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Mapping Startup Ambidexterity: An ADO-Guided Systematic Review and Research Agenda

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Abstract

Research on startup ambidexterity has grown rapidly, yet the evidence remains difficult to integrate because similar constructs are examined at different levels of analysis and exploration–exploitation is represented in markedly different ways. We systematically review 38 peer-reviewed journal articles published between 2016 and May 2026 and organize the evidence using the Antecedents–Decisions–Outcomes (ADO) framework. Following PRISMA 2020, studies identified through Scopus were screened using explicit document and substantive eligibility criteria. The review identifies six antecedent themes, four recurring decision-related domains, and five groups of outcomes, while also showing that exploration and exploitation are represented through different forms of evidence, ranging from explicit entrepreneurial choices to behavioral processes and broader configurations. The literature spans founder, team, venture, and cross-level relationships, with environmental, team, network, knowledge, and venture-stage conditions qualifying several reported associations. Building on these patterns, we develop a research agenda focused on clearer construct roles, direct examination of entrepreneurial choices, cross-level relationships, boundary conditions, and differentiated outcomes. The review contributes by separating construct role from analytical level, distinguishing direct decision evidence from realized exploration–exploitation patterns, and clarifying how contextual conditions and downstream consequences should be incorporated into cumulative research. The synthesis also clarifies how emerging digital capabilities enter startup ambidexterity as antecedent conditions rather than substitutes for exploration–exploitation. Practically, these distinctions can help founders, investors, and venture-support organizations assess whether a given factor represents an enabling condition, an exploration–exploitation pattern, or a downstream outcome, thereby supporting more targeted diagnosis and intervention.

Keywords: startup ambidexterity; exploration–exploitation; Entrepreneurial decision making; ADO framework; new ventures

1. Introduction

Startups operate under conditions in which experimentation and disciplined execution are not sequential luxuries but simultaneous strategic necessities. New ventures must search for novel technologies, markets, products, knowledge, and business models while also refining existing routines, commercializing current offerings, improving efficiency, and exploiting resources that are already available. This tension between exploration and exploitation lies at the core of organizational ambidexterity and becomes particularly acute in startups because their strategic flexibility is accompanied by severe resource constraints, uncertain market legitimacy, evolving organizational structures, and strong dependence on founders and small entrepreneurial teams. Accordingly, startup ambidexterity cannot be understood merely as a smaller-scale version of



ambidexterity in established firms. Recent research increasingly situates exploration–exploitation within founder cognition, entrepreneurial teams, learning and search processes, innovation, business-model development, external networks, technological capabilities, and venture growth, indicating that the phenomenon is distributed across several analytical levels and organizational processes. The manuscript underlying the present review similarly identifies this expansion from venture-level innovation toward entrepreneurial decision logics, founding-team interaction, business-model evolution, knowledge search, learning, and technology-enabled innovation as a central feature of the contemporary evidence base.

The importance of ambidexterity in entrepreneurship follows from a fundamental strategic dilemma. Exploration involves experimentation, discovery, variation, search, and the creation of new knowledge, whereas exploitation concerns refinement, implementation, efficiency, and the productive use of accumulated knowledge and existing competencies. For startups, an excessive emphasis on exploration can produce continuous experimentation without viable commercialization, while excessive exploitation can lock the venture into routines and market assumptions that become obsolete before the firm establishes a sustainable position. Empirical work consequently associates innovation ambidexterity with startup and new-venture performance, showing that the ability to combine exploratory and exploitative innovation can mediate the effects of broader entrepreneurial orientations and capabilities on performance (Khursheed & Mustafa, 2024; Singh & Singh, 2024). Similar tensions have been observed in hospitality ventures, where balancing exploration and exploitation affects innovation and performance (Cho et al., 2020), and in entrepreneurial growth processes in which bricolage, adaptiveness, and innovative ambidexterity jointly shape the capacity of ventures to develop under resource constraints (Fu et al., 2020; Tehseen et al., 2024). These findings position ambidexterity not as an abstract organizational ideal but as a consequential mechanism through which entrepreneurial ventures attempt to convert scarce resources and uncertain opportunities into innovation and growth.

Nevertheless, the emerging literature shows that startup ambidexterity is not represented through a single organizational mechanism. Some studies foreground entrepreneurial leaders and founders. Founders influence the balance between exploration and exploitation through experience, cognitive orientations, leadership behavior, procedural fairness, and the patterns through which they respond to competing demands. Individual ambidexterity and accumulated career experience, for instance, may contribute to technological startup founders' ability to acquire funding, thereby linking founder-level characteristics to important venture-level resource outcomes (Noguti et al., 2023). Founder orientation also appears consequential for accelerated venture scaling, with ambidextrous orientation helping explain how startups make the transition toward exceptionally rapid growth trajectories (Jha et al., 2024). At the same time, founder-CEO procedural fairness can shape the interpersonal conditions through which new-venture ambidexterity develops, demonstrating that leadership influences exploration and exploitation not only through strategic direction but also through perceived fairness and team interaction (Huo et al., 2025). Entrepreneurial mindfulness and ambidextrous leadership have likewise been connected with innovation-related capabilities and resilience, highlighting the cognitive and behavioral foundations through which entrepreneurs cope with uncertainty and sustain adaptive capacity (Indrianti et al., 2024).

A second stream shifts attention from individual founders to entrepreneurial teams. Because startups often depend on compact founding teams whose members simultaneously perform strategic, technical, and operational functions, the social organization of exploration and exploitation can become as important as the strategic intent to pursue both. Leadership behavior has been associated with team innovation through intervening mechanisms that enable teams to reconcile exploratory and exploitative requirements (Antonio et al., 2021). Research on startup teams further shows that leadership may affect creativity through team-level mediating processes, reinforcing the proposition that ambidexterity is partially constituted through interaction, information exchange, coordination, and collective behavior (Antonio et al., 2022). More recent evidence demonstrates that team members may respond to one another's exploration and exploitation through mimicking or behavioral switching, suggesting that ambidextrous patterns can emerge dynamically rather than simply being imposed by founders or formal structures (Koch et al., 2025). Team formation itself may also constitute an entrepreneurial choice with long-term implications: alternative team-formation strategies can produce different trajectories of team ambidexterity and, consequently, differences in entrepreneurial effectiveness (Chen et al., 2026). Such findings indicate that treating ambidexterity solely as a venture-level attribute may conceal the microprocesses through which it develops.



Knowledge acquisition, learning, and resource recombination constitute another major foundation of startup ambidexterity. New ventures rarely possess internally all the knowledge and resources needed to compete, making external search, absorptive capacity, bricolage, improvisation, and learning especially consequential. Boundary-spanning search can strengthen the sustainable development performance of technology startups by exposing them to heterogeneous knowledge and opportunities, although the benefits of search depend on how external information is interpreted and integrated (Wang et al., 2022).

Page | 3 Ambidextrous learning similarly provides a mechanism through which ventures can combine the acquisition of novel knowledge with the refinement and application of existing knowledge. Its effects may be strengthened by ecosystem relationships that improve access to resources and opportunities (Xiang et al., 2024). Resource bricolage also becomes strategically important when startups face shortages of capital, expertise, or market access; its effects on new-venture development depend partly on the capacity to recombine available resources with exploratory and exploitative learning (Li et al., 2024). Recent work extends this logic by showing that bricolage and ambidextrous learning can jointly foster micro-innovation, while customer participation and government support may alter these relationships (Li et al., 2025). These studies collectively suggest that ambidexterity depends not simply on possessing resources but on how startups search for, interpret, recombine, and deploy them.

This knowledge-based perspective is closely related to absorptive capacity and innovation capability. Potential and realized absorptive capacity help ventures acquire and transform external knowledge, but their contribution to innovation can vary according to structural arrangements that support simultaneous exploration and exploitation (Elidjen et al., 2025). Ambidextrous entrepreneurial learning may also increase innovation performance by making ventures more capable of recognizing and exploiting serendipitous opportunities, illustrating how learning processes connect environmental uncertainty with innovative outcomes (Chen et al., 2025). Moreover, entrepreneurial improvisation can generate competitive advantage when startups rapidly recombine resources and actions in response to unanticipated problems and opportunities (Xiong, 2022). Improvisational capability does not operate independently of search, however; its value can depend on the balance between exploratory and exploitative search behaviors (Rui & Ma, 2022). Together, these findings point toward a process view in which ambidexterity emerges through intertwined cycles of external search, learning, resource recombination, improvisation, and knowledge integration rather than through a single stable organizational characteristic.

Business-model development provides an additional arena in which the exploration–exploitation tension becomes visible. Startups must experiment with value propositions, revenue architectures, partners, customers, and channels while progressively stabilizing the arrangements needed for scale. Ambidextrous business-model innovation therefore requires capabilities that permit ventures to pursue novelty without abandoning efficiency. Dynamic capabilities and market orientation can facilitate this process by enabling firms to reconfigure business models while remaining responsive to market signals (Randhawa et al., 2021). The tension can also unfold temporally. New ventures may shift the relative emphasis placed on exploration and exploitation as they progress through development, thereby generating temporal rather than purely simultaneous forms of ambidexterity (Wang et al., 2019). High-technology international new ventures similarly alternate or combine predictive and effectual decision logics as they explore and exploit international opportunities, indicating that entrepreneurial decision making itself may exhibit sequential ambidexterity (Evers & Andersson, 2021). This temporal perspective is especially important because the appropriate configuration of exploration and exploitation may vary substantially across venture-development stages rather than remain constant throughout the startup life cycle.

The stage-dependent nature of ambidexterity has received growing empirical attention. Different drivers may become salient as startups move from early experimentation toward validation, commercialization, and growth, meaning that the antecedents of ambidexterity should not necessarily be assumed to operate uniformly across stages (Mielcarek et al., 2026). Broader investigations of critical success factors similarly indicate that startup ambidexterity is shaped by combinations of organizational, managerial, knowledge, and environmental conditions rather than by one universally dominant antecedent (Mielcarek & Kalisty, 2026). This observation is consistent with research showing that managerial autonomy and founding-team marketing capabilities can condition the extent to which ambidexterity produces superior innovation performance (Sayed & Dayan, 2024). It also complements evidence from crisis contexts, where job autonomy and unscripted agility can support



ambidextrous innovation by permitting startup employees to adapt rapidly when routines are disrupted (Frare & Beuren, 2021). Startup resilience consequently appears intertwined with ambidexterity, because ventures must maintain continuity while continually redesigning routines, offerings, and resource combinations in response to shocks (Aldianto et al., 2021).

An important recent development concerns the incorporation of digital and emerging technological capabilities into explanations of startup ambidexterity. Technology can extend the scope and speed of search, experimentation, learning, and innovation, yet technological adoption does not automatically generate ambidexterity. Generative artificial intelligence, for example, can influence entrepreneurial performance through exploratory and exploitative innovation, while the relationship may be nonlinear because increasing reliance on technological capability does not indefinitely produce proportional benefits (Duong et al., 2026). Likewise, design thinking can help new ventures address the paradox between innovation speed and novelty by supporting ambidextrous learning processes that reconcile rapid action with experimentation (He et al., 2026). These developments are theoretically important because digital capabilities are better conceptualized as conditions that enable or reshape exploration and exploitation than as substitutes for ambidexterity itself. They also raise questions about whether technology changes the optimal balance, sequence, or interaction between exploratory and exploitative activities across different stages and entrepreneurial contexts.

Despite this growing sophistication, the literature remains fragmented because similar concepts are studied at different analytical levels and assigned different theoretical roles. Broader scholarship on organizational ambidexterity has repeatedly emphasized the need to distinguish the individual, team, and organizational microfoundations of ambidextrous behavior (Pertusa-Ortega et al., 2021). Entrepreneurship-focused synthesis similarly shows that ambidexterity appears across heterogeneous theoretical perspectives, contexts, and actors, complicating attempts to cumulate findings without an explicit organizing framework (Guerrero, 2021). A more recent review of organizational ambidexterity reinforces this concern by documenting the conceptual breadth of the field and calling for greater clarity about antecedents, mechanisms, boundary conditions, and outcomes (Chakma et al., 2024). For startups specifically, this challenge is magnified because a construct labeled “ambidexterity” can refer to founder behavior, team learning, organizational innovation, knowledge search, business-model configurations, or an intermediate capability linking upstream conditions to downstream performance. Management-control systems provide a useful illustration: in startups, controls can support product innovation, business-model innovation, and ambidextrous innovation, but the meaning and effect of such systems depend on the organizational process they are designed to facilitate (Endenich et al., 2023).

Heterogeneity is also evident in the outcomes attributed to startup ambidexterity. Existing studies associate exploration–exploitation configurations with innovation performance, creativity, competitive advantage, growth, funding, resilience, commercialization, and entrepreneurial performance. Such outcomes differ substantially in analytical level and temporal horizon and should not be treated as interchangeable indicators of success. Ambidextrous innovation may generate immediate creative or innovation advantages without necessarily producing equivalent long-term scaling outcomes, while resource acquisition may precede rather than directly reflect venture performance. Entrepreneurial resilience represents another distinct consequence because it concerns continued adaptive functioning under uncertainty rather than conventional performance alone (Aldianto et al., 2021; Indrianti et al., 2024). Likewise, studies of technology startups demonstrate that innovation ambidexterity can be closely associated with venture performance, yet the strength of the relationship may depend on contextual conditions and complementary capabilities (Khurshed & Mustafa, 2024). This diversity of outcomes strengthens the case for an integrative synthesis capable of separating enabling conditions, decision-related manifestations of exploration–exploitation, and consequences.

The need for such synthesis extends to the nature of decision making itself. Although entrepreneurship is inherently concerned with choices under uncertainty, not all studies that investigate ambidexterity directly observe entrepreneurial decisions. Some examine explicit decision logics or shifts between exploratory and exploitative alternatives, whereas others infer ambidexterity from behavioral patterns, learning processes, innovation configurations, or capability measures. This distinction matters because observing a favorable exploration–exploitation configuration does not necessarily reveal the sequence of choices through which entrepreneurs created it. The entrepreneurship literature therefore requires a framework that can incorporate both explicit choices and broader decision-related manifestations without conflating them. The Antecedents–



Decisions–Outcomes (ADO) framework is particularly useful in this regard because it organizes accumulated research according to the analytical roles of upstream conditions, decision-related phenomena, and downstream consequences. Contemporary guidance for theory-building systematic reviews identifies structured frameworks such as ADO as valuable mechanisms for transforming dispersed findings into theoretically meaningful research agendas (Paul et al., 2024). Applications combining ADO with theories–contexts–methods structures demonstrate its capacity to synthesize heterogeneous evidence while maintaining distinctions among explanatory roles, contexts, and methodologies (Lim et al., 2021). Its continuing usefulness is also illustrated by recent systematic-review work in adjacent management domains, where an ADO-guided architecture has been used to integrate fragmented research and identify future research priorities (Singh & Kataria, 2026).

A rigorous synthesis additionally requires transparent procedures for identifying and selecting the relevant evidence base. The PRISMA 2020 statement provides a widely recognized structure for documenting systematic-review identification, screening, eligibility, and inclusion procedures (Page et al., 2021). Such procedural transparency is especially important in startup ambidexterity because the field employs overlapping terminology, including organizational, entrepreneurial, innovation, learning, structural, temporal, and individual ambidexterity. Transparent review procedures must therefore be complemented by conceptual coding that distinguishes the role of a construct from the analytical level at which it is examined. The uploaded manuscript operationalizes precisely this distinction by separating antecedent conditions, decision-related phenomena, and outcomes while independently retaining founder-, team-, venture-, and cross-level positions as analytical dimensions. This approach also accommodates evidence that ambidexterity may be manifested through explicit decisions, behavioral and learning processes, or broader configurations rather than through a uniform measurement model.

Taken together, the literature demonstrates both substantial progress and a clear cumulative-knowledge problem. Research increasingly explains how founder characteristics, entrepreneurial teams, leadership, resource bricolage, external knowledge search, learning, dynamic capabilities, autonomy, ecosystems, digital technologies, and business-model processes affect the capacity of startups to combine exploration and exploitation (Antonio et al., 2022; Elidjen et al., 2025; Li et al., 2025; Mielcarek & Kalisty, 2026). Yet the theoretical position of these constructs varies across studies, as does the empirical meaning assigned to ambidexterity. Some variables function as antecedents, others represent exploration–exploitation itself, and still others condition the relationship between ambidexterity and outcomes. The same fragmentation characterizes performance consequences and contextual moderators. Without separating these roles, literature synthesis risks comparing constructs that carry similar labels but represent different substantive processes. A startup-specific systematic review is therefore needed not merely to catalogue prior studies but to clarify what precedes ambidexterity, how exploration–exploitation is empirically represented, what consequences follow from it, at what analytical levels these relationships operate, and under what conditions they change.

Accordingly, the aim of this study is to systematically synthesize the startup ambidexterity literature through the Antecedents–Decisions–Outcomes framework, clarify how exploration and exploitation are represented across founder, team, venture, and cross-level research, and identify the conceptual, empirical, and contextual gaps that should guide future research.

2. Methods and Materials

A systematic literature review was conducted to identify, delimit, and synthesize research on startup ambidexterity. Systematic reviews provide a transparent basis for defining an evidence base, applying explicit study-selection criteria, and integrating findings from heterogeneous streams of research (Tranfield et al., 2003; Snyder, 2019). Study identification and selection were reported in accordance with PRISMA 2020 (Page et al., 2021). Following study selection, the substantive evidence was organized using the Antecedents–Decisions–Outcomes (ADO) framework (Paul & Benito, 2018; Paul et al., 2024). PRISMA therefore structured the construction and reporting of the review sample, whereas ADO provided the analytical structure for the subsequent synthesis.

The literature search was conducted in Scopus. The original search covered publications from 2010 through 2025 and was subsequently updated using the same search logic to include eligible studies published through May 2026. Searches were conducted across article titles, abstracts, and keywords. The search strategy combined terms referring to ambidexterity and



exploration–exploitation with terms referring to startups and new ventures, reflecting the terminological variation evident in prior ambidexterity research (Pertusa-Ortega et al., 2021; Chakma et al., 2024).

The search expression was:

(ambidext* OR "organizational ambidexterity" OR "entrepreneurial ambidexterity" OR "startup ambidexterity" OR "exploration and exploitation" OR "exploration-exploitation") AND (startup* OR "start-up*" OR "entrepreneurial firm*" OR "entrepreneurial venture*" OR "new venture*" OR "nascent venture*" OR "new firm*")

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The search was restricted to English-language, peer-reviewed journal articles. Defining the database, search fields, temporal coverage, language, and document type in advance is consistent with recommendations for transparent and reproducible systematic-review procedures (Tranfield et al., 2003; Snyder, 2019). Although the search window began in 2010, no study published before 2016 satisfied the final substantive eligibility criteria; the evidence base retained for analysis therefore spans 2016 through May 2026.

Study selection followed the PRISMA stages of identification, screening, eligibility assessment, and inclusion (Page et al., 2021). Figure 1 documents the movement of records through these stages.

Identification. The original Scopus search yielded 101 records. Twenty-nine records were removed before substantive screening because they did not meet the review's document-type requirements; these included review papers, conference papers, conference reviews, and books. Seventy-two journal articles, therefore, remained for title-and-abstract screening.

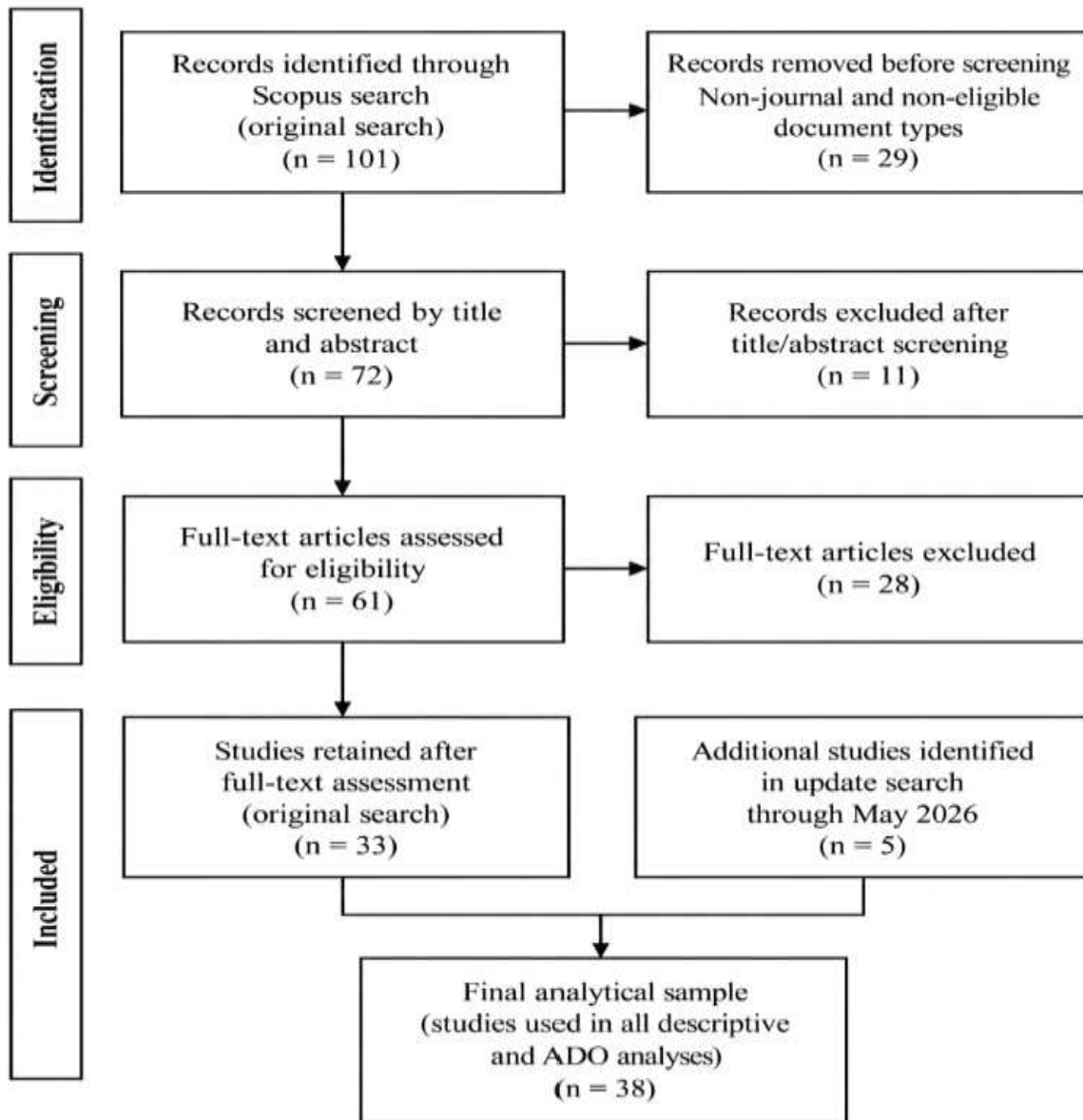
Screening. Titles and abstracts of the 72 remaining records were assessed against two preliminary relevance conditions. First, the study had to concern startups, new ventures, or a closely comparable entrepreneurial setting. Second, ambidexterity or exploration–exploitation had to constitute more than a peripheral reference. Eleven records did not satisfy these preliminary conditions, leaving 61 articles for full-text assessment. Applying explicit relevance criteria at this stage is consistent with systematic review guidance that emphasizes transparent and reproducible study selection (Snyder, 2019; Page et al., 2021).

Eligibility. Full-text assessment applied two substantive criteria: startups, new ventures, or comparable young entrepreneurial firms had to constitute the focal setting, or startup-specific evidence had to be separately identifiable; and ambidexterity or exploration–exploitation had to be substantive to the theoretical argument, empirical analysis, or principal findings rather than appear only as background terminology. These criteria ensured that inclusion reflected conceptual relevance rather than keyword occurrence alone (Tranfield et al., 2003; Snyder, 2019).

Balboni et al. (2019) was retained because high-tech startups were the focal setting and business-model novelty and efficiency were central to the analysis, while Evers and Andersson (2021) examined predictive and effectual decision logics in high-tech international new ventures. By contrast, studies in which startups or FinTechs appeared primarily as collaborators or ecosystem actors around established organizations were not retained. Broad SME studies were treated similarly when startup-specific evidence could not be isolated, and studies in which ambidexterity appeared only peripherally were also excluded. This distinction is important because ambidexterity may be examined across different organizational actors and analytical levels (Pertusa-Ortega et al., 2021; Chakma et al., 2024). Application of these criteria excluded 28 full-text articles, leaving 33 eligible studies from the original search.

Search update and final inclusion. The search was subsequently updated through May 2026 using the same search logic and substantive eligibility criteria. Maintaining the same inclusion logic across an updated search supports consistency between the original and subsequently identified evidence (Page et al., 2021). Five additional eligible studies were incorporated, producing a final analytical sample of 38 studies. All descriptive analyses, coding results, substantive findings, and research-gap statements reported in the remainder of the review are based on this same evidence base of N = 38.



Figure 1. PRISMA flow diagram of study selection**Figure 1. PRISMA flow diagram for study identification and selection.**

A structured extraction template was developed for the 38 included studies to capture descriptive, methodological, and substantive information consistently across the corpus. Structured data extraction provides a transparent basis for comparing heterogeneous studies and for subsequent synthesis (Tranfield et al., 2003; Snyder, 2019). For each article, information was recorded on publication year, empirical setting, sample, research approach and design, theoretical perspective, analytical level, focal constructs, relationships examined, and principal findings. These dimensions are broadly consistent with those used in prior reviews of ambidexterity research (Pertusa-Ortega et al., 2021; Chakma et al., 2024).

The extracted information served two related purposes. Publication, context, design, and level-of-analysis fields were used to profile the reviewed literature. In contrast, construct-level information—including focal constructs, relationships, and their theoretical roles—provided the basis for the ADO synthesis. The analytical level was recorded separately because the level at which a construct is theorized does not necessarily coincide with the level at which data are collected. This distinction is

particularly important in ambidexterity research, where founder-, team-, and venture-level constructs may be connected within the same study but should not be treated as conceptually interchangeable (Pertusa-Ortega et al., 2021).

The substantive synthesis followed the Antecedents–Decisions–Outcomes framework. Constructs were classified according to the analytical role they played in the primary study rather than by their labels or statistical positions, consistent with the organizing logic of ADO-based reviews (Paul & Benito, 2018; Paul et al., 2024)—antecedents comprised conditions positioned upstream of the focal exploration–exploitation phenomenon. The D component captured the decision logic, behaviors, processes, and exploration–exploitation configurations through which startup ambidexterity was represented—outcomes comprised consequences examined beyond the focal phenomenon. Variables explicitly specified as moderators or contextual contingencies were retained separately as boundary conditions rather than reassigned to A.

The coding proceeded in three steps. First, focal constructs and relationships were examined in relation to their theoretical role and analytical level and were assigned to A, D, or O accordingly. Because coding was conducted at the construct and relationship levels, a single article could contribute more than one construct and populate different ADO components when those constructs played different roles. This avoided assigning a single ADO label to an entire study and preserved within-study complexity.

Second, evidence associated with D was differentiated according to the form in which the exploration–exploitation phenomenon was observed. Four categories were distinguished: explicit decision/choice evidence, behavioral/process evidence, configurational/capability evidence, and no direct decision-related evidence. This classification was descriptive rather than evaluative. It distinguished studies that directly examined identifiable entrepreneurial choices from those representing exploration–exploitation through behavioral processes or broader configurations, as well as studies in which no separate decision-related process was observed. This interpretation is consistent with framework-based reviews in which the D component may encompass behavioral or dimensional representations of a focal phenomenon rather than only discrete managerial choices (Paul et al., 2024).

Third, conceptually comparable constructs were compared across studies and grouped into broader categories within A, D, and O. Within D, constructs were also compared according to the substantive activity through which exploration–exploitation was represented. The resulting higher-order categories were therefore derived from recurring patterns in the reviewed evidence rather than imposed as predetermined themes. Similar framework-based reviews use higher-order categories to organize heterogeneous evidence while retaining traceability to the primary studies (Lim et al., 2021; Paul et al., 2024; Singh & Kataria, 2026). Frequency counts were subsequently used descriptively to summarize the distribution of studies across the resulting categories.

The analytical level was retained independently of ADO placement throughout the synthesis. A founder-, team-, or venture-level construct could therefore appear in A, D, or O depending on the role it performed in the primary study. When classification was ambiguous, the study's theoretical argument, focal relationship, and interpretation of the construct were revisited. Ambidexterity was not coded as an outcome merely because it appeared statistically as a dependent variable; when it represented the focal exploration–exploitation phenomenon being explained, it remained within D. Similarly, moderators were not reclassified as antecedents solely because they appeared upstream in a statistical model. This procedure preserved the substantive role assigned to constructs in the primary studies rather than allowing statistical position alone to determine ADO placement (Paul & Benito, 2018; Paul et al., 2024).

Table 1 illustrates the application of these classification rules through representative cases. Its purpose is methodological: it shows how evidence from individual studies was translated into ADO placement and, where relevant, into a D evidence form. The synthesized antecedent themes, decision-related domains, outcome groups, and supporting studies are reported separately in the Results section.

Table 1. Representative Examples of ADO Classification and Coding Rationale

Source study	Evidence extracted from the study	Extracted construct	ADO placement	Coding rationale
Rippa et al. (2019)	Founder pre-entry technical and managerial knowledge precedes shifts between exploration and exploitation across venture-development activities.	Prior founder experience	A	Positioned upstream of the focal exploration–exploitation activity.
Yu et al. (2018)	Effectuation and causation are examined as strategic logics used by entrepreneurs	Effectuation/causation choices	D	Directly examines identifiable entrepreneurial choice logics.



	and jointly represent organizational ambidexterity.			
Rui & Lyytinen (2019)	External search breadth and depth precede explorative and exploitative knowledge integration; the latter jointly represents the focal ambidexterity construct.	External search; ambidextrous knowledge integration	A / D	Shows that distinct constructs within the same study can occupy different ADO roles.
Huo et al. (2025)	Team advice seeking transmits the effect of founder-CEO procedural fairness to new-venture ambidexterity.	Team advice seeking	D	Captures an interaction process rather than an identifiable discrete choice.
Noguti et al. (2023)	Founder individual ambidexterity is associated with subsequent venture funding acquisition.	Founder individual ambidexterity	A	Functions as an explanatory founder attribute linked to a downstream outcome; no separate D-related process is observed.
Balboni et al. (2019)	High-tech startup growth is examined as a consequence of the joint pursuit of novelty and efficiency in business-model design.	Startup growth	O	Positioned downstream of the focal exploration–exploitation configuration.

Note. D evidence classification applies only to D-related evidence. 'No direct D evidence' denotes a study-level status rather than a substantive D construct; the A / D entry for Rui and Lyytinen (2019) reflects separate constructs with different analytical roles within the same study.

3. Findings and Results

The final sample comprises 38 studies published between 2016 and May 2026, with publication activity concentrated in the latter part of the review period: 24 studies were published from 2022 onward. The evidence base is predominantly quantitative, comprising 31 quantitative studies (81.6%), 5 qualitative studies (13.2%), and 2 mixed-methods studies (5.3%). Cross-sectional quantitative designs account for 28 studies (73.7%). In contrast, the remaining studies employ qualitative case or process designs, multi-wave or time-lagged surveys, mixed or multi-method designs, and a small number of other longitudinal or archival approaches.

The literature also spans multiple analytical levels. Venture-level studies constitute the largest group (18 studies), followed closely by cross-level research (15), whereas team-level (4) and founder-level (1) studies remain comparatively limited. Geographically, the evidence is concentrated in a small number of settings, with China accounting for 13 studies and Indonesia for five; the remainder is distributed across several single-country, multi-country, and unspecified contexts. Overall, the profile indicates that the literature has expanded rapidly but remains concentrated in quantitative, predominantly cross-sectional designs and in venture- and cross-level analyses, with more limited coverage of founder-level phenomena and diverse geographical settings.

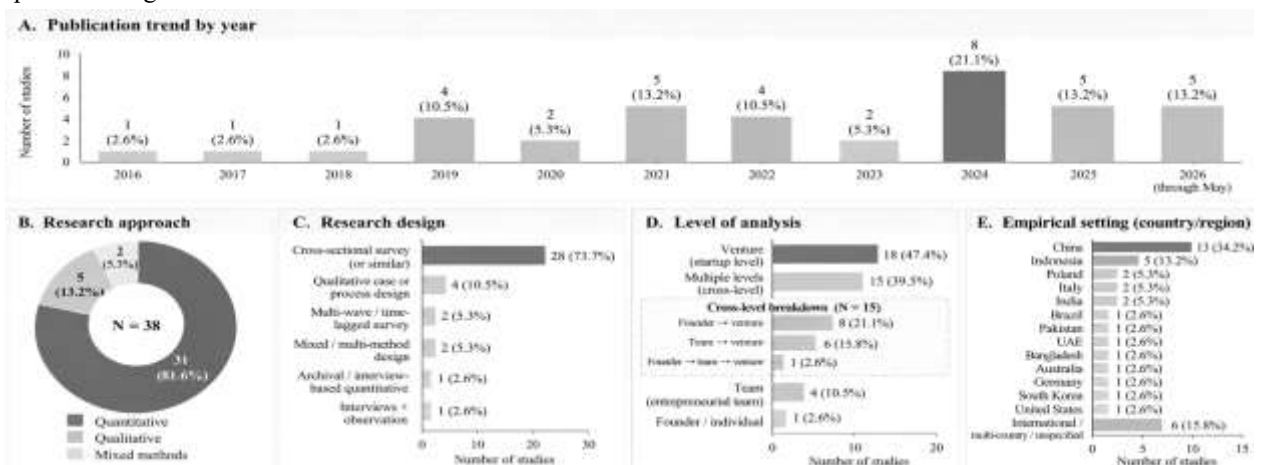


Figure 2. Profile of the Reviewed Studies (N = 38).

Antecedents

The reviewed studies identify six recurring antecedent themes: founder experience and cognition; team characteristics and interaction; leadership and managerial arrangements; knowledge and resource capabilities; strategic orientations and technological capabilities; and external relational and institutional antecedents. These themes comprise constructs positioned upstream of the focal exploration–exploitation activity or configuration in the primary studies; moderators and contextual



contingencies are retained separately when they perform a conditional rather than a direct antecedent role (Khursheed & Mustafa, 2024; Sayed & Dayan, 2024; Huo et al., 2025; He et al., 2026).

At the founder level, antecedent evidence centers on prior technical, managerial, commercial, and industry experience, as well as founder-level cognitive or behavioral characteristics such as individual ambidexterity and mindfulness (Rippa et al., 2019; Evers & Andersson, 2021; Noguti et al., 2023; Indrianti et al., 2024). Team-level antecedents include transactive memory systems, team reflexivity, shared mental models, interpersonal attraction, resource complementarity, and related interactional conditions that facilitate the coordination of exploration and exploitation (Dai et al., 2017; Xiong, 2022; Koch et al., 2025; Chen et al., 2026). Leadership and managerial antecedents cut across levels and include servant and transformational leadership, job autonomy, management-control arrangements, and founder-CEO procedural fairness when these constructs are modeled as upstream conditions (Antonio et al., 2021, 2022; Frare & Beuren, 2021; Eendenich et al., 2023; Huo et al., 2025).

At the venture level, knowledge and resource antecedents include external search, absorptive capacity, entrepreneurial bricolage, improvisational capability, and dynamic capabilities when these constructs precede the focal exploration–exploitation activity or configuration (Rui & Lyytinen, 2019; Fu et al., 2020; Randhawa et al., 2021; Rui & Ma, 2022; Elidjen et al., 2025). Strategic and technological antecedents include entrepreneurial and market orientations, technology-related capabilities, design thinking, and GenAI adoption or capacities (Aldianto et al., 2021; Randhawa et al., 2021; Singh & Singh, 2024; He et al., 2026; Duong et al., 2026). Design thinking, for example, is positioned upstream of ambidextrous learning in He et al. (2026), whereas GenAI adoption and capacities precede exploratory and exploitative innovation in Duong et al. (2026).

External relational and institutional antecedents include external connectivity, available networks, strategic or formal cooperation, and institutional support when these factors are modeled as direct predictors or enabling conditions (Wang et al., 2019; Evers & Andersson, 2021; Mielcarek & Kalisty, 2026; Mielcarek et al., 2026). The same types of variables are not automatically treated as antecedents when the primary study assigns them a moderating or contextual role.

Across the six themes, antecedent evidence is distributed across founder, team, venture, and external or cross-level positions rather than concentrated at a single analytical level. The synthesis also shows why construct role must be distinguished from construct label: managerial autonomy, network conditions, knowledge-related variables, and even ambidexterity-related constructs occupy different positions across primary studies depending on the relationship being examined (Sayed & Dayan, 2024; Noguti et al., 2023; Huo et al., 2025).

Decision-Related Domains

Four substantive domains emerge within the D component: opportunity development and innovation, knowledge search and learning, business model and market development, and team formation and coordination. These domains identify the substantive arenas in which exploration and exploitation are represented. They should not be interpreted as implying that all studies directly observe discrete entrepreneurial decisions.

Opportunity development and innovation contain the clearest evidence of identifiable strategic choice. Yu et al. (2018) examine entrepreneurs' use of effectuation and causation, while Evers and Andersson (2021) trace predictive and effectual logics across international opportunity exploration and exploitation. Rippa et al. (2019) capture shifts in emphasis between exploration and exploitation across opportunity discovery, product development, validation, and market development. Other studies represent this domain through exploratory and exploitative innovation activities or configurations rather than directly observed choices (Cho et al., 2020; Khursheed & Mustafa, 2024; Singh & Singh, 2024; Duong et al., 2026).

Knowledge search and learning encompasses exploratory and exploitative knowledge integration, external and boundary-spanning search, exploratory and exploitative learning, ambidextrous learning, and realized absorptive capacity associated with knowledge exploration and exploitation (Rui & Lyytinen, 2019; Rui & Ma, 2022; Wang et al., 2022; Xiong, 2022; Xiang et al., 2024; Chen et al., 2025; Elidjen et al., 2025; Li et al., 2025; He et al., 2026). The domain spans team- and venture-level evidence. Xiong (2022) provides team-to-venture evidence centered on ambidextrous learning, whereas most other studies locate search, knowledge integration, learning, or absorptive-capacity configurations at the venture level. Across these studies, the evidence is predominantly behavioral, processual, or configurational rather than direct observation of a discrete choice.

Business model and market development include the joint pursuit of novelty and efficiency in business-model design, business-model reconfiguration, market exploration and exploitation, and commercialization or scaling-related activity (Balboni et al., 2019; Evers & Andersson, 2021; Randhawa et al., 2021; Li et al., 2024; Sayed & Dayan, 2024; Indrianti et al., 2024). Here, the form of evidence varies across research designs. Longitudinal and case-based studies capture changes in



business models and market activity as they unfold. In contrast, survey-based studies more commonly represent the domain through business-model or market-related exploration–exploitation configurations.

Team formation and coordination capture how entrepreneurial teams organize and respond to competing demands for exploration and exploitation. The evidence includes advice seeking and participative information use, mimicking and switching responses to teammates' exploration–exploitation behavior, and explicit team-formation strategies (Huo et al., 2025; Koch et al., 2025; Chen et al., 2026). Chen et al. (2026) provide a particularly direct example through identifiable team-formation choices, whereas Huo et al. (2025) and Koch et al. (2025) capture decision-relevant coordination through team interaction processes.

The reviewed studies also differ substantially in the form of evidence supporting D. Only three studies (7.9%) provide explicit decision/choice evidence, nine (23.7%) provide behavioral/process evidence, and 24 (63.2%) represent exploration–exploitation primarily through configurational or capability-based measures. Two studies (5.3%) provide no separately observable D-related process. These categories describe the empirical form through which D is represented and are therefore distinct from the four substantive domains identified above.

Outcomes

The downstream consequences reported in the reviewed studies can be organized into five groups: innovation outcomes, venture growth and performance, market and scaling outcomes, team outcomes, and resilience and adaptation outcomes.

Innovation outcomes constitute a broad outcome category and include innovation performance, team innovation, ability to innovate, micro-innovation, and the balance between speed and novelty in new-product development (Rui & Lyytinen, 2019; Antonio et al., 2021; Sayed & Dayan, 2024; Elidjen et al., 2025; Chen et al., 2025; Li et al., 2025; He et al., 2026). These studies therefore extend beyond conventional measures of innovation performance to include both team-level consequences of innovation and more specific dimensions of venture-level innovation activity.

Venture growth and performance include venture growth, competitive advantage, new-venture or venture performance, technology-startup performance, and entrepreneurial performance (Balboni et al., 2019; Fu et al., 2020; Rui & Ma, 2022; Xiong, 2022; Khursheed & Mustafa, 2024; Li et al., 2024; Singh & Singh, 2024; Tehseen et al., 2024; Duong et al., 2026). A related but distinct category, market and scaling outcomes, captures commercialization and market entry, funding acquisition, venture expansion, and speed to unicorn status (Evers & Andersson, 2021; Randhawa et al., 2021; Noguti et al., 2023; Jha et al., 2024). Distinguishing these two categories preserves the difference between general venture performance and outcomes associated more specifically with market development, resource acquisition, and scaling.

At the team level, reported outcomes include team creativity and entrepreneurial effectiveness (Antonio et al., 2022; Chen et al., 2026). Resilience and adaptation outcomes, in turn, encompass business resilience, continuity, and related adaptive consequences under disrupted or changing operating conditions (Aldianto et al., 2021; Indrianti et al., 2024). Compared with innovation and venture performance outcomes, these two categories are represented by a smaller set of studies, indicating a more limited evidence base at the team and adaptive outcome levels.

A focal ambidexterity construct was not classified as an outcome solely because it appeared as a dependent variable in the primary study. When a founder-, team-, or venture-level exploration–exploitation configuration constituted the phenomenon being explained, it remained within D; O was reserved for consequences examined beyond that focal configuration. This distinction prevents statistical position from being conflated with conceptual role and preserves comparability across studies that operationalize ambidexterity differently.

No distinct founder-level outcome category emerged from the reviewed evidence. Founder-level constructs were used primarily as antecedent or explanatory attributes, whereas downstream consequences were concentrated at the team and venture levels. This asymmetry becomes relevant to the research agenda developed later in the review.

Figure 3 summarizes the ADO evidence by analytical level. Repetition of a theme or decision-related domain across levels is intentional; it indicates that related phenomena have been examined at more than one level, while boundary conditions are shown separately because they qualify rather than constitute ADO components.



	Antecedents (A)	Decision-related domains (D)	Outcomes (O)
Founder / Individual level	A1. Founder experience and cognition - Prior technical, managerial, commercial, and industry experience (Rippa et al., 2019; Evers & Andersson, 2021; Noguti et al., 2023) - Individual ambidexterity (Noguti et al., 2023) - Mindfulness and learning orientation (Indrianti et al., 2024) A2. Leadership and managerial arrangements - Founder-CEO procedural fairness (Huo et al., 2025)	D1. Opportunity development and innovation - Effectuation/causation choices (Yu et al., 2018) - Predictive/effectual decision logics (Evers & Andersson, 2021) - Shifts between exploration and exploitation across opportunity, product, and market development (Rippa et al., 2019)	<i>No distinct founder-level outcome theme identified in the reviewed studies.</i>
Team level	A3. Team characteristics and interaction - Transactive memory systems (Dai et al., 2017) - Reflexivity (Xiong, 2022) - Shared mental models and related sociopsychological team conditions (Koch et al., 2025) - Interpersonal attraction (Chen et al., 2026) - Resource complementarity (Chen et al., 2026) A4. Leadership and managerial arrangements - Servant leadership (Antonio et al., 2021, 2022) - Transformational leadership (Antonio et al., 2022)	D2. Team formation and coordination - Advice seeking and participative information use (Huo et al., 2025) - Mimicking and switching coordination responses (Koch et al., 2025) - Dual team-formation strategy (Chen et al., 2026) D3. Knowledge search and learning (team level) - Ambidextrous learning / exploratory-exploitative learning (Xiong, 2022)	O1. Team outcomes - Team creativity (Antonio et al., 2022) - Entrepreneurial effectiveness (Chen et al., 2026)
Venture level	A5. Leadership and managerial arrangements - Job autonomy (Frare & Beuren, 2021) - Management-control arrangements (Enderich et al., 2023) A6. Knowledge and resource capabilities - External search (Rui & Lyytinen, 2019; Rui & Ma, 2022) - Absorptive capacity (Khurshed & Mustafa, 2024; Elidjen et al., 2025) - Entrepreneurial bricolage (Fu et al., 2020; Li et al., 2024; Tehseen et al., 2025) - Improvisational capability (Rui & Ma, 2022; Xiong, 2022) - Dynamic capabilities (Aldianto et al., 2021; Randhawa et al., 2021) A7. Strategic orientations and technological capabilities - Entrepreneurial orientation (Singh & Singh, 2024) - Market orientation (Cho et al., 2020; Randhawa et al., 2021) - Design thinking (He et al., 2026) - Technology capability (Aldianto et al., 2021) - GenAI adoption and capacities (Duong et al., 2026)	D1. Opportunity development and innovation (venture-level manifestations) - Exploratory/exploitative innovation patterns (Cho et al., 2020; Khurshed & Mustafa, 2024; Singh & Singh, 2024; Duong et al., 2026) D3. Knowledge search and learning (venture level) - Exploratory/exploitative knowledge integration (Rui & Lyytinen, 2019) - Boundary-spanning and ambidextrous search (Rui & Ma, 2022; Wang et al., 2022) - Ambidextrous entrepreneurial learning (Xiang et al., 2024; Chen et al., 2025; Li et al., 2025; He et al., 2026) - Realized absorptive capacity and knowledge exploration/exploitation (Elidjen et al., 2025) D4. Business model and market development - Business-model novelty and efficiency (Balboni et al., 2019) - Business-model reconfiguration (Randhawa et al., 2021) - Market exploration/exploitation (Li et al., 2024; Sayed & Dayan, 2024) - Commercialization and scaling-related activity (Evers & Andersson, 2021; Indrianti et al., 2024)	O2. Innovation outcomes - Team innovation / creativity (Antonio et al., 2021, 2022) - Innovation performance (Rui & Lyytinen, 2019; Sayed & Dayan, 2024; Chen et al., 2025) - Ability to innovate (Elidjen et al., 2025) - Micro-innovation (Li et al., 2025) - Speed-novelty performance (He et al., 2026) O3. Venture growth and performance - Growth (Balboni et al., 2019; Fu et al., 2020; Li et al., 2024; Tehseen et al., 2024) - Competitive advantage (Xiong, 2022) - New-venture / venture performance (Rui & Ma, 2022) - Technology-startup performance (Khurshed & Mustafa, 2024) - Entrepreneurial performance (Singh & Singh, 2024; Duong et al., 2026) O4. Market and scaling outcomes - Commercialization / market entry (Evers & Andersson, 2021) - Funding acquisition (Noguti et al., 2023) - Scale-up / expansion (Randhawa et al., 2021) - Speed to unicorn status (Jha et al., 2024) O5. Resilience and adaptation outcomes - Business resilience / continuity (Aldianto et al., 2021) - Entrepreneurial resilience / scaling capacity (Indrianti et al., 2024)
External / Cross-level antecedents and boundary conditions (Context)			
- Environmental dynamism (Khurshed & Mustafa, 2024; Huo et al., 2025) - Environmental munificence (Chen et al., 2025) - Managerial autonomy (Sayed & Dayan, 2024) - Team climate (Antonio et al., 2021, 2022) - Entrepreneurial-ecosystem network relationships (Xiang et al., 2024) - Customer participation (Li et al., 2025) - Prior market and technological knowledge (He et al., 2026) - Gender (Yu et al., 2018) - Venture-development stage (Mielcarek & Kalisty, 2026)			

Figure 3. Integrative ADO Map of Startup Ambidexterity Research Across Analytical Levels.



4. Discussion and Conclusion

The findings of this systematic review demonstrate that startup ambidexterity has developed into a multidimensional and multilevel research domain in which exploration and exploitation are shaped by founder characteristics, entrepreneurial-team processes, leadership arrangements, knowledge and resource capabilities, strategic orientations, technological capabilities, and external relational conditions. The reviewed evidence was organized into six recurring antecedent themes, four substantive decision-related domains, and five groups of outcomes, while analytical level and contextual contingencies were retained as distinct dimensions. This structure is important because the literature does not treat ambidexterity consistently as a single organizational capability. Instead, ambidexterity appears variously as a founder attribute, a team-level process, a venture-level configuration, an intervening mechanism, or an explanatory condition associated with subsequent outcomes. The results therefore reinforce the broader argument that organizational ambidexterity is inherently heterogeneous and that its antecedents, manifestations, and consequences need to be interpreted in relation to analytical level and theoretical role rather than construct labels alone (Chakma et al., 2024; Guerrero, 2021; Pertusa-Ortega et al., 2021). This finding advances startup-specific understanding by showing that apparent inconsistencies across studies may frequently result from differences in conceptual placement and operationalization rather than genuinely contradictory empirical evidence.

The first major result concerns the antecedents of startup ambidexterity. Six recurrent antecedent domains were identified: founder experience and cognition; team characteristics and interaction; leadership and managerial arrangements; knowledge and resource capabilities; strategic orientations and technological capabilities; and external relational and institutional antecedents. Founder-related conditions were especially important because young ventures typically lack formalized organizational routines and consequently depend strongly on the experience, cognition, judgment, and behavioral orientation of entrepreneurs. This result aligns with evidence showing that individual ambidexterity and career experience can improve founders' ability to obtain venture funding (Noguti et al., 2023), while founders' ambidextrous orientation can facilitate accelerated scaling and movement toward high-growth trajectories (Jha et al., 2024). Entrepreneurial mindfulness and ambidextrous leadership have also been linked with business-model innovation capacity and resilience (Indrianti et al., 2024). Collectively, these studies support the present finding that founder-level cognition and experience represent important upstream conditions rather than merely background characteristics. They influence how emerging ventures identify opportunities, allocate scarce resources, and negotiate the competing requirements of experimentation and efficient implementation.

The findings also indicate that startup ambidexterity cannot be explained adequately at the founder level alone because team characteristics and interaction form a distinct antecedent domain. Team reflexivity, shared mental models, interpersonal attraction, complementary resources, advice seeking, and other interactional processes determine whether exploration and exploitation can be coordinated collectively. This observation is consistent with research showing that leadership behavior affects startup team innovation through mechanisms related to team ambidexterity (Antonio et al., 2021), while leadership can also influence creativity through mediating team processes (Antonio et al., 2022). More recent evidence provides even stronger support for a dynamic interpretation of team ambidexterity. Founding-team members respond to colleagues' exploratory and exploitative behavior by mimicking or switching their own behavior, indicating that ambidexterity may emerge from reciprocal behavioral adaptation rather than simply from formal role allocation (Koch et al., 2025). Similarly, alternative team-formation strategies generate different trajectories of team ambidexterity and entrepreneurial effectiveness (Chen et al., 2026). These findings support the review's conclusion that startup ambidexterity is partly constructed through interpersonal and collective processes that link individual actions with venture-level outcomes.

Leadership and managerial arrangements constituted another recurrent antecedent category. The reviewed evidence suggests that leadership matters not simply because founders determine venture strategy but because leadership creates the conditions under which exploratory and exploitative behavior can coexist. Servant leadership, managerial autonomy, management-control arrangements, job autonomy, and procedural fairness were repeatedly positioned upstream of ambidexterity-related processes. This finding corresponds with evidence that founder-CEO procedural fairness promotes new-venture ambidexterity through team-level mechanisms such as advice seeking (Huo et al., 2025). It is also consistent with research showing that managerial autonomy changes the relationship between ambidexterity and innovation performance (Sayed & Dayan, 2024), while job



autonomy and unscripted agility can strengthen ambidextrous innovation under highly disruptive conditions (Frare & Beuren, 2021). Management-control systems can likewise support product, business-model, and ambidextrous innovation when controls are designed to facilitate rather than suppress experimentation (Endenich et al., 2023). Thus, leadership and managerial systems appear to provide an enabling architecture within which exploration and exploitation can be coordinated.

Knowledge and resource capabilities formed a particularly prominent venture-level antecedent theme. Startups frequently lack slack resources, established routines, and deep internal knowledge bases, which makes external search, bricolage, absorptive capacity, improvisation, and dynamic capability especially important. The present findings align with studies showing that entrepreneurial bricolage facilitates new-venture growth when ventures creatively recombine available resources and develop complementary ambidextrous capabilities (Fu et al., 2020; Li et al., 2024). Bricolage can also operate through adaptiveness and innovative ambidexterity to promote growth (Tehseen et al., 2024). Similarly, absorptive capacity supports innovation by enabling ventures to identify, assimilate, transform, and exploit externally acquired knowledge, although the benefit can depend on structural ambidexterity (Elidjen et al., 2025). Improvisational capability represents another mechanism through which startups respond to uncertainty, and its performance effects depend partly on how exploratory and exploitative search are combined (Rui & Ma, 2022). Entrepreneurial improvisation has additionally been associated with startup competitive advantage, further demonstrating the importance of flexible resource deployment under uncertainty (Xiong, 2022). These convergent findings suggest that startup ambidexterity is deeply embedded in the processes through which ventures acquire and reconfigure knowledge and resources rather than being reducible to an abstract balance between two strategic orientations.

The decision-related component produced one of the most important findings of the review. Four domains emerged: opportunity development and innovation, knowledge search and learning, business-model and market development, and team formation and coordination. However, only a small proportion of studies directly examined explicit decisions or choices. Most represented the exploration–exploitation phenomenon through behavioral processes, learning activities, capabilities, or configurations. This distinction is theoretically important because observed ambidexterity does not necessarily reveal the decisions through which it was produced. Research on predictive and effectual decision making demonstrates that entrepreneurial decision logics may shift as ventures alternate between opportunity exploration and exploitation (Evers & Andersson, 2021). Likewise, temporal ambidexterity research shows that ventures may vary their emphasis on exploration and exploitation across developmental periods rather than maintaining a stable simultaneous balance (Wang et al., 2019). The present findings therefore suggest that existing startup research is considerably stronger in documenting realized exploration–exploitation patterns than in explaining the decision processes that generate those patterns.

Knowledge search and learning represented the most extensively developed decision-related process domain. Boundary-spanning search, exploratory and exploitative learning, ambidextrous learning, knowledge integration, absorptive capacity, and external search illustrate the variety of processes through which startups manage uncertainty. Boundary-spanning search has been linked with sustainable development performance among technology startups because it gives ventures access to diverse knowledge sources (Wang et al., 2022). Ambidextrous learning can convert resource acquisition into improved venture performance, particularly where entrepreneurial ecosystem relationships strengthen the value of knowledge access (Xiang et al., 2024). More recent studies similarly show that ambidextrous entrepreneurial learning enhances new-venture innovation and facilitates the productive use of serendipitous opportunities (Chen et al., 2025). Resource bricolage can reinforce micro-innovation through ambidextrous learning, although customer participation and government support can alter these mechanisms (Li et al., 2025). These findings support the review's conclusion that learning and search constitute central mechanisms through which startup ambidexterity becomes observable, while also reinforcing the importance of distinguishing learning processes from direct managerial choices.

The findings concerning business-model and market development further demonstrate that startup ambidexterity is inherently dynamic. Startups must simultaneously experiment with new value propositions and refine economically viable configurations. Dynamic capabilities and market orientation can enable ventures to pursue ambidextrous business-model innovation by supporting both reconfiguration and market responsiveness (Randhawa et al., 2021). Stage-specific research



also indicates that the drivers of ambidexterity differ across phases of startup development (Mielcarek et al., 2026), while broader investigation of critical success factors suggests that no single antecedent explains the emergence of startup ambidexterity across all contexts (Mielcarek & Kalisty, 2026). Consequently, the relative importance of exploration and exploitation may change as startups progress from opportunity recognition and experimentation toward commercialization, scaling, and organizational stabilization. This interpretation challenges static conceptualizations and supports a developmental perspective in which startup ambidexterity must be understood in relation to venture stage.

The review also identified growing evidence that digital technologies and emerging capabilities influence ambidextrous activity without constituting ambidexterity themselves. Generative artificial intelligence can improve entrepreneurial performance through innovation ambidexterity, although the effects may be nonlinear rather than uniformly positive (Duong et al., 2026). Design thinking can similarly help startups manage the speed–novelty innovation paradox through ambidextrous learning (He et al., 2026). This distinction is significant because emerging technologies may alter the cost, speed, and scope of exploratory and exploitative activities but do not eliminate the underlying requirement to allocate attention and resources between novelty and refinement. The finding therefore supports conceptual separation between technological capability as an enabling antecedent and exploration–exploitation as the focal organizational phenomenon.

Five categories of outcomes emerged from the synthesis: innovation outcomes, venture growth and performance, market and scaling outcomes, team outcomes, and resilience and adaptation outcomes. Innovation and venture performance dominated the evidence base. Previous research supports this pattern, showing positive relationships between innovation ambidexterity and technology-startup performance (Khursheed & Mustafa, 2024), and demonstrating that innovation ambidexterity mediates the relationship between entrepreneurial orientation and new-venture performance (Singh & Singh, 2024). Innovation ambidexterity has also been associated with performance in both startup and established organizational contexts (Cho et al., 2020). Nevertheless, the review reveals that startup success cannot be represented adequately by a single performance indicator. Ambidexterity has implications for funding, commercialization, scaling, creativity, entrepreneurial effectiveness, resilience, and adaptation. Founder-level ambidexterity and experience, for example, are associated with funding acquisition (Noguti et al., 2023), while founders' ambidextrous orientation has been connected to rapid progression toward unicorn status (Jha et al., 2024). At the team level, ambidexterity contributes to creativity and entrepreneurial effectiveness (Antonio et al., 2022; Chen et al., 2026). These differences justify treating outcomes as substantively distinct rather than as interchangeable indicators of venture success.

A further contribution of the review concerns resilience and adaptation. Although this outcome category remains smaller than innovation or performance, it may become increasingly important as startups operate in volatile technological and market environments. Business resilience depends on the ability to maintain continuity while adapting products, processes, and business models to unexpected changes (Aldianto et al., 2021). Ambidextrous leadership and entrepreneurial mindfulness may facilitate this process through business-model innovation capacity (Indrianti et al., 2024). These findings suggest that the value of ambidexterity may extend beyond maximizing conventional performance. Exploration and exploitation may also provide startups with the flexibility to survive shocks, redesign resource configurations, and preserve viable operations under conditions of instability.

Overall, the findings support a multilevel and contingent interpretation of startup ambidexterity. The literature indicates that founder characteristics, team processes, leadership arrangements, knowledge capabilities, external relationships, and technological resources interact in shaping exploratory and exploitative activity. However, these factors do not occupy identical theoretical positions, nor do they operate uniformly across venture stages and environmental conditions. The wider ambidexterity literature has similarly emphasized that individual and organizational ambidexterity should not be conflated (Pertusa-Ortega et al., 2021), while systematic synthesis has identified the need for greater conceptual integration across organizational ambidexterity research (Chakma et al., 2024). The present review extends these observations by demonstrating that startup ambidexterity research particularly requires explicit separation of construct role, level of analysis, empirical representation, and boundary conditions. The ADO framework offers a useful basis for this differentiation because it allows antecedents, decision-related manifestations, and outcomes to be organized without assuming that all studies employ equivalent



measures or theoretical models (Lim et al., 2021; Paul et al., 2024; Singh & Kataria, 2026). In this respect, the central contribution of the review is not merely the identification of factors associated with ambidexterity but the clarification of how these factors are positioned within the emerging startup ambidexterity knowledge structure.

This review has several limitations that should be considered when interpreting its findings. First, the evidence base was restricted to English-language, peer-reviewed journal articles indexed in Scopus, meaning that potentially relevant studies available in other databases, languages, conference proceedings, books, dissertations, and other forms of grey literature were not included. Second, although the systematic procedure improved transparency and consistency, the conceptual heterogeneity of startup ambidexterity inevitably required interpretive decisions when classifying constructs into antecedent, decision-related, and outcome categories. Some constructs could plausibly occupy different positions depending on the theoretical model in which they are embedded. Third, the reviewed literature was dominated by quantitative and cross-sectional research, limiting the ability to infer temporal dynamics and causal processes. Fourth, empirical research was geographically concentrated in a relatively small number of national settings, which restricts the generalizability of conclusions across entrepreneurial ecosystems. Finally, the available evidence was uneven across analytical levels, with considerably greater attention to venture- and cross-level relationships than to founder-specific outcomes and longitudinal team processes.

Future research should prioritize longitudinal, process-oriented, and multilevel designs capable of tracing how exploration and exploitation develop from founder choices through team interaction to venture-level configurations and subsequent outcomes. Researchers should distinguish clearly between ambidexterity as an antecedent, focal phenomenon, mediating mechanism, capability, or outcome-related predictor and should align measurement strategies with the theoretical role assigned to the construct. Greater attention should also be given to explicit entrepreneurial decisions rather than relying predominantly on retrospective or configurational indicators of exploration and exploitation. Future studies could employ event-based designs, repeated interviews, decision diaries, digital trace data, and multi-wave surveys to capture how founders and teams alter exploration–exploitation priorities over time. Comparative research across venture stages, countries, industries, and entrepreneurial ecosystems is also required to identify meaningful boundary conditions. In addition, emerging digital technologies should be investigated as contextual and enabling mechanisms that may alter the relationship between exploration, exploitation, learning, and performance. More research is particularly needed on founder-level consequences, team-level adaptation, resilience, and long-term outcomes rather than concentrating almost exclusively on short-term innovation and venture performance.

For founders and startup managers, the findings suggest that ambidexterity should be managed as a portfolio of interdependent capabilities and processes rather than as a single performance target. Founders should distinguish the conditions that enable exploration and exploitation from the actual behaviors through which these activities are performed and from the outcomes they are intended to produce. Entrepreneurial teams should create mechanisms for information sharing, reflection, behavioral switching, and complementary role allocation so that exploratory and exploitative demands can be addressed without creating persistent internal conflict. Managers should also align the degree and form of ambidexterity with the venture's stage of development, because early experimentation, market validation, commercialization, and scaling may require different exploration–exploitation configurations. External networks, customer participation, learning mechanisms, resource bricolage, and digital technologies should be treated as resources that support ambidexterity rather than substitutes for strategic judgment. Investors, incubators, accelerators, and entrepreneurial-support organizations can likewise improve assessment and intervention by separately evaluating enabling conditions, exploration–exploitation patterns, and downstream outcomes, thereby providing support that is matched more precisely to the developmental needs of individual startups.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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