



Opening the human spirit to sustainability transformation: the potential for individual human–nature resonance and integrative rituals

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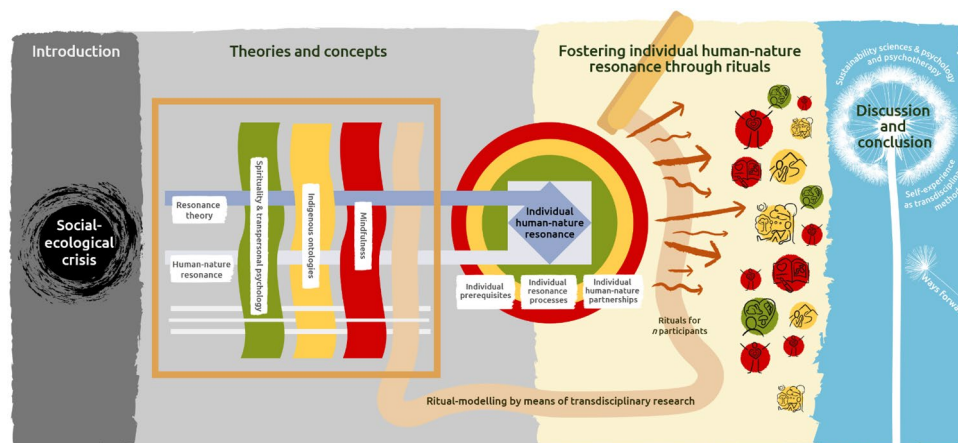
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Abstract

Urgent calls by the younger generation and the scientific community to approach sustainability only seem to scratch the surface of individuals' awareness while ecological destruction moves forward. In this regard, current dominant mindsets claiming a human–nature separation appear to hamper change by not granting nature dignity and *her own voice*. Therefore, the scientific community is inviting us to embrace Indigenous ontologies and an overall spiritual connectedness with nature in our lives. Yet, in times of crisis, it is unclear how individuals can overcome prevailing mind-action gaps—and instead turn towards sustainable caring human–nature relationships. Against this background, this conceptual paper elaborates, in a first step, individual human–nature resonance as a relational integrative framework to study psychological transformation processes and their supporting capabilities. In a second step, a ritual-based intervention is elaborated to nurture the quality of this relationship between human and nonhuman nature which is experientially enriched with insights from psychotherapy. Transdisciplinary research in the form of self-experience completes the research process. Eventually, we plead for openness in favor of adopting “lived wholeness” as a solution for sustainability transformations—of ourselves, science, and our relationship with nonhuman nature.

Graphical abstract

Including icons (concept: Müller, design: Bongaerts; IOER 2022)



Keywords Spiritual human–nature connectedness · Mindfulness · Relational ontologies · Indigenous knowledge · Social–ecological transformations · Inner–outer transformation

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Introduction

“It is to solve some of the problems of life, not only theoretically, but practically” (Thoreau 1995, p. 9)

Various statistics, reports, and parameters such as the World Overshoot Day, IPCC reports, or the Ecological Footprint stress the urgent need to change reductionist growth-oriented lifestyles and, to that effect, the current human destructive domination over nonhuman nature (Brand et al. 2021; Bristow et al. 2022; Böhme et al. 2022). However, despite numerous efforts by politics, the human sustainability transformation as “a deeply holistic, reflective, and relational process” (Vogel and O’Brien 2021, p. 657) endures. According to researchers (West et al. 2020; Walsh et al. 2020; Vogel and O’Brien 2021), the necessary transformation of the so-called Anthropocene has not reached individual humans’ hearts in spite of existing theoretical knowledge. Addressing this diverging gap on the respective individual scale, evidence suggests that qualitative research approaches are suitable for thoroughly revealing the roots of individuals’ *mind-action gaps* (Kollmuss and Agyeman 2002; Frank et al. 2019; Bercht 2021; Cass et al. 2023). There is supporting evidence that ontologies of modern human–nature relationships, such as those of Aristoteles or Descartes, which perceive humans and nature as separate and humans’ capability of rational cognition even as superior, have been intensifying the current social–ecological crises by legitimizing individuals’ resource-intensive consumption and mobility patterns (Walsh et al. 2020; Beery et al. 2023). If nature is seen and treated as a lifeless and soulless object, ecological destruction may not *touch* us (Meyer 2015; Artmann 2023). This hierarchical mindset of human–nature relationships that perceives humans as being above nature is also widely present in current academic thinking such as the concept of ecosystem services (Muradian and Gómez-Baggethun 2021). The transformation towards minding human’s inter-relatedness with nonhuman nature is subsequently seen as a deep leverage point for sustainability transformation (Abson et al. 2017; Ives et al. 2018; West et al. 2020). Yet, so far, in sustainability science, little is known about this linkage and the intentional evocation of different mindsets.

Embracing human interwovenness with nature is a cognitive, somatic, and spiritual alternative to existing in the world compared to acceleration-oriented anthropocentric lifestyles that focus on making more and more material resources *accessible* for human interests (Ives et al. 2020; Woiwode et al. 2021). Such holistic human–nature relationships are observed in various Indigenous cultures where all of the nature is imbued with spiritual embodied kinship and, therefore, in possession of dignity and rights

(Kealiikanakaoleohaililani et al. 2018; Walsh et al. 2020; Wamsler et al. 2021). Commonly, in academia and more precisely in sustainability science, we, scientists, struggle in using a clear definition of the term ‘nature’ (Beery et al. 2023). Yet, engaging with an overall relational perspective in this paper, we use the term nature holistically for non-human and human nature (the latter including biophysical and metaphysical aspects often also referred to as inner worlds/biology/nature, intrapersonal aspects, etc.) (Wilber 2000; Esbjörn-Hargens 2010; Ives et al. 2020). In terms of different dimensions of human–nature relationships, Bristow et al. (2022, p. 10) confirm that if humans have exclusively mental knowledge concerning the ecological crisis, this might not be effective for the needed transformation and that there is a need to holistically reconquer our inner nature including “heart” and “body”. For this purpose, inter- and transdisciplinary research become indispensable in order to enrich sustainability transformation by acknowledging “practical wisdom” (Ives et al. 2020, p. 209) concerning human–nature connectedness nurtured by human embodied experience (Fazey et al. 2020):

“... experience, in human practices is the privileged entry point for change mediated by professional interventions of all kinds, (...) there is abundant evidence (...) that the experiential domain can be explored, as we see in transformations mediated by specific practices and human interactions in prescribed settings” (Varela and Shear 1999, p. 4)

Nielsen et al. (2021) argue that, in particular, the disciplines psychology and psychotherapy addressing, among other things, individual humans’ internal cohesion and health have not unfurled their full potential in guiding sustainability transformation so far. However, sustainability scholars highlight the potential of psychological aspects and relational capabilities for the needed internal transformation, such as mindfulness, (self-)compassion and spirituality (Koppensteiner 2018; Wamsler et al. 2018; Ives et al. 2020; Bristow et al. 2022). By opening one’s own heart and integrating inner split parts, we embrace healing and wholeness as illuminated by Patten (2018, p. 150): “Wholeness is the most primary, root quality of existence, and the heart is where wholeness is intuited—and love is its expression.” Whereas recently in psychotherapy, the individual relationship with oneself, the so-called intrapersonal dimension, is targeted increasingly by fostering self-care, sustainability researchers plead to foster normative relationship qualities also in order to express them towards nonhuman nature (Jax et al. 2018; Diver et al. 2019; Bristow et al. 2022; Ramstetter et al. 2023). Compared to addressing change via policy measures only, there is supporting evidence that integrating the foci on internal dimensions and external regulations appears to have a lasting impact on accomplishing

sustainable transformations (O'Brien and Hochachka 2010; Wamsler et al. 2022).

In their quest for a notion describing humanity's so far inadequate handling of the social–ecological crisis in terms of human–nature relationships, some scholars use *avoidance* to deal with difficult resulting emotions (Bristow et al. 2022) or *ignorance* due to a lack of affection (Weder and Voci 2021; Cass et al. 2023)—both illustrating a lack of resonance with the crisis (Meyer 2015). To overcome missing resonances and hence actions for sustainability transformations, Bruns and Fünfgeld (2021, p. 3) highlight “theoretical-conceptual approaches with positive connotations” as possible starting points. A recent theoretical framework within sustainability science which captures the positive quality of human–nature relationships and identifies respective processual steps leading to human–nature resonance has been delivered by Artmann (2023). Her concept of human–nature resonance for sustainability transformation is based on Hartmut Rosa's resonance theory (2019). According to the resonance theory, societal acceleration and a fixation on accumulating resources have generated *mute* and *alienated human* relationships characterized by non-affection and non-responsivity. Besides a descriptive side, Rosa offers possible criteria for a *good life* based on *resonant relationships*. The relational metaphor ‘resonance’ coming from physics describes the relationship between two tuning bodies. Whereas in the resonating mode, both entities act autonomously and according to Rosa (2019) possess *their own voice*, on the contrary, the muteness of the individuals' voices signals a relationship of non-responsiveness. Due to its interwovenness retracing the “multi-faceted economic, social, and environmental crisis as symptoms of an increasing alienation” (Artmann 2023, p. 2), the resonance theory has been granted with acknowledgment (Masquelier 2020; Susen 2020). On the one hand, it appears compatible with modern values and societal attitudes, and on the other, it provides an integrative framework for further promising approaches such as mindfulness that are increasingly integrated into mainstream lifestyles fostering sustainability as a by-product (Geiger et al. 2019).

However, little is known so far about the applicability of the resonance theory, in general and in the context of human–nature relationships for sustainability transformations addressing collective and individual actors. While Artmann (2023) gives insights into the contribution of the concept of human–nature resonance (see also “[Theoretical basis: translating resonance for human–nature relationships](#)”), to *system knowledge* (what is), *target knowledge* (what should be), and *transformation knowledge* (how to get there) (Pohl and Hirsch Hadorn 2007), it remains unclear how these pillars are translated on the individual scale. In order to initiate individuals to mind nature as equal in the current system, certain *psychological prerequisites* appear

to be significant. These then lead to transformative *individual resonance processes* including several essential steps and eventually to *individual human–nature partnerships*. Therefore, in order to identify intrapersonal blockages and understand mind-action gaps that hamper pro-environmental behavior, an integrative qualitative approach including the mental, somatic and spiritual dimension of individual human–nature relationships is needed (Bercht 2021). In doing so, a deepening of the concept of human–nature resonance for individuals might contribute—in addition to many other needed approaches—to integrative positive solutions for the overarching sustainability transformation (Artmann 2023). An intervention is then required to translate the integrative concept into practice in order to analyze its effectiveness (Schulz and Martin-Ortega 2018; Woiwode et al. 2021; Artmann 2023). Bristow et al. (2022, p. 64) confirm that the development and testing of approaches and interventions is significant to break away from “the vicious cycle of climate change, threat response (...), poor mental health, world-views of separateness and disengagement”. One approach to overcome mute individual relationships that is stressed by Rosa (2019) is the execution of rituals, thereby creating resonant relationships with or within the world. This appears to be confirmed by conservationists pointing out that rituals incorporate the possibility of deepening our spiritual relationship with nature, to transform ourselves, and to express gratitude towards the Earth (Kealiikanakaoleohaililani et al. 2018). Hence, operationalizing the concept of individual human–nature resonance for sustainability transformations by means of rituals is still missing.

Targeting these research gaps and following the call by Wamsler et al. (2018, p. 153) for “more sustainability research that acknowledges positive emotional connections, spirituality, and mindfulness in particular”, we aim to enrich the necessary sustainability transformations on the individual level by introducing two notions: the interdisciplinary concept of individual human–nature resonance and, second, an operationalization for transformative rituals as practical tools enriched through the fields of psychology and psychotherapy. The section “[Theories and concepts](#)” paves the theoretical ground by first defining important aspects of Rosa's (2019) resonance theory and Artmann's (2023) concept of human–nature resonance. This is subsequently followed by an introduction to the further applied approaches to conceptualize individual human–nature resonance (spirituality and transpersonal psychology, Indigenous ontologies, and mindfulness) as well as an overview of rituals in sustainability science. In “[Fostering individual human–nature resonance through rituals](#)”, the concept of individual human–nature resonance in the context of sustainability science is introduced, and its applicability through ritual-based intervention is illustrated. The research process of the ritual-development is strengthened thereby through personal transdisciplinary

self-experience of the lead researcher (Koppensteiner 2018). The paper's approach and the results are discussed in "Discussion". Conclusions are drawn in the last section.

Theories and concepts

Theoretical basis: translating resonance for human–nature relationships

According to Rosa's (2019) resonance theory, modern societies are currently facing a vicious cycle. Yet, it appears that the cause of this crisis is rooted in modern society's mute relationship with the world, whose main pillar is the narrowed fixation on resources as *the epitome of a good life* being part of an anthropocentric worldview claiming humans' independence from nature (Artmann 2023). On the contrary, resonance, as the counter concept for these so-called alienated mute world relationships, describes the relating responsive quality between two entities (Rosa 2019). Observing and analyzing resonance always contains an embodied and transpersonal perspective, as Rosa points out, by referring to neurologists and phenomenologists such as Bauer (2019) or Heidegger (1996), as only the physicalness of all bodies leads to spatiality and a spatial relational interaction with the perceived world. Therefore, the muting of an entity according to Rosa (2019) tends to be reflected the same way by the respective body and its state in the surrounding world resulting in, for example, sleeping or eating disorders, anxiety, or depression. This interrelation between resonance and muteness is reflected within the resonance theory and applied to different spheres of human life such as work, food, and nature in general. By enriching the resonance theory with relational discourses and a strong consideration of internal transformations for sustainability transformations, Artmann (2023, p. 7) offers a concrete scheme to operationalize human–nature resonance in practice by drafting the "main pillars" of Rosa's (2019) resonance theory.

As psychological *prerequisites* to engage resonantly with nature as a segment of the world, Rosa (2019) and Artmann (2023) stress, therefore, the acknowledgment of human and nonhuman nature's *Unverfügbarkeit* (English: inaccessibility) and agency. This attitude is expressed by granting nature—regardless of inner or outer—a certain level of autonomy, respecting her needs, and accepting her limits. In order to touch or be touched sufficiently aiming to access the resonant mode with nature, both entities need to make themselves vulnerable and feel "trust in the world" (Rosa 2019, p. 416). Whereas dominance and enlargement of scope have been targeting collective human enhancement of self-efficacy, according to Rosa (2019, p. 423), this attitude is based on mute relationships since the "aspect of accommodation, affect, responsiveness, or encounter" is

missing. Given the fulfilled prerequisites, the *resonance process* might initially be triggered by a state of passiveness "in which the (human) subject is *affected*, e.g., touched and moved" (Rosa 2019, p. 163) by nature. With regard to the social–ecological crisis, Artmann (2023) highlights the importance of this affect in order to become active in a second step and engage in caring for nature's well-being. Resonance involves then indispensably a "mutual reaction(s) in the sense of (...) genuine *response(s)*" (Rosa 2019, p. 58 italics in original). In return, humans act intentionally and with expectations of self-efficacy towards touching and moving nature. Due to this *liquefaction* and transformation of the self-vis-à-vis nature, a mutual adaptation of nature and human beings as segments of the world is the culmination in which humans appreciate nature and acknowledge the given interwovenness. As a consequence, this *transformation* then includes the experience of sustainability not "as a burden but as a basic component for a good life" (Artmann 2023, p. 12) integrated into the daily life. A repetition of these resonating moments is "time-intensive" (Rosa 2019, p. 416) and needs trust and energy, yet eventually, it might guide humans and nature into a *human–nature partnership* in which both entities continuously *speak with their own voice*. Artmann (2023) classifies human–nature partnerships as conceptual target knowledge for sustainability science defining acting and value parameters of a good life for both human and non-human nature. However, further research is required based on how to operationalize human–nature partnerships in the daily life of individuals (de Groot et al. 2011).

Conceptual enhancement for individual human–nature resonance

To enhance human–nature resonance for individuals, the following sub-chapters introduce the state of the art for the triad of further applied ontological concepts and psychological mechanisms: going beyond egoic boundaries and embracing a *transpersonal spiritual* reality might help to imagine interdependent human–nature relationships (Koehrsen 2018; Artmann 2023) (see "Spirituality and transpersonal psychology"). Holistic connections between humans and nature as being found in *Indigenous ontologies* appear as examples for further conceptualization, as Rosa (2019, p. 75) stresses modern societies' loss of metaphysical relationships with the world "in the sense of cosmological or theological orders of resonance" (see "Indigenous ontologies"). *Mindfulness* as a resource and inner capability of transformation holds a potential for resonance in general (Bauer 2019) and can contribute to increased openness for new ideas and human–nature concepts through self-reflection (Wamsler et al. 2018; Woiwode et al. 2021; Bristow et al. 2022) (see "Mindfulness").

Spirituality and transpersonal psychology

Due to the disagreement among researchers regarding the conceptualization of spirituality (Moberg 2010; Ratnakar and Nair 2012), and to the strong bond with the broad research field of “religion” (Slife et al. 1999), spirituality did not play a significant role in science, especially prior to 1980/1990. The lack of clarity in operationalization and construct definition rendered access to scientific methods difficult, so that spirituality was often left out of the research with regard to its conceptual incompatibility (Slife et al. 1999; Chiu et al. 2004; Moberg 2010; Hedlund-de Witt 2011, 2014; Ratnakar and Nair 2012). Yet, one of the founders of modern psychology, William James, designated the *spiritual self* as one’s core self (Poll and Smith 2003). Hence, a reconciliation of spirituality and science is becoming increasingly important especially with the identified potential of humans’ spirituality for improved health, psychological health, sustainability and social change (Chiu et al. 2004; Hedlund-de Witt 2011) and is also becoming increasingly successful with improved concepts, definitions and methods (Ratnakar and Nair 2012; Hedlund-de Witt 2014). Contemporary researchers proclaim high potential for this holistic approach to the required transformation (Koehrsen 2018; Ives et al. 2020; Woiwode et al. 2021). As there is currently no accepted definition of spirituality, we want to refer here to one core aspect of spirituality (Chiu et al. 2004): an overall connection with oneself, nonhuman nature, others, and a higher being.

Yet, a recognized academic sub-discipline in psychology is transpersonal psychology that deals with “the expansion and extension of our sense of self—about the transformation of the self beyond its relatively enclosed and impermeable egoic boundary” (Daniels 2021, p. 222f.). In contrast to spirituality, transpersonal psychology does not necessarily include metaphysics. By denying the spiritual dimension in various disciplines, according to Weber (1988; cited in Rosa 2019, p. 549 italics in original), the assumption has arisen “that there are in principle *no mysterious, incalculable powers at work*, [...] but rather that one could in principle master everything through *calculation*. But that means the disenchantment of the world.” Yet, contrary to this academic bifurcation, it is widely accepted that many human beings—regardless of their origins—do feel a need for spirituality (Poll and Smith 2003). Living in harmony with nature might, therefore, contribute to fulfillment of the individual’s longing for spiritual value in his or her life world (Woiwode et al. 2021).

Indigenous ontologies

Indigenous cultures see nature as an active subject that connects holistically with other beings such as humans.

In sustainability science, the importance of, in particular, such relational ontologies regarding the human–nature relationship has been acknowledged under the term *relational turn* (Klain et al. 2017; Walsh et al. 2020). Nonetheless, we do not intend to replace Western worldviews stressing the characteristic of reason, logic and analysis. Instead, we want to acknowledge Indigenous ontologies and thoughtfully consider interweaving them into our local living situations in order to re-balance ideas of rationality with softer values such as intuition, feeling, and myth (Wilber 2000). In various South-American countries, the Indigenous Andean worldview *buen vivir* was hereby constitutionally integrated with the purpose of a peaceful harmonic cohabitation of all beings (Brand et al. 2021; de Sousa Santos 2012) and in various other regions, similar processes can be observed currently by recognizing nature’s rights legally (European Parliament et al. 2021). This approach of granting nature the status of legal personhood that is based on spiritual kinship between all beings is highlighted in the scientific community as extremely significant for nature’s protection (Inter-governmental Science-Policy Platform on Biodiversity and Ecosystem Services 2022). Given the accelerating urbanization, some scholars see an opportunity to bring together ideas of urbanity and Indigenous principles, yet research has often been bound to native Indigenous people (McMillen et al. 2020). Indeed, the term *Indigenous* already implies a relationship to a specific region, and the natural territory’s fertile continuation is essential for the dwellers’ physical and cultural survival (Charles and Cajete 2020). Cajete (1999; cited in Kealiikanakaoleohaililani and Giardina 2016, p. 58) illustrates this embodied and spiritual relationship as follows: “It is this place that holds our memories and the bones of our people (...). This is the place that made us.” A human being thus never exists in isolation, but is always embedded in a transcendent relational reality (Dornhoff et al. 2019). This relational thinking rejects, therefore, a one-sided utility-driven perspective (Kealiikanakaoleohaililani et al. 2018; Muradian and Gómez-Baggethun 2021) and supports rather the idea of collective health that needs to be cared for.

In order to identify ourselves as researchers, thereby giving the reader insight into our cultural background, we would like to note that all three of us grew up in Germany as an example of a considerably industrialized and technologized country. Experiencing Indigenous cultures first hand was only possible for the lead author by means of a longer research stay abroad. Yet, working with Indigenous ontologies requires respect for different forms of knowledge that need to be placed on an equal footing. Their contribution to sustainability science is still ongoing, yet there exists a lack of clarity regarding what and how modern urban life environments, with their daily material and immaterial human–nature relationships, can learn from traditional Indigenous wisdom (Johnson et al. 2016).

Mindfulness

“Mindfulness can be thought of as moment-to-moment, non-judgmental awareness” (Kabat-Zinn 2015, p. 1481) that allows the individual to tolerate “as openheartedly as possible”, thereby integrating one’s vulnerability by taking down fears and blockages intrapersonally. By being aware of the present moment (Kabat-Zinn 2015), an individual person is able to reconnect with his/her own body and psyche (Grossman et al. 2004; Bristow et al. 2022). The 8-week training course *Mindfulness-Based Stress Reduction (MBSR)*, which was developed by the physician John Kabat-Zinn, proves that mindfulness can be effectively cultivated and contributes to diverse health-related aspects such as increased levels of well-being in general (Grossman et al. 2004) and a decrease in anxiety (Singh et al. 2007). Evidence suggests also an interpersonal contribution to increased stability and satisfaction in loving partnerships (McGill et al. 2016). Lately, mindfulness is being applied increasingly in the context of sustainability transformation research (Geiger et al. 2019, 2020; Frank et al. 2019). In this context, it appears to contribute to the reciprocity between humans and nature as Kimmerer illustrates (cited in Bristow et al. 2022, p. 19): “The land is the real teacher. (...) Paying attention is a form of reciprocity with the living world, receiving the gifts with open eyes and open heart”. Wamsler et al. (2018) proclaim, therefore, that mindfulness should become a core concept of sustainability research, practice, and teaching.

Rituals as powerful relationship tools

Rituals represent an “embodied, prescribed, condensed enactment” (Grimes 2014, p. 195) whereby social and cultural functions are meant to stabilize social order and community as well as to cause irreversible transformations. Parallel to this, the reader might easily notice why rituals can be criticized as they are always ethically and culturally embedded, but what appears “good” for one society might not necessarily be good for entities or systems outside that boundary (Wojtkowiak 2018). On the one hand, mainly stabilizing long-term rituals in modern societies involve honoring birthdays and holidays (Eastern, Christmas, etc.), which allow members of a society to deepen their relationships with each other or with God, to express affection and mutual trust. On the other hand, transitional rituals, also called rites of passage, intentionally change the status of the ritual’s participants through marriage, ceremonial farewells, or confirmation. Interestingly, we are not aware of many nature-related rituals here in Germany as an example of an industrialized country. Only sporadically, several nature-related rituals exist explicitly, such as the Erntedankfest (*Thanksgiving*).

In general, misunderstood as mute habits, rituals have gained a bad reputation in science, mostly in the field of psychology, as if actions were managed through the human auto-pilot and not regulated by conscious decisions (Hobson et al. 2018). This is illustrated in particular by the psychotherapeutic use of the notion *ritual* to carry out certain compulsive actions or thoughts to suppress fear and anxiety in short-term behavior by maintaining previous habits. However, rituals can be considered as powerful interventions: by performing rituals in the form of an integrated spiritual acknowledgement of the ancestors and the contact with places as living, thinking and feeling counterparts, the inner space as well as mindfulness are cultivated and one feels accepted and safe (Kealiikanakaoleohaililani et al. 2018). The perceived care exhibited by a counterpart establishes emotions between the participants, increases the social sense of community, and motivates actions based on the shared identity of the place (Wojtkowiak 2018). Hereby, the counterpart can be a mountain, river, the Earth, etc. Furthermore, feeling empathy throughout the ritual with one’s own body and senses subsequently allows one to have empathy with another being (Wojtkowiak 2018). Thus, ritual processes—and the psychological and transformative aspects associated with them—should be understood as relational exchange processes that occur intrapersonally, on the one hand, and, on the other hand, between the participants in rituals such as places, plants, or things. So far, empirical psychological studies about specific ritual processes regarding, in particular, transformation and the formation of sustainable relationships between humans and nonhuman nature remain rare (Wojtkowiak 2018); nonetheless, different research notions such as habits expressed by repetitive behavior do play a significant role in psychology and sustainability science, making it difficult to merge existing streams.

Fostering individual human–nature resonance through rituals

Conceptualization of individual human–nature resonance

By applying Artmann’s (2023) concept of human–nature resonance and contributing to positive solutions for sustainability transformations, we aim to shed light on specific aspects of individual human nature resonance. In this context, human–nature resonance, being based on Rosa’s (2019) main pillars of his resonance theory, constitutes the theoretical basis and is complemented by the introduced concepts in “[Conceptual enhancement for individual human–nature resonance](#)”. In order to transfer the respective theoretical pillars into a ritual, practical tools complete the conceptualization of individual human–nature resonance (see Table 1).

Table 1 Individual human–nature resonance, related references, and possible fostering tools

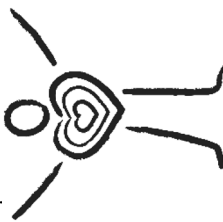




Resonance dimensions	Theoretical basis	Conceptualization of individual human–nature resonance	Related concepts and references	Possible tools feeding into the ritual
<p>Openness</p> 	<p>Resonance, sensitivity and trust are preconditions for resonance that become possible by a state of individual vulnerability and openness (Rosa 2019; Artmann 2023)</p>	<p>Openness is necessary to allow oneself to connect with nature, possibly due to an increase in mindfulness, thereby reducing inner resonance barriers such as fear</p>	<p>Related to mindfulness: - Wamsler et al. (2021) - Wamsler et al. (2018) - Bauer (2019) - Frank et al. (2019)</p>	<p>Mindfulness (e.g., mindfulness-based stress reduction (Kabat-Zinn 2015), contemplative practices (Singh et al. 2007))</p>
<p>Value of <i>Unverfügbarkeit</i> (<i>Inaccessibility</i>)</p> 	<p>A strong valuation of the respective counterpart is needed (Rosa 2019). By accepting limits to making nature visible, accessible, controllable and utilizable, thereby respecting nature’s own voice, we acknowledge our mutual dependencies and respect nature’s agency and intrinsic value (Artmann 2023)</p>	<p>The acknowledgment of nonhuman nature’s <i>Unverfügbarkeit</i> by treating and protecting her as a spiritual relative can be inspired by Indigenous cultures. A relational approach also considers valuing and caring for one’s own body, mind, and psyche to be part of this spiritual nature whose <i>Unverfügbarkeit</i> and limits are likewise worthy of dignity</p>	<p>Related to Indigenous ontologies: - Muradian and Gomez-Baggethun (2021) - Dornhoff et al. (2019) - de Groot (1992) - de Sousa Santos (2012)</p>	<p>Narratives about value of nature and landscapes (Mikaels and Asfeldt 2017) including information about, and the existence of, legal personhood status for nature in New Zealand and Ecuador (Dornhoff et al. 2019)</p>
<p>Affect</p> 	<p>Affect is a passive “(...) experience or condition, in which the subject is affected, i.e., touched and moved, by some segment of the world (...)” (Rosa 2019, p. 163). Artmann (2023) stresses the importance of being externally and/or internally affected by the social–ecological crisis in our contemporary living environment in order to become active and respond to it</p>	<p>Affect is described as “(...) an experience of intensity (...) that changes the state of a body” (Thoburn 2007, p. 84) leading to an empathetic inner representation of the state of the acting subject. Inner nature and outer nature are the acting counterparts hereby, likewise being valuable parts of a transcendental relational reality</p>	<p>Related to spirituality and transpersonal psychology: - Thoburn (2007) - Preckel et al. (2018) - Kealiikanakaolehaililani et al. (2018)</p>	<p>Examples of (intimate) care by nature (Kealiikanakaolehaililani et al. 2018; Wojtkowiak 2018), addressing various types of knowledge testing their potential affect-laden capacities (Wamsler et al. 2021; Böhme et al. 2022)</p>
<p>Response</p> 	<p>To respond to a segment of the world and experience self-efficacy to move a relating object constitutes an active intentional response (Rosa 2019). In human–nature relationships, caring about nature’s needs and acting upon them is the first visible step out of humanity’s current state of alienation (Artmann 2023)</p>	<p>After being touched passively by a subject, this might lead to an active compassionate and caring response based on intuition what is needed and the individual capacity of self-efficacy and self-regulation to act</p>	<p>Related to mindfulness: - Singh et al. (2007) - Jax et al. (2018) - Muradian and Gómez-Baggethun (2021) - Wamsler et al. (2018) - Neff and Beretvas (2013) - Kabat-Zinn (2015)</p>	<p>MSC (Germer and Neff 2013), mindfulness (Kabat-Zinn 2015) nurturing contact and closeness leading to understanding and intuition, enhancing intrapersonal resonance (Rosa 2019), mental hygiene (Salmon 2006)</p>

Table 1 (continued)

Resonance dimensions	Theoretical basis	Conceptualization of individual human–nature resonance	Related concepts and references	Possible tools feeding into the ritual
	<p>Experiencing sustainability “as a basic component for a good life” (Artmann 2023, p. 12) might be the result of a successful adaptive transformation of the world leading into a habit of natural care for nature</p>	<p>Throughout a transformation, both entities mutually grow and become a spiritually related part of each other following William James’s idea of the development of a spiritual self whose feelings and soul are connected with other beings and, therefore, the web of life</p>	<p>Related to spirituality and transpersonal psychology:</p> <ul style="list-style-type: none"> - Pritchard et al. (2020) - Poll and Smith (2003) - James (1988) - Naess (1993) - Wamsler et al. (2018) - Hanh (2010) 	<p>Tools linking well-being and nature relatedness (Pritchard et al. 2020), mindfulness and MSC (Germer and Neff 2013), specific psychotherapy or ACT therapy (Hayes 2004)</p>

“Prerequisites for individual human–nature resonance: openness and acknowledgment of nature’s value of *Unverfügbarkeit*” exemplifies in depth the importance of certain individual prerequisites that are highlighted as “dispositional resonance” (Rosa 2019, p. 416). Mindfulness (Bauer 2019; Wamsler et al. 2021) and Indigenous ontologies (Dornhoff et al. 2019; Muradian and Gómez-Baggethun 2021) play a significant role hereby for further understanding. “Individual resonance processes with nature through affect, response and transformation” drafts the three-part individual resonance processes containing affect, response and transformation and is based on spirituality and transpersonal psychology (James 1988; Poll and Smith 2003; Hayes 2004; Thoburn 2007; Preckel et al. 2018), and mindfulness (Neff and Beretvas 2013; Kabat-Zinn 2015). Finally, “Individual human–nature partnerships for generating target knowledge” relates to Artmann’s (2023) assertion of human–nature partnerships as sustainability target knowledge for individuals and includes references from all three theory branches as being continuously involved over the long term.

Prerequisites for individual human–nature resonance: openness and acknowledgment of nature’s value of *Unverfügbarkeit*



According to Rosa (2019, p. 121), fear and anxiety are “resonance killers” because they “prevent the subject from opening up to, tuning into, or becoming involved in the world.” Mental illnesses and anxiety disorders, on the one hand, and the simultaneous extinction of nature experiences and its health benefits (Fitzpatrick and Willis 2020), on the other hand, might be reinforcing parts of the vicious circle (Bristow et al. 2022). Wamsler and Bristow (2022) indicate that the social–ecological crisis and the accompanied mental health issues such as climate anxiety and a feeling of powerlessness might again lead to more unsustainable consumption patterns. Yet, if anxiety has already impeded and muted an individual’s resonance sensitivity, it has thus far been unclear regarding how to re-enter the resonant mode with oneself and nature by making oneself vulnerable and open again. As mindfulness is suggested as a possible entrance point and tool to experience resonance (Bauer 2019), evidence supports this hypothesis that being mindful increases the responsiveness in relationships—be it between two cells or between mind and body (intrapersonally), with other beings (interpersonally), or even with life itself (spiritually)

(Siegel 2007). Developing intrapersonally the ability to take the responsibility for one self is highlighted in this context by psychiatrists and psychotherapists (Siegel 2007) as it has a positive salutogenetic effect on the prefrontal cortex as well as well-being in general. While intentional avoidance of anxiety mostly reinforces the felt stress and is accompanied by extreme energy depletion, being aware of the present moment allows the entire individual system to relax and reflect upon feelings (Kabat-Zinn 2015; Woiwode et al. 2021). Eventual removal of the anxiety-based barriers leads to an individual's re-opening, thereby increasing the resonance sensitivity towards the needs of oneself, others and nonhuman nature.



Another prerequisite for the process of individual human–nature resonance is to grant both nonhuman and human nature the *value of Unverfügbarkeit*. Only if nature possesses—from the individual humans' perspective—dignity, intrinsic value, and the ability to *speak with her own voice*, the development of a resonant reciprocal relationship to her becomes possible. Besides mental and somatic dimensions of human–nature relationships, the spiritual element, as demonstrated in Indigenous cultures, includes recognition of nature as a living, sensitive entity whose needs and limits are likewise worthy of respect. A relational approach also considers that valuing and caring for one's own inner nature are integral parts of a transpersonal natural reality which includes the ability to listen carefully to the inner voice (Artmann 2023). Yet, besides a theoretical definition of nature's *Unverfügbarkeit*, the actual internalization of this value includes practical tools to learn about nature's needs and to generate an intuition vis-à-vis further actions. In this context, the tools of telling stories and narratives, while disseminating knowledge—also in contemporary life worlds—have proven themselves to be very effective in acknowledging nature's features (Mikaels and Asfeldt 2017). This might be complemented by offering narratives regarding other countries that protect her dignity and *Unverfügbarkeit* as being equal to humans' dignity (Dornhoff et al. 2019; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services 2022). For instance, New Zealand could serve as an example for a highly industrialized country, as national politics have been trying successfully to integrate Indigenous heritage into a postmodern constitution (Schoder 2013).

Individual resonance processes with nature through affect, response and transformation



First, to enter the resonant mode with nature, an individual human being needs to show humbleness and let nature express her needs by means of *her own voice* (see also “[Pre-requisites for individual human–nature resonance: openness and acknowledgment of nature's value of Unverfügbarkeit](#)”). Embracing this voice in an open, passive and trustful state, an individual might go through “(...) an experience of intensity (...) that changes the state of the body” (Thoburn 2007, p. 84). Parallel to this, inner human and outer nonhuman nature can serve as the acting counterparts, likewise being valuable parts of a transcendental relational reality. Through this affect, the human entity is enabled to develop internally a representation of the acting counterpart and his or her current state. Biologically, this is possible due to mirror neurons, permitting the individual to empathetically feel what someone else feels or thinks (Rosa 2019). Therefore, the state of this inner representation of another being transcends previously defined subjects and objects and confirms relational ontologies; regardless of to whom the species subject and object belong. Yet, given the social–ecological crisis, Artmann (2023) argues that modern societies are currently facing a lack of this affect, thereby pointing towards a neglect of a relational reality. Since human beings are extremely capable of achieving a state of empathy and creating inner representations (Preckel et al. 2018), we, therefore, stress the need to re-engage empathetically with nonhuman and human nature. For this purpose, to reconnect with one's own inner nature, psychology and psychotherapy offer contemplative practices such as the mindful body scan that nurtures inner representations of one's own bodily parts, their caring intimate presence as well as their respective conditions—regardless of the individual's location (e.g., at home, in a park, or in the office).



Second, after being touched passively by nature, this might lead to an actively compassionate response. Care is intrapersonally based here on the self-regulation of the preceding experience of intensity (Thoburn 2007). Given the current ecological destruction, an empathetic inner

representation of the previous step might be accompanied by intense emotions of grief, anger, or pain, etc. (Clayton 2020). Therefore, in order to respond in a caring manner towards nature, it appears highly effectual to enable individuals to deal responsibly with their own emotions (Ramstetter et al. 2023). Whereas the previously introduced capability of mindfulness fosters openness and acceptance, a practical and well-researched tool for handling difficult emotions and related needs is Mindful Self-Compassion (MSC) (Germer and Neff 2013). This concept makes use of meditation, movements, and the exercise of journaling to reflect upon one's own experiences and emotions. According to Koppensteiner (2018), self-compassion is essential for getting through one's own blockages and inner conflicts, and might, therefore, contribute considerably to intrapersonal resonance. The process of becoming familiar with my own and others' needs nurtures intuition regarding necessary actions. At the same time, besides a rise in intuition, the individual gains trust and self-efficacy to be able to move something significantly. When in fact, speaking in terms of one's own inner nature, a physical problem might affect an individual and lead to intensive attempts to become familiar with the respective problem, the related organs and its needs. Externally in response to nonhuman nature, individuals might change their dietary habits due to ethical concerns given the current state of meat production (Werner and Risius 2021). Finally, responding to felt individual helplessness by joining environmental activism groups holds the potential for an increased sense of collective self-efficacy (Bamberg et al. 2018; Francesconi et al. 2021).



As a consequence of being affected by nature and responding self-efficiently to her, humans might adapt to this segment of the world leading to a mutual transformation of both entities. According to Bauer (2019, p. 135), it is humans' deepest desire to experience resonance, although the counterpart is not specified here. In return, not experiencing any resonance by means of not moving anyone, feelings of helplessness or loneliness, might lead to severe consequences, for example massive attachment disorders negatively influencing a person's interactions in relationships throughout his or her lifespan (Zeanah and Humphreys 2018). Regarding the ecological crisis, poor health exacerbates, once again, the vicious cycle by not allowing the individual to engage in activism or care for nature. Sustainability scientists thus plead for linking modern examples of life and health science with relational spiritual values in

the sense of a (re)connection between humans and nature (Woiwode et al. 2021). A successful adaptation of nature would then include the value of sustainability as part of a good healthy human life by caring for the loved ones (Artmann 2023). Spiritually, both the human being and nature would then become intermingled with each other, following William James's idea of the development of a spiritual self-being embedded in a transcendental reality. To approach the phenomenon pragmatically, we suggest specific forms of psychotherapy, such as the acceptance-and-commitment therapy (ACT), which shifts their focus away from persons and towards core values and spiritual aims of life. In fact, ACT therapy itself is deeply rooted in relational contextual ontologies (Hayes 2004). By concentrating on these internal dimensions rather than on materialistic objects or personal living conditions, ACT teaches individuals, over the long term, how to commit to these values and develop trust in the spiritual flow of life; and a less resource-intensive sustainable lifestyle might be supported thereby, as research shows (Hay 2005).

Individual human–nature partnerships for generating target knowledge

The concept of individual human–nature partnerships as stable resonance bonds with nature becomes possible in connection with the individual's intrinsic interest in enabling a dignified life and long-term perspective for human and nonhuman nature (Naess 1993; Böhme et al. 2022; Artmann 2023). Based on the previously elaborated assumptions of individual human–nature resonance processes including necessary prerequisites, Rosa's (2019) declaration about the time-and-energy-intensiveness for establishing such bonds appears evident. Whereas, so far, research about partnerships has mainly been bound to romantic bonds between humans, human–nature partnerships build a foundation for all life on the planet and can contribute to safe operation zones for planetary health (Artmann 2023; de Groot 1992). Targeting individual human–nature partnerships, we stress the need to deploy our inner and outer nature in important individual decisions, to appreciate nature and her limits, and let spiritual values such as compassion and care guide our daily lives rather than materialistic short-term decisions (Hanh 2010). It might also help to engage in regular activities of mental hygiene to keep the mind clear and capable of acting as well as to nurture one's own body by eating healthily and doing sports (Salmon 2006). Knowing one's own self-worth permits one to live in a caring partnership with oneself; this could likely increase the resonance sensitivity towards the beauty of nonhuman nature (Artmann 2023), since specific resonances cannot remain separately on their own (Rosa 2019). Yet, continuous care for inner and outer nature involves many difficulties for individuals, as

currently modern societies' modes of production, living and infrastructure are rooted in unilateral dominance of nature (Clayton 2020). Learning the power of endurance, coping with strategies for frustration, as well as nurturing resilience deserve to receive more attention in order to help individual forerunners to remain healthy and resilient in human–nature partnerships, and prevent them from depletion (Salmon 2006). This stresses again the need to target individual and collective actors for lasting sustainability transformations. Yet, qualitative insights from individual inner blockages leading to mind–action gaps and the overcoming of same demand a focus, in part, on individuals in order to upscale the results to the collective level with more efficacy (Bercht 2021; Wamsler and Bristow 2022).

Translating individual human–nature resonance into a practical ritual

Studies show that, by defining an intervention explicitly as *ritual*, it communicates to participants a greater meaning of the exerted actions (Norton and Gino 2014). Yet, in a globalized world, regional cultural understandings of rituals will have to be verified in order to offer them locally (Wojtkowiak 2018; McMillen et al. 2020). In addition, psychologists stress the value of longer interventions to change habits and attitudes (Lally et al. 2010; Baer et al. 2012)—also in the field of human–nature relationships (Schulz and Martin-Ortega 2018; Geiger et al. 2020). This builds also upon evidence that the relational capability mindfulness is mostly taught over a period of 8 weeks (Kabat-Zinn 2015). Yet, according to the resonance theory, we suggest (i) to generally map an overall effect on individual human–nature resonance through a ritual and (ii) to clarify how the individual dimensions of the resonance theory, such as *openness*, *affect*, and value of *Unverfügbarkeit*, are connected, and to identify which variables are perhaps particularly important for the resonance experience. Targeting a thoughtful transformation in participants' attitudes or relational dispositions towards nature, the drafted ritual represents a transitional ritual rather than a stabilizing enactment. Yet, we do presume and favorable stabilizing effects on the individuals and their emotional state as they will have to proceed through the respective weeks while following their usual daily life (work, care-work, family and friends, etc.) (Geiger et al. 2020). We are aware that transcendent contents of the ritual might be provocative for some groups due to the converging of opposing worldviews. Nonetheless, the ritual contains the potential to affect people in their so far non-affected living conditions (Artmann 2023). To conclude, by working in general through emotional blockages such as prejudices, traumas, and fears by means of the nurtured inner capabilities, we simultaneously expect a letting go of old nature-related attitudes—this without pushing participants. Grimes (2014,

p. 202) calls this ritual process “a death and a resurrection, a rebirth in sorts”. “[Embodying the ritual-modeling through self-experience](#)” outlines the role of transdisciplinary self-experience (Koppensteiner 2018). “[The proposed ritual design](#)” presents a proposed ritual draft including information about psychotherapeutic structure guidelines (Germer and Neff 2019).

Embodying the ritual-modeling through self-experience

Evidence suggests that, as researcher, direct engagement with one's own research material enables wholeness and a different form of knowledge, as Koppensteiner (2018, p. 60) illustrates:

“I personally find research to be at its most inspiring when I allow myself to somatically explore the topics through my body, when the heart is empathetically open to the investigation and to research participants, when the mind is engaged and when the intuitive voice of souls speaks. (...) Research then turns into a holistic process that does not lead only to more information, but touches me on all levels of being.”






Therefore, in order to design a relational nurturing process that is not exclusively theoretical, our lead researcher participated in an 8-week-long MSC course. MSC's basics are mindfulness, connectedness, and kindness with the inner human nature (Germer and Neff 2013)—relational values and aspects that appear as well significant for humans' relationships with nonhuman nature (Klain et al. 2017; Artmann 2023). We presume that our lead researcher's 8-week-long participation in an MSC course allows us to gain a better understanding of the course sequences, the constitutive character of the learning process, and the individuality of each participant in his or her respective capabilities regarding responses to one's own inner dimensions.

The proposed ritual design

We plan to nurture each dimension of the previous conceptualization while participants follow the ritual throughout a 5-week period. More specifically, the procedure is divided into five 1-week sequences where the resonance dimensions are assigned to selected specialized tools proposed in the previous section (see Table 2).

Besides societal and cultural factors, emotional criteria and possible preferences for rituals are highly subjective as each human being has his or her own unique epistemological experience regarding the mental, physical and spiritual world. In accordance with the guidelines of the Declaration of Helsinki, the World Medical Association (WMA), and the German Psychological Society, an introductory online meeting is supposed to transmit necessary information to the

Table 2 Fostering individual human–nature resonance trough rituals

		Week 1	Week 2	Week 3	Week 4	Week 5
Introductory meeting	Target dimension of individual human–nature resonance					
	Exemplary tool for operationalization	Openness	Value of <i>Unverfügbarkeit</i>	Affect	Response	Transformation
	Hypothesis	Mindfulness	Narratives about nature	Intimate care by nature	MSC with focus on journaling	ACT therapy
		Expected increases in individual human–nature resonance				

participants, enabling an understanding of the subsequent procedures, while at the same time ensuring informed consent. Following the call by researchers (Mikaels and Asfeldt 2017) for more experiential education within sustainability science, we plead to apply the individual exercise *place search* at the beginning of the first module serving as an initial spatial “embodied engagement with nature” (Jax et al. 2018, p. 5). Simultaneously, as in the MSC course where the relationship to one’s own emotions, body, and needs are built up incrementally (Germer and Neff 2013), the ritual module configuration follows this idea starting modules 1 and 2 by nurturing the *individual prerequisites* of openness and nature’s value of *Unverfügbarkeit*. Module 3 then initiates the intended triggered *individual resonance processes* by stressing intimate affect by nature. Afterwards, the content of module 4 focuses intensively on how to respond adequately to nonhuman and human nature’s needs and to develop the inner capabilities needed for activism in the social–ecological crisis (Wamsler et al. 2018; Woiwode 2020). Finally, module 5 aims to support the individuals to follow sustainable lifestyles (Böhme et al. 2022). Regarding the operability of larger samples and embedding the ritual into the modern lifeworld, the development of a smartphone app is proposed guiding the participants through their ritual process (McEwan et al. 2019) while guaranteeing the singularity of each individual human–nature resonance process. In order to check for possible data biases through time and alternative processes that might affect the results, we strongly suggest including a control group, where additional participants undergo the procedure without tools that are supposed to nurture individual human–nature resonance. Simultaneously, as resonance cannot be forced (Rosa 2019), an evaluation of ritual efficacy can be criticized by focusing on the offering–nature instead of the commanded nature of rituals (Wojtkowiak 2018). Yet, in order to detect the potential of the ritual to close any mind–action gaps, changes in behavioral adaptations of the individuals could be assessed in terms of their behaviors related to, for instance, food, transportation, and energy (Taylor et al. 2020). In order to

examine the interrelationships of weekly changes in more detail, the application of regression models is proposed. Eventually, we want to highlight the mixed method approach (Schulz and Martin-Ortega 2018; Bercht 2021) of the ritual as it delivers (i) quantitative statistical data via standardized surveys (Nisbet et al. 2009) regarding increases/decreases in individual human–nature resonance, single dimensions, and possible blockages as well as (ii) qualitative processual relational data regarding inner processes that are collected through journaling entries as part of the tool mindful self-compassion. To conclude, the drafted design of a 5-week-long panel study delivers a solid innovative framework to foster individual human–nature resonance by means of potential tools, a strong evaluation approach, and control over possible interfering variables due to the execution of a control group (Gagné et al. 1948).

Discussion

Integrative potentials for individual human–nature resonance

In the previous chapter, we introduced in the first instance individual human–nature resonance as a relational framework for sustainability transformations along with required *individual prerequisites*, *the individual resonance processes* themselves, and individual *human–nature partnerships* as target knowledge for sustainability science. The qualitative framework sheds light, at the same time, on individuals’ inner dimension as “behavior is largely unconscious, boundedly rational, and driven by emotions and contexts” (Bercht 2021, p. 2). The first target of the paper was to integrate knowledge from sustainability science and psychology to foster a broader scientific understanding in both disciplines while targeting more integrative concepts and theories (Wilber 2000). Currently, there could be a window of opportunity for approaching spirituality and metaphysics within different scientific disciplines; this is because modern

societies are integrating Eastern spiritual practices such as mindfulness, Yoga, and meditation more and more into their lifestyles (Geiger et al. 2020; Thiermann and Sheate 2021). Facing large-scale and system adjustment over the next few decades, we additionally need to realize that knowledge regarding intrapersonal processes has to be further enhanced. This, while focusing on change at the collective level. Therefore, we invite researchers from multiple disciplines to further interweave related insights from the disciplines of law, education science, economics, medicine, etc. and to generate more integrative knowledge for planetary health (WBGU 2021). Along with the above-mentioned disciplines, notably the potential of law and the constitutional protection of nature might be worthy of more exploration (Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services 2022), thereby linking individual and collective self-efficacy and learning from Indigenous knowledge to foster human–nature resonance. For instance, in light of current events such as the rejection of a new constitution for Chile that would have been enriched by Indigenous ontologies, it has been suggested that individual prerequisites need to be more extensively fostered in order to change the laws for cohabitation on Earth. Addressing the constitutional level, insights from individuals might foster collective debates about societal openness and democratic power shifts towards entities that transcend human beings (O’Brien and Hochachka 2010; Artmann 2023).

Self-experience as transdisciplinary resonant research approach

Besides interdisciplinary work, the application of transdisciplinary, embodied methods for sustainability science might contribute to further integration of different forms of knowledge into the scientific process and subsequently back into society. The specific aim of building the ritual upon the lead author’s experiences was to gain knowledge regarding the planning and execution of a methodologically objective several-week-long course, its structure, specific patterns and how to merge these insights with the conceptualization of individual human–nature resonance, hence integrating “practical wisdom” (Ives et al. 2020, p. 209; Ramstetter et al. 2023). Yet, beside the fulfillment of the objectives, we confirm Koppensteiner’s (2018, p. 60) declaration that “[R] research then turns into a holistic process” when engaging with one’s own material, thereby becoming a deeply resonant and appreciative task. This spans from being touched and feeling the theories intensively inside, to responding to and living with the concepts and eventually letting the ideas transform one’s self, hence, changing one’s own mindset. As Rosa (2019) suggests, to adapt a segment of the world—in this case to reflect upon and adapt a concept, its theories and its origin, and witness its effect on participants—could lead

to an increase in intrinsic interests, empathy and self-efficacy in the scientific process, thereby becoming and staying open, curious, and sensitive as researcher (May and Perry 2017). Subsequently, this intimate scientific self-experience might strengthen the researcher’s authenticity and trustworthiness (Strom et al. 2018). In the end, we as researchers can also ask ourselves if we are internally touched by our work in such a way as to be personally engaged in sustainable behavior that is demanded of us by society. In this regard, Rosa (2019) is also criticizing the fact that creative work such as research is in danger of becoming mute due to the external pressure to quantify its impact and its underlying acceleration of competitive pressure. In this context, future studies can also include sustainability researchers and their relational qualities along with their research objects (e.g., nonhuman nature), internal mindsets and systemic pressures in academia.

Ways forward: the transformative role of rituals for modern urban societies

Besides theoretical concepts, there is an urgent need for practical and applicable solutions for sustainability transformations (Bristow et al. 2022). We join the call to conduct interventions, notably in the urban context, as empirical studies analyzing human–nature relationships in cities are rare in spite of increasing urbanization rates and involving separateness to nature and her representatives, processes and regional seasons (Ives et al. 2018; Muradian and Pascual 2018; McEwan et al. 2019). As previously pointed out, working with the notion of a ritual showed stronger effects in engaging in certain behaviors than engaging in a random activity (Norton and Gino 2014). However, there is no competition, since all interventions target stronger human–nature relationships and pro-environmental behavior. One of the few descriptive contributions regarding explicit use of urban rituals as a tool to deepen the relationship with nature is provided by Bergmann (2020, p. 88), illustrating the ritual’s potential role as a mediator between humans, urban place, and nature:

“Rituals help people to figure out, divine and even construct a cosmos. In order to make ourselves at home on Earth, we do need to interrelate the local and the cosmic, at every place anew, and rituals, are nurturing this process (...)”

Woiwode and Woiwode (2019) assume that urban space is to be seen as an expression of human values, which in the past was increasingly shaped by a rationalistic image of man dominating nature and suppressing the spiritual dimension. Therefore, urban rituals, such as the drafted holistic ritual in “[Translating individual human–nature resonance into a practical ritual](#)”, could play a significant role and operate as

experiential tools to ground cities within Mother Earth and the universe. In this connection, the spiritual inner dimension of rituals has the potential to nurture humbleness for nature on a global scale against the backdrop that globalization and urbanization have intensified human separation from nature, food production, and the exploitation of materials while disguising negative consequences (Soga and Gaston 2016; Beery et al. 2023). Hence, working on the content design for such a ritual, there is a need to implement specific knowledge about global processes into the ritual in order to illustrate the value of nature's *Unverfügbarkeit*, for example, the destructive process of mining vis-à-vis local Indigenous people and nature. Yet to conclude, in order to unfold their potential, we invite nature-related rituals to be integrated into larger systems (such as schools, offices, or health insurances), thereby collectively affirming society's connection and dependence on natural processes. In the course of time, Grimes (2014, p. 328) points out, "rituals, like art, communicate a worldview or articulate a sense of purpose, and, by connecting its creators and appreciators with each other, enable people to foster community". Hence, we invite further research to discuss, on the one hand, societal affiliations towards embracing more-than-human nature within the circle of protected and dignified entities and, on the other, to simultaneously and scientifically re-legitimize the ritual's role within society—notably in times of crisis (Hobson et al. 2018), in order to increase the contribution of rituals towards sustainability transformations.

Conclusions

Rethinking the relationship between humans and nature is both an individual and societal challenge and presents one key for greater awareness of the relational embeddedness of the web of life (Beery et al. 2023). Indeed, it questions human relationships in general and invites us to openly reflect upon ourselves, our values, and our goals on Earth. To understand the processual mechanism of *resonance* more deeply for possible contributions to sustainability transformations, we have proposed individual human–nature resonance in order to learn about the joy of care for nature, acceptance of her limits, and commitment. Current societal accelerations call for practical instruments that allow us to provide ourselves with an anchor, in order to reduce anxiety and, therefore, the inner space to reflect upon what matters to us spiritually (Kealiikanakaolehaililani et al. 2018). Thus, through the attempt to integrate this spiritual dimension into people's daily lives and to potentially contribute towards "evoking the sacred" (Grimes 2014, p. 202), the suggested ritual can, therefore, be seen as experiential support for

turning inwards. In addition, at the same time, it can also be seen as a potential intervention for a higher commitment by individuals to live according to planetary requirements.



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Declarations

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