Under construction: how managerial cognition shapes sustainable transition pathways

Claire Beach, Michael S.W. Lee and Sitong Michelle Chen

Abstract

Purpose – *As concerns over climate change and social inequality intensify, firms are increasingly transitioning toward sustainable business models. However, the fragmented nature of the literature limits our understanding of how sustainable transition pathways are constructed. This paper aims to examine how managerial cognition, particularly managers' cognitive frames and their underlying content, influences the construction and efficacy of sustainable transition pathways.*

Design/methodology/approach – *An integrative literature review of 184 studies was conducted using thematic analysis and dialectical interrogation.*

Findings – *Sustainable transition pathways emerge through repeated interventions, shaped by the cognitive frames managers use to guide their decision-making. The authors identify four managerial orientations toward sustainability: business-as-usual, instrumental, transition and transformation, each underpinned by distinct assumptions, values and priorities. These orientations influence how managers conceptualize sustainability, set objectives, operationalize interventions and define value. By integrating these insights, the authors theorize how differences in cognitive content explain variations in the construction and efficacy of sustainable transition pathways.*

Originality/value – *This study uncovers the overlooked role of managerial cognition in shaping sustainable transition pathways by synthesizing the fragmented literature. By identifying differences in cognitive content, the authors develop a conceptual framework of managerial orientations toward sustainability. This framework advances the understanding of how managers construct sustainable transition pathways, explaining why similar interventions can lead to divergent sustainability outcomes. Lastly, this paper offers conceptual insights that can help managers reflect on how to construct more effective sustainable transition pathways.*

Keywords *Sustainable transitions, Sustainable transition pathways, Business models, Managerial cognition, Cognitive frames, Cognitive content*

Paper type *Literature review*

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Introduction

Growing awareness of the negative social and environmental costs of doing business, such as climate change, biodiversity loss and growing social inequalities, has prompted calls for alternative business paradigms that embed environmental and social considerations alongside economic goals (Bocken *et al.*, 2014; Karns, 2011). In response, many firms are exploring sustainable business models, which aim to deliver environmental, social *and* economic performance (Elkington, 1998). However, achieving this often requires firms to redesign their existing business models (Rao and Shukla, 2023; Waddock *et al.*, 2015), fundamentally changing how firms create and capture value.

These changes unfold through sustainable transitions, which are complex, long-term processes that shift sociotechnical systems toward more sustainable configurations

(Markard *et al.*, 2012). At the firm level, sustainable transitions are enacted through the repeated implementation of sustainability interventions (Geels, 2002), which gradually form a sustainable transition pathway (Turnheim and Nykvist, 2019). While structural enablers and constraints to sustainable transitions in business models are well studied (e.g. Bocken and Geradts, 2019; Geissdoerfer *et al.*, 2023), the firm-level dynamics of sustainable transitions in business models remain under-explored (Bidmon and Knab, 2018). In particular, we know little about how firms construct sustainable transition pathways over time, or how the cognitive frames managers use influence these pathways.

Research in corporate sustainability has begun to explore how managers make sense of sustainability challenges through cognitive frames, which represent the mental maps or thought structures (Eggers and Kaplan, 2013) managers use to filter and "selectively admit information into the decision-making process" (Sharma and Jaiswal, 2018, p. 292). Cognitive frames reveal patterns in beliefs that influence organizational learning and adaptation (Lane *et al.*, 2006), and guides managers' strategic responses to sustainability challenges (Sharma and Jaiswal, 2018). Although corporate governance mechanisms may influence which sustainability goals are prioritized and which cognitive frames are legitimized, it is ultimately managers who interpret and act on these goals. Their cognitive frames play a central role in determining how sustainability interventions are selected, prioritized and implemented within business models.

Existing research often focuses on how organizations and managers make sense of sustainability challenges (Dzhengiz and Hockerts, 2022; Hahn *et al.*, 2014; Preuss and Fearne, 2022), but it rarely connects managerial cognition to how sustainable transitions unfold over time. In particular, studies overlook how the cognitive content underpinning cognitive frames (Walsh, 1995) can support or undermine a firm's long-term sustainability efforts. As a result, existing research does not adequately account for how managers' cognitive frames influence the construction of sustainable transition pathways, limiting our ability to explain why similar interventions produce different sustainability outcomes across firms.

This paper addresses this gap by conducting an integrative literature review, asking:

Q1. How do managers' cognitive frames influence the construction and efficacy of sustainable transition pathways?

We synthesize a fragmented and interdisciplinary body of research to develop a conceptual framework linking managers' cognitive orientations to differences in sustainability outcomes. By emphasizing the cognitive content underpinning managerial orientations toward sustainability, we explain how managers construct sustainable transition pathways and why these vary in their effectiveness. In doing so, we connect the literature on sustainable transitions in business models to managerial cognition, clarifying how micro-level processes shape sustainable transition outcomes. These findings can help managers reflect on how to improve the design and efficacy of sustainable transition pathways.

The following sections outline the theoretical background and methodology. The results and discussion examine how sustainable transition pathways have been conceptualized. We identify the cognitive content of each frame, conceptualizing how this influences the construction and efficacy of firms' sustainable transition pathways. We conclude with a discussion of the implications and directions for future research.

Theoretical background

Business models are central to how firms create, deliver and capture value (Vernay *et al.*, 2022). Traditionally, business models are understood as "systems of interconnected and interdependent activities" (Amit and Zott, 2012, p. 42) that firms use to generate economic value. Sustainable business models build on this foundation by requiring firms to consider a

broader range of stakeholders and to create environmental and social value alongside economic outcomes (Bansal, 2005; Bocken *et al.*, 2014; Elkington, 1994, 1998). To do this, firms must often make fundamental changes to their business strategies and practices (Waddock *et al.*, 2015).

These changes unfold through sustainable transitions, which are long-term, nonlinear processes that shift organizations and industries toward more socially and ecologically sustainable configurations (Markard *et al.*, 2012). Within firms, sustainable transitions are implemented through repeated sustainability-focused interventions, which accumulate to form what the literature refers to as a sustainable transition pathway (Turnheim and Nykvist, 2019). These pathways represent the processes through which firms progressively adopt sustainability-oriented practices (Geels, 2002).

However, much of the research on sustainable transitions focuses on conceptualizations of business models (e.g. Gorissen *et al.*, 2016; Hernández-Chea *et al.*, 2021), and circularity (e.g. Gandolfo and Lupi, 2021; Susur and Engwall, 2023). Less attention has been paid to the managerial decision-making that underpins the implementation of interventions. This limits our understanding of how sustainable transition pathways are constructed and why similar interventions can lead to different outcomes.

A separate body of literature addresses this gap indirectly, through studies on managerial cognition (Dzhengiz and Hockerts, 2022; Hahn *et al.*, 2014; Sharma and Jaiswal, 2018). This stream of research has produced several typologies of cognitive frames, emphasizing how organizations and individuals make sense of, and manage, the tensions or trade-offs between their economic, environmental and social goals. For example, Dzhengiz and Hockerts (2022) distinguish between dogmatic, instrumental and paradoxical cognitive frames at the organizational level, while Mesherry and Chen (2024) focus on dichotomous, business-case and paradoxical lenses at the individual level. Although these typologies help identify how different goals are prioritized, they tend to treat cognitive frames as static categories.

Sharma and Jaiswal (2018) critique static approaches, and instead offer a dynamic, multi-level perspective that examines how different individuals' cognitive frames interact in managing tensions between sustainability goals. Their work highlights the importance of interactions between cognitive frames, but continues to focus on the management of tensions in sustainability, rather than how managers construct effective sustainable transition pathways.

These approaches do not sufficiently unpack the underlying decision-making logic behind managers' intervention choices. Without examining the cognitive content, or the assumptions, values and priorities (Walsh, 1995) that underpin managers' cognitive frames, we cannot explain how they influence the construction and effectiveness of a firm's sustainable transition pathway. This study responds by focusing on the cognitive content embedded in managerial decision-making. Examining this cognitive content provides a more granular understanding of how managers' operationalization of similar sustainability interventions varies, and why this produces divergent sustainability outcomes across firms.

In sum, the literature has yet to offer a coherent explanation of how managers' cognitive content shapes the construction and effectiveness of sustainable transition pathways. Accordingly, this study adopts an integrative literature review approach to synthesize the fragmented literature on sustainable transitions in business models, which we then link to literature on managerial cognition.

Methodology

An integrative literature review

Integrative literature reviews are especially useful when synthesizing interdisciplinary and disparate topics (Snyder, 2019), enabling the development of new conceptual frameworks

(Torraco, 2016). This approach is appropriate for our objective of synthesizing research on sustainable transitions in business models and identifying analytical gaps, such as the underexplored role of managerial cognition.

PRISMA protocol

To reduce methodological drift, we followed Cooper's (1982) five-step methodology (Figure 1). To enhance the rigor and validity of the findings, we documented our process in the PRISMA diagram below (Figure 2). A comprehensive and replicable search strategy was designed, using natural and controlled language to increase the thoroughness of the review, while database, grey literature and ancestry searches maximized the variety of literature captured, mitigating the risk of biases (Whittemore, 2007). Initial search terms targeted the intersection of business model innovation and sustainable transition pathways. After screening for relevancy, 205 documents were appraised for quality.

The quality appraisal step, which acts as the inclusion criterion, assesses document reliability and validity, strengthening the internal validity and rigor of the review (Katrak *et al.*, 2004). We systematically applied a modified version of the Quality Assessment with Diverse Studies (QuADS) tool (Harrison *et al.*, 2021). This tool helps assess research quality across multiple criteria, generating a summary score. To avoid bias, we retained only the equally weighted criteria identified by Katrak *et al.* (2004) and Oxman *et al.* (1991) (Table 1).

Initially, we excluded documents that scored three or fewer quality points. However, this approach excluded several highly cited but methodologically weak studies (e.g. opinion pieces). Therefore, we adjusted our inclusion criteria to retain:

- documents with 20 or more citations; and/or
- documents scoring ≥ 4 quality points

We adopted 20 citations as a benchmark, well below the median citation count of 30 within the sample, ensuring that important but less methodologically rigorous publications were retained. Many documents less than a year old met this threshold, indicating that it did not unduly penalize new publications. Applying these criteria yielded a total of 184 documents,

Figure 1 Integrative literature review process

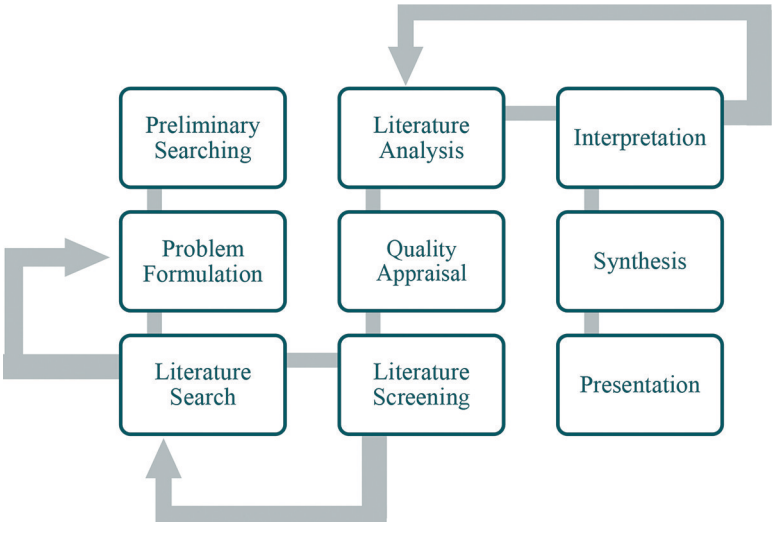

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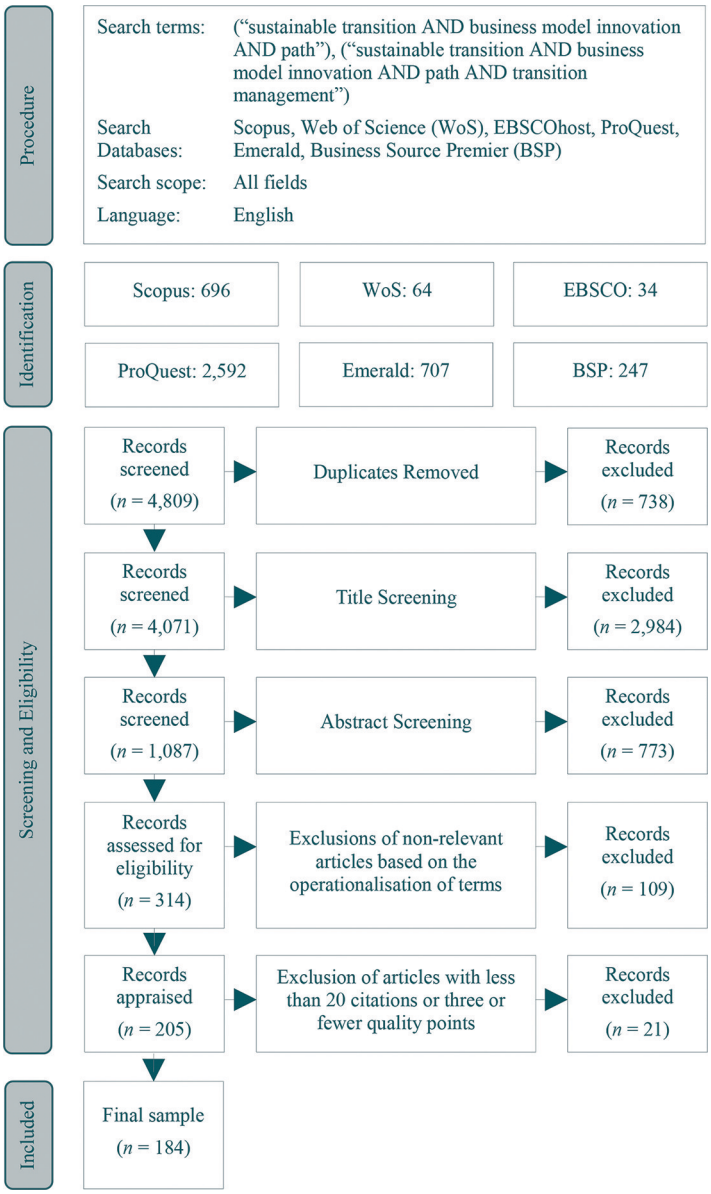
Figure 2 PRISMA diagram



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which we analyzed using dialectical interrogation (Hoon and Baluch, 2020) and thematic analysis (Fryer, 2022).

Results and discussion

Overview

Although "cognitive framing" was not an original keyword in our search protocol, its absence became evident during the conceptual integration (Torraco, 2016). As the review progressed, we found that while many documents addressed sustainability interventions, few examined the cognitive content that shape how sustainability interventions are

Table 1 Quality appraisal criteria, adapted from QuADS

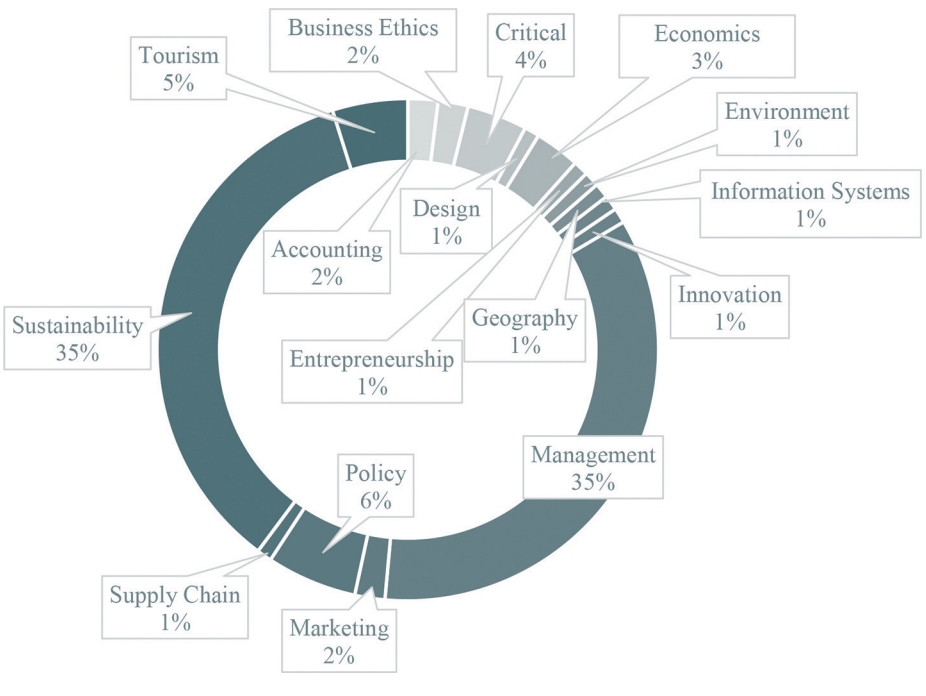
Criteria	*Operationalization*
Reflexivity	Stated philosophical stance (interpretivist, realist, etc.) Identification of position or approach taken to the topic (critical, normative, etc.)
Phenomenon	Research questions or objectives are clearly identified
Methodology	Methodological approach is specified (qualitative case studies, literature review, quantitative, etc.)
Ontological–methodology fit	Fit between reflexive statement and methodological approach
Research question–methodology fit	Statement of how the methodology fits the research question
Method–methodology fit	Justification of fit is offered that explicitly says why the approach is best, not just that it is
Validity control	Procedure for internal validity and bias reduction addresses external validity

Source(s): Authors' own work

operationalized, or their outcomes. Rather than expanding the data set to include managerial cognition, we theorized the role of cognitive frames based on the synthesis of the sampled literature. This insight informs the structure of our conceptual framework, which is grounded in the literature captured through our original review. It also justifies the subsequent conceptual linkage to managerial cognition, which emerges as an essential concept in explaining how managers construct effective, sustainable transition pathways.

To contextualize our conceptual bridging, we first analyzed the scope and coherence of the literature on sustainable transitions in business models. Our analysis, based on journal categorization and author-chosen keywords, revealed significant fragmentation across disciplines (Figure 3), with Management and Sustainability the most represented. The multilevel perspective (Geels and Schot, 2007) and transitions management (Loorbach *et al.*, 2010) emerged as the dominant theoretical lenses. Of the 184 documents sampled, 178 articles appeared across 81 journals. Only ten journals had three or more articles on the

Figure 3 Documents across disciplines



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topic (Table 2). These findings confirm earlier critiques of the literature's scattered nature (Bidmon and Knab, 2018), reinforcing the value of an integrative approach. Recognizing this fragmentation drew attention to the role of cognitive framing as a unifying mechanism across levels of analysis.

To identify important concepts in the literature, we analyzed the co-occurrence of keywords using VOSviewer (Khanra *et al.*, 2020). Among the 607 keywords, only 23 had at least four co-occurrences, forming five thematic clusters (Figure 4). Circular economy and sustainability were the most prominent, with 50 and 46 co-occurrences, respectively. Other themes included sustainable development (15), business models (13) and sustainability transitions (10). The low number of co-occurrences and the thin lines between clusters indicate a high level of fragmentation and the need for conceptual integration.

From abstraction to action

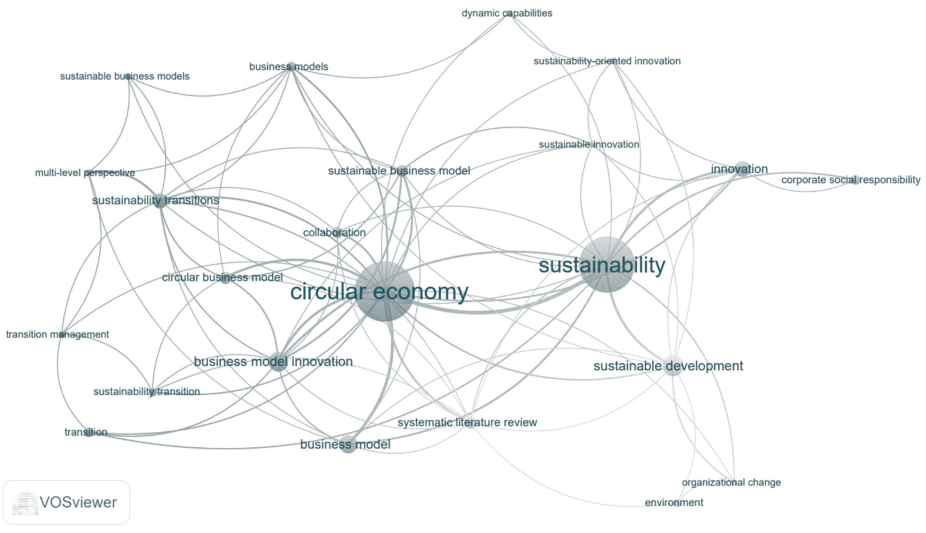
This section synthesizes the clusters identified above, using a funnel that moves from abstract theoretical representations of sustainable transition pathways to highly situated

Table 2 Journals by publications

Journal	N
Sustainability	28
Business Strategy and the Environment	19
Journal of Cleaner Production	17
Environmental Innovation and Societal Transitions	7
Journal of Organizational Change Management	5
Sustainable Production and Consumption	4
Corporate Governance	3
International Journal of Operations & Production Management	3
Organization & Environment	3
Research Policy	3

Source(s): Authors' own work

Figure 4 Keyword co-occurrences



Source: Authors' own work; created in VOSviewer

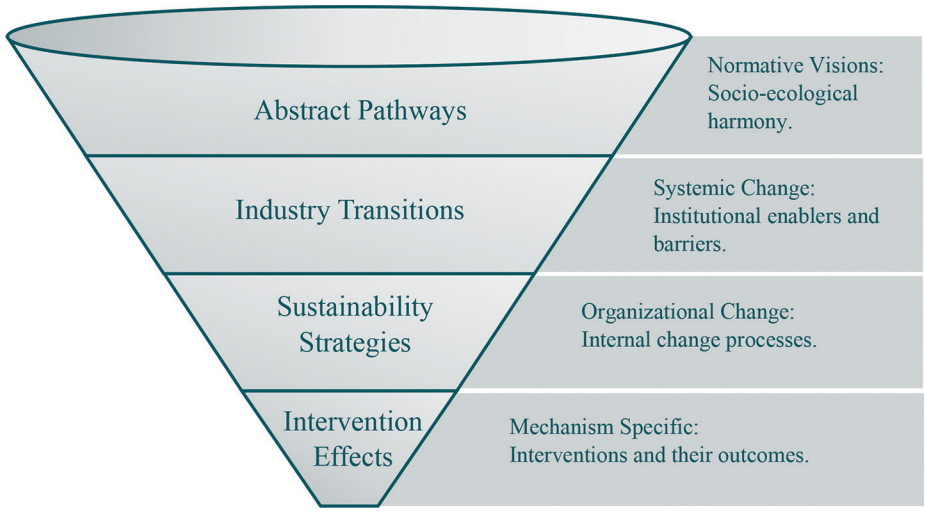
empirical studies (Figure 5). This layering enables us to bridge methodologically diverse studies by exposing patterns in empirical focus and revealing analytical blindspots. At each level, we clarify what is known, while highlighting the limited attention given to the cognitive assumptions that shape decision-making. This oversight leaves the construction of sustainable transition pathways under-theorized, underscoring the need to incorporate managerial cognition to explain *how* managers construct effective sustainable transition pathways.

At the most abstract level, studies propose visionary models emphasizing idealized versions of socioecological harmony. These normative contributions focus on decoupling social and environmental externalities from economic growth (e.g. Franceschini and Pansera, 2015), and paradigmatic shifts requiring systemic transformation (e.g. Vandeventer *et al.*, 2019). This literature advocates for degrowth, circularity and systems change but remains highly theoretical and lacks operationalization.

The next level includes industry or sector-level research on transitions toward circularity (e.g. Meath *et al.*, 2022; Schultz and Reinhardt, 2022), institutional logics (e.g. Van Cauwenbergh *et al.*, 2022; Vernay *et al.*, 2022) and structural enablers and constraints to sustainable transitions in business models (e.g. Bocken and Geradts, 2019; Geissdoerfer *et al.*, 2023). While useful, firms are typically treated as aggregated actors within the broader system. Decision-making is viewed as a response to external conditions, such as impending legislation, providing limited insight into the internal dynamics of the decision-making process.

At the firm level, studies provide greater insight into organizational change. For example, Warren *et al.* (2018) analyzed a single accommodation provider's 14-year transition toward more sustainable business practices, while Frishammar and Parida (2019) provided a "roadmap" for any firms interested in pursuing circular business models. Other studies explore how organizations build capabilities to promote sustainable transitions (Lazaretti *et al.*, 2019; Sehnem *et al.*, 2022) and manage organizational change when implementing sustainable transitions (Benn *et al.*, 2018; Hofmann and Jaeger-Erben, 2020). These studies, however, focus on organizational processes or structure, rather than interrogating the cognitive framing that underpins managerial choices.

Figure 5 An integrative view of sustainable transitions research in business models



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The most situated studies examine specific sustainability interventions or initiatives in firms. Some studies focus on subsystems of business models, like supply chains (Sudusinghe and Seuring, 2022) and human resources (Baek and Kim, 2021), while others analyze individual interventions, like inter-organizational collaboration (Brown *et al.*, 2020). These studies provide useful guidance on "what" firms do, but they tend to evaluate outcomes rather than the rationales behind decisions.

Across all levels, the literature has made substantial contributions to understanding sustainable transition in business models. However, this literature rarely examines the decision-making processes that shape sustainable transition pathways. This limits our understanding of how managers construct effective, sustainable transition pathways. By introducing managerial cognition, we connect abstract visions to empirical practices through the cognitive frames managers use to approach sustainability challenges. Analyzing the cognitive content embedded in these frames helps explain how managers construct sustainable transition pathways in practice, and why their effectiveness varies across firms.

Managerial cognition in constructing sustainable transition pathways

This section conceptualizes how variations in managers' cognitive frames and their underlying cognitive content influence how managers implement sustainability interventions and the effects of those interventions. The repeated selection and implementation of sustainability interventions over time form the firm's sustainable transition pathway (Geels, 2002), meaning that the cognitive framing managers use in approaching sustainability challenges directly affects how they construct sustainable transition pathways and their sustainability outcomes.

Managerial cognition is central to this process; it refers to how managers process information, such as sustainability challenges, and make strategic decisions (Walsh, 1995). In this process, cognitive frames act as interpretive lenses, directing managers' attention, shaping their priorities and guiding their actions (Sharma and Jaiswal, 2018). These frames influence which sustainability challenges managers perceive as salient, what outcomes they value, and how they measure success (Preuss and Fearne, 2022). Understanding the cognitive content of these frames helps explain why similar interventions may lead to very different outcomes. For example, resource efficiency initiatives can reinforce business-as-usual logics or support long-term transformation, depending on the cognitive content guiding their implementation.

Several typologies classify cognitive approaches to managing sustainability challenges (e.g. Dzhengiz and Hockerts, 2022; Hahn *et al.*, 2015; Mesherry and Chen, 2024). Despite differences in terminology and emphasis, many converge conceptually. Resolution strategies (Hahn *et al.*, 2015), dogmatic frames (Dzhengiz and Hockerts, 2022) and dichotomous logics (Mesherry and Chen, 2024) all reflect hierarchical mental models in which one sustainability dimension (typically economic) is prioritized. In contrast, acceptance strategies and paradoxical frames reflect integrative models that attempt to hold multiple goals in productive tension over time.

Building on these insights, we identify four dimensions where the cognitive content of these frames varies:

- how sustainability is conceptualized;
- which objectives are prioritized;
- the perceived purpose of sustainability interventions; and
- how value is defined.

These dimensions collectively shape distinct archetypes of managerial orientations toward sustainability (Table 3). Identifying patterns in these orientations clarifies how cognitive content influences the operationalization of sustainability interventions, explaining why similar interventions (e.g. energy efficiency) can result in radically different sustainability outcomes. Recognizing these differences is necessary to explain how managers construct sustainable transition pathways and why their effectiveness varies.

To generalize these insights, we develop a conceptual framework (Figure 6) that categorizes managerial orientations along two axes: the degree of innovation (incremental to radical) and temporal focus (short- to long-term). These dimensions reflect how managers evaluate organizational resources and capabilities (Geels and Schot, 2007), and the different timeframes needed to meet various stakeholders' goals (Hahn *et al.*, 2015). Innovation ranges from incremental improvements to existing processes to radical shifts, involving the acquisition of new knowledge (Smith and Lewis, 2011), while temporal focus distinguishes between short-term business needs and long-term intergenerational equity and environmental integrity (Hahn *et al.*, 2015; Slawinski and Bansal, 2012).

While the difference between business-as-usual and instrumental orientations is widely accepted, the literature often uses the terms "transitions" and "transformations" interchangeably. Both involve radical, uncertain changes in complex systems, but reflect distinct managerial logics. Transition orientations implement socio-technological interventions at the subsystem level while maintaining operational continuity (Hall, 2025). Transformation orientations, in contrast, focus on long-term socioecological goals that often require fundamentally reconfiguring the firm's core purpose and governance structures (Holscher *et al.*, 2017).

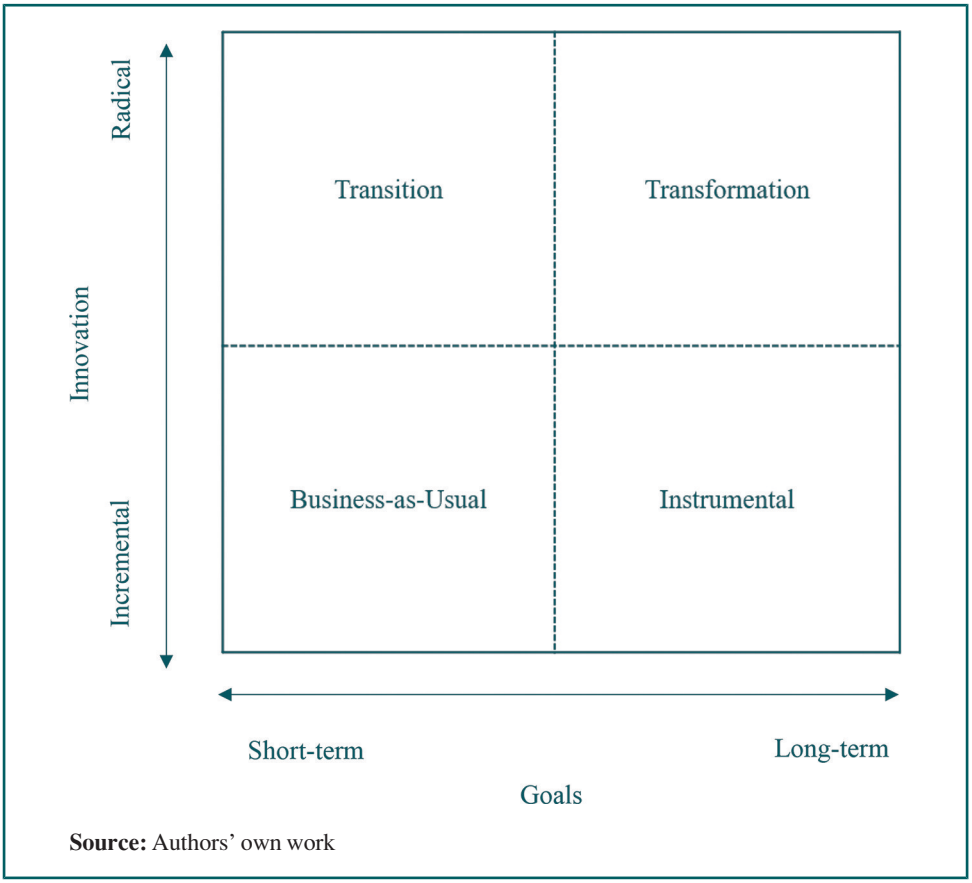
To illustrate how these managerial orientations influence the construction and effectiveness of sustainable transition pathways, we apply the framework to examples of corporate collaboration in the fast-fashion industry. Corporate collaboration, where firms jointly develop products or services (Nidumolu *et al.*, 2014), is widely recognized as essential for facilitating sustainable transitions (Gandolfo and Lupi, 2021; Palmié *et al.*, 2021). We focus on the fast fashion industry, which is responsible for 20% of global water pollution (European Parliament, 2020) and has been consistently linked to modern slavery (Dzhengiz *et al.*, 2023). These

Table 3 Managerial orientation toward sustainability

	Cognitive content			
Managerial orientation	*Sustainability*	*Objectives*	*Interventions*	*Value*
Business-as-usual	Sustains the current business model	Increase economic productivity and continuous growth	Minimize changes to the business model	Profits, revenue and factors that affect immediate operations
Instrumental	Maximizes resource efficiency and differentiation	Increase the firm's competitive advantage through higher revenue and cost savings	Maximize outputs, increase differentiation	Profits and revenue; environmental and social objectives that benefit the firm's economic goals
Transition	Extends the lifespan of the current business model	Increase the firm's resilience to changes in the business environment or operating conditions	Redesign subsystems of the business model	Profits, revenue and risk mitigation
Transformation	Achieves socioecological harmony and systemic change	Increase the business model's contribution to creating an equitable, safe and just world	Promote long-term systemic change	Environmental and social equity are prioritized, and operating profits are maintained

Source(s): Authors' own work

Figure 6 Conceptual framework of managerial orientations toward sustainability



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examples demonstrate how the same intervention, enacted through different managerial orientations, can lead to divergent sustainability outcomes.

Business-as-usual orientations

In the business-as-usual orientation, managers prioritize short-term operational continuity through incremental innovations. Their cognitive content assumes that sustainability is a constraint to be managed, typically driven by regulatory compliance or reputational risk. This manifests in cognitive frames that treat environmental and social goals as necessary evils (e.g. regulatory compliance) rather than as strategic or moral imperatives.

For example, EU legislation requiring textile waste separation prompted Inditex (Zara's parent company), H&M and Mango to form a nonprofit to manage their textile recycling jointly (Pons and Reid, 2023). This collaboration allowed the firms to share compliance costs without altering their operations or meaningfully contributing to social or environmental sustainability. The underlying cognitive content treats sustainability issues as potential liabilities, while their sustainability intervention reinforces the status quo and prevents structural change. Even when such interventions accumulate, they are unlikely to generate a sustainable transition pathway that leads to strong social or environmental sustainability outcomes.

Instrumental orientations

In the instrumental orientation, managers' cognitive content assumes that sustainability provides strategic opportunities to improve business performance, manifesting in win–win

and business-case cognitive frames. Interventions focus on incremental innovation, and managers adopt environmental or social initiatives when they create economic value, such as cost savings, efficiency gains or competitive differentiation (Johnson *et al.*, 2021).

For example, many fast fashion firms, manufacturers and recyclers are partnering with universities as part of the zero-waste movement (Hoang, 2020). These collaborations aim to reduce waste through resource efficiency, increasing the firm's total outputs and competitive advantage. However, such interventions often shift the sustainability burden onto end consumers without addressing systemic issues such as overproduction.

Thus, instrumental orientations can contribute more meaningfully toward longer-term goals than business-as-usual orientations, but they are still likely to result in relatively superficial sustainable transition pathways. Instrumental orientations will likely create rebound effects or serve as tokenistic substitutes for more radical interventions without challenging deeper systemic issues.

Transition orientations

Transition orientations reflect a willingness to engage in radical and often structural innovation within subsystems. Their cognitive content articulates sustainability as resilience, emphasizing the need to adapt and continue operating despite disruptions like labor shortages or economic downturns (Susur and Engwall, 2023). This manifests in cognitive frames that support structural change at the subsystem level, with interventions focused on reducing vulnerabilities, but which do not challenge the dominant economic paradigm.

For example, in 2021, Coach introduced (Re)Loved, a resale program that evolved into the Coachtopia sub-brand, aiming for full circularity. The initiative involved buying back used products, which they restored or upcycled through collaborations with artists. While this required Coach to develop new capabilities and processes, the intervention did not fundamentally alter the core business model or shift its underlying priorities.

Thus, while transition orientations enhance the firm's resilience, they remain embedded in existing economic paradigms. As a result, interventions implemented with a transitions orientation may serve as important stepping stones in sustainable transition pathways, but are unlikely to drive the systemic changes required for long-term socioecological sustainability alone.

Transformation orientations

In the transformation orientation, managers pursue radical innovation and prioritize long-term socioecological goals. Their cognitive content conceptualizes sustainability as the pursuit of socioecological harmony (e.g. Kennedy *et al.*, 2020). This manifests in cognitive frames that treat sustainability as a moral or systemic imperative; interventions seek to embed social and environmental goals into the firm's identity and governance structures, fostering systemic change, promoting social equity and environmental integrity (Van Cauwenbergh *et al.*, 2022). While this orientation is the most likely to create sustainable transition pathways with strong social and environmental sustainability outcomes, it demands significant tradeoffs, such as forgoing short-term profitability to prioritize systemic impact.

Patagonia exemplifies this approach. Following decades of advocacy and innovation, Patagonia restructured in 2022, declaring that "Earth is now our only shareholder," and placing 98% of the company in a trust dedicated to climate action (Gelles, 2022). The company has since expanded into food production through Patagonia Provisions as part of its broader climate change strategy. These interventions reflect a systemic transformation of the firm's purpose and values, illustrating how transformation orientations can reconfigure the business model.

Beyond individual orientations: cognitive integration in sustainable transition pathways

While each managerial orientation reflects a distinct set of assumptions, values and priorities that managers can use to approach sustainability challenges, none is likely sufficient to construct an effective sustainable transition pathway on its own. In reality, managers likely need to draw on multiple orientations, simultaneously or over time, to construct effective, sustainable transition pathways.

This section offers a novel contribution by conceptualizing how orientations can be layered, alternated or combined to construct sustainable transition pathways over time. Unlike prior work that views cognitive frames, including paradoxical approaches, as largely stable or dominant mindsets (e.g. Dzhengiz and Hockerts, 2022; Mesherry and Chen, 2024), we treat them as distinct cognitive resources that managers can strategically deploy in response to contextual constraints and opportunities. Our approach echoes Sharma and Jaiswal (2018) dynamic view of cognitive frames, but shifts the focus from managing tensions in sustainability to constructing effective sustainable transition pathways over time.

For example, business-as-usual orientations can help managers maintain operational continuity throughout sustainable transitions, but are unlikely to support long-term competitiveness. However, this approach can help build legitimacy and internal support when paired with other orientations. For example, a company could use familiar compliance procedures (business-as-usual) to trial sustainable packaging partnerships (transitions), thereby minimizing internal resistance.

Similarly, layering instrumental orientations with other approaches can help secure stakeholder support for sustainability initiatives by demonstrating tangible returns and building internal momentum. Such interventions can serve as tactical entry points that enable other structural or systemic changes. For example, a hospitality brand might launch an eco-label to differentiate itself (instrumental), and use the resulting brand equity to justify subsequent investments in low-carbon infrastructure across its properties (transition).

Transition orientations promote innovation within specific subsystems, supporting organizational learning and resilience, but may silo sustainability efforts if not linked to broader organizational goals. When combined with other orientations, like transformation, transition orientations can serve as bridges, laying the groundwork for systemic change. For example, a fashion company might pilot a take-back and resale program in one region (transition), and then use the lessons learned to redesign their product life cycle, from sourcing to recovery, embedding circularity into their business model (transformation).

While the transformation orientation offers the strongest potential for systemic change, such interventions may be dismissed as unrealistic. However, transformation orientations can be phased into practice when complemented by more pragmatic orientations, making them tangible and credible without compromising their intent. For example, a regional energy provider might begin innovating with smart grids to cut emissions (instrumental), then adopt solar initiatives (transition), and ultimately restructure as a cooperative focused on energy equity, illustrating how transformation orientation can emerge through layered managerial orientations.

In these examples, managers can use different orientations to respond to changing business environments, stakeholder pressures and internal constraints. This cognitive integration challenges the literature's tendency to analyze decision-making through a single, dominant frame, obscuring how managers combine, alternate or layer cognitive frames to construct sustainable transition pathways that are both contextually responsive and future-oriented. Understanding how managers integrate different orientations over time to construct effective, sustainable transitions represents an important opportunity for future research.

Future research

Our integrative literature review has synthesized the various literature streams on sustainable transitions in business models and integrated insights from research on managerial cognition to explain how managers' cognitive frames influence the construction of sustainable transition pathways. As part of this process, we have identified two analytical blind spots that would significantly improve our understanding of how managers construct sustainable transition pathways.

The literature on sustainable transitions and cognitive frames tends to analyze the *dominant* approach individuals use to make sense of sustainability challenges (Dzhengiz and Hockerts, 2022; Hahn *et al.*, 2014; Preuss and Fearne, 2022). However, because the interventions managers select are context-dependent, they may use multiple managerial orientations simultaneously or sequentially. Future research should examine how managerial orientations evolve and are combined over time (e.g. Sharma and Jaiswal, 2018; Waddock *et al.*, 2015). This would help validate our conceptualization of frame integration as a dynamic process-based understanding of managerial cognition in constructing sustainable transition pathways:

P1. Managers often use multiple managerial orientations when implementing sustainability interventions, resulting in hybrid or layered approaches to constructing sustainable transition pathways.

Second, understanding how managerial orientations interact can reveal how to build more effective sustainability transition pathways. Some combinations may reinforce progress, while others may create internal contradictions or lead to poor resource allocation, weakening sustainability outcomes. Avoiding conflicting orientations and leveraging complementary ones may accelerate shifts toward more sustainable business models. Future research should examine when and why managers shift between orientations, how governance influences these shifts and what this means for achieving long-term sustainability goals:

P2. The interactions between different managerial orientations, whether reinforcing, conflicting or evolving, may significantly influence the construction and effectiveness of sustainable transition pathways over time.

Conclusion

Limitations

As with any research, this study has limitations. The main limitation is that our framework simplifies the fluidity of managerial cognition within dynamic systems. While we identified several managerial orientations and deconstructed their cognitive content, our conceptual framework does not capture the complexity of managerial decision-making. In practice, managers may shift between frames or hold multiple orientations at once, which our conceptual framework does not capture.

Methodologically, this study relied upon a single screener, appraiser and coder, which may introduce bias despite efforts to ensure rigor. Additionally, while we used a quality appraisal tool to ensure consistency, a generic tool and summary score may be considered limiting. Restricting the review to English-language sources introduces a Western bias, potentially excluding valuable perspectives on sustainable transitions from other regions. Despite these limitations, this review offers meaningful contributions to the literature on sustainable transitions in business models.

Contributions

We answered the research question by building on previous literature, which argues that sustainable transition pathways are constructed through the repeated selection and

implementation of sustainability interventions over time. Using an integrative literature review, we synthesized the fragmented literature on sustainable transitions in business models and integrated the literature on managerial cognition, making three key contributions.

First, we synthesized fragmented, interdisciplinary research on sustainable transitions in business models. Our review of 184 documents provides an overview of key concepts. It synthesizes the literature across empirical levels of analysis, demonstrating that existing research tends to address either highly abstract systems-level change or micro-level interventions, while neglecting the cognitive processes that shape the construction of sustainable transition pathways. This synthesis establishes the foundation for integrating managerial cognition into sustainable transitions research.

Second, we introduced a conceptual framework of managerial orientations toward sustainability and deconstructed the cognitive content embedded in the cognitive frames managers use to approach sustainability challenges. By organizing managerial orientations by their degree of innovation and temporal focus, we explain how the managerial cognition underlying the operationalization of similar sustainability interventions can lead to divergent sustainability outcomes across firms. As a result, we connect the granular cognitive content embedded in managers' cognitive frames to the tangible outcomes of sustainability interventions.

Third, we advance the literature on sustainable transitions in business models by conceptualizing sustainable transition pathways as dynamically constructed over time. Rather than viewing managers as operating within a single, dominant frame or orientation, we argue that effective, sustainable transition pathways often emerge from integrating multiple orientations, simultaneously and over time. This reconceptualization challenges assumptions of fixed cognitive mindsets within the literature and introduces a more flexible, context-responsive view of managerial decision-making in constructing sustainable transition pathways. It also generates new avenues for future research on how managers combine and shift between orientations and any resulting interaction effects.

Together, these contributions enhance our understanding of how managers' cognitive frames influence the construction and efficacy of sustainable transition pathways. By clarifying the cognitive content underlying different managerial orientations and providing a structured approach to analyzing variations in operationalization and outcomes, we integrate the microfoundations of managerial cognition into the construction of sustainable transition pathways.

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