



# Seven questions on agency in sustainability transformations research: insights from a systematic-narrative review

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## Abstract

The conceptualization of agency for the purpose of sustainability transformations research remains a pivotal yet elusive subject, requiring to capture the inherent interactive complexity of the agent's individual attributes and their socio-material embeddedness while providing enough clarity for empirical applicability. While significant advancements have been made in conceptualizing agency in recent years, the discourse has been characterized as scattered, using inconsistent terminology and drawing on ambiguous analytical lenses. This paper addresses these issues by providing a systematic-narrative review of the literature up to the year 2023 around concepts of agency in sustainability transformations research. On the basis of 157 included articles, three central conceptual claims are made to bring the debate forward: *First*, seven questions on agency are put forward as a theoretical tool to structure both past and future debate on agency, discussing the state of the art of definition, source of agency, relationships to transformative change, structure, power, determinants of actions' qualitative characteristics as well as theoretical foundations. *Second*, a typology of prototypical perspectives on agency is proposed, distinguishing between singular, embedded, and relational/emergent agency approaches. *Third*, drawing on insights from the systematic literature review as well as from discussions in sociology, it is suggested to bring particularly singular and embedded agency perspectives constructively together by conceptualizing agency as the situated capability of an agent to perform intentional action (as a result of some reflective deliberation) with/within specific spatio-temporal contexts.

**Keywords** Agency · Sustainability transformation · Sustainability transition · Transformative change · Intentionality

## Introduction

*“In failing to recognize the agency of both human and nonhuman actors, such a view makes struggle and contingency invisible and produces nihilism, nostalgia, and ultimately paralysis.” (Jenny Odell 2023, p. 115)*

In essence, any purposeful transformation of a social system towards sustainability must be driven by agents, whose

(inter-)actions aggregate and multiply to effect substantial shifts in collective ways of doing. Wherever sustainability transformation or transition<sup>1</sup> is required to take place, some agents *must* act deliberately and differently from the status quo to make change happen, i.e., via performing some degree of agency. As sustainability researchers, if we underestimate this simple fact, the analysis of change is a purely absent and descriptive one in which agents are rendered passive and instrumental, without agency, led mostly by pressures, forces, incidents and their immediate intuitive reactions to them.

Consequently, when thinking about transformative change, agency has to come into play not only as a factor for change (Grin et al. 2011; Wiek et al. 2012; Koistinen et al. 2018), but one of *the fundamental units of analysis*. It has often been critically pointed out that sustainability transformations research comes from more systemic perspectives (Fischer and Newig 2016; Wittmayer et al. 2017)

<sup>1</sup> Where the distinction is not important, it is subsumed by *sustainability transformations research*.

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and has therefore developed more structural, higher-level theories. These have frequently been based on the multi-level-perspective (MLP) (Geels 2002) in socio-technical systems research (STS) (Smith et al. 2005; Fuenfschilling and Truffer 2014; Upham et al. 2021), or Hollings' adaptive cycle (Holling 1986, 2001) and broader resilience theory in socio-ecological systems research (SES) (Westley et al. 2013; Adams 2021). While systems-oriented approaches are clearly key to grasp the complexity of sustainability challenges (Sahle et al. 2024), understanding action and agency, as the necessary micro-foundation of these, has for some time been left implicit.

This critique having been raised for quite some time (Folke et al. 2005; Smith et al. 2005; Genus and Coles 2008; Head 2010; Pesch 2015), in recent years, more attention has been put on overcoming this issue. For example, more systemic theories, like the MLP, were explicated with regards to agency, drawing on multiple theoretical traditions (see Geels 2020). In the last decade a shift has occurred towards theorizing and also empirically researching agency more prominently in sustainability transformations research (Teerikangas et al. 2021; Kok 2023). However, simultaneously with this closer look on such a foundational concept as agency, naturally come ontological challenges and problems of how to deal with the multitude of different understandings and theoretical traditions.

Theorizing on agency is and always has been controversial and highly diverse, not only in transformation research (as concluded in Fischer and Newig 2016; Koistinen and Teerikangas 2021) but also in sociology (e.g., Giddens 1984; Sewell 1992; Archer 1995, 2000; Emirbayer and Mische 1998; Barnes 2000) and philosophical thought (Schlosser 2019; Ferrero 2021). While Luca Ferrero (2021), editor of the Routledge Handbook of Philosophy of Agency, indicates “a rough-and-ready definition—agency as the capacity to do things or make things happen” (p. 3), he decidedly emphasizes that such a definition does not really say much, and there is *no one right definition*, but more different “pictures of agency”<sup>2</sup> (ibid., p. 8), essentially hinting at the pertinent riddle of understanding action per se.

As a response to the enduring criticisms of a lack of agency conceptualisations in the field, various and distinct advancements have emerged with concepts such as institutional work (Lawrence and Suddaby 2006; Fuenfschilling

and Truffer 2016), transformative agency (Westley et al. 2013), leadership-based concepts (Gram-Hanssen 2021; Strasser et al. 2022), value-based theories (Sarid and Goldman 2021) or integrated notions of distributed agency (Enfield and Kockelman 2017; Engez et al. 2021). Additionally, the development of notable novel theories of agency is ongoing, such as pragmatic transactionalism as a practice-based form of agency theory (De Roeck and van Poeck 2023) or fractal agency as a value-based relational approach (O'Brien et al. 2023).

However, although this diversity and novelty in approaches keeps the debate lively, it makes communication across sub-disciplines, overall comparability, as well as applicability for sustainability practice, challenging. Koistinen and Teerikangas (2021) conclude in their descriptive systematic review “that the conceptualizations of agency remain scattered” (p. 12) and there is “a need for more conceptual clarity and coherence” (p. 22). Echoing this concern, the goal of the present *systematic but decidedly narrative* review (see “Methods”) is to not only make navigating agency research easier but also to enable future research to be better situated within the diversity of existing and partially contradicting approaches and definitions, allowing a more cumulative gain of knowledge as well as synthesis for sustainability science and policy. This leads to the following central research question:

*How can the ongoing conceptual debate, including diverse definitions, and analytical lenses, on agency in sustainability transformations research be structured to enable greater conceptual clarity for future research, considering the key challenges in the field?*

In this review, both research under the sustainability transitions and transformations label are considered together, as the fields seem to converge and address both the fundamental question of how societal change towards sustainability can be achieved (see also Hölscher et al. 2018). Given this overlap, and the foundational importance of agency for both, a unified overview across both fields is timely and necessary—especially since existing reviews have so-far focused only on transition studies (e.g. Fischer and Newig 2016; Koistinen and Teerikangas 2021).

## Methods

### What type of systematic review is needed?

The systematic review conducted can be labeled as a configurative (Gough et al. 2012) or narrative one (Turnbull et al. 2023) with the main aim of understanding the development of research in the field, making comparisons and synthetically deriving some form of theory or conceptual

<sup>2</sup> Ferrero (2021) sketches his impression of four different foundational understandings of agency in the philosophy of agency: agency as creation, agency as self-constitution, agency as psychological causality, and agency as reason responsiveness. Delving deeper into these different paradigms may be useful for a strong theoretical foundation of agency for transformation research, since particularly philosophical perspectives are largely overlooked in this field.

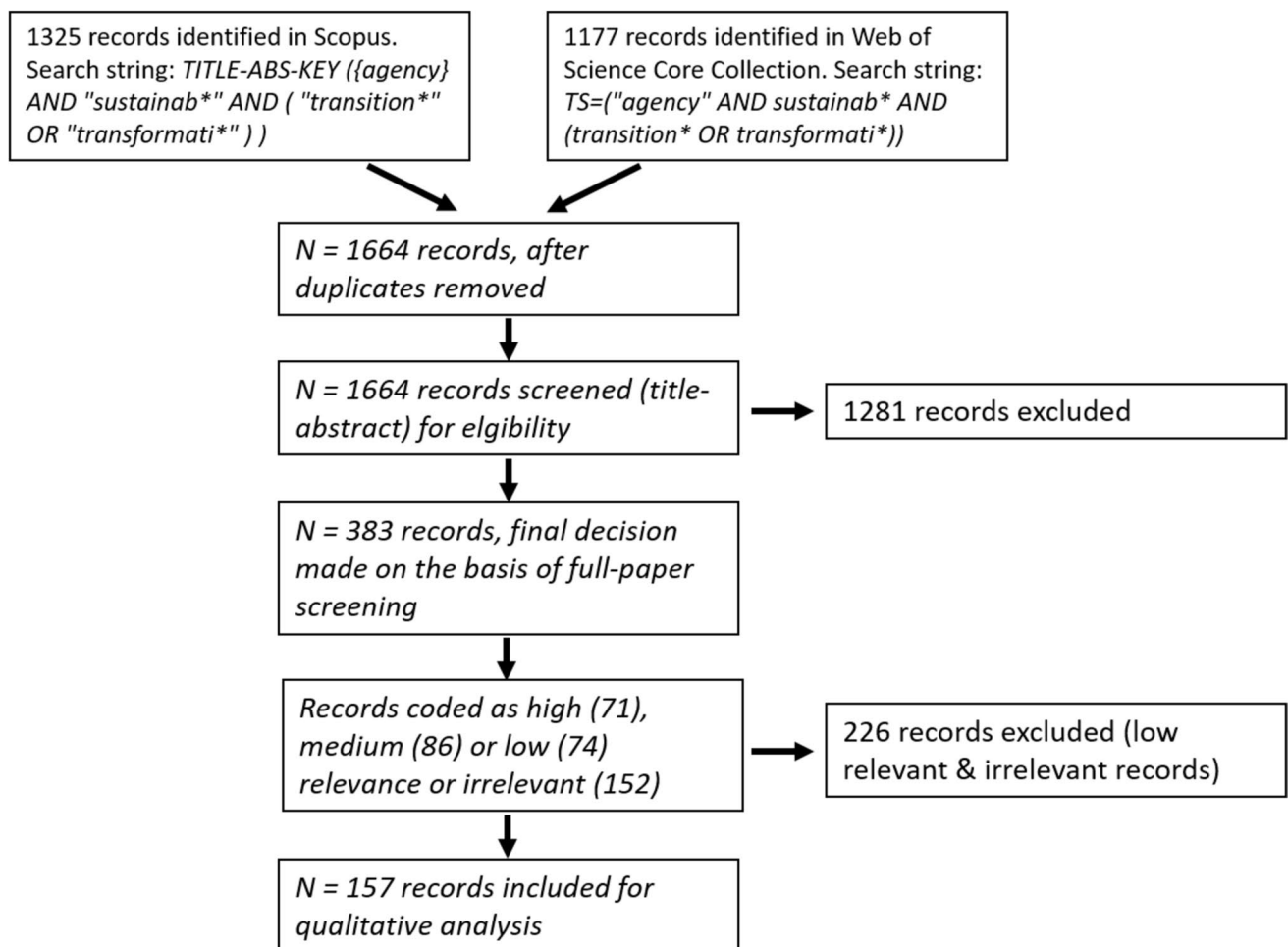


**Fig. 1** Flow chart of the search and screening process, following PRISMA (Page et al. 2021)

advancement from these results. Due to the complexity of integrating theory and situated research meaningfully, it has been tried to avoid decontextualized categorization and quantification (Dixon-Woods 2010), which, however, naturally increases the subjectivity in the process. This review type stands in between ‘classic’ systematic reviews and meta-analyses common in the medical sciences or psychology which follow completely a strict analysis- and reporting procedure (such as PRISMA, see Page et al. 2021) and on the other ‘traditional’ narrative reviews which typically do not specify how literature included was found, selected and interpreted at all (Ferrari 2015).

## Literature search

Since the focus is on agency concepts in sustainability transitions *and* transformations research, both terms were included in the search string. Existing systematic reviews on agency (Fischer and Newig 2016; Koistinen and Teerikangas 2021) only use the term *transition*, limiting the scope quite

significantly. The final search string was “agency” AND *sustainab\** AND (*transition\** OR *transformat\**) yielding 1664 results in Web of Science Core Collection and Scopus, after removing duplicates (see Fig. 1). This is basically an extension of Fischer and Newig’s (2016) search string.<sup>3</sup>

## Screening process

Figure 1 illustrates the literature search, screening, and selection process. The yielded 1664 results underwent a title-abstract screening process, categorizing them as excluded, pending, or likely included based on the following criteria:

<sup>3</sup> Some alternatives were considered, such as including specific agent concepts such as entrepreneur, incumbent, niche agent or change agent. However, it was not intended to reduce the scope further since then hardly a general claim on agency research could be made, nor to broaden it further due to limited resources (e.g. by adding the agent concepts as a disjunction as part of the agency conjunction term).

1. The publication makes some contribution to the theoretical or empirical understanding of agency—while addressing it as such, and
2. the publication is concerned with sustainability transition or transformation processes.

A publication was deemed irrelevant if it did not suffice both criteria. After the first round of title-abstract screening, all pending results were screened again, if necessary, based on full-paper text, and were either excluded or went into the likely included category, resulting in 383 likely included papers. For these papers, all full-paper texts were checked to make a final decision on inclusion for theoretical analysis. Records were coded as highly, medium, low relevant, or irrelevant during this process. The degree of relevancy (low, medium, high) was judged based on how substantially the research was concerned with understanding agency (criterion 1). Publications with low relevancy tackled agency only tangentially or indirectly and were mainly concerned with other concepts or topics. The final corpus of included literature contained 157 results, with 71 coded as highly relevant and 86 as medium relevant (see full literature list in supplementary materials).

### Analysis and interpretation process

The analysis and interpretation process involved two rounds of reading and coding. The *first round* of analysis entailed reading approximately 50% of included articles and was performed taking an inductive coding approach. The goal was here to get an overview of the literature, collecting and listing for each paper the central research focus, agency definition, theoretical backgrounds, empirical context (if applicable) and overall themes.<sup>4</sup> Based on this first explorative analysis, a detailed ‘questioning scheme’ was developed by looking at the distinguishing conceptual themes across the analyzed articles in this first phase to structure the debate. This questioning scheme was developed by integrating the main conceptual focal points taken in the literature, along with key points of conceptual contradictions noticed between the articles—such as differing definitions or underlying assumptions. A second round of reading followed in which this scheme was used as an analytical and interpretative tool. Each paper was questioned on the basis of this scheme, and respective answers were derived, listed, and categorized. The analysis remained open during this phase to change or add questions, but no significant

changes were made, except that two separate questions were collapsed to one (this concerns question 2 with regard to source and location of agency, see ["Seven Questions on Agency"](#)).

### Descriptive results

The main quantitative descriptive results can be viewed in Fig. 2. It shows the lists of top journals and edited volumes for included publications,<sup>5</sup> a graph for the results yielded by the search string per year in the research database Scopus, illustrating a significant yearly growth of publications captured by the search string, and the prevalence of defining agency as a term.

A key result is the issue of defining the term agency. As will be explicated in ["Seven Questions on Agency"](#), the question of what agency is actually about, is really not clear or commonly agreed upon in the literature. Almost half of the coded as high relevance, and three quarters of the coded as medium relevance publications do not provide a clear definition of agency (either none at all, or only implicitly as e.g. revealed in examples or if referring to other literature). This is an issue because it complicates the debate and reference to different perspectives on agency (as is also a difficulty faced in this review, see ["Theoretical Roots"](#)).

The top journals publishing research on agency approaches are by a long way *Environmental Innovation and Societal Transitions* (26 publications in total of the 157 included) and the MDPI journal *Sustainability* (17 publications in total). Next up the list are the journals *Technological Forecasting and Social Change* as well as the *Journal of Cleaner Production* with seven included publications, as well as the *Research Handbook of Sustainability Agency* which was published in 2021, edited by Satu Teerikangas and others. Due to the usage of the word transformation in the search string instead of only using transitions, a broad range of journals are included (over 50 peer-reviewed journals and three other edited collections) with only three or less included articles per publication medium.

Further, Fig. 3 shows a heuristic depiction of different theoretical roots of which included publications conceptually draw from as a starting point for agency research and further conceptualizations.

<sup>4</sup> Only literature from 2022 and before and from the Web of Science Core Collection could be considered for the first, explorative coding phase, since an updated search including Scopus and literature published in 2023 has been conducted just in late January 2024.

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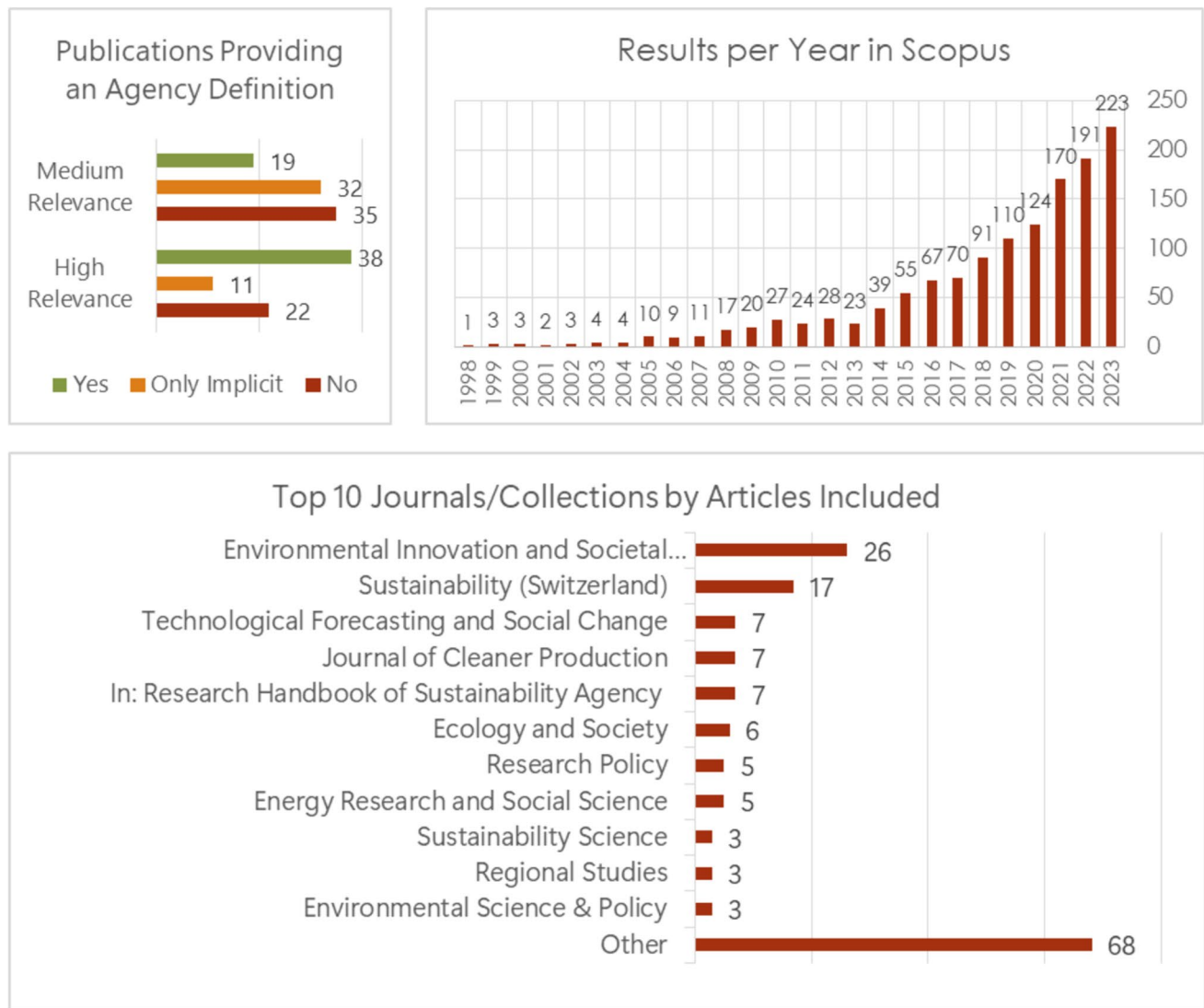


Fig. 2 Descriptive results

## Theoretical roots

As Fig. 3 illustrates, agency-related research in the field stems from diverse theoretical backgrounds and, thus, different paradigms and ontological assumptions. This makes discussing key results challenging since one risks decoupling or oversimplifying different theories. To mitigate this, it is useful to take a closer look at some central theoretical roots directly concerned with agency that included articles tend to rely on first, to account for some of the ontological differences before giving a conceptual synthesis. The selection here is an immediate outcome of the literature analysis. Included articles largely build on one, or sometimes more than one, of the following authors/traditions and their comprehensive ontologies as a starting point for further conceptualisation and/or empirical application.

Examples are mentioned for each. Some influential thinkers (such as Weber, Bourdieu, Sewell, Sen, or Nussbaum) are often only tangentially referenced in the literature but rarely taken as a theoretical basis with regards to agency. Therefore, they are not covered in greater detail here.

**Anthony Giddens'** structuration theory and his conceptualization of agency are commonly utilized ontologies in sustainability transformations research across conceptual borders (e.g., Feola and Binder 2010; Geels 2010, 2011, 2020; Crivits and Paredis 2013; Avelino 2017; Hermwille et al. 2017; de Haan and Rotmans 2018; Pekkanen 2021; Colloff et al. 2021; Koistinen et al. 2022). In his seminal work, *The Constitution of Society* (1984), Giddens aims to overcome the—from his perspective—one-sided thought of functionalist and structuralist theory on one side, and individualist and hermeneutical subjectivist

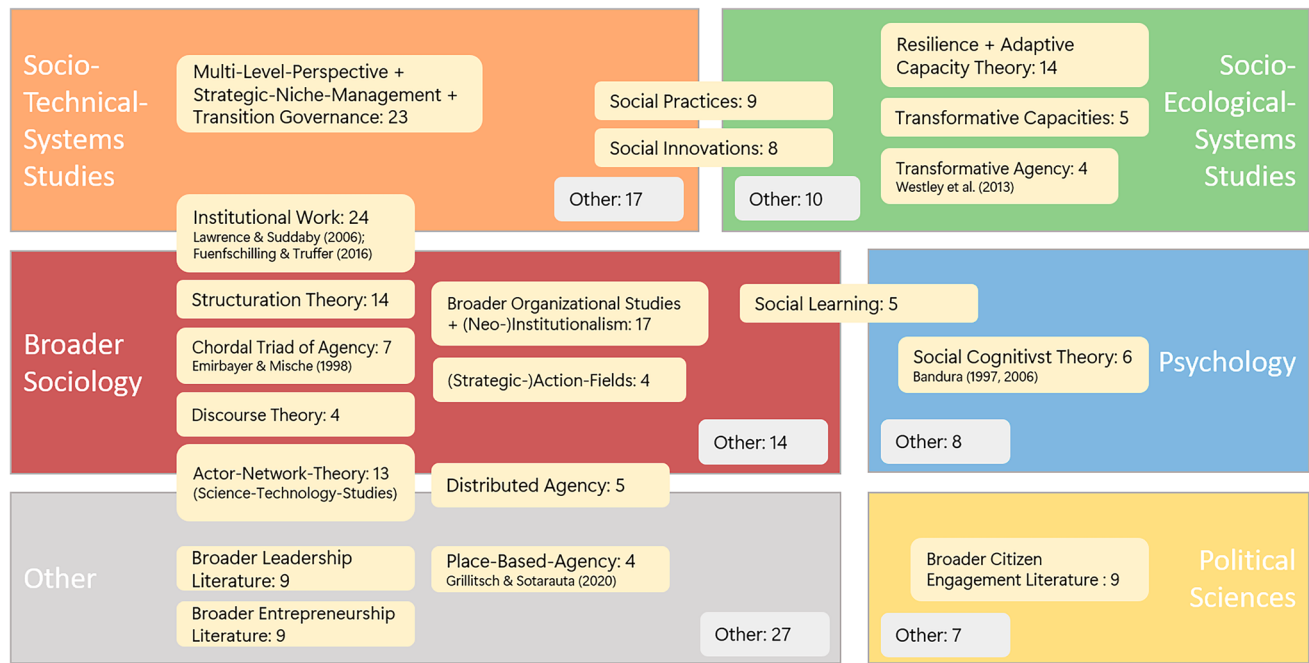


**Fig. 3** Diverse theoretical backgrounds of agency concepts in sustainability transformations research. This figure is a heuristic depiction of theoretical approaches and fields significantly drawn from as a conceptual starting point for agency research in the included publications. Since many publications employ multiple theories or schools of thought, up to three entries have been counted for each. While most

theoretical approaches listed here can be associated with multiple and partially unmentioned disciplines, for simplicity, the primary ones have been selected for depiction. The grey category ‘other’ at the bottom left largely entails theory/approaches from economics, business and management studies, innovation studies, design studies, and human geography

traditions on the other. The former would give deterministic primacy of action to structure while the latter side argues that structures are essentially independently and purposefully created by agents (pp. 1f.). Giddens tries to overcome this dichotomy with his theory of the duality of structure, which embeds agency in the process of structuration, where action is understood simultaneously as constrained and enabled by existing structures while reproducing or shaping/creating them.

In this context, Giddens scrutinizes the common definition of agency as intentional action-taking (meaning agents intending their action to have a certain effect) by arguing that this understanding of agency ties agency to the consequence of action without recognizing the necessity of power and knowledgeability. Giddens argues that “[a]gency refers not to the intentions people have in doing things but to their capability of doing those things in the first place” (p. 9), and hence, agency implies power. In his terms, agency is about agent-driven events where “the individual could, at any phase in a given sequence of conduct, have acted differently” (p. 9). Although this aspect of ‘could have acted otherwise’ is key to his concept and also is usually cited in the current literature, it is only little discussed what this ‘could have’ really means and how far it goes. Stones’ formulation of ‘strong structuration’ theory (utilized e.g. by

Upham and Gathen 2021) is a bit more explicit on this issue, situating agency in the quadripartite nature of structuration (Stones 2005, pp. 84 ff.). Active agency is here described as the “ways in which the agent either routinely and pre-reflectively, or strategically and critically, draws upon her internal structures” (p. 84). However, some argue that this separation of the agent and structure, while a deliberate response to critiques of conflation (see below), stands in tension with Giddens’ initial effort to overcome such a dualism (Spaargaaren and Mommas 2006).

Often briefly mentioned along Giddens in the literature are critical realists such as **Margaret Archer and Roy Bhaskar**, who criticise his approach. While essentially agreeing with Giddens’ critique of the one-sided approaches to agency, Archer criticizes his solution as analytically blurring the issue (1995, pp. 93ff.) since it conflates structure and agency, which, although interdependent, should be treated separately. She argues that processes of agency and structure should be analyzed using a periodical time frame that dissects their intermingled nature.<sup>6</sup> Similarly, Bhaskar’s

<sup>6</sup> Archer does this with the concept of the morphogenetic-cycle (1995, pp. 247ff.), which, as well as her broader work on agency and reflexivity, is not really applied or referred to in the sustainability transformations literature.

ontology follows a comparable approach, emphasizing particularly that structures constitute “slots [which] are filled by agents who either reproduce or transform pre-existing structures via their social practices” (Kaidesoja 2009; p. 10; citing Bhaskar 1979). This is a much more distinct view of agents *acting in structures* than is posed in structuration (e.g. utilized by Sorrell 2018; Roebke et al. 2022). Notably, Archer further stresses the active role of agents’ reflexivity, understood as the ability of people “to consider themselves in relation to their (social) contexts and vice versa” (Archer 2007, p. 7) in agency,<sup>7</sup> which has been taken up in recent concepts (O’Brien et al. 2023). Reflexivity can be seen as the key mental and active-agential mode of relating individual action to the social context purposefully.

The differing perspectives of Giddens and the critical realists Archer and Bhaskar essentially concern whether we can and should separate structure and agency, which is still a central ambiguous disagreement within the larger sustainability transformations literature on agency (see “Seven Questions on Agency” Q3).

The literature also builds on multiple other perspectives with varying stances on this issue. One is **Albert Bandura’s** (1997, 2006) psychological conceptualization of agency in which agents’ psychological processes shaping their deliberate actions are articulated. Bandura’s theory of agency postulates four general characteristics—intentionality, forethought, self-reactiveness, and self-reflectiveness—which are all personal processes characterizing individual freedom of action (Bandura 2006). In his view, agency is about agents’ ability to make plans, shape the situations they are in, and guide their overall pathways of life. Examples using Bandura’s conceptualization are Koskela and Paloniemi (2023), Benessaiah and Eakin (2021), Buhr et al. (2023) and Cloete et al. (2023).

Conversely, **Emirbayer and Mische** (1998) propose a temporal, highly embedded, and relational notion, defining agency as “temporally constructed engagement by actors of different structural environments [...] which, through the interplay of habit, imagination, and judgment, both reproduces and transforms those structures [...]” (ibid., p. 970). Crucial here are two things: the temporal construction of agency and the shift away from individual action to an actorial engagement. The former they articulate clearly by further distinguishing between three “constitutive elements of human agency” (ibid.): *iteration* (associated with routines, and habits rooted in the past), *projectivity* (associated with visions and narratives for the future), and

*practical evaluation* (how past and future come evaluatively and consciously together in the present moment). The latter remains nebulous since they do not further conceptually explore what ‘engagement by actors’ really refers to and what types of action the concept entails. Still, the temporal aspects they discuss are strongly represented (if not echoed) in current research of institutional practices (e.g., Friedrich et al. 2023; Wojtynia et al. 2023) on one hand, and visioning/futuring on the other (e.g., Bazzani 2022; also w.r.t. leadership in Wolfgramm et al. 2015; or moral entrepreneurship in Antadze and McGowan 2017), offering specific insights on bridging the two.

It seems appropriate to consider **institutional work** as an ‘established’ approach here as well, because a substantial part of the included articles build directly on it (e.g., Brown et al. 2013; Bettini et al. 2015a, b; Barnes et al. 2018; Beunen and Patterson 2019; Arenas et al. 2020; Galvan et al. 2020; Duygan et al. 2021; Hoffman et al. 2021; Löhr et al. 2022; Madsen et al. 2022; Simoens et al. 2022; Friedrich et al. 2023). Being based on Giddens’ structuration theory, institutional work is a very specific way of viewing agency in large parts of sustainability transition studies. The concept of institutional work emerged in organizational studies and new institutionalism, with early conceptual roots in DiMaggio (1988) and Oliver (1991, 1992). It was more systematically developed by Lawrence and Suddaby (2006) and Lawrence et al. (2009), and later advanced and applied to sustainability transitions most prominently by Fuenfschilling and Truffer (2016). Institutional work refers to actions that (intentionally) “aim at the creation, maintenance or disruption of institutions” (Fuenfschilling and Truffer 2016, p. 299). Approaches of institutional work are keen on describing and analyzing actors and their actions (as in strategies) specific to the institutional context they are embedded in, which is naturally intuitive and close to the defining endeavor of sustainability transition studies. However, with regard to the deterministic nature of this institutional embeddedness of agency the concept remains ambiguous, occasionally converging to a structuralist view. Similar in this regard is also the regularly referred to eclectic notion of place-based agency by Grillitsch and Sotarauta (2020), combining Schumpeterian innovative and institutional entrepreneurship and place-based leadership theory.

Contrary to these embedded notions of agency, an array of highly relational conceptualizations of so-called **distributed agency** should be mentioned here, which particularly found application in social innovation theory (e.g., Pel et al. 2020a, b), in intersectionality (Arora et al. 2023), understanding materiality/affordances (Jokinen et al. 2021; Babri et al. 2022), complex adaptive systems (Kok et al. 2021), or also generally with regards to transitions research or the MLP (Quitau et al. 2013; Raven et al. 2011;

<sup>7</sup> This understanding of agency contrasts Giddens’ understanding of reflexivity as a form of monitoring social life self-consciously – which is more passive, almost habitual compared to Archer’s more active definition.

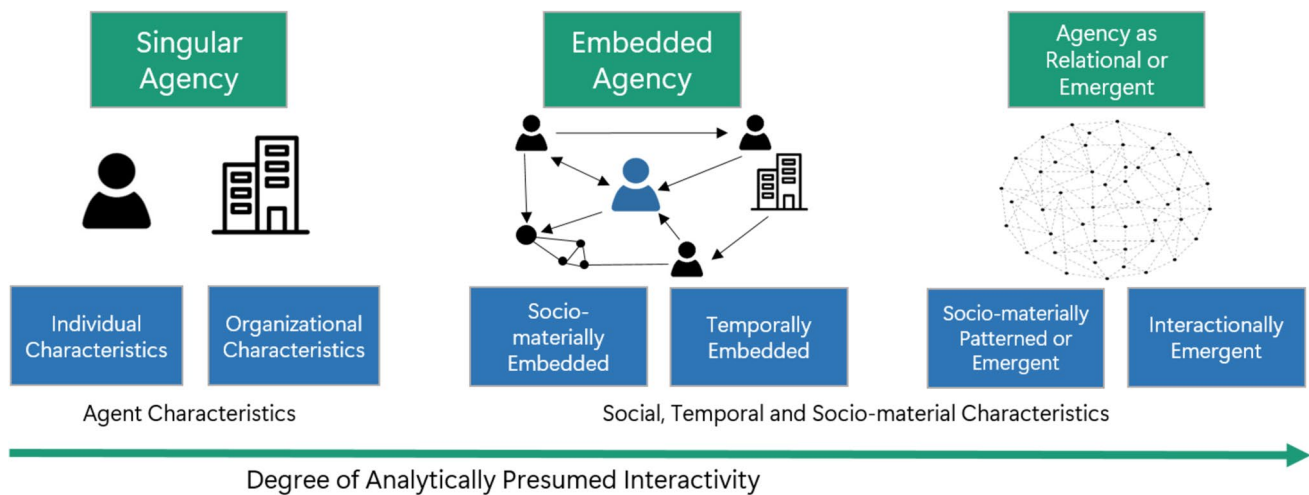


**Fig. 4** Conceptual synthesis of diverse perspectives on agency in sustainability transformations research

Contesse et al. 2021; Huttunen et al. 2021). The distinctive feature of these notions being that agency is shared among multiple human or non-human agents, and hence, actions and related outcomes that may seem like individual agency are actually complex *emergent* phenomena resulting from an interplay of numerous forces of agency (see Enfield and Kockelman 2017, for an overview on distributed agency).

A crucial foundation which many of the relational studies refer to, is **Actor-Network-Theory** (ANT) which has been largely developed by Latour, Callon and Law across multiple publications in the 1980s and 90s (see Durepos and Mills 2012; Muniesa 2015). At the core of ANT lies the recognition of an uncertainty on who or what is acting, implying a radical “‘critique’ of the object/subject dichotomy” (Sayes 2014; p. 141) putting human and non-human agents conceptually on one level. Latour makes quite clear, that in ANT an entity has (or is attributed with) agency, only if both of the following can be answered positively: “[d]oes it make a difference in the course of some other agent’s action or not? Is there some trial that allows someone to detect this difference?” (Latour 2005, p. 71; following Sayes 2014). Actions are largely understood as complex associations between actors (Elder-Vass 2008) and a key interest of ANT, understood more as a methodology, is also which human and non-human actors participate how, in a sense symmetrically, in an action (Dwiartama and Rosin 2014). Interestingly, ANT also denies structural power conceptually and “places the burden of sociological explanation on the causal influence of actors” (Elder-Vass 2008; p. 17) and in this sense, it is more micro-foundational in its approach than other ontologies. Crucially, it should also be pointed out, that in ANT something like intentional action taking (i.e. the ‘traditional’ understanding of agency) is not essentially denied, but being considered only a specific

type of agency and always relates to external, methodical attribution (Sayes 2014). ANT provides a completely different, arguably more descriptive and ‘outer’ perspective on agency than other approaches which have been applied and reinterpreted in multiple studies to shed light particularly on the emergence and conditioning of agency within complex, multi-agential systems.

## Interpretative results

As the main interpretative result, it is proposed to structure the debate by following seven key questions on agency research (see “Seven questions on agency”). Additionally, it is argued in the following that three prototypical perspectives on agency in the field can be derived, which are established in this article first to allow a clearer presentation.

### Three prototypical perspectives on agency in sustainability transformations research

The following typology has been derived using the *criterion* of how far deterministic primacy is analytically put on the agent alone versus given to the relational interactivity of being and acting in a socio-material environment filled with engaging institutional structures as well as other human and non-human agents. It is proposed here to distinguish between three prototypical perspectives: singular agency, embedded agency and relational/emergent agency (see Fig. 4).<sup>8</sup> It should be noted

<sup>8</sup> The typology proposed here has some similarity with Huttunen et al.’s (2021) distinction between institutional, socio-psychological and relational/distributional agency approaches. They argue, that these distinct theoretical branches can pluralize the perspectives on agency in sustainability transitions research. Two crucial differences

here, that these perspectives can overlap and some authors tend also to take an in-between approach.

### Singular agency

Under singular agency approaches, perspectives on agency are subsumed, which perceive the agent as rather independent from the specific context the agent is embedded in regarding the determination of their (intentional) actions. Hence, while the agent of course interacts with their environment (e.g., via mobilizing resources), these interactions stem purely (or largely) from the intention and ability of the agent. The (intentional) actions of the agent are primarily formed by the agent's internal characteristics alone, only in reference to the environment. These characteristics can be motives, interests, knowledge, beliefs, skills, or personality in case of a human agent, and organizational or leadership characteristics in the case of a corporate agent (see Q2).

From the 'classic' authors, Albert Bandura's social cognitivist approach with its emphasis on the human, internal capabilities can be placed in this category. Also critical realist perspectives (Archer and Bhaskar) take quite a singular agency view on the matter, since they try to analytically clearly separate how agents act in relation but distinction to structure.

Taking a singular agency perspective helps with particularly two aspects: understanding the human agent with their internal attributes, such as values, beliefs, personality or abilities/competences, and how they affect their (intentional) actions. This is often done in clear distinction to structure (such as in Wilden and Feldmeyer 2021; Koistinen et al. 2020; Koskela and Paloniemi 2023 or also Wamsler et al. 2023). And on the other side, examining what actions or behaviors agents specifically perform, either w.r.t. consumption and daily life (Wamsler et al. 2021; Pekkanen 2021), or w.r.t. transformative action (Barnes et al. 2018; Ruhrort and Allert 2021; Benessaiah and Eakin 2021, Roebke et al. 2022).

#### Footnote 8 (continued)

between the typology proposed here and Huttunen et al.'s (2021) suggestion should be noted: (1) the typology presented in this article goes beyond distinguishing between theoretical traditions potentially useful for transitions research and is concerned with the present analytical assumptions taken in the existing literature in general across theories; (2) Huttunen et al.'s typology is largely concerned with the source (or emergence) of agency as an capability (represented here in Q2) instead of taking a broader perspective on utilized agency approaches. The second point is particularly reflected in the fact that Huttunen et al. does not distinguish between singular or embedded approaches ontologically, because their view is more about the question of how agentic capability is explained from different angles.

Some studies drawing on structuration and institutional work are more singular in focus, by viewing the agent as rather independent, centering clearly on their strategies/ actions they deploy in relation to the preset (institutional) environment they act in (e.g. Crivits and Paredis 2013; Barnes et al. 2018; Torre et al. 2020; Koistinen et al. 2022). However, structuration theory per se, or arguably also institutional work originally put forward, does take strictly speaking a more embedded than singular agency approach.

### Embedded agency

Embedded agency approaches perceive (intentional) actions more as stemming from an interactive process between the agents' characteristics and the causal or suggestive effects of the structural context the agent is embedded in on the agent. Therefore, agency is also shaped in strong reference to the socio-material system the agent is embedded in, but not only on a knowledge or strategic level (e.g. by the agent analyzing the system), as would be the case for singular agency approaches, but also on the basis of (a) normative and incentivization expectations that the structural context suggests, and (b) the available resources, means, and power the structure allows for the agent.

Giddens' structuration theory and Stones' strong structuration theory can be placed in this category since they conceptualize agency as inherently based on internalized structures (prolonged and momentarily). Similarly, Emirbayer and Mische's concept of agency as a chordal triad of past, future and present is a highly embedded perspective as well. Institutional work, since conceptually based on structuration theory, takes the embedded analytical perspective too, but centers on agents in more or less interdependent relation to their institutional context.

Explicit theorizing has yielded diverse embedded agency approaches specifically for transformations research. Notable examples are de Haan and Rotmans' (2018) framework for actors in transformative change, de Roeck and Van Poeck's (2023) transactional pragmatism, Madsen et al.'s (2022) theory of contestation axes, as well as approaches based on Lewin's field theory (Kump 2023) or strategic action field theory (Kungl and Hess 2021).

The advantage of such embedded agency approaches is that they allow to examine more the intricate dynamic between agency, or often multiple agencies, as well as structure and their effects on each other. Agency is understood more comprehensively as in relation to other agents and the structural context they are situated in, while simultaneously upholding analytically some behavioral freedom the agents possess. It could be argued, that such approaches draw a more 'realistic' picture of the agents' capability to actually exert agency in their specific context than singular agency approaches may simply assume.

**Table 1** Proposed seven questions on agency in sustainability transformations research. Based on the first explorative coding phase and applied as a coding tool for all included articles. The column ‘status

of the literature’ reflects the author’s subjective assessment of the state of agency research, based on the interpretative analysis and the arguments provided in “Seven Questions on Agency”

| Question                                                                                                  | Status of the literature                               |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Q1 How can agency be <i>defined</i> ? (What is agency?)                                                   | Implicitly debated/diverse and partially contradictory |
| Q2 What is the presumed <i>source of agency</i> ? (Where does agency lie? How is it constituted?)         | Elaborate and diverse perspectives                     |
| Q3 What is the specific relationship of agency to <i>sustainability transition/transformation</i> ?       | Implicit                                               |
| Q4 What is the relationship of agency and <i>structure</i> ?                                              | Debated and partially contradictory                    |
| Q5 What is the relationship of agency and <i>power</i> ? (What is the exact difference?)                  | Underdeveloped/unclear                                 |
| Q6 What are <i>shaping factors of the normative quality</i> of agency, and also, of exercised agency?     | Underdeveloped/unclear                                 |
| Q7 What is expected of a <i>theory of agency</i> ? (What does and doesn’t it explain? What does it help?) | Implicitly debated                                     |

As suggested above, some approaches can be put more in between the singular and embedded category, such as most studies on institutional work (Novalia et al. 2018, 2020; Beunen and Patterson 2019), institutional entrepreneurship (Heiskanen et al. 2019) or place-based agency (Sotarauda et al. 2021; Sotarauda and Grillitsch 2023).

### Relational or emergent agency

Relational or emergent agency approaches are highly diverse, but they take agency and also (intentional) action-taking per se more as a phenomenon that is patterned or emerges as a result of a process of various interacting agents (or actors/actants), often including non-human agents and their various relationally conditioned characteristics. The unit of analysis is often a complex network of interactions or associations between these different agents, usually stemming from concepts of distributed agency, actor-network theory, or poststructuralist thought.

As a consequence, such approaches are particularly useful to take a broader, but micro-foundational perspective on how agency within specific situations does come about, and how it is qualitatively constituted by the specific socio-material configurations. Such approaches basically take an outer perspective on human agency, trying to describe its emergence and quality within a whole contextually bound configuration (e.g., Kok et al. 2021). Or, especially when taking decidedly a non-human agency approach, shed a completely new perspective on how actually materials, or objects in a general sense, in complex relations, shape social reality or phenomena, such as human agency described in the other two approaches (e.g. Jokinen et al. 2021, Babri et al. 2022). However, not all publications take such an outer perspective. For example, O’Brien et al.’s (2023) notion of fractal agency interprets change agency more as emergently patterned and connected through universal values, and therefore combining the inner-dimensions with the relational study of agency. This inner-dimension is otherwise typically absent in studies of this category, particularly when based on ANT.

Other notable publications taking a relational/emergent agency approach are Charli-Joseph et al. (2018, 2023), Contesse et al. (2021), Hirvensalo et al. (2021), Kok et al. (2021, 2023), Arora et al. (2023) and Tàbara (2023).

### Seven questions on agency

Table 1 shows the adapted questioning scheme<sup>9</sup> developed as a result of the explorative coding phase and the estimated state of the literature. Key interpretative results are reported for each of the questions in the following. The focus is here more conceptual than empirical, since differences in empirical findings correspond usually to different conceptual focal points or assumptions.

#### Q1 Definition

Despite the generally shared understanding that agency is about agents and their actions, there is no consensus on the exact definition and meaning of agency within the broader research community, as is a continuing trend, since scattered terminology has been a key result of other reviews on the issue (e.g., Fischer and Newig 2016; Koistinen et al. 2018; Teerikangas et al. 2021; partially Buhr et al. 2023). This lack of consensus is highlighted in Table 2, which presents a selection of definitions of agency from the included articles, each associated with a key distinguishing attribute and the prototypical perspective (singular, embedded, or relational/emergent).

First, there is an inconsistency in whether agency should be viewed merely as taking some form of action or if it encompasses—as is typical in philosophy (see Ferrero

<sup>9</sup> To avoid any impression of intentional parallelism, it should be noted that it is purely coincidental that other notable conceptual contributions closely related to this topic also happen to present exactly seven points – such as Avelino’s (2021) seven points of contestation on power, and Kok’s (2023) seven sets of interpretations on structure. I want to thank Reviewer 1 for pointing this out!

**Table 2** Examples of definitions of agency. There are several key distinguishing attributes between the selected definitions (while not being an exhaustive list, it was tried to select the most representative examples for distinguishing attributes)

| Definition type                              | Examples                                                                                                                                                                                                                                                                                                                                       | Suggested agency perspective                           |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Only Action</b>                           | "Agency ( <i>i.e. the <b>making</b> of independent choices by actors</i> )" (Grin et al. 2011, p. 3)                                                                                                                                                                                                                                           | Singular agency                                        |
| + Intentionality                             | "Agency means <b>to "influence intentionally one's functioning and life circumstances. [...]"</b> (Bandura 2006, p. 164)" (Buhr et al. 2023, p. 4223)                                                                                                                                                                                          | Singular agency                                        |
| + Effect and consequence                     | "Human agency refers to <b>"intentional, purposive and meaningful actions, and the intended and unintended consequences of such actions"</b> (Grillitsch and Sotara 2020, p. 707)." (Roebke et al. 2022)                                                                                                                                       | Singular/embedded agency                               |
| <b>Ability/capability/capacity to action</b> | " <b>Capacity</b> to choose and pursue a course of action" (Adams 2021, p. 10)                                                                                                                                                                                                                                                                 | Singular agency                                        |
|                                              | "Agency refers to the <b>ability</b> to act, to make one's own free choices in hopes of changing one's life circumstances" (Benessaiah and Eakin 2021, p. 1843)                                                                                                                                                                                | Singular agency                                        |
| + Intentionality                             | "We understand agency as the <b>ability to act with intention</b> —as opposed to just reacting" (de Haan and Rotmans 2018, p. 4)                                                                                                                                                                                                               | Embedded Agency (as rooted in their concept of agency) |
| + Intentionality/reflexivity                 | "We approach agency as the culturally and historically contingent <b>capacity of actors "to interpret and morally evaluate</b> their situation and to formulate projects and try to enact them" (Ormer 1995: 185)—both individually and collectively" (Hölscher et al. 2023, p. 5)                                                             | Embedded agency                                        |
| + Intentionality/effect                      | "Human agency can be defined as the <b>capacity to change systems through conscious actions</b> " (O'Brien et al. 2023, p. 1449)                                                                                                                                                                                                               | Agency as relational/emergent                          |
| + Non-human agency                           | "Hence, from this relational nondualistic perspective, agency is understood as the <b>capacity</b> to influence the interactions of others, but where these 'others' also include <b>non-human actants</b> (cf Latour) that affect human agents' motives, socioenvironmental practices, and system' structuring forces." (Tàbara 2023, p. 369) | Agency as relational/emergent                          |
| <b>Different</b>                             | "Actors' agency—conceived as the meanings and means behind (re) actions" (Lundsgaard-Hansen et al. 2018, p. 1)                                                                                                                                                                                                                                 | Singular/embedded agency                               |
|                                              | "Agency is defined as <b>"the relation between a person and a course of action and its effects</b> (Enfield and Kockelman 2017, p. 7)." (Engez et al. 2021, p. 293)                                                                                                                                                                            | Agency as relational/emergent                          |
| <b>Vague/implicit</b>                        | "Agency arises from the ability to enrol others" (Heiskanen et al. 2018, p. 3)                                                                                                                                                                                                                                                                 | Singular/embedded agency                               |
|                                              | "The problem of agency involves questions like: what is or can be the contribution of actors to transitions; how can this role be theoretically captured; and how can agents influence or contribute to a transition process?" (Pesch 2015, p. 379)                                                                                            | Embedded agency                                        |

2021)—the broader capability of taking action. What this capability analytically captures, is a key distinguishing feature of whether the perspective is more singular, embedded, or relational/emergent. Second, there is the question of whether and to which extent to include some form of intentionality or purposefulness in the definition, which characterizes the type of actions deemed agential. Third, the definitions diverge on whether agency addresses merely action or in how far it includes extends of effect or consequence. This is a distinction that significantly influences the scope of agency. Lastly, some recent publications, usually drawing on Actor-Network-Theory, include non-human entities as agents capable of exerting agency into the definition, reflecting and expanding the boundaries of what constitutes

agency and where it lies or emerges (e.g. Fatimah and Arora 2016; Contesse et al. 2021; Jokinen et al. 2021; Kok et al. 2021; Arora et al. 2023).

While this diversity in definitions, in a way, mirrors the pertinent conceptual richness of the different theoretical backgrounds researchers draw from, it also poses challenges not only for coming to a shared minimal understanding of what agency is but also hinders the cumulative development of deeper characterizations or theories of agency. Further, it cannot be said that an explicit debate is going on within the broader research community about which definition (not to talk about characterization/theory yet) would be more useful. While some publications extensively contrast different approaches (e.g. Teerikangas et al. 2021; de Roeck

and van Poeck 2023; Huttunen et al. 2021; Geels 2020), the question of how to define agency usefully for sustainability transformations research (i.e. for example, whether to distinguish via intentionality or ability/capability/capacity) has not been substantially addressed in any of the included articles (besides brief reflections on the issue, such as in Kok et al. 2021 or Koistinen et al. 2018). This problem is exacerbated by publications omitting to clarify what their understanding of agency is, although being decidedly and conceptually about agency (see Fig. 2).

Empirically, this can have substantial implications which is partially represented in the respective articles. If researchers assume agency being about action and behavior in general, a clear distinction between structure is (consciously) not made (see Q4), potentially leading to general description of action, including behaviors and routines (e.g., Geels 2011, 2020). Whereas, when defining agency being about intentional or deliberate action taking, it is usually about pro-active initiation attempts of change or certain strategies deployed, or norm alterations (e.g., Pekkanen 2021; Ruhrort and Allert 2021).

## Q2 Source and location

The question of source (i.e., where the capability for action actually stems from), as well as location (i.e., where the agent with crucial agency is located), are most intensely both theoretically and empirically studied in the literature. While source and location of agency essentially being two different concerns, they tend to be closely linked in the articles conceptually. This is, because the location of agency (e.g. a particular position of power) can also be viewed as a source of agency (such as, that the structural position makes agency just possible).

For more *singular agency* approaches, the source of agency is largely understood as lying in the *internal* characteristics of the agent. Key human-individual internal agency characteristics (which may overlap to some degree and relate to the corresponding conceptualizations) are:

- knowledge/competence (e.g., system-knowledge, knowledge of strategies) (Colloff et al. 2021; Wilden and Feldmeyer 2021), beliefs (such as perceived self-efficacy or trust) and emotions (Wamsler et al. 2022, 2023).
- preferences, attitudes, values (Bögel and Upham 2018; Pekkanen 2021; Pahl-Wostl et al. 2023; Plüschke-Altof et al. 2023) and internalized social norms (Ibrahim 2017; Ruhrort and Allert 2021; Upham et al. 2021)
- perceptions (Halinski and Duxbury 2020; Wamsler et al. 2022, 2023)
- personality (Crivits and Paredis 2013; Antadze and McGowan 2017; Vasquez-Delsolar and Merino 2021)

- skills, abilities, or practical competencies to exert certain strategies (Novalia et al. 2018, 2020; Torre et al. 2020; Roebke et al. 2022; Buhr et al. 2023; Friedrich et al. 2023)

Some publications emphasize that agency (since internally characterized) directly is constituted by complex forms of (social-) learning (Stetsenko 2019; Stocco et al. 2021; Koskela and Paloniemi 2023; tangentially also Pesch et al. 2017). This issue of learning is discussed with regard to not only enabling agents to do what they want to do but also to allow agents to actually learn to develop what they may want to do—generating ideas for sustainable involvement (Lotz-Sisitka et al. 2017; Probst et al. 2019; Budowle et al. 2021).

The role of the ability to use or relate these characteristics to the specific contextuality the agent is in is regularly emphasized and often based on the usage of various types of resources available at hand (Colloff et al. 2021) or also by conciliating and collaborating in networks (Ibrahim 2017).

*Embedded* conceptualizations of agency do not deny these internal characteristics and often explicitly integrate these into their frameworks. However, additional emphasis as a source of agency is put on how the contextual conditions interact and shape the actions or the capability for action of certain agents.

For example, de Haan and Rotmans (2018) base agency on value streams which can rise or dry up, being not—as would be the perspective of singular approaches—values one agent has (and which may be shared by other agents), but more values which are picked up collectively and are structurally/conditionally upheld. Conversely, Westley et al.'s (2013) transformative agency approach sees the source of 'successful' agency in the competence of strategic correspondence, of linking the system's status (following Holling's adaptive cycle) and tailored strategies, particularly exploiting windows of opportunities.

More recent literature stresses agency being inherently affected by capabilities of (social-) resource mobilization and characteristics of existing social networks (Duygan et al. 2019; Yu and Gibbs 2020; Strasser et al. 2022; Friedrich et al. 2023), some also reflecting on the shaping nature of actor-interactions on agency in general (De Herde et al. 2019; De Roeck and van Poeck 2023). Approaches drawing on Dorado (2005) or also Emirbayer and Mische's (1998) theory of agency rely on existing, previously formed practices in interaction with future-oriented visions/aims and narratives as being a defining driver of agency. Further, some researchers articulate that (institutional) spaces can allow or foster agency. Bögel et al. (2022) see space as "the container for agency" (p. 171) and Charli-Joseph et al. (2018, 2023) examine how specific experimental spaces allow agency to emerge. In this case, the source of agency

is—at least analytically—emphasized as driven from the spatial and conditional context.

*Relational or emergent* agency approaches go much further in foregrounding the interactive nature of agents and their context (e.g., Schlüter et al. 2019; Contesse et al. 2021), attributing the source of agency to complex interactive networks of human and non-human relationships. It is argued that analytically, there is no way of putting the finger on a general class of factors that shape emergent agency phenomena. Arora et al. (2023) argue that agency is “constituted by [agents’] relations with nature and technology” (p. 2), while agency always remains underdetermined since “relational effects are emergent” (p. 8).

Relational approaches with an explicitly not-only-human agency approach tend to remain rather agnostic to the explicit source of agency. Whereas Kok et al. (2021) theorize agency, understood as the “capacity for reorientation” (p. 1) of (networks of) human and non-human components, as patterned by structures and external agency, the *remaining* source of this capacity for reorientation is not further explained.

### Q3 Agency and transformation

The connection between agency and the transformative process is largely only implicitly suggested (as agency being required to initiate substantial change) or understood/analyzed with reference to specific frameworks or theories, such as in institutional work (Fuenfschilling and Truffer 2016; Beunen and Patterson 2019; Hoffman et al. 2021), building adaptive capacities (Bettini et al. 2015), transformative capacities (Wolfram 2016) or governance (Hernandez and Schanz 2019; Salman and Mori 2023).

The tie between agency and transformative processes<sup>10</sup> is occasionally also explicated via theorizing about specific agents and actions/strategies. For example, taking the definition of institutional work “as those actions through which actors attempt to, or in effect do, create, maintain, or disrupt institutional structures” (Beunen and Patterson 2019, p. 23), agency is directly linked to a *specific* understanding of the transformational process. Consequently, different strategies can be associated to each of the attempted kind or phase of

institutional work (Novalia et al. 2018) and are then discussed as different kinds of agency.

Throughout the literature, regularly the assumption is made that if certain agents would have been given more agency (or if they could unfold their agency better), then transformative change towards sustainability would be amplified (de Haan and Rotmans 2018; Koistinen et al. 2018; Hoppe 2021; Plüschke-Altöf et al. 2023) and also participatorially/democratically be more just (Gram-Hanssen 2021; O’Brien et al. 2023). Consequentially, it is argued that certain structures should be changed or construed in order to improve the agency of agents (e.g., Hirth et al. 2023).

### Q4 Agency and structure

The question of the relationship between agency and structure is a very foundational and ontological one, controversially debated across disciplines and also in general agency theorizing (see “[Theoretical Roots](#)”). Great and diverse discussions in the context of sustainability transformations can be found in Hausknot (2014), Stirling (2014), De Roeck and van Poeck (2023), Kok et al. (2021) and Kok (2023).

The relationship between agency and structure clearly distinguishes the singular, embedded, and relational typology. In general, there is a broad agreement that structure essentially limits and enables agency in various ways. However, singular agency approaches see this structured environment more as the situation in which the agent acts in rather independently, e.g., by being subjected to certain structural logics or constraints (Benessaiah and Eakin 2021; Vasquez-Delsolar and Merino 2021), whereas in more embedded or relational approaches, structure impacts agency directly and inherently. This interactivity of subject and environment is analytically taken to various degrees. Relational approaches take it furthest, up to viewing structures as uncertain indeterminacies emerging fluidly within assemblages (Arora et al. 2023). Other relational approaches reject the agency-structure distinction fully and directly (Jokinen et al. 2021; Tàbara 2023).

Notably, Kok et al. (2021) see structure (in the context of a complex adaptive systems perspective) as those networks of components “[...] forming the conditions of agency—i.e. as constituting components’ capacity for reorientation. These structures may be rules, habits, routines, cultures but also materiality, ecology, technology etc.” (p. 5). Particularly due to their unique understanding of agency (as a capacity of (networks of) human and non-human agents for reorientation), this is an interesting turn on the structure-agency debate, since it distinguishes in a way between the ‘free’ (in the sense of internally alterable) and ‘non-free’

<sup>10</sup> Two other notable examples for this linked conceptualization are De Roeck and van Poeck (2023), who perceive agency as the crucial means to interrupt existing social practices, which is argued to enable transformative change by altering old or creating novel practices, and Pel et al. (2020a), who are putting more attention on the collective and, coming from a social innovations view, link a strongly distributed notion of agency to the transformative process understood as shifting social relations.

configurations in a network and points at how their free action space is shaped via other structuring components exerting power.

### Q5 Agency and power

Agency and power are intuitively strongly related, not only since transformative agency may challenge power relations (Heiskanen et al. 2018; Benessaiah and Eakin 2021) but also, since processes of (dis-)empowerment shape whose agency impacts what and whom how in the end (Madsen et al. 2022; Pel et al. 2020a, b). However, the exact relationship of agency and power remains often blurry or purely implicit, and only few publications tackle both concepts simultaneously and their link in detail.

In general, power is largely seen as an integral part of agency via the capability of mobilizing people and resources, or having the means to achieve a goal (Benessaiah and Eakin 2021). Agents without power either do not really have agency, or their agency does not count (Lundsgaard-Hansen et al. 2018). It is often suggested that only those who have power or access to power can actually create an impact (Upham and Gathen 2021; Salman and Mori 2023; van Dokkum et al. 2023).

In some conceptualizations, the focus is less placed on power as a means of agency, but more on agency requiring to navigate or “to attune to power dynamics” (Budowle et al. 2021, p. 5) in order to be effective, hence viewing it more structural. Similarly, de Haan and Rotmans (2018) link it to positionality by stating that not everyone is in a position to change something.

Avelino (2017) gives a comprehensive conceptualization of different kinds of power(s), which, as she states, are largely “agency-based notions of power” (ibid. p. 5). Without giving a clear concept of agency herself (besides referring to Giddens’ notion of agency as acting otherwise), her dialectical notion of power as “the (in)capacity of actors to mobilize resources and institutions to achieve a goal” (ibid. p. 3) is quite close to how many authors view agency. The different mobilizable resource types Avelino mentions (mental, human, artefactual, natural and monetary) to exercise power are largely part of the internal and external characteristics mentioned for enabling agency in singular and embedded approaches. However, Avelino (2017) puts a stronger emphasis on the relational nature of power, e.g. who has power over whom or who has more/less power, which could be interpreted as relations of interacting agencies of different agents. Further, she argues that power largely “resides in the social context (Barnes [1988] 2002: 127) and actors ‘possess power only in so far as they are relationally constituted as doing so’ (Clegg [1989] 2002: 257)” (Avelino 2017, p. 4). Specifically, in locating different types of power within the MLP and characterizing empowerment,

Avelino (2017) makes a huge contribution to understanding better which types and shapes agency can take and how these relationally interact in the form of power relations within various qualitatively different contexts in transition processes. However, although Avelino directly illustrates how closely knit power is to agency, with regard to the distinct relationship between the two concepts, she remains rather agnostic.

Conversely to seeing power as a means for agency, more relational approaches, such as Kok et al. (2021) see power more distinctly as structuring the conditions agency takes place or emerges in (similar in this assumption are Jokinen et al. 2021; Charli-Joseph et al. 2018, 2023; Tàbara 2023; Arora et al. 2023). As suggested briefly in Q4, Kok et al. (2021) describe power as “emerg[ing] from interactions” (p. 6) with an “intensity as well as a directionality (Stirling 2019)” (p. 6) which “structur[es] agency” (p. 6) via impacts on social relationships, practices, and institutional arrangements. These conditions for agency, are impacted by either structures or other agents and their agency (including non-humans and networks). This understanding of power is, in principle, not so different from Avelino’s, but a conceptual explication and augmentation to non-humans of agency as conditioned by power.

Notable in this context is also Jokinen et al.’s (2021) depiction of the power of non-human agents over other agents. They take the simple example of asbestos by describing it as having significant power over humans because of its “material properties, capacities, and affordances” (p. 309). Via this power, the agency of other agents (e.g. a human agent in a chemistry lab) is structured. Although this understanding of agency and power is quite general and erases the role of intentionality completely from the concept, it shows quite clearly how networks of components enable and constrain each other.

### Q6 Normative quality of agency

While processes enabling or restraining agency are largely discussed in the literature, there is only little research specifically addressing what actually shapes the normative direction and also the ‘success’ (normatively attributed) of performed agency. In most studies, it is implicitly assumed that if certain agents have more agency or can act more freely, then they will likely act toward a more sustainable system or society as a whole. Quality determinants listed here are usually just mentioned in the described context, but the exact relationships between these factors and the normative direction of the performed agency are rarely studied in sustainability transformations research—at least under the agency label.

(a) *Aspects shaping the normative orientation.* Among more singular approaches (and also some embedded), the

normative orientation is taken as aims or objectives of agents (Andriamihaja et al. 2021; Plüschke-Altof et al. 2023), which agents are assumed to be having internally and analytically ex-ante. Others take into account that such aims as drivers of agency are rooted in a variety of psychological concepts, such as values, beliefs, perceptions, attitudes, desires (compare Q2), but also mindsets (Ruhrt and Allert 2021), the force of wanting to reduce conflict (Kump 2023), or norms and culture in general (Upham et al. 2021). Learning and education are discussed as a key driver as well, not only by helping to integrate information and value orientations but also by shaping a person's beliefs (Wolfgramm et al. 2015; van Poeck et al. 2017). Such characteristics can also be analyzed from a life-course perspective (Koistinen et al. 2020). The role of perceived risk and uncertainties in interaction with other factors are also highlighted by some as shaping characteristics of agency (e.g., Groves et al. 2016; Colloff et al. 2021; Upham et al. 2021). This is exemplified in detail in the context of farmers' struggle for change (Friedrich et al. 2023), or the context of projective reasoning (Bazzani 2022). Although only occasionally hinted at, reflexivity can be seen as key for integrating these different shaping aspects consciously (e.g., Novalia et al. 2018, 2020).

(b) *Aspects shaping the success, outcome, or performance.* Since outcome is a key explanandum for sustainability transformations research, generally more explicit emphasis is put on this part of Q6. Much research drawing on case studies derives particular characteristics of strategies and interventions (or explicit strategies in the first place) that are likely to be effective in bringing sustainability change processes forward. General 'success' factors, among others, are considered to be reflexivity (e.g., Novalia et al. 2018; Suitner et al. 2023) in relation to utilizing opportunity windows (e.g., Westley et al. 2013; Ruhrt and Allert 2021; Hölscher et al. 2023), participation/co-production (e.g., Novalia et al. 2020; Plüschke-Altof et al. 2023) and availability and the usage of networks/allies (e.g., Duygan et al. 2019). Studying these strategies or actions, which are often also portrayed in certain actor roles (e.g., Mossberg et al. 2018; Sotarauta et al. 2021), are then associated with the label 'agency'. Such strategies are largely context-specific and cannot all be listed here (some notable examples in general are: Brown et al. 2013; Werbeloff et al. 2016; Brodnik and Brown 2018; Heiskanen et al. 2018; Arenas et al. 2020; Chaminade and Randelli 2020; Ramirez et al. 2020; Gram-Hanssen 2021; Sotarauta et al. 2021; Strasser et al. 2022).

Overall, the lack of explicitly addressing how certain characteristics do not only shape agency in magnitude, but also in quality may be an issue, particularly when examining not only the agency of the often so-called change agent but also the agency of resistant forces with other, conflicting normative goals.

## Q7 Agency theory

A fundamental issue threads through the literature implicitly, which is about *what should* an agency theory actually *explain* on one side and, in a second step, *provide* for bringing sustainability transformations research forward. During analysis, it was revealed that the actual meta-questions concerned when zooming out across paradigms are not always the same. Coding suggests three distinct perspectives on what agency theory should actually entail. However, little can be said about how these differences occur. In how far it is a consequence of the choice of research goal or whether it is an implication of the utilized definition and theoretical background is not quite clear.

(a) *Describing actions or interactions within specific contexts.* Even though agency is often defined as some sort of capability, agency-related research, often drawing on case studies or agent typologies (see also Fischer and Newig 2016; Teerikangas and Koistinen 2021), tends to have the aim to more describe actions w.r.t. the theory of change applied (and not so much to explain the capability per se, see Q3). Thus, the description of agency is some kind of micro-foundation of the process and largely descriptive, with prescriptive outcomes implicitly suggested. Many studies partially deal with this as a starting point, but expand then further to other aspects. This is done quite comprehensively, for example, conceptually in de Haan and Rotmans (2018) and Geels (2020), based on ANT in Contesse et al. (2021) and Jokinen et al. (2021) or with regard to practices in Fatimah and Arora (2016) and Arora et al. (2023).

(b) *Informing the performance of change agency.* In a way, an extension of (a), agency-related research focussing more specifically on informing successful change agency are abundant (compare studies cited in Q6b). The question of anticipated outcome, or also which specific characteristics (e.g., abilities, skills, knowledge) a certain agent needs to possess to enable change are studied (e.g., Novalia et al. 2018, 2020).

(c) *Showing how agency (as a capability) is acquired, shaped and structured.* This is basically debated most in the literature which concerns Q2 but also Q4–Q6 (see studies listed the respective sections). It is about understanding how to build this capability but also understanding essentially the reasons for certain actions.

Most researchers dealing with agency probably intend to contribute to multiple or all of these aspects but the respective research goals likely lead to more emphasis on one of the three. Also, one can argue that b) is always indirectly a consequence of (a) and (c).

However, a big issue with all three (a), (b), and (c) is that there is no coherent distinction in terms of what type of actions are addressed. This is where the distinction of talking about intentional (or 'free' or deliberate) action versus just

any action or also ‘change action’ becomes crucial. This is, because all three aspects would mean and imply completely different things depending on the type of action dealt with, making meaningful comparison across studies challenging. There is no clear consensus on the question of which types of action we talk about when talking about agency in sustainability transformations research. Even in cases of defining agency explicitly being about intentional action, there is rarely clarified what actions can be seen why as intentional. This makes the debate fuzzy, particularly w.r.t. the agency-structure debate, as, for example, routinious actions relate very differently to structure than intentional ones.

In general, while this implicit question emerged in the analysis, it is crucial to more explicitly examine how to theorize agency in sustainability transformations research in close relation to its inter- and transdisciplinary demands and general problem–solution orientation (see also Schlüter et al. 2022).

## Discussion

As shown, agency conceptualizations in sustainability transformations research are incredibly diverse, are rooted in a variety of different theories, and have been applied in an array of different empirical contexts. Represented in the questions and typology put forward here, studying agency in and for sustainability transformations is widely recognized in the literature as a complex, multifaceted, yet crucial issue.

Research on agency deals with a variety of distinct theories and analytical focal points, which occur necessary to deal with the various complex challenges of transformative sustainability science. Further, while many conceptual difficulties exist, much has been achieved particularly with regards to studying the source and location of agency for transformative change (Q2), as well as different ways of analyzing actions and actor roles (which partially has been a result of previous reviews already, see Fischer and Newig 2016; Teerikangas and Koistinen 2021).

The purpose of this systematic-narrative review has been to critically examine and trying to make sense of the debate around agency. A key finding in this regard is particularly the rich diversity of approaches and ontologies, which have been categorized into three prototypical perspectives on agency (singular, embedded, and relational/emergent). As has been mentioned briefly in "[Three Prototypical Perspectives on Agency in Sustainability Transformations Research](#)", it is suggested that these perspectives come with specific **use cases, advantages and disadvantages**.

Even though singular conceptions of agency may have the advantage of being quite clear by separating the agent ontologically and focussing on how their internal characteristics are utilized in decision-making processes,

strategic intervention and power acquisition/exertion for (or against) sustainable change, they run the risk of blinding out the substantial determining effect structures may have. When a singular understanding of agency may presume too much agentic freedom, independence and power, embedded agency approaches can exactly overcome this shortcoming, by including this foundational, partly situational, influence of structure on the agent directly into the conceptualization of agency. However, as Archer’s argument implies, embedded approaches are in a conceptual challenge of attribution, particularly when they want to explain how successfully performed change agency comes or doesn’t come about. Relational or emergent (non-human) agency approaches can offer quite a different perspective on these issues. Necessarily, when aiming to treat all human and non-human agents similarly (as ANT is based on), it cannot really be shed light on the inner characteristics as a cause for (intentional) action-taking, which are crucial aspects for sustainable change (see Davelaar 2021; Sahle et al. 2024). However, they uniquely capture the dynamic contingencies of broader associative configurations, in which agency (as externally attributed), is constituted. Especially, when examining agency as distributed across multiple key agents to describe and understand a larger phenomenon, or potentially also collective action, such analysis appears incredibly useful.

At this point, it should be pointed out that while the conceptual diversity has advantages, and its contextually sensitive combination is needed for sustainability science (Schlüter et al. 2022), it comes with the substantial challenges of eclecticism and ‘multilingualism’ (Blanchard 2020; Gerrits 2023). The interpretation of the literature put forward here tried to respect the diversity and contextual embeddedness of the concepts, while also offering specific tools for dealing with this challenge of researching agency in this inter- and transdisciplinary field.

To improve clarity and a more cumulative gain of knowledge in the debate, it is suggested that **scholars researching agency** should try to express clearly which definition as well as underlying ontology they utilize to avoid misunderstanding. Other than is occasionally assumed, there is not one clear definition or characterization of agency, leading to authors talking about completely different phenomena when talking about agency (e.g. some talking about any behavior and others specifically about intentional action-taking or the ability thereof, contrasting structure). Giving the specific reasoning for why to choose a certain ontology in relation to which aspect or phenomenon of agency investigated may also improve a better common but also intricate understanding of agency in the field.

Furthermore, there seems to me to be a crucial issue at heart of the debate, which needs clarification for the purpose of both transformations research and practice: As results for

Q1, Q3 and Q7 suggest, it is not so much clear **which kinds of actions we are talking about** when examining agency. However, for a more fruitful debate on agency, research needs to distinguish more explicitly and clearly between different types of action or behavior (see Kaufman et al. 2021, for a notable classification of behavioral types).<sup>11</sup>

This problem concerns not only whether research addresses *agency in general* or, often implicitly, *only change agency*, but also whether they include all actions—e.g. including those performed within structurally governed roles—or only those seen as ‘free’, as when an agent is assumed to act as the leader of their own life. This issue can be seen as the question of whether and how to include intentionality in a definition of agency. Clarifying this is crucial, particularly because sustainable change is exactly about overcoming the harmful existing ways of doing (i.e. the default and structurally led actions) by finding ways of how it is possible *to stop the stable reproduction* of these harmful practices, *to do differently* until a more sustainable enactment is created and normalized (Shove and Walker 2010; Haslanger 2022; Spatan et al. 2024). A conceptualization of agency for the purpose of sustainability transformation research representing the singular or embedded approaches needs to capture and not blur this distinction which lies in the way structure is being understood as part of agency or not. If this is not precisely accounted for in conceptualizing agency, we lose the conceptual link to the agentic initiation moment in change, which is, at least analytically, not only structural. This is particularly important for an ‘active’ agency concept, which also practitioners can utilize to reflect on their own agency with regard to the specific situation they are in (echoing Koistinen et al.’s, 2018 moving call for action as part of their review on agency). Hence, the need for a clarified definition utilizable for both singular and embedded agency approaches is at least two fold: 1) to offer an explicit, operationalizable, adaptable but also challengeable starting point beyond complex ontologies, to acquire a shared understanding, and 2) to fill the void for an ‘active’ agency concept, assuming at least some agentic power in clear relation to structure.

For this purpose, the stance is taken and argued for, that including intentionality in such a definition of agency is

paramount. The following agency definition is proposed and elaborated:

**Definition.** Human agency is the capability (of the situated agent) to perform intentional action (as a result of some *reflective deliberation*) within/with reference to specific spatio-temporal contexts.

The proposed definition has essentially four components: *capability*, *intention*, *performance*, and *locale*.

*Capability* is analytically entailing here the conception and performance of the intentional action the agent came up with as suitable from their view w.r.t. the specific spatio-temporal context they are situated in. Further, the usage of the word capability<sup>12</sup> is meant as including both the internal ability of an agent, as well as their external power (as in lying in the contextual properties for the agent, such as the access to mobilizing resources, conditions of networks, aspects of legitimacy). Subsequently, *performance* is referring to the enactment of the intentional action the agent consciously decided for and is linked to the agent’s specific spatio-temporal context (*locale*). This locale is structured by the socio-material conditions via shaping the spatio-temporal realities the agent is situated in as well as their corresponding perceptions, governing correspondingly the set of available actions the agent possibly could perform, as well as the ones the agent consciously construes as possible and reasonable to perform (compare Hausknost 2014 for a discussion on *decision* as a key agential operator).

*Intentionality* is a more complex issue and has been part of extensive debates not only in philosophy (Jacob 2023) but also directly in sociology concerning agency (e.g., Giddens 1984; Sewell 1992; Barnes 2000). Intentionality can be viewed as being about a ‘will’ to achieve or perform something that stems from the agent’s own thoughts, beliefs, and values, being somewhat separate from the immediate influence of the agent’s socio-material or structural situatedness. This is ontologically a difficult topic since, of course, thoughts, beliefs, and values, even arguably ‘the will,’ stem from the environment and culture we grow up or live in. Without being capable to theoretically dissect fully what is agent and what is structure here, a necessary heuristic might be that thoughts, beliefs and values have to be *manifested* within an agent to be called their own in the

<sup>11</sup> This lack of clarity with regards to action or “scattered terminology in the study of agency” (Koistinen et al. 2018, p. 1140) is particularly evident in singular and embedded agency approaches. Usually, emergent/relational approaches make quite clear that they either talk about any action, potentially extending it to the effects of non-human agents, or specify their particular notion of agency (such as in ANT in general, see Sayes 2014, or in the unique conceptualizations of Kok et al.’s 2021, 2023, or O’Brien et al.’s 2023). This seems to be because there is a general awareness that emergent/relational approaches tend to transcend the seeming ‘common’ notions of agency.

<sup>12</sup> The use of *capability* in the definition is intended to encompass both the internal abilities of an agent as well as the external means or conditions that capacitate them within their specific situation. According to the *Oxford Learner’s Dictionary*, *capability* refers to “the ability or qualities necessary to do something”, capturing arguably both the ability and capacity side of things. However, the terms *ability*, *capability*, and *capacity* vary in meaning across different dictionaries. Any of the three could serve in the definition of agency proposed here – provided it is clear that both internal and external dimensions are included in the interpretation.

upper sense. Therefore, a kind of situational constancy is at play—the agent holds certain thoughts, beliefs and values throughout time and space, throughout various situational contexts and thus, actions based on those manifest attributes (via a process of reflective deliberation) are actions concerning agency.

Another issue of intentionality, regularly omitted, is what the intention is actually about.<sup>13</sup> When Giddens (1984) criticizes the role of intention via exclaiming that no agent really knows what the outcome of their action will be (see pp. 8ff.) and therefore, the intention of actions would sociologically not really matter as much, particularly for understanding agency, he omits fully that intention can also be about the *process of action*. There is a severe difference between intending an outcome and intending an act or a performance due to its characteristics (which is the key distinction between consequentialist and deontological ethics). The latter is about agents doing something intentionally because the performance may be seen as the right thing to do or also because it may create something desirable experientially during the act. There are deeply ethical, emotional, and experiential components in this intention of performance of action, which as a whole is overlooked. When talking about actions having to be intentional (in order to be about agency and not about structure) it is meant that the action has to be consciously decided for—on the basis of whatever reason, which not only has to be an outcome.

This process of intentionally deciding creatively *for* something may be best described as a process of reflective deliberation. Characterizing the deliberation process is a challenging task and there are probably a variety of different types and intensities of deliberation also interacting with structural forces. As a starting point for discussion, the following characterization is proposed:

**Reflective deliberation** (about performing an action) is a process of mindful contemplation about what and how to do, which takes

- own *internal* characteristics, such as beliefs, values, goals, interests, abilities, skills, knowledge, and emotions, on one side
- and *external* characteristics, such as available resources, general norms, institutional conditions, as well as the specific action context, others' actions & agency, etc., on the other

synthetically into account.

Further, it should be elaborated that the deliberation process does *not necessarily* have to be immediately tied to the action since it can have temporal, spatial, and even thematic distance. For example, if someone decides to eat vegan (as a result of some form of reflective deliberation and not because a social group strongly incentivizes them to do so), then the future acts of the person eating vegan meals are a result of this *distant* deliberation process.

The given definition of individual agency distinguishes clearly between actions purely, unquestioningly governed by structures, from actions stemming from the 'active', reflective and integrating agent—without excluding the effect of structure on the decision and performance of the intentional action from agency. It aims to capture the capability of an agent to act in reflexive correspondence right in the situation they are in, applying the values and competencies they carry.

## Further research, limitations and concluding remarks

The aim of this review has been to characterize the debate on agency conceptualizations within the broader sustainability transformations literature and provide a typology of agency theory. This has been done by distinguishing between singular, embedded, and relational/emergent agency approaches, and by discussing these along seven questions around definition, source, normatively shaping characteristics of agency, as well as conceptual relations to structure, transition/transformation and power. This developed typology and questioning scheme can be viewed as tools to finally focus the ongoing debate in the field around agency, by enabling conceptual clarity and a more cumulative gain of knowledge. Additionally, an active, reflexive and situated understanding of agency has been proposed, emphasizing the crucial act of reflective deliberation for purposeful transformative action. These tools may provide the capability to explicate questions of the agent, their actions and conditions of inner transformation *within* the necessary systems-oriented approaches in future sustainability science more clearly and in depth.

This review reveals key inconsistencies and gaps in the debate, particularly around definition and normativity, as well as relations to larger concepts such as transformation and power. Largely unaddressed remains also the issue of *multiple intersecting agencies* of different agents. Similarly, the crucial question of *collective agency* could only sparsely be addressed in this review due to the absence of clear theoretical development in the publications included within the scope of this review (notable exceptions are Ibrahim 2017; Charli-Joseph et al. 2023). This shall not suggest that

<sup>13</sup> According to the Routledge Encyclopedia of Philosophy, “[i]ntentionality is the mind's capacity to direct itself on things” (Crane 2016), so the directedness of intentionality is seen as the defining characteristic (Jacob 2023).

sustainability transformations research is not examining the actions of collectives and how they emerge since particularly initiatives or social movements and their collective action are key topics of study in the field. More so, results suggest that theorizing on collective action is quite disconnected to explicit theorizing on agency within the literature. It is crucial to bring existing concepts of agency closer to theory on collective action or even develop a solid notion of collective agency.

Three main limitations of this narrative-systematic review should be highlighted: first, although unavoidable due to the choice of methodology and style of the review, it should be mentioned that naturally substantial author subjectivity is involved in the interpretation of the literature as well as the selective presentation of results here. Second, with the conceptual synthesis comes the risk of decontextualization of individual results. This was tried to account for to some degree by discussing crucial individual publications explicitly and not only giving cumulated results. Third, this review has been mainly focussed on the definition and characterization of agency as a concept, and the diversity of agent/actor and agency types, as well as key empirical results, could only be sparsely explored due to the limited scope.

The derived reading and synthesis of current conceptualizations of agency in sustainability transformations research can only be seen as a starting point for understanding transformative change constituting on an individual level more clearly. Surely, substantial social change is always made collectively, but it is sparked with individual agency pointing at various creative forms of collective organizing. Combining such a rather ‘zoomed in on the agent’ conception with the broader, highly relational/emergent approaches, may lead to a more comprehensive and multifaceted understanding of transformative collective agency towards sustainable systems in future research.

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