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PERSPECTIVE

Reconnecting with food: The how and where of human-food resonance for sustainability

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Abstract In a world marked by disconnect and alienation, the need for relational approaches in science and society is clear. Despite attempts toward sustainable transformations, pressure on the world, humans, and more-than-human entities continues to rise. The current food system has a well-documented, negative impact on sustainable development. However, it also offers potential for sustainability-oriented change, and the way we *relate* to food is proving to be a key pillar. In this *perspective* we elaborate on human-food resonance as a theoretical concept of understanding relationships between humans and food. We argue that, rather than a lifeless resource, food is an affective agent in its diverse materializations. Human-food resonance illustrates *how* food may affect sustainable transformations. The concept indicates *where* relationships with food are shaped. It thus offers a theoretical framework and a vision of a good life in relation to food, while highlighting the need for future empirical research.

Keywords Care · Inner-outer transformation · New materialism · Relational turn · Resonance theory · Sustainable food consumption

INTRODUCTION

Like many other scholars, we begin by welcoming the readers into the Anthropocene, an age in which human dominance has become undeniable, with extensive and devastating consequences (Steffen et al. 2015). Scientists continue to seek theoretical and empirical approaches to explore the causes, dynamics and transformational pathways toward sustainability in response to the accelerating and intensifying entanglement of ecological, social and economic crises. We tackle this overarching problem by deliberately addressing paradigms, worldviews, and values—referred to as elements of the inner dimension (Woiwode et al. 2021). These underlying aspects shape and structure systems and function as deep leverage points for profound sustainability transformations (Meadows 1999; Abson et al. 2017). In our understanding, sustainability transformations evolve around "reconnecting people to nature, restructuring institutions and rethinking how knowledge is created and used in pursuit of sustainability" (Abson et al. 2017, p. 30). Further, deep leverage points are argued to overcome reductionist as well as dualistic thinking and practices that present root causes of today's sustainability crises (Muradian and Gómez-Baggethun 2021; Böhme et al. 2024).

In this line of thought, West et al. (2020) coined the term 'relational turn for sustainability science', which proposes alternative approaches to understand the relational qualities of individuals, collectives, and systems. Such alternative approaches work against the current modes of human-nature relations characterized by the disconnection, instrumentalization, and alienation of highly industrialized—so-called modern societies (Artmann 2023; Beery et al. 2023). In contrast to this, we (and other scholars) propose a form of *living with*, a sense of *being part*, and an understanding of *depending on* nature and more-than-human entities (Ives et al. 2020; Woiwode 2020; Artmann 2023). The scholarly debate on sustainable transformations continues to be enriched by the exploration of relational ontologies (Böhme et al. 2022). These include among others: process philosophy (approach that understands reality as relational and ongoing processes), new materialism (theoretical current that addresses agency of human and non-human

matter), or Indigenous knowledge (that advocates for relational and place-based ways of knowing) (Walsh et al. 2021). However, exploring the relational turn and its conceptualization in terms of sustainability transformations remains challenging due to a lack of appropriate terminology, theoretical frameworks, and methodological approaches (Brossette and Bieling 2025).

A promising new path to growing the scientific movement toward more complex and in-depth research is seen in applying more relational perspectives (Böhme et al. 2024). An example of novel relational perspectives can be found in the theory of resonance by Hartmut Rosa (2019a), which offers corresponding terms to overcome current accelerated modes of living toward sustainable transformations. Resonance is described here as an alternative form of world relationship that offers a normative understanding of a good life based on meaningful and responsive connections to diverse aspects of life (ibid.). In this context, the resonance theory, has already been applied to advance social-ecological thinking (Brossette and Bieling 2025). Examples include human-nature partnerships (Artmann 2023; Artmann et al. 2026) and individual human-nature relations (Müller et al. 2023). That being said, the theory leaves a lot of open space for further conceptualizing numerous forms of relating to the world (Masquelier 2020) and particularly sustainable relations to the world (Artmann 2023; Brossette and Bieling 2025). We therefore apply the resonance theory in a very specific area of world-relations which, at the same time, presents as a major pillar for sustainability transformations.

Eating is an elemental form of relating to the world individually, while the collective system of producing, purchasing, and consuming food has serious environmental and social implications (Exner and Strüver 2020). This is illustrated by Hartmut Rosa, who points out that our "world-relationship (…) goes not least through the mouth", (Rosa 2019b, p. 103). The planetary health diet identifies food as "the single strongest lever to optimize health and environmental sustainability on Earth" (EAT, n.d., p. 5) stressing the mutual interdependencies between planetary and human boundaries (ibid.). However, there seems to be an unbalanced interplay between our inner dimensions, which represent the capabilities and motivations for sustainable food consumption (Siebrecht 2020), and the outer dimensions that impede and withhold those sustainable food options, by being collectively and systemically discouraged (Vigors 2018). In consequence, consumers seem to be "only peripherally aware of the relationship between the foods they buy and consume" (Stubbs et al. 2018, p. 130).

Food continues to be a *product* of trust where individuals are confronted with the system´s lack of transparency and communication, leading them to make uninformed decisions (Macready et al. 2020). Sustainable food consumption prioritizes long-term ecological viability while keeping environmental impacts—such as resource depletion, pollution, and waste generation—within limits that can be maintained over time (cf. Vermeir et al. p. 2, 2020), supporting human and non-human well-being. In practice, individuals who not only express an interest in, but also actively practice vegetarianism or veganism, purchase regional, seasonal, and organic foods, or participate in non-governmental organizations that promote sustainable food consumption, meet this definition. However, such individuals remain rare (Vermeir et al. 2020; Linder et al. 2021). Thus, even though sustainable ways of eating are popular (Alcorta et al. 2021; Chemnitz et al. 2021), they are still not common (Vermeir et al. 2020; Linder et al. 2021). In that line of thought, it seems worthwhile to dive deeper into the unbalanced inner-outer-play of consuming, procuring, and producing food by looking at those interplays as relationships in crises. More specifically, what is still missing is a closer examination of the quality of relationships between people and food (Stubbs et al. 2018).

Therefore, we aim to explore and propose the ability of the resonance theory to address an inner-outer (Böhme et al. 2024) or internal–external transformation (Wamsler et al. 2021) in the context of human-food relations. This approach is still rarely addressed in sustainability science, despite its advocation by sustainability scholars. Therefore, instead of solely focusing on driving changes in the 'material' outer world (Bristow et al. 2024), through actions such as banning meat advertisements in public space (Boffey 2022), attention is also given to activating and integrating our inner human capacities, such as fostering compassion for farmed animals (Voll et al. 2023).

The resonance theory is relevant here where we want to conceptualize *how* resonant moments with food evolve and *where*—meaning in what kind of contexts do these moments establish as resonant relationships to build **human-food resonance (HFR)** as a framework for sustainability science. With that, the resonance theory enables an understanding of relating individually in a world that is shaped collectively and systemically (Artmann 2023). Therefore, we believe that focusing on the conceptualization of HFR facilitates a deep theoretical investigation of (un)sustainable food consumption. This focus is likely to reveal relational qualities that society is missing to reconnect with food.

Our conceptual contribution starts with a closer look at the resonance theory as a relational approach in general (Section "Resonance: A relational approach for sustainability scholars") and its potential for sustainability science (Section "Using resonance as a framework for sustainability science"). We continue with a closer examination of sustainable human-food relations and our own understanding of HFR, informed by further relational theories and concepts such as new materialism, care, and inner-outer dimensions (see Section "Conceptualizing human-

food resonance as a framework for sustainability science"). We thereby introduce the conceptual difference between the *how* (resonant moments) and *where* (resonant relationships) of HFR. In the following discussion (Section "Discussion"), we elaborate on the feasibility and limitations of HFR to explore sustainability in human-food relationships, connecting the framework to ideas for future empirical studies. Finally, we provide conclusive remarks on our conceptual journey (Section "Conclusions").

RESONANCE: A RELATIONAL APPROACH FOR SUSTAINABILITY SCHOLARS

Late modern societies continue to seek world scope enlargement resulting in mute world relations that are characterized by a "constitutive inability to live sustainably", (Rosa 2019b, p. 712). Rosa states that "if acceleration is the problem, then resonance may be the solution." (Rosa 2019b, p. 13). In other words: instrumental modes of living to be found in the ever-increasing accumulation of resources as well as elevated egocentric standards and opportunities, represent the decisive driving factors that hinder resonance. Thus, the idea of resonance offers a potential theoretical construct that holds great promise for demonstrating a missing but much-needed quality for future ways of living sustainably in and with this world. Along these lines, resonance is defined as the opposite of capitalistic lifestyles, focusing instead on being connected and open toward the world, each other and more-than human entities (ibid.). Resonance is a metaphor for flourishing relations—a new normative understanding of what a *good life* can comprise. As a "momentary triad of converging movements of body, mind and experiential world", (Rosa 2019b, p. 290) resonance describes another possible way of being in the world (ibid., cf. p. 28) with great capacities to nurture humanities need for connection and belonging (Artmann 2023).

Being a relational concept, resonance cannot to be understood as a mere echo acknowledging universal agency and autonomy to the entities in relation (Fuchs 2020; Susen 2020). The theory consists of a descriptive part referring to different resonance qualities that emerge in relation, involving distinctive prerequisites and aspects of resonant moments and resonant relationships that are established on the resonance axes (see Fig. 1), which we will explain in the following sections.

The qualities of resonant moments

Resonant moments capture our *being-in-the-world*, a moment of true *encounter*, a moment that makes us aware of our *embedding* in this world (Rosa 2019a, p. 34). These moments are dominant during childhood, and the remembrance of them in adulthood pulls us back to what we already know and experience. It is an embodied and emotional experience, often accompanied by physical effects such as tearing up. To explain those moments in detail, qualities such as *affect*, *response,* and *transformation* are used (Rosa 2019a, cf., p. 174). Rosa describes the resonance quality of *affect* as a moment of openness that enables a reciprocal modus between entities of being truly touched or moved. If a human being is affected, a resonating moment needs a response, a corresponding action that allows for self-efficacy (Rosa 2019b). With *response* as another resonance quality, Rosa adds to his understanding of resonant world relationships that human beings do not only perceive the world by being affected, they also react by establishing practices that substantiate those moments (ibid., cf. p. 69). Therefore, a resonant response is always in alignment with the affect—and thus the entity in relation—that initiated this response. To complete a resonant moment, a transformational notion is necessary. This translates into a capacity of "adapting to the world, which is the only way individuals become capable of experiencing themselves as alive" (Rosa 2019a, p. 25). In this mode of adaptive *transformation*, the resonance qualities of affect and response accumulate, and our mode of being aligns with our inner values, resulting in a resonance-loaded, individual, and thus normative living of a good life.

Fig. 1 Schematic representation of the resonance qualities (how to resonate) and stable resonant relationships (where to resonate) (M. Ramisch (concept), N. Bongaerts (design))

Additionally, modes of *alienation,* in which the opposing entity(ies) is/are *unverfügbar* (German for uncontrollable, see Rosa 2020) while speaking with one's *own voice* are necessary prerequisites. For Rosa, the term alienation is, on the one hand, a testimony to the imprisonment of accelerated modern societies expressed through mute and instrumental relationships of world appropriation (Rosa 2019b). This is depicted as the antithesis of resonance (p. 184, cf.). On the other hand, alienation can also be a moment of awakening, closely connected to the resonance quality of affect, which allows one to be truly touched and moved again while relating to the world. The two-sided nature of alienation is a necessary evil since "a relation to the world that knows and allows no interruptions or disturbances (…) no periods of estrangement from oneself and the world, would not only tend to be flat (…) but ultimately fall mute" (Rosa 2019a, p. 30). In other words, we need to be able to experience the *Unverfügbarkeit* of the world, acknowledging those alienating disruptions. At the same time, we should view these experiences as encounters with the world's own voice, allowing the world to vividly speak to us (ibid.).

Resonant relationships establishing on the resonance axes

Resonant moments are usually stand-alone experiences. However, while unfolding repeatedly in particular sections of the world, resonant relationships can manifest on the resonance axes (Rosa 2019a). Those axes display the access points in one´s life, *where* and in what kind of contexts we are prone to be in resonance with the world. Rosa clearly defines those resonance axes while describing object relations (*diagonal axis*), social relations (*horizontal axis*) (ibid.), relations to oneself (*self-axis*) (Rosa 2021) and transcending relations with the world (*vertical axis*) (Rosa 2019a). On the diagonal axis, Rosa illustrates our "relation to the world of things" or in other words our world relationships with inanimate objects (Rosa 2019a, cf., p. 226–229). Being in resonance with objects is based on a genuine individual connection between the human subject and the respective *thing*. This resonant relationship is characterized by becoming a part of an object and letting this object become a part of oneself while for instance "repairing, altering, cleaning, or manipulating" (ibid., changed tense, p. 232) the thing.

The horizontal axis represents social relationships as spheres to experience resonant moments. The notion of *recognition* is presented as an essential part of resonant social relationships with other human beings. Family and friendship are important pillars of those responsive world relationships that are sustained by human affection. Thus, in resonant social relationships, we can experience acceptance or even unconditional love that bolsters our integrity and strengthens our individuality (Rosa p. 203–215). In his 2019 book on the resonance theory, Rosa omitted the self-axis but introduced it in a talk two years later (Rosa 2021). For the self-axis, someone's biography, body and psyche are required to come into diagonal listening (ibid.). Even though Rosa did not elaborate on self-relations as worldly relations while introducing the resonance axes, he still discussed the sense of self relating (Rosa 2019a, cf., p. 142f). Personality traits, cultural background, evaluative maps are acknowledged to have a strong impact on our world relationships. In addition, Rosa depicts the "body [of oneself] as instrument, medium, object, and element of one´s relationship to the world" (ibid., p. 38). The vertical axis of the resonance theory evolves around transcendent relations to the world above and beyond oneself (Rosa 2019a, cf., p. 195). On this axis, the relationship to the world is more abstract while being holistic and refers to societal concepts such as religion and nature.

Using resonance as a framework for sustainability science

The resonance theory claims an ubiquitous scope of applications by referring to all kinds of world relations (Rosa 2019a), hence, it leaves a lot of leeway for further context-driven conceptualizations (Masquelier 2020). In connection to this, a small number of sustainability scholars took up the task to take a closer look at the role of human-nature relations in the context of resonance. For instance, Artmann (2023) has translated and applied the resonance theory toward human-nature relations showing the potential of the theory to provide system, target, and transformation knowledge for sustainability transformations. In a follow-up publication, Artmann et al. (2026) propose flourishing partnerships between humans and nature as an alternative normative framework grounded in a positive conception of a good life in relation to the natural world. This vision emphasizes the necessity of limits that acknowledge and respect nature's inherent uncontrollability. The need for further research toward sustainability on 'everyday material life' in connection with inner transformational processes was thereby established (ibid.). Müller et al. (2023) followed the call of Artmann (2023) to explore how the three knowledge pillars toward sustainable transformations apply on an individual level. The scholars focused on the importance of individuals´ inner dimensions and associated abilities, challenges and opportunities to address the social-ecological crisis, which has been demanded by other sustainability scholars as well (Ives et al. 2020; Woiwode et al. 2021; Bristow et al. 2024). Recently, Müller et al. (2025) published a practical attempt

at capturing and fostering individual resonance with nature through a ritual intervention to move toward sustainability transformation. This small amount of contributions was further enforced by the empirical article of Brossette and Bieling (2025), who explore self-world relations by applying the resonance axes in the context of social-ecological systems. In this way, the scholars expand the scope of the individual toward its embedding in its environment by means of collective practices (here: landscape stewardship).

With this, another essential call in sustainability science, which seeks to combine the inner and outer dimensions (Wamsler et al. 2021), was addressed through the resonance theory. However, despite the growing number of scientific contributions, the resonance theory remains underexplored in sustainability science in general (Sommer 2019), especially in terms of distinguished fields of sustainability transformation that are part of human-nature relations. This is why we want to focus on human-food relations and how those can be informed by the resonance theory toward sustainability. In the end, even Rosa clarifies that "how we relate to the world through eating (…) deserves a far more comprehensive analysis and discussion that can be accomplished" (Rosa 2019a, p. 56).

CONCEPTUALIZING HUMAN-FOOD RESONANCE AS A FRAMEWORK FOR SUSTAINABILITY SCIENCE

Positioning human-food resonance in sociology

Eating is an ever-present world relation as the uptake of food is a vital component of our everyday existence. Rosa does acknowledge this by stating that the "world is therefore incessantly and quite literally processed through our bodies. There is no more elementary and no more porous form of [a] world relationship." (Rosa 2019b, p. 100). However, what, when, where, and how we eat remains a subjective matter in modern societies. Although delicious food can be a source of happiness, it can also cause symptoms such as constipation or diarrhea. These experiences can be interpreted as both prosperous and disturbing moments in the world. More fundamentally, Rosa interprets psychological conditions such as anorexia, obesity, or bulimia as unwholesome relations to the world. Accordingly, the foods we choose to eat—to form relations with—are fundamental for our physical and psychological becoming. It is acknowledged that how modernity relates to food is connected to mute characteristics such as "incorporating, controlling, and processing world" (Rosa 2019b, p. 60). Rosa recognizes this in the various information on different fad diets, the scientific contradictions regarding benefits and downsides of foods, or the words of wisdom that tell us how to eat for a successful life. At the same time, Rosa also recognizes the longing of modern societies for more natural, non-processed, and organic foods, depicting sustainable ways of producing, procuring, and consuming food, as resonant world relationships (ibid.).

Rosa's understanding of food is a prime example of relating to the world—whether in a resonant or a mute way, as he terms it—does not come as a surprise, since food has long been an object of sociological interest. In a short essay, Georg Simmel discussed the practices of eating and drinking from a sociological point of view (Simmel 1910 cited by Lichtblau 2023). Simmel describes the intake of food as a 'primitive physiological human need' that every individual has to follow. At the same time, eating and drinking go beyond the individual by bringing people together, as a medium that enables community, whereas culturally embedded rules must be followed (ibid.). With time and even earlier on, other thinkers moved the discussion around food forward from sociological, anthropological, and ethnological perspectives. To name a few, Pierre Bourdieu connected food to his thinking on the concept of habitus (Bourdieu 2025), Mary Douglas depicted food as a code, a form of language for the formation of social relations (Douglas 1972) and Claude Fischler displayed the bilateral power of food for identity building and cultural affiliation (Fischler 1988). In the last decades, food as a topic of sociological inquiry continues to evolve around individualization and cultural meanings expanding toward feminist research (Fielding-Singh and Oleschuk 2023; Vuciterna et al. 2025), the influence of technologies and digitalization (Kofahl 2014; Patgiri 2025), and the impact of governance induced power structures (Lamine and Marsden 2023). In light of recent global developments, eating and drinking as part of social formations further incorporated ecological and ethical discussions on what to eat in addressing the need to transform sustainably (Kofahl 2014; Beciu et al. 2024). In fact, all of those elaborations align with the need and our aspirations to develop HFR as a framework for sustainability science deeply embedded in sociological research.

However, since we believe that there is not one integrative theory that has the power to explain everything, we searched for further relational (currents of) theories, concepts, and terms that help us to describe the concept of HFR. For our conceptual framework we thus dive deeper into the *how* of resonant moments with food by defining and applying the relational accounts of new materialism, the concept of care, and the idea of an inner-outer transformation for sustainable transformations. We thereby find it not only necessary but also beneficial to stay theoretically. The necessity derives from the fragmented nature of

resonant moments possibly being "only" stand-alone experiences while the theoretical point of view provides a reasoned grounding for practical advancements. This is why we put those moments into contexts only afterward to see where they evolve into stable relationships. To achieve this, we consulted literature on practical examples of sustainable food production, procurement, and consumption to illustrate the *where* of HFR on the resonance axes. With this, we also take into account the relational disposition of resonance that implies that resonant relationships are always resulting out of reoccurring resonant moments.

How to human-food resonance

While conceptualizing resonant moments with food toward sustainability, we have to take a closer look at the resonance qualities: *affect, response,* and *transformation* as well as at the prerequisite of resonance—namely, *alienation*. To conceptualize the resonance quality of affect in relation to food, we draw on new materialist theory, which questions hierarchical ontological understandings of human–world relations (Choat 2018) and moves beyond perceiving food as merely lifeless matter. From a sustainability perspective, scholars already broadly elaborated on the missing awareness of societies toward their environmental and societal impact due to unsustainable ways of consuming, producing, and purchasing food (Frank and Stanszus 2019; Vermeir et al. 2020). From the perspective of new materialism, we assume that this unawareness could be overcome by enabling food to become a touching, moving, and thus affective entity that people can relate to. Here, any entity is no longer considered as a passive matter to be controlled by human beings (ibid.) since "'anything' that makes a difference to other actors is an agent" (Latour cited by Pearson 2015, p. 712). Meaning, animals, plants, even microbes, for instance, have agency (Pearson 2015; Turnbull and Bär 2020). The assumption of agency being an incessant part of any entity leads to the conclusion that any materialization of food has agency.

Therefore, we are aware of the "overlap between [those] domains generally regarded as separate" (Rosa et al. 2021, p. 3), referring to the resonance theory´s grounding in critical theory in contrast to the theoretical current of new materialism. However, both intellectual currents seek to overcome the restraining power of anthropocentric rationalism (ibid., cf. p. 3) which lies within the observation of individual normative reasoning that continues to overwrite "the material, vital and affective aspects of our world" (ibid., p. 1). Accordingly, we bring them together to rely on their differences while acknowledging how they complement each other. Thus, thinking about the resonance quality of affect through the lens of new materialism enables a more radical perspective on the agentive power of the materialities and thus entities in relation. In contrast, by remaining in the logic of resonance, we do not lose the important distinction between humans and more-than-human entities needing to speak with their own voice to establish resonating relations (ibid.). In fact, "not subject and objects, but dynamic relationships (…) form the basic material of reality" (Rosa 2019a, p. 36), which connects the two theoretical currents in discussion. This reminds us that, as researchers, we cannot possibly have the skills to fully grasp the (more or less) abstract agency of more-than-human entities, but we can try theoretically and conceptually. This leads to the following conceptual understanding of *affect* for HFR in sustainability:

> *In moments of HFR, food is an affective entity, whether it be as a product to be consumed, purchased, or produced; or other material forms of appearance and interpretation (*Choat 2018; Fox and Alldred 2019*). Food affects the respective relating human and vice versa (*Nisbett 2019*), encouraging a new relational state of the entities and involved practices (*Darnhofer 2020*). Becoming affected by food entails negative and positive encounters internally and externally (*Artmann 2023*) regarding current modes of (un)sustainable ways of consuming, procuring, and producing food.*

As mentioned, being affected in the sense of resonance is likely to lead to a response. In the context of HFR, we turn toward the concept of care to describe resonant responses as a fundamental part of fostering human-nature resonance (Artmann 2023). Closely aligned with the previously introduced flat ontology in new materialism, caring for nature—and food as an integral part of nature "cannot be framed in merely instrumental terms." (Jax et al. 2018, p. 2). Care is lived through an internal and external motion, which means that one can internally care about through feelings, which motivates externally caring for by coming into action (ibid.). We therefore assume that the ability to answer through caring can be initiated by getting affected through the realization of food having agency. Pungas (2021) states that "care is a fundamental yet often overlooked factor in building sustainable food systems" (p. 70), which leads us to the following conceptual understanding of a response for HFR in sustainability:

> *A resonant response in terms of HFR is to be achieved by showing different notions of care (*Pungas 2021*). This involves internal affective feelings of responsibility, empathy, frugality, modesty (*Jax et al. 2018; West et al. 2018*), and an external, altruistic, behavior based on a meaningful partnership where the individual experiences self-efficacy while acting sustainably (*Manyukhina 2017*). Making resonant*

*responses in relation to food in a sustainable way is therefore based on processes of "giving and receiving care (…) nurture[ing] well-being among humans and [food] alike", (*West et al. 2018*, p. 7).*

In the transformational part of resonant moments ""what is" and "what ought to be" tend to coincide" (Rosa 2019a, p. 170, quotation marks in original). By being affected and responding accordingly, a transformational notion is built up whereas "our cognitive and evaluative maps [translating to affect] converge with our being or behavior [translating to response]" (ibid., p. 170). This connects to research in sustainability science on the interconnectedness of the inner and outer dimensions (Bristow et al. 2024). A refocus and incorporation of the inner dimensions in terms of "individual and collective mindsets, beliefs, values, worldviews, and associated inner qualities/capacities" (Böhme et al. 2024, p. 2) presents a promising leverage toward sustainable actions in the outer dimensions. For HFR this implies the nurturing of a relational inner-outer exchange which leads us to the following conceptual understanding of a resonant transformational notion in connection with sustainable food consumption:

*The transformational notion in HFR likewise occurs where—in the outer dimension—we act in accordance with our values and corresponding worldviews—which originate in our inner dimension, establishing individual perceptions of a good life. Corresponding values evolve around notions of care (*Muradian and Gómez-Baggethun 2021*), including eudemonic values (*Neuteleers 2020*) and relational values (*O'Connor and Kenter 2019*) while sustainably engaging with food. Corresponding worldviews attribute food to have intrinsic value by being a necessary and thus fulfilling part of humans´ lives (ibid.). Transforming to a sustainable diet is then not perceived as a negative act of self-limitation but as part of a good life (*Artmann 2023*).*

Finally, a resonant moment is not complete without explaining the quality of alienation. With this, we take the *Unverfügbarkeit* of food and its associated own voice into consideration. Thus, to describe our conceptual idea of alienation for HFR we look back to the former resonant quality of affect and the dialectic nature of those qualities (see Section "Resonance: A relational approach for sustainability scholars) by illustrating opposing forms of relating to food sustainably:

*Alienated experiences are present when food is not recognized as an active agent, but as a simple resource to be controlled (*Backa 2020; Raatikainen et al. 2020; Stuart and Gunderson 2020*), usually grounded in unsustainable practices with and toward food. However, alienated experiences with food are not only a catalyst for mute relations presenting at the same time as possible ways of getting affected. That said, alienated experiences with food emerge as a dialectic and a necessary condition in relation to the quality of affect (*Rosa 2019b*)*

Where to human-food resonance

As discussed, resonant moments being experienced time and again in a specific context have the potential to grow into stable resonant relationships that can be allocated on four resonance axes, i.e., the diagonal, horizontal, self, and vertical axis (Rosa 2019a). The localization of resonant moments on the resonance axes thus paints a picture of *where* resonance might evolve. This picture emerges by enriching the qualities of resonant moments with examples of actual practices and entities of the outer dimensions, as well as examples of the inner dimensions such as values and mindsets, all in relation to food. So far, Rosa only recognized food as a responding entity while being an object to relate to on the diagonal axis. However, as stated in the elaborations on resonant moments, we extended our understanding of food toward not only being an object with agency but a lively entity with agency in all its materialities. With this, we argue that HFR can be allocated on all four resonance axes. Thus, in the following, we provide a conceptual idea of HFR on the resonance axes enriched by examples found in sustainability science. For an overview, Fig. 2 illustrates the concept of HFR, including comprehensive explanations of the four resonance axes.

Diagonal axis vis-à-vis object relations

One form of object-relationship that Rosa elaborates on are the experiences of self-efficacy through interacting with materialities of diverse entities. In this connection, he specifically addresses food as an object to relate to. By working with food as a material—be it a dough kneaded by a baker or edible plants cultivated through gardening (Rosa 2019a, cf., p. 234)—affective and responsive moments that have transformational notions can be experienced. The literature in sustainability science likewise reports on practices with food, especially in regards to sustainable modes of producing, purchasing, or consuming food (Exner and Strüver 2020). Growing, harvesting and preparing food by gardening (Exner and Strüver 2020; Scheromm and Javelle 2022), by being active in community based agriculture (Butler Flora and Bregendahl 2012), by foraging wild herbs and berries (Martin 2018; Sharman 2025), by cooking food (Lee 2023) are not only examples that can foster sustainable food relationships but also illustrate the

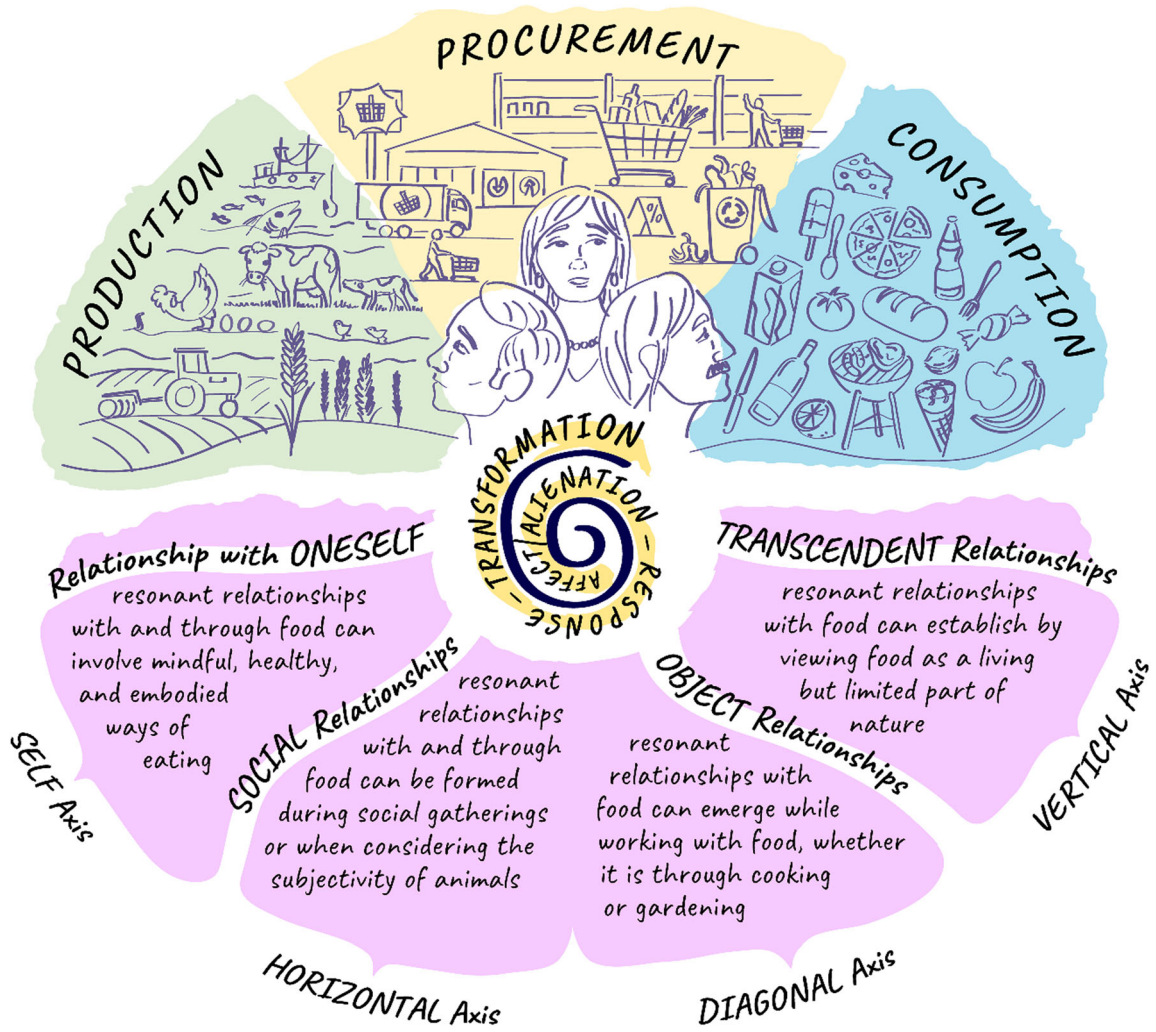

Fig. 2 Representation of the concept of HFR whereas resonant moments with food occur in its diverse materialities while being produced, procured, and consumed leading to resonant relationships on the resonance axes including comprehensive declarations (M. Ramisch (concept), N. Bongaerts (design))

potentially resonating connection people can have to food. In alignment with Rosa, sustainability scholars also align the relationships to food and "their embedding in the whole of life and the world as it confronts the experiencing and acting subject" (Rosa 2019b, p. 392). Accordingly, we describe HFR on the diagonal axis as follows:

> *On the diagonal axis, food is seen as an object with agency to interact with. Food is an object to learn about, to cook (*Martin 2018*), to buy (*Scalvedi and Saba 2018*), and to produce (*Exner and Strüver 2020*). It is an object embedded in the direct environment (e.g., supermarkets, landscapes, cities, etc.) displaying different everyday situations (ibid.) as access points to establish stable resonant relations with food that promote sustainability.*

Horizontal axis vis-à-vis social relations

For HFR, we want to acknowledge the impact that social relationships can have while practicing sustainable food consumption. One particularly socially discussed aspect of sustainable consumption is the limitation or reduction of the consumption of animal products (Markowski and Roxburgh 2019). Studies in sustainability science already showed the impact of adopting a vegan diet facilitated through the feeling of community, social identification and network embeddedness (Cherry 2006; Judge et al. 2022). In comparison, there is also a vast amount of literature that shows how social relationships such as family relationships can negatively impact sustainable food decisions (Markowski and Roxburgh 2019; Salmivaara et al. 2022), making the social domain a potential area of alienation and thus also of resonance. In addition, we take into account the

special role of supposed farm animals, which we theoretically want to liberate from their inanimate status as animal products to be consumed on the basis of their known impacts on sustainability. In this connection, the relationships to non-human animals by seeing them as feeling subjects as a motivator to not consume them is widely researched (Joy 2011; Stuart and Gunderson 2020; Nungesser and Winter 2021). This brings us to the following conceptual idea of HFR on the horizontal axis:

> *On the horizontal axis, resonant food relations are formed through social relations with one´s family, friends, and within other societal settings (*Vermeir and Verbeke 2006; Emmerman 2019*). Such relations develop where people come together, agreeing and empowering each other toward sustainable food consumption (*Exner and Strüver 2020; Salehi 2020*). Those relations can also evolve between human and more-than-human animals (*Jaquet 2021*). In that manner, more-than-human animals—or more specifically, supposed farm animals—are acknowledged to have subjectivity and a moral status (ibid.). This allows for sustainable consumption of animal-based foods in terms of transforming to a plant-based diet as part of a good life for humans and more-than-human animals.*

Self axis vis-à-vis relations to oneself

In line with Rosa's idea of the self-axis (Rosa 2021), we proclaim that resonant self-relationships regarding the incorporation of food also derive from the triad of "food, body, and mind" (ibid. p. 59). Correspondingly, sustainability scholars have researched the impact of food that is healthy for the planet and oneself, addressing our body and mind. This involves, for instance, the connection between mindfulness and reflection while consuming food, moving toward sustainable decision-making (Fischer et al. 2017; Hunecke and Richter 2019). Other studies discussed the association with good food—here sustainable food (Exner and Strüver 2020)—and a healthy body or a 'compassionate self-concept' that is associated with healthy food choices within sustainable food consumption (cf. Werner et al. 2020). This brings us to the following conceptual idea of the self-axis for HFR:

> *On the self-axis, HFR is found in actions of self-care and self-love through food (*Werner et al. 2020*). Further, food is acknowledged to affect one´s mind and body (*Hunecke and Richter 2019*), in processes of self-reflection or by experiencing self-efficacy in interacting with food in a sustainable manner.*

Vertical axis vis-à-vis transcendent relations

By viewing food as part of and a product of nature, we can position food on Rosa's axis of vertical resonance regarding 'the voice of nature' (Rosa 2019a). This own voice is recognized as natural guidance to align with earthly conditions through rhythms of change, adaptation, and evolution (ibid., cf., p. 269). These transcendent forms of relating to nature are found, among others, in Indigenous knowledge with high relevance for sustainable futures (Kealiikanakaoleohaililani and Giardina 2016). Sustainability scholars thus have already begun to recognize these practices of wisdom as transformative knowledge, also with regards to human-food relationships. This applies, for instance, to ideas of Indigenous communities that embrace respectful relationships with food beyond the globally dominant exploitive food systems (Knorr and Augustin 2025). Further perceptions evolve around practices that show deep gratitude and humility toward the food provided by nature (Turner et al. 2022). For HFR we therefore arrive at the following conceptual idea on the vertical axis:

> *On the vertical resonance axis, HFR can be understood as a spiritual and transcendent relation with nature and with this also food (Baur 2018;* Rosa 2019a, b; Werner et al. 2020*). Food is perceived as a valuable, limited, and living part of nature deserving justice and dignity (*Manyukhina 2017; Stuart and Gunderson 2020*) grounded in a basic understanding of sustainability.*

DISCUSSION

In the former section, we extensively elaborated on our conceptual understanding of HFR. We thereby believe in the potential of the resonance theory to provide what sustainability scholars promote: a relational, non-fragmented theoretical framework (Walsh et al. 2021; Böhme et al. 2024). This theoretical framework might have the capacity to integrate the inner and outer dimensions while addressing the worldly modes of encounter as individual, collective, and system. In this way, resonance could provide what scientists are striving for: a relational social-ecological perspective to connect with the world differently or even sustainably. Even though we are eager to award the resonance theory with those great possibilities, we also want to provide a disclaimer and acknowledge that resonance has been critiqued as this privileged utopia with a metaphoric appearance, hard to grasp, and impossible to willfully generate (Fuchs 2020; Haugaard 2020; Susen 2020). In the end, resonance might also occur while following the conventional excessive and thus unsustainable

lifestyles of Western societies, which Rosa initially frames as mute (ibid.). In fact, relationships of any kind can, on the one hand, facilitate resonant moments for one individual while, on the other hand, result in a mute experience for another person (Haugaard 2020; Susen 2020). This is, for example, described in the noise of a motorcycle being a moment of resonance for a Harley Davidson fan but also a mute experience for a person who prefers silence and wishes to read a book (cf. Haugaard 2020). Those objections certainly have to be addressed which Rosa also does by acknowledging culture and life style induced differences in resonance, by elaborating on time and place bound atmospheres, and by closely focusing on both entities within a resonant moment which is always relational (Rosa 2019b).

Concerning HFR, as an example, one could argue that people who consume meat excessively (which accounts for an unsustainable way of eating), can still have a resonant relationship with meat. However, within this relational experience, the other entity—here, the animal—will most certainly not frame the death experience as a resonant moment. Firstly, we take this argument as a strong case to free food from its perception of being an object alone, which is why we turned toward post-human theoretical currents such as new materialism and concepts such as care, which help humans to act differently. Secondly, we want to show once again how a resonant way of experiencing moments and establishing relationships with food aligns with what we understand by producing, procuring, and consuming food sustainably. Still, as Rosa (2019b, p. 736f) states: "what late modernity lacks, is not a reform program or an institutional plan for improving its modes of dealing with the world; not a list of things to acquire or of states to achieve, but a tangible, palpable vision of a closer form of relating to the world.", suggests that Rosa himself rejects thinking about resonance as a panacea for the social-ecological crises toward sustainability as other scholars have pointed out (Fuchs 2020; Haugaard 2020; Susen 2020). Instead, our claim is that resonance presents itself first as a theory, and then as a vision that functions as a potential tool for looking at and engaging with the world with open eyes and minds while striving for a good life for all living beings.

For HFR, our next proposed step is to operationalize this framework while seeing the world and food as responsive entities. Staying with the relational turn in sustainability science, we need empirical research that adheres to relational methods that are promising in displaying the entanglement of humans and food. If we as researchers aim to do justice to the relational dynamics of social-ecological phenomena while striving toward sustainable transformations, we must also be bold enough to explore alternative methodological approaches. These may offer at least a glimpse into the complex and deeply entangled nature of what we call life (Mancilla García et al. 2024). Correspondingly, embodied and dwelling perspectives are suggested to acknowledge the becoming notion of situated observations adhering to the respective practices and places in focus (West et al. 2020). For HFR, we therefore might take into account the places where we connect with food sustainably or not. This involves, for instance, places where we procure (e.g., supermarkets), produce (e.g., agriculture, slaughterhouses), or simply consume (e.g., public catering, kitchen table) food. By zooming in and zooming out of those places, we might grasp what our inner dimensions contribute or not while being confronted by and situated in those outer dimensions.

CONCLUSIONS

In this article, we took several steps toward the conceptualization of **human-food resonance (HFR)** as a way to explore sustainability in human-food relationships. We elaborated on *how* we as human beings might experience resonant moments with food sustainably by looking at the resonance qualities of *affect, response, transformation*, and *alienation*. By incorporating the theoretical current of new materialism, the concept of care, and the idea of inner-outer transformation, we enriched the resonance theory and further connected those moments to their emergence toward stable resonant relationships following sustainable ways of producing, procuring, and consuming food. Those stable relationships unfold on the resonance axes, the spheres *where* resonant moments appear and manifest. We thereby want to acknowledge that what the conceptualization of HFR would have needed is to think of the resonance qualities and axes in flux. This means that there is no beginning nor end to a resonant moment or relationship. Those are dynamic processes that have an iterative nature. The order of the resonant qualities, as well as the axes, does not necessarily hold true, nor does the order speak to any degree of relevance. We need to start at some point to also do justice to our way of brain functioning (McGilchrist 2019) as you cannot read or write in circles or in three dimensions.

Thus, what our conceptual journey toward the framework of HFR has shown is that food is indeed a complex materiality and that sustainable ways of consuming food have to be viewed from different angles, addressing diverse perceptions while acknowledging different perspectives. HFR is a framework that appears promising in capturing these relational complexities, which, if continued to be viewed and reduced to stand-alone reasoning and practices, might fall short in moving toward sustainability transformations. We strongly advocate for future work to address

the need of empirical work for HFR, and especially for relational methods in data collection and analysis to attempt at researching in loops and dimensions. By asking ourselves: " (1) how we see the world; and (2) how we get to know, (3) engage, and (4) ensure quality and equity considerations across these aspects" (Böhme et al. 2024, p. 1173), we see a possibility to come closer to this relational vision of doing research. Accordingly, we want to focus on ways to overcome current anthropocentric ways of thinking and being, and this involves the materialization of other entities as agentive, such as food.

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Declarations

Conflict of interest The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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REFERENCES

Abson, D.J., J. Fischer, J. Leventon, J. Newig, T. Schomerus, U. Vilsmaier, H. von Wehrden, P. Abernethy, et al. 2017. Leverage points for sustainability transformation. *Ambio* 46: 30–39. https://doi.org/10.1007/s13280-016-0800-y.

Alcorta, A., A. Porta, A. Tárrega, M.D. Alvarez, and M.P. Vaquero. 2021. Foods for plant-based diets: Challenges and innovations. *Foods* 10: 293. https://doi.org/10.3390/foods10020293.

Artmann, M. 2023. Human-nature resonance in times of social-ecological crisis: A relational account for sustainability transformation. *Ecosystems and People* 19: 2168760. https://doi.org/10.1080/26395916.2023.2168760.

Artmann, M., P. Harms, C.D. Ives, and C. Woiwode. 2026. Respecting nature's limits in urban planning: Values and principles for human–nature partnerships. *npj Urban Sustainability*. https://doi.org/10.1038/s42949-025-00328-3.

Backa, A. 2020. My responsibility, my food. *Ethnologia Fennica* 47: 54–76. https://doi.org/10.23991/ef.v47i2.88801.

Beciu, S., G.A. Arghiroiu, and M. Bobeică. 2024. From origins to trends: A bibliometric examination of ethical food consumption. *Foods* 13: 2048. https://doi.org/10.3390/foods13132048.

Beery, T., A. Stahl Olafsson, S. Gentin, M. Maurer, S. Stålhammar, C. Albert, C. Bieling, A. Buijs, et al. 2023. Disconnection from nature: Expanding our understanding of human–nature relations. *People and Nature*. https://doi.org/10.1002/pan3.10451.

Boffey, D. 2022. Dutch city becomes world's first to ban meat adverts in public. The Guardian. https: //www.theguardian.com/world/2022/sep/06/haarlem-netherlands-bans-meat-adverts-public-spaces-climate-crisis.

Böhme, J., E.M. Spreitzer, and C. Wamsler. 2024. Conducting sustainability research in the anthropocene: Toward a relational approach. *Sustainability Science* 19: 1169–1185. https://doi.org/10.1007/s11625-024-01510-9.

Böhme, J., Z. Walsh, and C. Wamsler. 2022. Sustainable lifestyles: Towards a relational approach. *Sustainability Science*. https://doi.org/10.1007/s11625-022-01117-y.

Bourdieu, P. 2025. Die feinen Unterschiede: Kritik der gesellschaftlichen Urteilskraft (B. Schwibs & A. Russer, Übers.; 30. Auflage). Suhrkamp.

Bristow, J., R. Bell, C. Wamsler, Björkman, P. Tickell, J. Kim, and O. Scharmer. 2024. The System Within: Addressing the inner dimensions of sustainability and systems change. (The Club of Rome, Hrsg.). https: //www.clubofrome.org/publication/earth4all-bristow-bell/.

Brossette, F., and C. Bieling. 2025. Connecting resonance theory with social-ecological thinking: Conceptualizing self-world relationships in the context of sustainability transformations. *People and Nature*. https://doi.org/10.1002/pan3.10777.

Butler Flora, C., and C. Bregendahl. 2012. Collaborative community-supported agriculture: Balancing community capitals for producers and consumers. *The International Journal of Sociology of Agriculture and Food*. https://doi.org/10.48416/IJSAF.V19I3.208.

Chemnitz, C., and R. Benning. 2021. *Heinrich-Böll-Stiftung, & Bund für Umwelt und Naturschutz Deutschland*. Fleischatlas: Daten und Fakten über Tiere als Nahrungsmittel.

Cherry, E. 2006. Veganism as a cultural movement: A relational approach. *Social Movement Studies* 5: 155–170. https://doi.org/10.1080/14742830600807543.

Choat, S. 2018. Science, agency and ontology: A historical-materialist response to new materialism. *Political Studies* 66: 1027–1042. https://doi.org/10.1177/0032321717731926.

Darnhofer, I. 2020. Farming from a process-relational perspective: Making openings for change visible. *Sociologia Ruralis* 60: 505–528. https://doi.org/10.1111/soru.12294.

Douglas, M. 1972. Deciphering a meal. *Daedalus* 101: 61–81.

Emmerman, K.S. 2019. What's love got to do with it? An ecofeminist approach to inter-animal and intra-cultural conflicts of interest. *Ethical Theory and Moral Practice* 22: 77–91. https://doi.org/10.1007/s10677-019-09978-6.

Exner, A., and A. Strüver. 2020. Addressing the sustainability paradox: The analysis of "good food" in everyday life. *Sustainability* 12: 8196. https://doi.org/10.3390/su12198196.

Fielding-Singh, P., and M. Oleschuk. 2023. Unequal foodwork: Situating the sociology of feeding within diet and nutrition disparities. *Sociology Compass* 17: e13067. https://doi.org/10.1111/soc4.13067.

Fischer, D., L. Stanszus, S. Geiger, P. Grossman, and U. Schrader. 2017. Mindfulness and sustainable consumption: A systematic literature review of research approaches and findings. *Journal of Cleaner Production* 162: 544–558. https://doi.org/10.1016/j.jclepro.2017.06.007.

Fischler, C. 1988. Food, self and identity. *Social Science Information* 27: 275–292. https://doi.org/10.1177/053901888027002005.

Fox, N.J., and P. Alldred. 2019. The materiality of memory: Affects, remembering and food decisions. *Cultural Sociology* 13: 20–36. https://doi.org/10.1177/1749975518764864.

Frank, P., and L.S. Stanszus. 2019. Transforming consumer behavior: introducing self-inquiry-based and self-experience-based learning for building personal competencies for sustainable consumption. *Sustainability* 11: 2550. https://doi.org/10.3390/su11092550.

Fuchs, A. 2020. Resonance: A normative category or figure of uncertainty? On reading Hartmut Rosa with Thomas Mann's *The Magic Mountain*. *Journal of Political Power* 13: 353–365. https://doi.org/10.1080/2158379X.2020.1828756.

Haugaard, M. 2020. What is resonance? What is alienation? How do the two relate? Reflections on Rosa's theory of resonance and alienation. *Journal of Political Power*. https://doi.org/10.1080/2158379X.2020.1831085.

Hunecke, M., and N. Richter. 2019. Mindfulness, construction of meaning, and sustainable food consumption. *Mindfulness* 10: 446–458. https://doi.org/10.1007/s12671-018-0986-0.

Ives, C.D., R. Freeth, and J. Fischer. 2020. Inside-out sustainability: The neglect of inner worlds. *Ambio* 49: 208–217. https://doi.org/10.1007/s13280-019-01187-w.

Jaquet, F. 2021. A debunking argument against speciesism. *Synthese* 198: 1011–1027. https://doi.org/10.1007/s11229-019-02080-5.

Jax, K., M. Calestani, K.M. Chan, U. Eser, H. Keune, B. Muraca, L. O'Brien, T. Potthast, et al. 2018. Caring for nature matters: A relational approach for understanding nature's contributions to human well-being. *Current Opinion in Environmental Sustainability* 35: 22–29. https://doi.org/10.1016/j.cosust.2018.10.009.

Joy, M. 2011. *Why we love dogs, eat pigs and wear cows: An introduction to carnism; the belief system that enables us to eat some animals and not others*. Berkeley: Conari Press.

Judge, M., J.W. Fernando, and C.T. Begeny. 2022. Dietary behaviour as a form of collective action: A social identity model of vegan activism. *Appetite* 168: 105730. https://doi.org/10.1016/j.appet.2021.105730.

Kealiikanakaoleohaililani, K., and C.P. Giardina. 2016. Embracing the sacred: An indigenous framework for tomorrow's sustainability science. *Sustainability Science* 11: 57–67. https://doi.org/10.1007/s11625-015-0343-3.

Knorr, D., and M.A. Augustin. 2025. Towards resilient food systems: Interactions with indigenous knowledge. *Trends in Food Science & Technology* 156: 104875. https://doi.org/10.1016/j.tifs.2025.104875.

Kofahl, D. 2014. *Die Komplexität der Ernährung in der Gegenwartsgesellschaft: Soziologische Analysen von Kultur- und Natürlichkeitssemantiken in der Ernährungskommunikation*. Kassel: Kassel Univ. Press.

Lamine, C., and T. Marsden. 2023. Unfolding sustainability transitions in food systems: Insights from UK and French trajectories. *Proceedings of the National Academy of Sciences* 120: e2206231120. https://doi.org/10.1073/pnas.2206231120.

Lee, K.S. 2023. Cooking up food memories: A taste of intangible cultural heritage. *Journal of Hospitality and Tourism Management* 54: 1–9. https://doi.org/10.1016/j.jhtm.2022.11.005.

Linder, N., M. Giusti, K. Samuelsson, and S. Barthel. 2021. Pro-environmental habits: An underexplored research agenda in sustainability science. *Ambio* 51: 546. https://doi.org/10.1007/s13280-021-01619-6.

Macready, A.L., S. Hieke, M. Klimczuk-Kochańska, S. Szumiał, L. Vranken, and K.G. Grunert. 2020. Consumer trust in the food value chain and its impact on consumer confidence: A model for assessing consumer trust and evidence from a 5-country study in Europe. *Food Policy* 92: 101880. https://doi.org/10.1016/j.foodpol.2020.101880.

Mancilla García, M., C. Abunge, S.O. Bandeira, C. Cheupe, D.J. Combane, T. Daw, E.M. Drury O'Neill, T. Hertz, et al. 2024. Exploring a process-relational approach to qualitative research methods for sustainability science. *People and Nature* 6: 1512–1523. https://doi.org/10.1002/pan3.10667.

Manyukhina, Y. 2017. Consumer food ethics: Considerations of vulnerability, suffering, and harm. *Journal of Agricultural and Environmental Ethics* 30: 595–614. https://doi.org/10.1007/s10806-017-9689-0.

Markowski, K.L., and S. Roxburgh. 2019. "If I became a vegan, my family and friends would hate me: " Anticipating vegan stigma as a barrier to plant-based diets. *Appetite* 135: 1–9. https://doi.org/10.1016/j.appet.2018.12.040.

Martin, M. 2018. Urban foraging: Rethinking the human-nature connection in cities. *eTropic Electronic Journal of Studies in the Tropics*. https://doi.org/10.25120/etropic.17.1.2018.3647.

Masquelier, C. 2020. Book review: Hartmut Rosa, resonance—A sociology of our relationship to the world. *Sociology* 54: 858–860. https://doi.org/10.1177/0038038519899344.

McGilchrist, I. 2019. *The master and his emissary: The divided brain and the making of the Western world*. London: Yale University Press.

Müller, S., M. Artmann, and C. Surrey. 2023. Opening the human spirit to sustainability transformation: The potential for individual human–nature resonance and integrative rituals. *Sustainability Science*. https://doi.org/10.1007/s11625-023-01360-x.

Müller, S., C. Surrey, P. Kanske, J. Roscher, M. Höfler, and M. Artmann. 2025. Exploring the fosterage of individuals' resonances with nature through a 5-week-long ritual: Findings, limits and outlook of a feasibility study for sustainability transformations. *Discover Sustainability* 6: 894. https://doi.org/10.1007/s43621-025-01399-z.

Muradian, R., and E. Gómez-Baggethun. 2021. Beyond ecosystem services and nature's contributions: Is it time to leave utilitarian environmentalism behind? *Ecological Economics* 185: 107038. https://doi.org/10.1016/j.ecolecon.2021.107038.

Neuteleers, S. 2020. A fresh look at relational values in nature: Distinctions derived from the debate on meaningfulness in life. *Environmental Values* 29: 461–479. https://doi.org/10.3197/096327119X15579936382699.

Nisbett, N. 2019. Understanding the nourishment of bodies at the centre of food and health systems: Systemic, bodily and new materialist perspectives on nutritional inequity. *Social Science & Medicine* 228: 9–16. https://doi.org/10.1016/j.socscimed.2019.02.041.

Nungesser, F., and M. Winter. 2021. Meat and social change: Sociological perspectives on the consumption and production of animals. *Österreichische Zeitschrift Für Soziologie* 46: 109–124. https://doi.org/10.1007/s11614-021-00453-0.

O'Connor, S., and J.O. Kenter. 2019. Making intrinsic values work; integrating intrinsic values of the more-than-human world through the life framework of values. *Sustainability Science* 14: 1247–1265. https://doi.org/10.1007/s11625-019-00715-7.

Patgiri, R. 2025. 'Let me take a photo before we eat': The impact of digital technologies on food production and consumption in New Delhi. *Sociological Bulletin* 74: 273–287. https://doi.org/10.1177/00380229251333129.

Pearson, C. 2015. Beyond 'resistance': Rethinking nonhuman agency for a 'more-than-human' world. *European Review of History:*

Revue Européenne D'histoire 22: 709–725. https://doi.org/10.1080/13507486.2015.1070122.
Pungas, L. 2021. Caring dachas Food self-provisioning in Eastern Europe through the lens of care. In *Food for degrowth perspectives and practices*, ed. A. Nelson and F. Edwards. London: Routledge.
Raatikainen, K.J., K. Juhola, M. Huhmarniemi, and H. Peña-Lagos. 2020. "Face the cow": Reconnecting to nature and increasing capacities for pro-environmental agency. *Ecosystems and People* 16: 273–289. https://doi.org/10.1080/26395916.2020.1817151.
Rosa, H. 2019a. *Resonance: A sociology of our relationship to the world*. Cambridge: Polity Press.
Rosa, H. 2019b. *Resonanz: Eine Soziologie der Weltbeziehung* (Erste Auflage). Suhrkamp.
Rosa, H. 2020. *Unverfügbarkeit*. Suhrkamp.
Rosa, H. 2021. *The Listening Society. Zuhören als mediopassive Form der Weltbeziehung*. Listening/Hearing internationales Symposium. https: //vimeo.com/637396132.
Rosa, H., C. Henning, and A. Bueno. 2021. *Critical theory and new materialisms*. London: Routledge.
Salehi, G. 2020. Consumers switching to vegan diets_a systematic review_IAPNM 19th.pdf. 185029 Bytes. https://doi.org/10.6084/M9.FIGSHARE.12522758.V1.
Salmivaara, L., M. Niva, M. Silfver, and A. Vainio. 2022. How vegans and vegetarians negotiate eating-related social norm conflicts in their social networks. *Appetite* 175: 106081. https://doi.org/10.1016/j.appet.2022.106081.
Scalvedi, M.L., and A. Saba. 2018. Exploring local and organic food consumption in a holistic sustainability view. *British Food Journal* 120: 749–762. https://doi.org/10.1108/BFJ-03-2017-0141.
Scheromm, P., and A. Javelle. 2022. Gardening in an urban farm: A way to reconnect citizens with the soil. *Urban Forestry & Urban Greening* 72: 127590. https://doi.org/10.1016/j.ufug.2022.127590.
Sharman, R. 2025. Who goes foraging in Bristol, UK and why? A qualitative investigation into wild food acquisition and food justice. *Health & Place* 91: 103397. https://doi.org/10.1016/j.healthplace.2024.103397.
Siebrecht, N. 2020. Sustainable agriculture and its implementation gap: Overcoming obstacles to implementation. *Sustainability* 12: 3853. https://doi.org/10.3390/su12093853.
Simmel, G. 2023. Soziologie der Mahlzeit. In *Soziologische Ästhetik*, ed. K. Lichtblau. Fachmedien, Wiesbaden: Springer. https://doi.org/10.1007/978-3-658-40939-5_15.
Sommer, B. 2019. Resonanz und Nachhaltigkeit: Zum Verhältnis zweier Schlüsselbegriffe zeitgenössischer Gesellschaftskritik. In *Resonanz: Im interdisziplinären Gespräch mit Hartmut Rosa*, ed. J.-P. Wils. German: Nomos Verlagsgesellschaft mbH & Co. KG. https://doi.org/10.5771/9783845288734.
Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney, and C. Ludwig. 2015. The trajectory of the anthropocene: The great acceleration. *The Anthropocene Review* 2: 81–98. https://doi.org/10.1177/2053019614564785.
Stuart, D., and R. Gunderson. 2020. Human-animal relations in the capitalocene: Environmental impacts and alternatives. *Environmental Sociology* 6: 68–81. https://doi.org/10.1080/23251042.2019.1666784.
Stubbs, R.J., S.E. Scott, and C. Duarte. 2018. Responding to food, environment and health challenges by changing meat consumption behaviours in consumers. *Nutrition Bulletin* 43: 125–134. https://doi.org/10.1111/nbu.12318.
Susen, S. 2020. The resonance of resonance: Critical theory as a sociology of world-relations? *International Journal of Politics, Culture, and Society* 33: 309–344. https://doi.org/10.1007/s10767-019-9313-6.
Turnbull, O.H., and A. Bär. 2020. Animal minds: The case for emotion, based on neuroscience. *Neuropsychoanalysis* 22: 109–128. https://doi.org/10.1080/15294145.2020.1848611.
Turner, N.J., A. Cuerrier, and L. Joseph. 2022. Well grounded: Indigenous Peoples' knowledge, ethnobiology and sustainability. *People and Nature* 4: 627–651. https://doi.org/10.1002/pan3.10321.
Vermeir, I., and W. Verbeke. 2006. Sustainable food consumption: Exploring the consumer "attitude—Behavioral intention" gap. *Journal of Agricultural and Environmental Ethics* 19: 169–194. https://doi.org/10.1007/s10806-005-5485-3.
Vermeir, I., B. Weijters, J. De Houwer, M. Geuens, H. Slabbinck, A. Spruyt, A. Van Kerckhove, and W. Lippevelde, et al. 2020. Environmentally sustainable food consumption: A review and research agenda from a goal-directed perspective. *Frontiers in Psychology* 11: 1603. https://doi.org/10.3389/fpsyg.2020.01603.
Vigors, B. 2018. Reducing the consumer attitude-behaviour gap in animal welfare: The potential role of 'nudges.' *Animals* 8: 232. https://doi.org/10.3390/ani8120232.
Voll, A., L. Jost, and P. Jansen. 2023. Heartfulness in vegans, vegetarians, and omnivores. *International Journal of Environmental Research and Public Health* 20: 4943. https://doi.org/10.3390/ijerph20064943.
Vuciterna, R., G. Ruggeri, and C. Stefano. 2025. Understanding gender in food consumer behaviour: A review and research agenda. *International Journal of Consumer Studies* 49: e70099. https://doi.org/10.1111/ijcs.70099.
Walsh, Z., J. Böhme, and C. Wamsler. 2021. Towards a relational paradigm in sustainability research, practice, andeducation. *Ambio* 50: 74–84. https://doi.org/10.1007/s13280-020-01322-y.
Wamsler, C., G. Osberg, W. Osika, H. Herndersson, and L. Mundaca. 2021. Linking internal and external transformation for sustainability and climate action: Towards a new research and policy agenda. *Global Environmental Change* 71: 102373. https://doi.org/10.1016/j.gloenvcha.2021.102373.
Werner, A., A. Spiller, and S.G.H. Meyerding. 2020. The yoga of sustainable diets: Exploring consumers mind and spirit. *Journal of Cleaner Production* 243: 118473. https://doi.org/10.1016/j.jclepro.2019.118473.
West, S., L.J. Haider, V. Masterson, J.P. Enqvist, U. Svedin, and M. Tengö. 2018. Stewardship, care and relational values. *Current Opinion in Environmental Sustainability* 35: 30–38. https://doi.org/10.1016/j.cosust.2018.10.008.
West, S., L.J. Haider, S. Stålhammar, and S. Woroniecki. 2020. A relational turn for sustainability science? Relational thinking, leverage points and transformations. *Ecosystems and People* 16: 304–325. https://doi.org/10.1080/26395916.2020.1814417.
Woiwode, C. 2020. Inner transformation for 21st-century futures: The missing dimension in higher education. *Environment Science and Policy for Sustainable Development* 62: 30–38. https://doi.org/10.1080/00139157.2020.1764299.
Woiwode, C., N. Schäpke, O. Bina, S. Veciana, I. Kunze, O. Parodi, P. Schweizer-Ries, and C. Wamsler. 2021. Inner transformation to sustainability as a deep leverage point: Fostering new avenues for change through dialogue and reflection. *Sustainability Science* 16: 841–858. https://doi.org/10.1007/s11625-020-00882-y.

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