sutta on Not-Self*” (S 22.59), it is stated that to recognize that “this is not mine, this is not what I am, this is not my self” leads to freeing the mind from all bondage and, furthermore, “... when liberated, there comes the knowledge “It is liberated””. Such states provide glimpses of unification (or void), beyond the usual first-person perspective that retains the habitual subject-object dichotomy. In such deep absorption states, there is still a (disturbed) reference to the body (i.e., altered embodied processes) but without a sense of agency and boundedness, and often with a related loss of the regular sense of time and location (Ataria et al., 2015; Nave et al., 2021).
3. *Affective processes* — Given the consolidated experience of the self as a stable whole, the deeply altered experience of self-deconstruction can lead to intense aversive emotional states (e.g., fear, panic and disgust, Lindhal & Britton, 2019). This may give rise to “the dark night of the soul” (Ataria, 2014a, 2014b; Hunt, 2007). It could also result in dissociative states, disenchantment, and delusions, which are also typically associated with the experience of threatening situations (Keesman & Weenink, 2020; van der Kolk & van der Hart, 1989). On the other hand, such experiences may support the development of the transformative mental factors of mindfulness, keen investigation of phenomena, energy, joy, tranquility, concentration, and equanimity (Goleman, 1977).
  4. *Reflective processes* — In deep absorption states, we suggest that what remains of the reflective processes, after the embodied and experiential processes have shifted, is mainly the mindful awareness that coalesces with prereflective mineness. Awareness is experienced as non-conceptual, nondual, in itself empty of most other (or all — in extreme cases) phenomenal content, yet reflexively aware (Dunne, 2011; Josipovic, 2014, 2019; 2020; Rabjam, 2007). This functions as a witnessing-consciousness (Albahari, 2009; Gupta, 1998), and enables some reportable content post-state. However, in extreme cases of absorption (“full-absorption episodes”), even this mindful nondual awareness could be lost, resulting in “pure-awareness” or “consciousness-as-such” (Berkovich-Ohana, 2017; Dunne, 2011; Josipovic, 2010; Laukkonen & Slagter, 2021), hence there cannot be any reportable content (Josipovic & Miskovic, 2020; Metzinger, 2020).
  5. *Psychological/cognitive processes* — We suggest that during such temporally intensified states of absorption, the psychological and cognitive processes totally disappear. The notion that attentional absorption leads to experiences of ego dissolution and unity has received some empirical support in the literature, for example, by studies showing that increased frontal midline theta during meditation — which is a marker of attentional absorption — predicts such experiences (Aftanas & Golosheikine, 2001; Bajjal & Srinivasan, 2010; DeLosAngeles et al., 2016; Garland et al., 2022).
  6. *Narrative processes* — Impermanence-related insight potentially leads to breaking the underlying view of the self as a continuous entity, which ordinarily rests at the backstage of consciousness (Barendregt, 1988, 1996). In this case, self-narrative processes should cease, since there is nothing to narrate in this experience.
  7. *Social/intersubjective processes* — There are very few or none in such deep states, as evidenced by phenomenological studies (Austin, 1998; Nave et al., 2021; Woods et al., 2022).
- To summarize, during deep states of absorption significant aspects of the self-pattern are strongly altered, thus shaking all the other aspects of the self-pattern that rely on embodied and experiential processes as a basic prereflective background. What remains from the reflective, psychological, cognitive, and narrative aspects of the self-pattern in reportable states is the most restrictive or constrictive form of reflective processes, i.e., mindful awareness. In non-reportable states of witnessing-consciousness or “consciousness-as-such”, even mindful awareness vanishes.
- We suggest that such experiences can enable releasing the pervasive influence of self-concept, self-narrative, and ingrained habits, including identification with the content of self-pattern, resulting in a profound reorganization of the self-pattern. If the self-pattern is not flexible enough, such a dis-organization of the psychological/cognitive and narrative aspects can lead to a highly negative affective reaction, such as the experience of the “dark night” (Ataria, 2014a, 2014b; Lindahl & Britton, 2019). However, if the flexibility already gained within the self-pattern through practice allows, this might possibly give way to an expanded access to a field of awareness (Sumedho, 2004), related to the deep meditative experiences of silence, space, stillness, tranquility, and equanimity (Goleman, 1977). In such cases, we suggest that there

will be a beneficial reorganization of the self-pattern resulting in enhanced flexibility and stronger mindful awareness. We propose that this can result in a strong liberation and an experience of relief (see last proposed transition).

### Self-Pattern Flexibility

Psychologically, after having experienced the first three transformations and as the result of the self-deconstruction state, we propose that a functional reorganization of the self-pattern may take place (Barendregt, 1996), and all meditation types can contribute to it. By strengthening mindful awareness, one is gaining access to strong insights on the impermanent and conditioned nature of mental and bodily processes, as well as of the elements of the self-pattern. This, in turn, leads to deep insight into selflessness as a permanent feature, the “emptiness” of the self-pattern.

In contrast to the previous transformation, we contend that this transformation is characterized not by the way it affects individual processes of the self-pattern, but the way it affects the system dynamics, towards enhanced flexibility of the self-pattern as a whole (Rogge & Daks, 2021). Here, flexibility is defined as the ability to switch between different (sometimes conflicting) experiences within any aspect of the self-pattern, as well as experiencing multiple aspects simultaneously. The enhanced flexibility in the self-pattern is reflected in enhanced integration speed between mindful awareness (reflective process turned reflexive) and the different processes, which then can be used to efficiently plan for action, as well as enhanced segregation within different processes of the self-pattern, especially the narrative processes. To survive in an ever-changing environment, complex systems like the brain (e.g., Lord et al., 2017) must balance their ability to *integrate* information from various sources with a complementary capacity to *segregate* information into modules which perform specialized processes. Hence, two key processes are at play. The first is enhanced integration speed between mindful awareness and different processes. Mindful awareness can be considered an “online” non-conceptual meta-awareness or monitoring (see the third transformation), unlike sticky “offline” narrative and higher-order-thought-based reflections. Hence, we propose that it can be integrated almost synchronically (in short-term elemental time scales) with other processes of the self-pattern, such as psychological/cognitive, affective, and behavioral aspects, thus enabling enhanced speed of integration and emotion regulation in the present moment (Hölzel et al., 2011; Malinowski, 2013; Tang et al., 2015). Before this transformation, we propose that the elemental time scale in conscious processing was temporally integrated into longer units of conscious self-experiences through reiterated cycles of conscious access, working memory

maintenance, and narrative elaboration, which can be related to the temporal unfolding or extended integration of the self-pattern. Given the overarching role of narratives in the long-term integration of the self-pattern (Sui & Humphreys, 2015), in combination with processes that extend well beyond retentional and protentional processes, enhancing the integration speed (usually on the scale of seconds) to the scale of a few hundred milliseconds can lead to insights that deconstruct the structures associated with a reified experience of the self as an independent or identical self (Laukkonen & Slagter, 2021; Lutz et al., 2015). The previous meditative deconstruction state enables a profound transformation of mental states and habits linked to the reified self (Dahl et al., 2015; Davis & Vago, 2013; Hölzel et al., 2011) and we propose this is reflected in greater flexibility within the self-pattern.

The second key process is enhanced segregation within different processes. We further propose that the segregation of some processes within the self-pattern changes towards enhanced independence. With this self-pattern transformation, narrative and reflective processes reduce their evaluative bindings to the other elements of the self-pattern, otherwise automatically used. Instead, mindful awareness progressively discerns experiences without necessitating mental action. Thus, the possibility to enhance meta-awareness states and to decrease “closed loop interactions” between ruminative thoughts and (negative) emotional states, can modulate self-referential processing (Northoff et al., 2006) of different features and their binding. This modulation would also support the mindfulness functions of non-reactivity to emotional experiences, and non-judging inner experiences (Baer et al., 2006). Hence, a more flexible self-pattern would also correspond to an individual’s enhanced freedom from identifying with, and the related clinging to, any aspects of the self-pattern, ultimately characterizing a mindful trait of being (Anālayo, 2010; Truntpa, 1978). But as narrative identification can no longer play the continuous role of connecting experiences together and creating a sense of continuity that previously provided coherence to the self-pattern, we propose that the system transitions into a different sense of unity. This unity is provided by mindful awareness as dynamical integration. In this transformation, instead of constantly creating and adjusting narratives, present-moment elements of experience are “minimally integrated”, in terms of a temporal process, experiencing the flow of consciousness rather than the quality or strength of integration with the previous and the next moment. This directly relates to the original meaning of the Pali term *sati* (translated in English as mindfulness), i.e., recollection, for its retentional aspect (e.g., Anālayo, 2003). The dynamical integration relates to the sequential (discrete) transitions of attention and conscious access from one object (e.g., in perception or thought) to another one, with mindful

awareness of such transitions, and with accessibility of their conditions (e.g., contextual feelings and intentions) (Vago & Zeidan, 2016).

### Self-Liberation (Selflessness) as a Trait

In the Buddhist path, the cultivation of mindfulness always involves a progress toward Bodhi, translated as either awakening or enlightenment (Anālayo, 2021b), as a trait. The term trait is used here, as in trait theory of personality (Mischel & Shoda, 1995), to denote habitual patterns of behavior, thought, and emotion, i.e., habitual functioning of the individual processes of the self-pattern and the relations between them, creating a habitual functioning of the self-pattern. According to the *Sutta Piṭaka* (Ñāṇamoli & Bodhi, 2009), four distinct levels of such progress of attainment are described, from stream-entry to becoming an arahant (i.e., attaining enlightenment), all of which are not exclusive for monastics, but could be attained by lay-people (Anālayo, 2021a). What distinguishes the four attainment levels from one another is a progressive abandonment of restraints, which result in a progressive ending of suffering (Anālayo, 2021a). Important for our discussion is the fact that the first fetter to abandon (a fetter is a bond shackling a sentient being to saṃsāra, the cycle of lives with suffering. By cutting through all fetters, one attains liberation), even from the first level of “stream-entry”, is self-view or identity-view, thus attaining no-self view. In the following, we restrict our discussion to the first two levels of enlightenment, as we are mainly concerned with the possible reflection of selflessness as a trait.

In terms of the self-pattern, self-liberation as a trait involves a constantly flexible re-organized self-pattern, and selflessness (subsequently defined). The transition from the previous transformation of temporary self-flexibility is a critical change. During the transition, we suggest that there could be discrete moments of “enlightenment micro-states”, which may occur at different stages throughout the meditation practice. The frequency of such episodes can be assumed to increase with practice, or in intensive meditation retreats, until the critical transition to self-liberation, when there is a dramatic increase in the frequency of such micro-states in everyday life, to the point of establishing a constant trait. In other words, with further practice of meditation (regardless of training category), the temporary enhanced flexibility within the self-pattern achieved in the previous transformation can lead to reduced reification of the self-concept, as a stable, consistent, separate, continuous, permanent, and intrinsically existing entity. Hence, self-pattern flexibility becomes constant. We term this “selflessness”, and consider it a moral characteristic, an attitude which does not prioritize one’s self over others.

Psychologically, this profound transformation of consciousness processes, mental states, and the underlying self-view can be characterized as a trait of psychological integration. Such a trait was called by some “self-transcendence” (Garland & Fredrickson, 2019; Maslow, 1971), “leaving transcendence” (Freimann et al., 2024), or a “selfless mode of psychological functioning” (Dambrun & Ricard, 2011). This trait is also characterized by constant supremely positive affective qualities of joy, happiness or bliss, and love, energetic presence, and a sense of connectivity or “inter-being” with everything (Freimann et al., 2024).

Specifically, Dambrun and Ricard (2011) propose three interrelated markers of variance which create the structure of the self along a continuum: the degree to which the self is treated as an entity that is reified (i.e., real), entified (i.e., solid), and independent. Two principal types of psychological functioning that are at the opposite poles of this continuum are self-centeredness and selflessness. In the self-centered type, the self is experienced as sharply defined, real, solid, and independent. At the opposing pole of selflessness, the self is experienced as lacking reification and entification, without sharp boundaries and fundamentally interconnected and enmeshed with all things (hence we term it experiential and moral selflessness). This approach received ample empirical support by psychological studies linking mindfulness disposition, selfless functioning, reduced self-boundaries, and enhanced well-being (e.g., Dambrun, 2016; Hanley & Garland, 2017, 2019; Hanley et al., 2017). Other studies showed that meditators did not show stronger binding (reduced temporal estimation between action and outcome shape) for self-associated compared with other-associated outcome (Chiarella et al., 2020), and that relative to matched controls, self-related behavioral and neural activity is attenuated but other-related behavioral and neural activity is strengthened in mindfulness meditators (Shi & He, 2020, 2022).

One may also wonder how a liberated person can be well functioning with a constant non-self experience. A sense of self is obviously necessary to physically move through the world, to interact with others, and more generally, function in daily life (e.g., to eat). This is exemplified by research showing that schizophrenia, a debilitating mental disorder, is associated with disturbances in the sense of minimal self (Sass, 2013). However, moral selflessness should be distinguished from “extreme selflessness”, characterized by Dambrun and Ricard (2011) as involving extreme loss of self-boundaries. Such experiences include near-death experiences, psychedelic-induced ego dissolution, or certain cases of brain lesions (as reviewed by Dambrun & Ricard, 2011). In our heuristic model, extreme selflessness can only occur as a state, as described in the fourth transformation, as we acknowledge, it is impossible to function for long without some degree of self-boundaries, which are required to

maintain the living organism. Hence, selflessness as a trait can only be experiential and moral selflessness, the opposite of self-centeredness, as defined by Varela et al. (1991) to be merely practical, “a convenient way of referring to a series of mental and bodily events and formations, that have a degree of causal coherence and integrity through time” (p. 179). As described using our proposed pattern theory of selflessness, the idea is not that there is no longer any sense of self, but the self-pattern is transformed such that there is no longer an experience of self as a stable, consistent, continuous, permanent, and intrinsically existing entity.

In the transition to self-liberation as a trait, one consistently faces the selflessness that was there all along (Hanley et al., 2020). Constantly facing the impermanence of one’s existence may force a re-evaluation of values, and give rise to the mental quality of existential resilience (the quest for meaning and purpose in life, Nilsson, 2014), which in this transformation turns into spiritual resilience (when the person resorts to spiritual perspective to answer life’s big questions, Wong & Wong, 2012, p. 593). This, in turn, involves facing death anxiety, as well as a qualitative experience of profound ease, of deep psychological well-being that is independent of circumstances (Amaro, 2019). A recent neural study provided initial empirical evidence linking meditators’ brains response to the coupling of death and self-stimuli in a manner indicating acceptance rather than denial, and corresponding to increased well-being. Additionally, death acceptance predicted positively valenced meditation-induced self-boundary dissolution experiences (Dor-Ziderman et al., 2023).

It is important to emphasize that while the last stage of enlightenment, or self-liberation, is difficult to achieve, the early stage which comprises the reduction of unwholesome factors, is considered to be a very realizable goal, as Ajahn Amaro (2019, p. 1954) puts it: “That irreversible quality of well-being, that breakthrough to full psychological integration that cannot be completely fallen away from, is a reachable goal for most people if they have the faith to engage and practice meditation, and to really sit down and work on their mind”.

## Discussion

In the paper, we have tried to demonstrate the relevance of self-pattern theory for understanding self-transformation induced by Buddhist meditation. Our analysis led to suggestions that may allow for a coherent account across the disciplines of phenomenology, psychology, neuroscience, and Buddhist studies. Our novel proposition, named the pattern theory of selflessness (PTSL) is that the self-pattern is transformed through meditative practice, leading to an arrangement of processes in the self-pattern that is not

self-centered. This “selfless-pattern” involves (i) transforming the reflective aspect into a more habitual reflexive — and less (even non) judgmental process or mindful awareness; and (ii) reducing the influence of different aspects of the self-pattern (especially affective and narrative processes); which in turn (iii) enhance flexibility of the self-pattern to a point of a critical transition into a trait.

Further, we described selfless states as induced by some extreme meditation practices (e.g., *jhana* practices) along a continuum from states where there is still a minimal pre-reflective self-awareness (witness consciousness), so that experience is reportable, to states where the self-pattern totally dissolves, in which case there would not be an experience to report (e.g., cessation, e.g., Laukkonen et al., 2023).

We described these transformations in terms of Buddhist psychology, and provided initial evidence for some aspects from the cognitive and neuroscientific literature. In our heuristic model, most transitions work to deconstruct and reorganize the over-rigid self-pattern. Constructive processes correspond mostly to the first transition (integrating the self-pattern), while deconstructive processes include the third and the fourth transitions (mindful awareness and self-deconstruction states, Dahl et al., 2015). The other transitions are largely reorganizing the dynamics within the self-pattern.

The pattern theory of selflessness (PTSL) we put forth can be tested empirically via contemplative neuroscience. For example, in another paper, we describe how the self-pattern could be partially studied based on the cortical network view (Giommi et al., 2023). By combining neural investigation with phenomenological inquiry, i.e., neurophenomenology (Varela, 1996), subtle stages of meditative attainment could be compared (as described, for example, in Berkovich-Ohana et al., 2020). In this way, the different proposed transformations could be tested, as well as their possible sequence. By using tools from cognitive psychology, future studies can assess ethical aspects or concentration, test self-centeredness or self-bias, or probe emotional aspects by teasing, to search for correlations with neural and phenomenological fingerprints of the different proposed transformations. Additionally, based on the phenomenological model presented here, future studies can suggest computational modeling which operates within the free energy principle (FEP) and active inference framework (for a recent review, see Lutz et al., 2024). Thus, future research could build on this account to study the neurophysiological mechanisms underlying non-self states, as well as the trait of selflessness (Davis & Vago, 2013). It could also address whether and how changes in the self-pattern manifest in various clinical conditions and the putative mechanisms involved.

It is also important to consider the limitations of the proposed heuristic model. First, some terms are somewhat vague, or used “loosely”, given the interdisciplinary

attempt made here. Readers who are experts in one discipline, e.g., Buddhist philosophy, might find the paper not detailed enough for the Buddhist terms used and literature. Psychologists and philosophers might feel the same. However, we tried to fairly represent these different scholarly traditions, and still enable easier reading for non-professionals. Second, there are many views and theories on the self and the value of the non-self (within Buddhism as well as within Western science). The focus on the PTS is an attempt to bridge some of these views, but cannot accommodate all the views on this topic. It should also be noted that whether selfless states are beneficial or not has long been, and still is, a topic of active debate within Buddhism (Thompson, 2020), as well as within contemporary science (Britton, 2019; Sass, 2013). It has been shown that for some individuals, mindfulness can also be too much of a good thing (Britton, 2019), and might even lead to experiences of depersonalization and dissociation (Lindahl & Britton, 2019). It is therefore important that future studies also examine the self-related processes of ex-meditators who no longer meditate because of negative effects, and/or include expert meditators with mental health issues, who are typically excluded from scientific studies. Finally, as noted above, transformations that lead to selfless experiences can also be accomplished in other ways than through Buddhist meditation. There are various other nondual traditions that emphasize the importance of self-transcendence, such as the Advaita Vedanta, Kashmiri Shaivism, and Samkhya-Yoga (Maderey & Laura, 2016). Ultimately, it will be important to determine how those accounts align with the framework put forward here or can be used to expand the current framework towards a more generic understanding of how selflessness and self-liberation may come about as a state and trait experience.

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## Declarations

**Conflict of Interest** The authors declare no competing interests.

**Use of Artificial Intelligence** AI was not used.

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## Authors and Affiliations

Aviva Berkovich-Ohana<sup>1,2</sup>  · Kirk Warren Brown<sup>3</sup> · Shaun Gallagher<sup>4,5</sup> · Henk Barendregt<sup>6</sup> · Prisca Bauer<sup>7</sup> · Fabio Giommi<sup>8,9</sup> · Ivan Nyklíček<sup>10</sup> · Brian Ostafin<sup>11</sup> · Antonino Raffone<sup>12,13</sup> · Heleen A. Slagter<sup>14</sup> · Fynn-Mathis Trautwein<sup>1,7,15</sup> · David Vago<sup>16</sup> · Ajahn Amaro<sup>17</sup>

✉ Aviva Berkovich-Ohana  
avivabo@edu.haifa.ac.il

<sup>1</sup> Edmond Safra Brain Research Center, Faculty of Education, University of Haifa, Haifa, Israel

<sup>2</sup> The Integrated Brain and Behavior Research Center (IBBRC), University of Haifa, Haifa, Israel

<sup>3</sup> Department of Psychology, Virginia Commonwealth University, Richmond, USA

<sup>4</sup> Department of Philosophy, University of Memphis, Memphis, USA

<sup>5</sup> SOLA, University of Wollongong, Wollongong, Australia

<sup>6</sup> Radboud University, Nijmegen, The Netherlands

<sup>7</sup> Department of Psychosomatic Medicine and Psychotherapy, Medical Center – University of Freiburg, Faculty of Medicine, University of Freiburg, Freiburg, Germany

<sup>8</sup> NOUS-School of Specialization (PsyD) in Psychotherapy, Milan, Italy

<sup>9</sup> Insight Dialogue Community  
<https://insightdialogue.org/teachers/>

<sup>10</sup> Department of Medical and Clinical Psychology, Tilburg University, Tilburg, The Netherlands

<sup>11</sup> Department of Clinical Psychology, University of Groningen, Groningen, The Netherlands

<sup>12</sup> Department of Psychology, Sapienza University of Rome, Rome, Italy

<sup>13</sup> School of Buddhist Studies, Philosophy and Comparative Religions, Nalanda University, Rajgir, India

<sup>14</sup> Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

<sup>15</sup> Institute for Frontier Areas of Psychology and Mental Health, Freiburg, Germany

<sup>16</sup> Vanderbilt Brain Institute, Vanderbilt University, Nashville, USA

<sup>17</sup> Amaravati Buddhist Monastery, Stanford, USA