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Design in entrepreneurship: Unveiling multiple interpretations and philosophical underpinnings

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Abstract

Design has become a prominent concept in entrepreneurship research and practise. However, previous literature has offered multiple, often divergent interpretations of the role of design in entrepreneurship. For example, studies have highlighted the benefits of adopting design thinking practises in entrepreneurial endeavours, using design science as a research method for studying entrepreneurship and treating entrepreneurial opportunities as design artefacts that entrepreneurs can shape. Although this multitude of perspectives reflects the conceptual richness of design, it simultaneously complicates the accumulation of scholarly understanding. To address this issue, we have conducted a systematic literature review, uncovering the philosophical assumptions underpinning different interpretations of design in entrepreneurship: (i) design as ontology (*entrepreneurship as design*), (ii) design as epistemology (*entrepreneurship research as design research*), (iii) design as phenomenology (*entrepreneurship as a means to design*), (iv) design as logic (*entrepreneurship by design*) and (v) design as methodology (*entrepreneurship through design*). Further, we have identified five modes of enquiry that can guide future studies of design in entrepreneurship. The resulting interpretive framework contributes to entrepreneurship theory and practise by providing a foundation for more conscious and systematic research on design in entrepreneurship.

INTRODUCTION

Management scholars often draw parallels between design and management when characterising management as something real, realisable and subject to human agency (Gruber et al., 2015; Liedtka, 2000; Pandza & Thorpe, 2010). Entrepreneurship scholars have also evoked the concept of design (e.g., Berglund et al., 2020; Dimov, 2021; Sarasvathy, 2004a), but it is often reduced to the use of design thinking as an approach for creating new ventures (Klenner et al., 2022; Mansoori & Lackéus, 2020). Consequently, design might be understood in a rather limited, instrumental way, as a tried-and-tested method with a delimited set of practises that promise a straightforward path to entrepreneurial success. Increasingly, scholars are recognising design as a multifaceted concept with multidisciplinary roots and are examining how design relates more broadly to entrepreneurship as an academic field. For example, scholars have viewed entrepreneurial opportunities as design artefacts (Berglund et al., 2020;

Sarooghi et al., 2021) that entrepreneurs can leverage to realise their visions of the world (Berglund et al., 2018; Dimov, 2021). Additionally, they have uncovered work practises that constitute a 'designerly' approach to entrepreneurship (Klenner et al., 2022). Adopting similar terminology, other studies have advanced the use of design science as a research method that is particularly well-suited for studying entrepreneurship (Dimov et al., 2023; van Burg & Romme, 2014; Zhang & van Burg, 2020), offering yet another perspective. Another sign of design's central role in entrepreneurship research is the *Journal of Business Venturing Design*, which was recently launched to provide a dedicated platform for publishing entrepreneurship research with a design lens.

Although scholars seem to converge on the importance of design in entrepreneurship, the growing body of research is increasingly characterised by coexisting, yet divergent interpretations of design in the entrepreneurship literature. Entrepreneurship scholars have assigned different meanings to the concept and developed different understandings of its role in entrepreneurship. For example, the above studies used design to, respectively, discuss the nature of *what* entrepreneurship is (Berglund et al., 2020), suggest *how* research in entrepreneurship should be conducted (Dimov et al., 2023) and explain *why* design practises enable entrepreneurs to create new ventures (Magistretti et al., 2023).

These various perspectives have drawn criticism that design may be misinterpreted by entrepreneurship scholars (Klenner et al., 2022; Sarasvathy, 2004a). A lack of clear conceptual boundaries between these multiple interpretations hinders cumulative theory building and complicates the development of a more unified view of design in entrepreneurship.

To better understand the multifaceted interpretations of design in the entrepreneurship literature, we have conducted a systematic review (Tranfield et al., 2003), searching and analysing 114 articles published between 2003 and 2024 using an abductive approach (Mosonyi et al., 2020; O'Mahoney, 2016). Consistent with other systematic literature reviews, we followed an iterative process (Klag & Langley, 2013), moving back and forth between the data (i.e., the articles) and potential explanations for emerging findings (i.e., themes and interpretations) (Ketokivi & Mantere, 2010). This process enabled us to unpack the underlying philosophical assumptions associated with multiple interpretations of design in entrepreneurship and to develop a framework that can guide future research.

Our analysis reveals five philosophical assumptions underpinning scholars' interpretations of design in entrepreneurship, which we identify as the main cause for the increasing divergence in our scholarly understanding: (i) design as an ontology of entrepreneurship (*entrepreneurship as design*), describing what entrepreneurship is through the analogy of design; (ii) design as an epistemology of entrepreneurship (*entrepreneurship research as design research*), describing how entrepreneurship should be studied using design as a research method; (iii) design as a phenomenology of entrepreneurship (*entrepreneurship as a means to design*), describing how the individual experience of entrepreneurs mirrors that of designers; (iv) design as a logic of entrepreneurship (*entrepreneurship by design*), describing how 'designerly' thinking can guide entrepreneurial reasoning; and (v) design as a methodology of entrepreneurship (*entrepreneurship through design*), describing how design can offer practises and principles to inform entrepreneurial action. We distinguish sub-themes within each interpretation and present them in a descriptive framework. Our analysis also reveals a distinct mode of enquiry associated with each interpretation. Drawing on our findings, we propose an interpretive framework that highlights how these five modes of enquiry inform entrepreneurship research at the micro, meso or macro levels, thereby providing actionable guidelines for future research.

Our contributions are threefold. First, our review sheds light on different interpretations of design in entrepreneurship (e.g., Berglund et al., 2020; Mansoori & Lackéus, 2020). The proposed interpretive framework explains how design can inform entrepreneurship research at multiple levels, from addressing the essence of entrepreneurship (i.e., macro level) to informing its practises and lived experiences (i.e., micro level) (Klenner et al., 2022). Second, we theorise the philosophical assumptions underpinning the perspective shift in entrepreneurship research from an opportunity- and advantage-seeking perspective (McMullen & Shepherd, 2006) to a human-centred and iterative design lens (Elsbach & Stigliani, 2018), emphasising the multiplicity of roles design can play in entrepreneurship. Third, we position design in entrepreneurship as an extension of its recognised but underexplored role in fields such as strategy (Liedtka, 2000), innovation (Verganti, 2008) and management (Gruber et al., 2015; Pandza & Thorpe, 2010). Establishing a philosophical foundation enables us to develop a framework that supports a more integrated perspective of design's role in entrepreneurship, with potential relevance across disciplines. Building on our findings, we propose an agenda for future research to serve as the basis for fostering cumulative theoretical insights in the ongoing conversations on design in entrepreneurship.

MULTIPLE INTERPRETATIONS OF DESIGN IN ENTREPRENEURSHIP

The concept of design is frequently evoked in the entrepreneurship literature, for example, inspired by the observation that entrepreneurs engage in a wide range of design activities, such as designing new products and services, business models or innovative processes and systems (Klenner et al., 2022). To do so in a structured fashion, entrepreneurs may leverage design thinking, which enables them to better understand stakeholder needs and leverage a human-centred approach to guide the creation of new products, services and ventures (Magistretti et al., 2023). Consequently, the multifaceted use of design has inspired diverse conversations in entrepreneurship research in recent years (Berglund et al., 2018; Sagath et al., 2019).

To distinguish entrepreneurship from the natural sciences and address the field's overreliance on economic theories, some entrepreneurship scholars have adopted the perspective that entrepreneurship can be understood as an act of design, thereby aligning it with the science of the artificial (Simon, 1969, 1988). This conceptualisation of design has long been influential in the fields of management and strategy (Liedtka, 2000; Pandza & Thorpe, 2010), permeating entrepreneurship studies as well (Sarasvathy, 2004a; Berglund et al., 2020). Proponents of this view have argued that entrepreneurship is constrained but not determined by natural laws; it is also non-predictive, governed by locality and contingency rather than universality and characterised by near-decomposability (Sarasvathy, 2003). Yet, despite its growing popularity in entrepreneurship research, design theorists have long challenged the underlying assumptions of this scientific perspective on design (Buchanan, 1992). Although initial attention to design theory developed in parallel with systems science and reflected a linear, analytical and predictive perspective (Bazjanac, 1974), its critics have highlighted the inadequacy of such approaches in the face of 'wicked problems' and emphasised learning as the core of design under uncertainty (Rittel, 1972), all of which are equally characteristic of entrepreneurship. Schön (1983) espoused an alternative to design as a science of the artificial by drawing on pragmatist ideas and framing design as a hypothesis-driven 'shaping process' in which designers create local experiments that 'talk back' to them. March (1976) argued that design is rooted in a logic of abduction, emphasising that scientific and design hypotheses differ dramatically: whereas scientists discover laws governing current reality, designers create new realities. Such a philosophical shift can also be observed in entrepreneurship research, as scholars moved from an early emphasis on economics and business planning to identifying and exploiting emerging opportunities (Bruyat & Julien, 2001; Shane & Venkataraman, 2000).

Alternative philosophical perspectives on design in entrepreneurship have spurred diverse scholarly conversations. A design perspective has enabled entrepreneurship scholars to reframe entrepreneurship as the design of organizations (Sarasvathy, 2004a) and environments (Sarasvathy et al., 2008). Scholars also have started to probe for deeper theoretical explorations of entrepreneurship as a science of the artificial, leading to the distinction between the design processes of experimentation and transformation—two archetypes of artefact design that reconcile the longstanding debate in entrepreneurship research regarding whether an opportunity can be both discovered and created (Berglund et al., 2020). Consequently, opportunities, often seen as the distinguishing feature of the entrepreneurship field, have been conceptualised as design artefacts (Berglund et al., 2020; Ding, 2019). Scholars also have adopted a design science perspective to enquire into the artificiality of entrepreneurial opportunities (Dimov, 2016; G. Romme, 2016). Design has been conceptualised as the missing third body of knowledge to bridge the theory-practise gap, which requires the development of 'entrepreneurial design principles' (Berglund et al., 2018, p. 88). In addition, scholars have studied the role of design thinking practises in entrepreneurship (Klenner et al., 2022) and the design process of opportunity development (Magistretti et al., 2023).

This mounting evidence suggests some convergence around the important role of design in entrepreneurship. However, scholars' perspectives of design differ in fundamental ways. Whereas some scholars explicitly consider design as a science of the artificial (e.g., Sarasvathy, 2003, 2004b, Sarasvathyet al., 2008; Berglund et al., 2020), others explicitly distinguish between creative design and scientific validation, implying that design and science are distinct (e.g., A.G.L. Romme & Reymen, 2018). Thus, understandings of design differ and are grounded in fundamentally different epistemic assumptions. Furthermore, some scholars have used conventional methods to study entrepreneurs' 'designerly' and entrepreneurial ways of doing and thinking (e.g., Klenner et al., 2022), whereas others have adopted novel design science methods to study entrepreneurship (e.g., Dimov, 2016; Dimov et al., 2023). The assumptions informing methodological approaches to studying design in entrepreneurship thus differ as well. Although many scholars refer to design indiscriminately, conversations occur across various philosophical viewpoints, resulting in a multitude of coexisting perspectives on design in entrepreneurship.

In summary, we note that the ongoing scholarly conversations on design in entrepreneurship have led us to a critical inflection point. This inflection point offers suf-

ficient research volume to systematically review design in entrepreneurship research (Cronin & George, 2023). Given the increasing growth, complexity and multiplicity of conversations, we take stock of different perspectives and synthesise existing research, provide an interpretive framework to move the conversation forward and identify opportunities for future research.

METHOD

To synthesise the multiple interpretations of design in entrepreneurship, we conducted a systematic literature review (Simsek et al., 2023; Tranfield et al., 2003). Our aim was to make sense of the concept of design in entrepreneurship and to lay the groundwork for future research in this field (Bacq et al., 2021; Jones & Gatrell, 2014). We collected articles by following a four-step process (adapted from Jones & Gatrell, 2014; Tranfield et al., 2003): setting, searching, selecting and systematising.

Setting

First, we conducted a scoping review to assess the extent and scope of research on design in entrepreneurship. Motivated by the lack of a comprehensive view of the literature on the role of design in entrepreneurship, we drew inspiration from editorial articles, several panel discussions at international academic conferences (e.g., DRUID, 2019; Chalmers University's Symposium on Entrepreneurship as Design, 2021, 2022; AOM, 2022, 2023; EGOS, 2023) and direct interactions with members of the academic community. Having set our intention for the review, we first adopted a historical approach to search the literature for articles linking design concepts to entrepreneurship. This involved reconstructing the temporal evolution of scholarly work in the field, starting with Sarasvathy (2003), one of the first articles to engage with design as a concept in the entrepreneurship literature.

Searching

Second, following previous studies (Gradillas & Thomas, 2025; Schmitt et al., 2018; Zahoor et al., 2024), we searched the Web of Science database to identify articles exploring the role of design in entrepreneurship published in leading academic journals. Web of Science includes the Social Sciences Citation Index (SSCI) collection, considered the most comprehensive database of the literature in the social sciences, covering the majority of journals in the field of management. We applied inclusion and exclusion criteria consistent with previous reviews (e.g., Portyanko et al., 2022) and searched the subject areas of business, management and economics, reflecting the multidisciplinary nature of entrepreneurship. The search query included two main keywords and their combinations (i.e., entrepr* and design*) across the document fields, including title, abstract, authors, keywords and KeyWords Plus[1], which enhanced our ability to find articles across disciplines that cite the same references, increasing the reliability of our dataset. Using these keywords ensured that we captured all relevant articles in the entrepreneurship literature that employed design as a concept to explain its elements. We restricted our search to peer-reviewed journal articles and editorials published after Sarasvathy's (2003) article up to and including 2024, excluding working papers, dissertations, books, book chapters and conference proceedings (Keupp et al., 2012). This resulted in an initial database of 2604 articles. To account for the most recent specialised research in the field, we integrated our database-driven search with a journal-driven approach (Hiebl, 2023) and included 53 articles published in two journals not indexed by the Web of Science, namely, the *Journal of Business Venturing Design* and the *Journal of Business Venturing Insights*. We included the former because it was specifically established to publish research on entrepreneurship as design, and the latter because it published a virtual special issue on the topic.

Selecting

We followed Hiebl's (2023) three steps for sample selection: identification, screening and disclosure of the review sample, consisting of 2657 articles published between January 2003 and December 2024. The screening phase involved applying the inclusion and exclusion criteria (Table 1) to define the final sample of articles relevant to our research objectives. Three authors independently screened the titles and abstracts of the articles to exclude articles that did not meet these objectives. We used the software Rayyan and employed the 'yes', 'no' and 'maybe' categorisation (Rousseau, 2024) to evaluate individual documents and discussed whether to keep or delete articles categorised as 'maybe' and articles with inconsistent categorisation. The abstract screening process resulted in the selection of 153 articles which we read in full, excluding those that were not relevant to the scope of our review. The full-text screening resulted in a final database of 114 relevant articles published in 49 journals. Figure 1 summarises the article selection process.

[1] KeyWords Plus provides additional terms related to the content of an article that are not necessarily part of the title, abstract or author-provided keywords.

TABLE 1 Search and selection criteria.

Search Sources	Search filters	Inclusion criteria	Exclusion criteria
• Web of Science Social Sciences Citation Index (SSCI) collection • Specialised journals: *Journal of Business Venturing Design*, *Journal of Business Venturing Insights*	• Topic (title, abstract and keywords) • Document type: Articles published or in-press in peer-reviewed journals • Language: English • Subject areas: Business, management and economics • Document publication year: 2003–2024	• Articles conceptualising entrepreneurship as a form of design • Articles investigating entrepreneurial processes based on a design approach (e.g., design thinking) • Articles investigating specific design principles, practises, processes and tools for conducting entrepreneurial processes • Articles on entrepreneurship as a design science • Articles on teaching entrepreneurship using design practises • Articles exploring entrepreneurship in a design context	• Articles where the word design refers to the research method (e.g., research design) • Articles where the word design is used to indicate the design of public policy for entrepreneurship (e.g., policy design) • Articles where the word design is used to indicate an outcome (e.g., organization design) • Articles not related to entrepreneurship

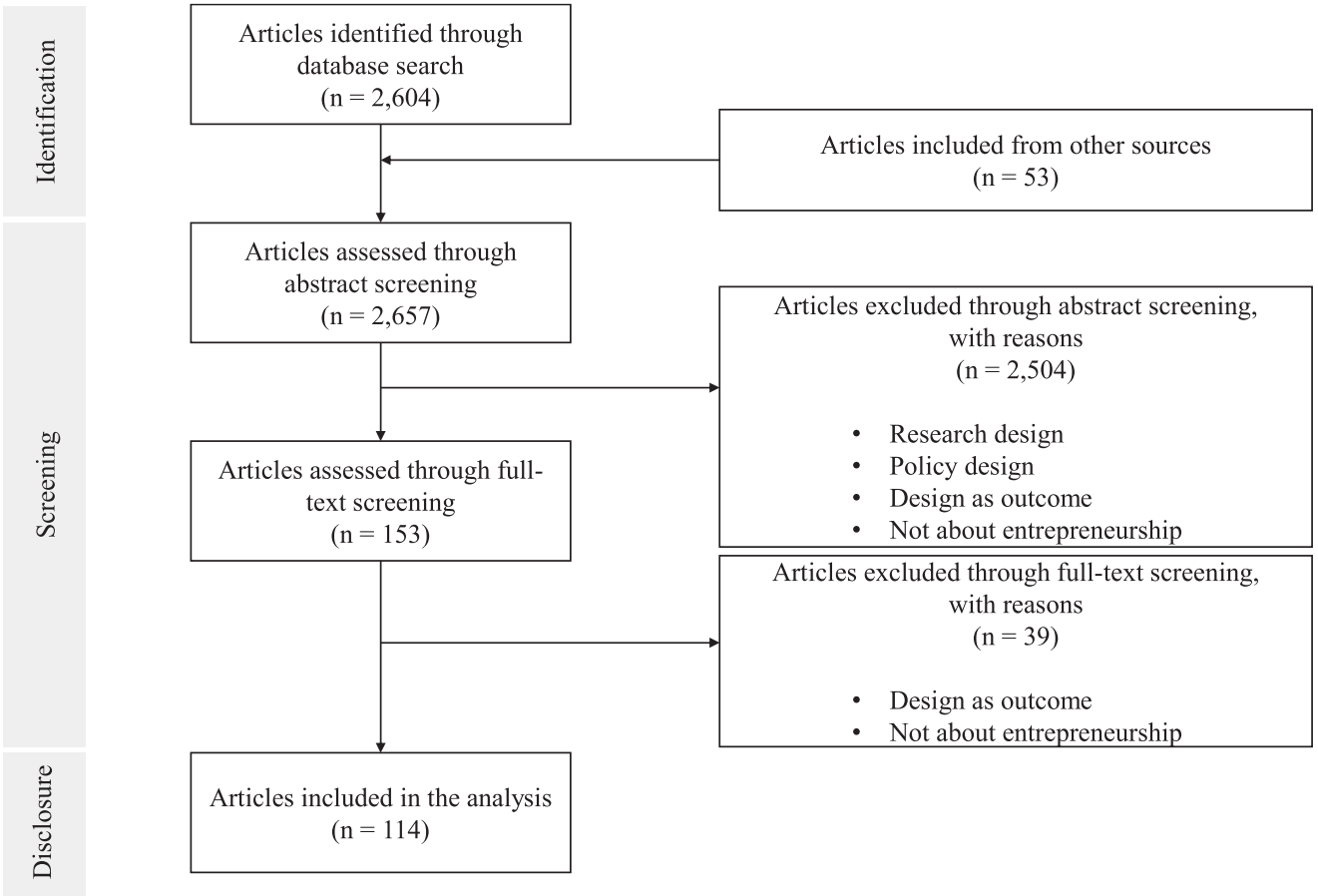

FIGURE 1 Article selection process following Hiebl (2023).

Systematising

In this step, we reviewed and organised the 114 articles in our database (see Table A1 for the detailed list). We began with a descriptive, numerical analysis. Most of the debate has unfolded in the *Journal of Business Venturing Design* and the *Journal of Business Venturing Insights* (see Table A2). This is not surprising, given that these are companion journals introduced by the editors of the *Journal of Business Venturing* as a forum for emerging and growing conversations related to entrepreneurship. The dataset shows that a peak in the number of publications occurred in 2021, when the first issue of the *Journal of Business Venturing Design* was published (see Table A3). Interest in the topic increased from 2017 onwards, with more than five articles published each year.

ANALYSIS

After collecting the articles, we analysed them through an in-depth abductive process (Peirce, 1978). Abduction involves leveraging existing knowledge to identify overarching categories (i.e., philosophical assumptions) from which lower level nuances are derived through coding (i.e., interpretations and themes) (Mosonyi et al., 2020). This abductive mode of analysis leverages an iterative approach (Klag & Langley, 2013) that involves moving back and forth between the data (i.e., the articles) and potential theoretical explanations (Ketokivi & Mantere, 2010).

To do so, we followed a two-step process. First, we read the articles individually to identify the philosophical assumptions underpinning each. The resulting database consisted of a column indicating whether the article adopted an ontological, epistemological, phenomenological, logical or methodological interpretation of design in entrepreneurship. Alongside this, we saved excerpts from each article that motivated its classification. Second, we reviewed all the excerpts showcasing the philosophical assumptions underpinning the approach adopted by each article to code and aggregate them into themes and interpretations.

Identification of philosophical assumptions

Similar to previous review articles (Mosonyi et al., 2020; O'Mahoney, 2016), we began our abductive analysis by categorising the articles according to their philosophical assumptions. Initially, we grouped the articles based on their interpretations of the role of design in entrepreneurship, using categories aligned with the three main philosophical assumptions: ontology, epistemology and methodology (Rabetino et al., 2021). For example, Berglund et al. (2020) highlighted that their intent was to conceptualise entrepreneurship as a form of design, reflecting an interpretation of design as an ontology of entrepreneurship—that is, using design concepts to explain *what entrepreneurship is*. In contrast, Dimov et al. (2023) presented design science as a research method that is particularly well-suited to improving the relevance of entrepreneurship research. Hence, we interpret their understanding of design as an epistemology of entrepreneurship or *how entrepreneurship should be studied*.

Recognising that several articles did not fit within these three categories, we abductively introduced two additional categories, phenomenology and logic, informed by philosophical assumptions reflecting these articles' stances. For example, Garbuio et al. (2018) explained how a set of design methods and tools helps entrepreneurs deal with uncertainty in their endeavours. This phenomenological perspective differs from ontological, epistemological or methodological interpretations of design in entrepreneurship by using design concepts to explain how *individuals experience and interpret reality*.

This combined bottom-up and top-down categorisation process (Grodal et al., 2021) enabled us to leverage prior knowledge and apply an abductive mode of analysis (Mosonyi et al., 2020), ultimately grouping the articles into five clusters based on whether design is viewed as an ontology, epistemology, phenomenology, logic or methodology of entrepreneurship, respectively (Table A1). This abductive process of grouping the articles into clusters required in-depth thematic coding and systematic interpretation of the articles.

Thematic coding and interpretation

This phase involved four distinct steps. First, the first two authors individually read and coded the articles, keeping in mind their underpinning philosophical assumptions to inductively identify themes (B.G. Glaser & Strauss, 1967). Second, they compared their coding and reached a consensus on a shared classification of the themes emerging within each interpretation. Third, the resulting coding was shared with the full author team to align and validate the emerging themes and identify overarching constructs, which we labelled 'interpretations'. Analysing the text, we identified representative quotes that illustrate each article's philosophical stance in terms of its interpretation of design in entrepreneurship. For example, for articles reporting how design science can

TABLE 2 Illustrative excerpts of articles viewing entrepreneurship as design.

Interpretation	**Entrepreneurship as design**	
Definition	Design explains what entrepreneurship is	
Philosophical assumption	Design as an ontology of entrepreneurship	
Themes	**Selected excerpts from included articles**	**References**
Entrepreneurship as a science of the artificial	'If I do my job right, the story will have the happy ending that effectuation, together with Simon's work on the artificial can explain the creation of high growth firms; and also, that several interesting sequels can be developed by envisioning entrepreneurship as a science of the artificial' (Sarasvathy, 2003, p. 205). 'Design is essential to entrepreneurship as it is concerned not primarily with the world as it is, but as it ought to be in terms of better buildings, cars, databases, or medical treatments' (Packard et al., 2021, p. 1).	(Sarasvathy, 2003, 2004b, 2013; Shluzas & Leifer, 2014; Berglund et al., 2018; Garud, 2021; Packard et al., 2021; Nelson & Read, 2024)
Entrepreneurship as a design process	'The opportunity design process can be comprehended as an intentional creative process that stimulates the emergence and evolution of an opportunity' (Ding, 2019, p. 3). 'Several scholars have recently started conceptualizing entrepreneurship as a type of design activity … and proposed using design as a novel mode (approach) for entrepreneurship' (Hyytinen, 2021, p. 1).	(Ding, 2019; Sarooghi et al., 2019; Selden & Fletcher, 2019; De Cock et al., 2020; Auernhammer & Roth, 2021; Hyytinen, 2021; Rozentale & van Baalen, 2021; Dimov & Pisturi, 2023; Elias et al., 2024)
Entrepreneurship as solution design	'The purpose of this paper is to conceptualize entrepreneurship as a form of design […] with special emphasis on how opportunities-as-artifacts iteratively develop at the interface between organized individuals and their environments' (Berglund et al., 2020, p. 826). 'Novel problems are explored for which novel solutions are designed, which may further improve the understanding of the problem and, in turn, provide new insights into solutions and so forth. Arguably, this approach is entirely consistent with an entrepreneurial mindset' (Seckler et al., 2021, p. 8).	(Berglund et al., 2020; De Massis et al., 2021; Ding, 2021; Seckler et al., 2021; Stevenson et al., 2024)

be used as a research method to study entrepreneurship (e.g., Gilsing et al., 2010; Muñoz & Cohen, 2018; A.G.L. Romme & Holmström, 2023), we codified the subtheme *design science as a method for entrepreneurship research*. Together with two other subthemes—*design as a mode of entrepreneurship research* and *prospective enquiry as entrepreneurship research*—we labelled this interpretation *entrepreneurship research as design research*. Finally, we organised the resulting interpretations and subthemes into tables (Cloutier & Ravasi, 2021) to systematise the role of design in entrepreneurship (see Tables 2–6 for more details on the coding and aggregation into themes).

After coding and classifying the articles according to the different philosophical stances, we constructed our interpretive framework, enabling us to systematise the literature on the role of design in the entrepreneurship literature. Our analysis revealed several areas that have received little research attention, which we highlight as potential avenues for future research.

FINDINGS

Taking stock of the literature, we first synthesise and systematise articles along five philosophical assumptions, respectively, viewing (i) design as an *ontology* of entrepreneurship, (ii) design as an *epistemology* of entrepreneurship, (iii) design as a *phenomenology* of entrepreneurship, (iv) design as a *logic* of entrepreneurship and (v) design as a *methodology* of entrepreneurship. These philosophical assumptions underpin five distinct scholarly interpretations of design in entrepreneurship: (i) *entrepreneurship as design*, (ii) *entrepreneurship research as design research*, (iii) *entrepreneurship as a means to design*, (iv) *entrepreneurship by design* and (v) *entrepreneurship through design*. Below, we define each interpretation and detail the sub-themes that emerged from our coding. Figure 2 summarises the different interpretations of design and illustrates how exposing different underpinning philosophical assumptions can illuminate how design in entrepreneurship is viewed (represented as a prism in

TABLE 3 Illustrative excerpts of articles viewing entrepreneurship research as design research.

Interpretation	**Entrepreneurship research as design research**	
Definition	Design explains how to study entrepreneurship	
Philosophical assumption	Design as an epistemology of entrepreneurship	
Themes	**Selected excerpts from included articles**	**References**
Design science as a method for entrepreneurship research	'We introduce the research method of science for design in relation to fostering technology entrepreneurship in regional settings' (Gilsing et al., 2010, p. 13). 'More recently, Simon's initial set of ideas were re-introduced in the discourse on the purpose and nature of management and entrepreneurship studies … which in turn may serve to develop a more inclusive 'design science' perspective on the field of entrepreneurship, also inspired by similar perspectives in adjacent fields' (A.G.L. Romme & Reymen, 2018, p. 2).	(Gilsing et al., 2010; Muñoz & Cohen, 2018; Van Burg & Romme, 2014; A.G.L. Bertrand et al., 2021; Dellermann et al., 2019; Romme & Reymen, 2018; Suh & Chow, 2021; Guerineau et al., 2022; Dimov et al., 2023; Hevner & Gregor, 2022; A.G.L. Romme & Holmström, 2023; Nachyła & Justo, 2024)
Design as a mode of entrepreneurship research	'Our study of the decision-making behaviour of (nascent) technology entrepreneurs is, through the first level of analysis, based on coding the outcome of four days of work on a design theory-based interpretation of the two types of decision making (causal and effectual)' (Agougé et al., 2015, p. 642). 'The real-time exploration of the entrepreneurship phenomenon can be carried out with a view towards formulating new design principles that are robustly grounded in theory' (Futonge Nzembayie & Buckley, 2020, p. 807).	(Agogué et al., 2015; Nzembayie et al., 2019; Futonge Nzembayie & Buckley, 2020; Wyrtki et al., 2021)
Prospective enquiry as entrepreneurship research	'That design science is different because it is concerned with what might work; why something works is either less relevant or lies in the domain of explanatory science' (Pandza & Thorpe, 2010, p. 172). 'Thus, approaching the ecosystem as something still to come into existence means taking a prospective stance. This provides a robust theoretical foundation to study entrepreneurial ecosystem formation with a process view … Methodologically, the ecosystem thereby becomes something to be imagined and created, which others have called a design artefact' (O'Shea et al., 2021, p. 1117).	(Berglund, 2021; Berglund & Dimov, 2023; Hor, 2023; O'Shea et al., 2021; Pandza & Thorpe, 2010; Sarooghi et al., 2021; Zhang & Van Burg, 2020)

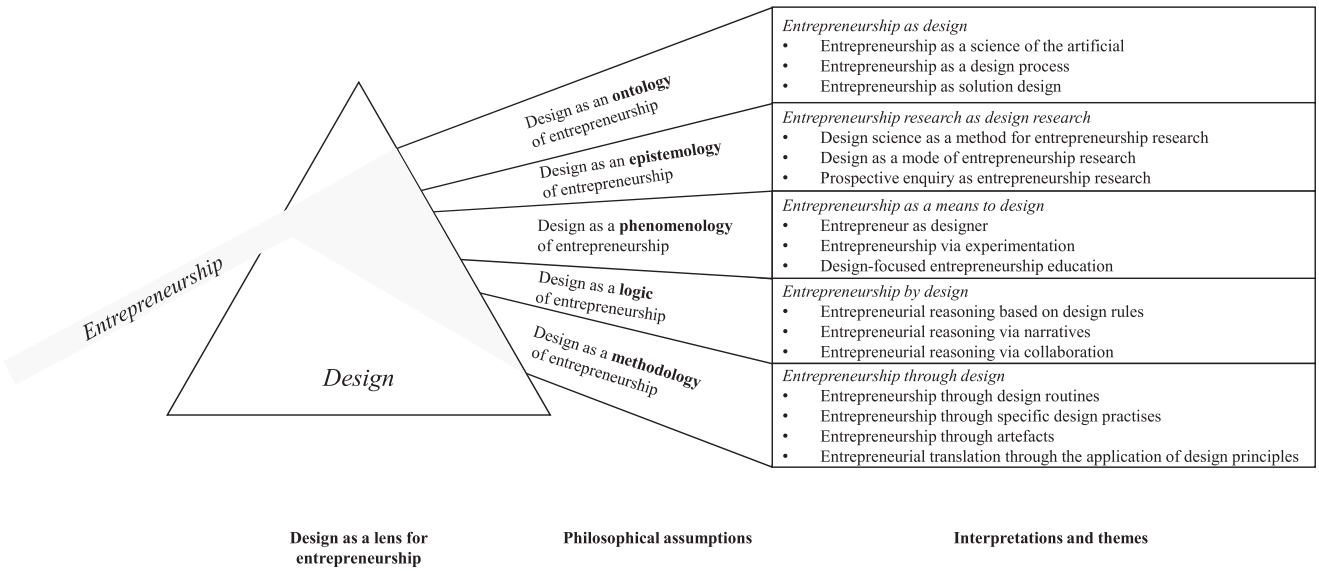

FIGURE 2 A descriptive framework of design in entrepreneurship.

TABLE 4 Illustrative excerpts of articles viewing entrepreneurship as design.

Interpretation	**Entrepreneurship as a means to design**	
Definition	Design explains how individuals *experience* entrepreneurship	
Philosophical assumption	Design as a *phenomenology* of entrepreneurship	
Themes	**Selected excerpts from included articles**	**References**
Entrepreneur as designer	'The role of designers within the manufacturing system is changing, moving from the role of a concept and creative insight provider (for manufacturers) to that of an entrepreneur who is able to market his/her own designed and 'handmade' productions' (Cautela et al., 2014, p. 490). 'To explore the relationship between design thinking and effectuation theory, we conducted in-depth interviews with Australian designer-founders engaged in entrepreneurial innovation' (Klenner et al., 2022, p. 67).	(Cautela et al., 2014; Amit & Zott, 2015; Bianchi & Verganti, 2021; Dimov, 2021; Klenner et al., 2022)
Entrepreneurship via experimentation	'Depending on the results of a round of experimentation, the entrepreneur may revise the hypothesis and run another experiment, harvest the value created through a sale, or abandon the hypothesis and pull the plug' (Sull, 2004, p. 2). 'Useful for business and entrepreneurship education … and for resilience training, because it posits early experimentation and prototyping, and thus, lessons can rapidly be drawn from failure' (González-López et al., 2019, p. 470).	(Sull, 2004; Hsu et al., 2017; González-López et al., 2019; Straker et al., 2021; Selviaridis et al., 2023)
Design-focused entrepreneurship education	'The student designers needed to both understand the concept of entrepreneurship to best design the space and act as entrepreneurs with a real brief set by real people and respond accordingly to their demands, tastes, and logic' (van Horne et al., 2021, p. 66). 'The focus of entrepreneurship education was on the development of non-cognitive skills or soft skills, and in this case, by using design' (Daniel et al., 2017, p. 71).	(Christensen et al., 2023; Daniel et al., 2017; Fassbender et al., 2022; Garbuio et al., 2018; Iandoli, 2023; Lynch et al., 2021; Neck & Greene, 2011; Okudan & Zappe, 2006; Reis et al., 2019; Seet et al., 2018; Tantawy et al., 2021; Tiberius et al., 2023; Van Horne et al., 2021)

the figure). We also present a series of tables to highlight key references and excerpts that illustrate the interpretations and corresponding themes. Elaborating our findings, we highlight a distinct mode of enquiry associated with each design lens adopted by scholars so far.

Design as an ontology of entrepreneurship

Several studies in the entrepreneurship literature have discussed how entrepreneurship can be understood *as* design (Sarasvathy, 2013). These contributions can be synthesised under the view of design as an *ontology* of entrepreneurship that defines the nature and being of *entrepreneurship as design*. In other words, these studies use the concept of design to explain *what entrepreneurship is*—that is, its nature and essence. This ontological interpretation of design in entrepreneurship includes articles that present entrepreneurship as a science of the artificial (Sarasvathy, 2003), as a design process (Sarooghi et al., 2019) and as a solution design mechanism (Ding, 2021).

The first theme stems from the work of Sarasvathy (2003), who built on Simon's (1979) understanding of design as a science of the artificial to introduce the idea of 'design' (as opposed to 'choice') as a means of creating something artificial. Based on this idea, a growing stream of research began conceptualising *entrepreneurship as a science of the artificial* (Packard et al., 2021; Sarasvathy, 2003, 2004b, 2013). These studies understand design as an act of creating 'what ought to be' (Berglund et al., 2018; Garud, 2021) and view entrepreneurship as the construction of a human-made reality (Shluzas & Leifer, 2014).

The second theme emerging from the literature concerns the ontological perspective of *entrepreneurship as a design process* (Auernhammer & Roth, 2021; Rozentale & van Baalen, 2021; Selden & Fletcher, 2019). Indeed, different scholars (e.g., De Cock et al., 2020; Hyytinen, 2021) have presented the entrepreneurial process (e.g., following the Lean Startup methodology) as rooted in problem framing, prototyping and user testing, elements that are typical of design (Auernhammer & Roth, 2021).

TABLE 5 Illustrative excerpts of articles viewing entrepreneurship by design.

Interpretation	**Entrepreneurship by design**	
Definition	Design explains how individuals reason in entrepreneurship	
Philosophical assumption	Design as a logic of entrepreneurship	
Themes	**Selected excerpts from included articles**	**References**
Entrepreneurial reasoning based on design rules	'Scholars have considered how social innovations can enhance both economic and social values by enacting entrepreneurial initiatives … that are grounded by principles of service design' (Chakrabarti & Henneberg, 2023, p. 1). 'Design thinking practices put the cognitive principles of effectuation into practice for entrepreneurial innovation' (Kamble et al., 2023, p. 1).	(Sarasvathy, 2004a; Sarasvathy et al., 2008; P.C. Patel & Jayaram, 2014; Gruber et al., 2015; Gilbert-Saad et al., 2018; Mansoori & Lackéus, 2020; Lehtonen et al., 2022; Chakrabarti & Henneberg, 2023; Kamble et al., 2023; Ilyas et al., 2024)
Entrepreneurial reasoning via narratives	'Novel strategies in the business world abound, they tend to be associated with visionary entrepreneurs who transform mundane products into intelligent devices' (V.P. Rindova & Martins, 2021, p. 813). 'Entrepreneurs deploy narrative and discursive practices—'storytelling'—to render familiar and acceptable goods that were previously unfamiliar' (Khaire, 2019, p. 1).	(V. Khaire, 2019; Rindova et al., 2009; V. Ricciardi et al., 2021; Rindova & Courtney, 2020; V.P. Rindova & Martins, 2021; V.P. Rindova & Martins, 2022)
Entrepreneurial reasoning via collaboration	'Even founders who started selling early said they were too focused on convincing prospects of the new product's merits and not concerned enough with finding out what prospects thought of the idea' (Onyemah et al., 2013, p. 3). 'Social entrepreneurs utilize key principles of design thinking … It provides ways to work iteratively on solutions while simultaneously collaborating with diverse stakeholders' (Mahato et al., 2021, p. 396).	(Mahato et al., 2021; Onyemah et al., 2013; Piterou & Coles, 2021; Sapsed et al., 2007; Vassallo et al., 2023)

Furthermore, researchers have conceptualised entrepreneurship as a future-oriented process aimed at creating novel opportunities (Ding, 2019; Sarooghi et al., 2019). Similarly, the design process has the creation of novelty (e.g., products, services and systems) as its main goal (Dimov & Pisturi, 2023; Hyytinen, 2021).

The third theme that emerged from our analysis presents entrepreneurship as the act of designing something new (Berglund et al., 2020) to fulfil a specific purpose in the environment in which design operates (Ding, 2021). This interpretation is based on an inherent understanding of *entrepreneurship as solution design*. In support of this view, scholars have argued that entrepreneurship lends itself naturally to being interpreted as design. This argument is based on entrepreneurship's pragmatic approach to opportunity creation, which has clear parallels with the creation of design artefacts (Berglund et al., 2020). In this sense, entrepreneurship involves the materialisation of decision-making through design artefacts (e.g., business model canvas) (De Massis et al., 2021). This view emphasises the designer's ability to continuously iterate between different knowledge domains (e.g., explanatory knowledge gained through explaining and describing phenomena, the entrepreneur-designer's existing background knowledge) (Seckler et al., 2021). Table 2 presents illustrative excerpts from the articles viewing *entrepreneurship as design*—that is, interpreting design as an *ontology* of entrepreneurship.

Design as an epistemology of entrepreneurship

A second interpretation of design within the entrepreneurship literature involves the use of design as a research methodology that can enable the study of entrepreneurship and related phenomena (Pandza & Thorpe, 2010). From this perspective, entrepreneurship research is viewed as design research and studied using a design approach. Epistemologically, design is the means to gain knowledge about the phenomenon of entrepreneurship, that is, *how to study entrepreneurship*. Within this interpretation, scholars advocate adopting a design approach to entrepreneurship research based on building and evaluating artefacts (Van Burg & Romme, 2014), observing and intervening in the investigation (Nzembayie et al.,

TABLE 6 Illustrative excerpts of articles viewing design as a methodology of entrepreneurship.

Interpretation	**Entrepreneurship through design**	
Definition	Design explains how entrepreneurs do entrepreneurship	
Philosophical assumption	Design as a methodology of entrepreneurship	
Themes	**Selected excerpts from included articles**	**References**
Entrepreneurship through design routines	'Entrepreneurs were consumed with the notion of getting their first products absolutely perfect, with the very best competitive design, regardless of development time and cost. While robust industrial design takes longer, our data show that the entrepreneur needs to be mindful of pragmatic time-to-market' (Marion & Meyer, 2011, p. 782). 'Design as the act of achieving a particular goal, considering the environmental circumstances. This definition of design as the act of looking forward is in line with the fundamental principles of entrepreneurship' (Magistretti et al., 2023, p. 8).	(Boni et al., 2009; Corner & Wu, 2012; Marion & Meyer, 2011; S. Patel & Mehta, 2017; Vogel, 2017; Hodges & Link, 2019; Magistretti et al., 2023; Santamaria et al., 2024)
Entrepreneurship through specific design practises	'Design-based entrepreneurial processes are driven by an identified opportunity and articulated through two main processes, build and evaluate' (Lopez et al., 2019, p. 2). '[Entrepreneurs] increasingly use design thinking methods to develop novel products, environments, services, and systems' (Ericson, 2022, p. 407).	(Heusinkveld & Reijers, 2009; Yan, 2018; Lopez et al., 2019; Bergman & McMullen, 2020; Newbert et al., 2020; Ericson, 2022; Bao, 2024; Yamauchi & Hjorth, 2024)
Entrepreneurship through artefacts	'An opportunity is a design artifact in the sense that its emergence reflects the purpose and efforts of the entrepreneur as well as the resources and constraints of his or her context' (Dimov, 2020, p. 344). 'Similarly, entrepreneuring scholars broadly acknowledge that creating organization, new business models and opportunities involves the recursive social construction of imagined futures manifest in artifacts' (Thompson & Byrne, 2022, p. 264).	(Baker et al., 2003; Dimov, 2020; V.L. Glaser & Lounsbury, 2021; Thompson & Byrne, 2022; Gruber & Tal, 2024; Palmié et al., 2024)
Entrepreneurial translation through the application of design principles	'Design can be used to support translational processes that connect and align different stakeholders to create value in academic entrepreneurship' (Simeone et al., 2017, p. 59). 'The paper proposes a conceptualization of the arts and design as a translational mechanism to connect and align different stakeholders for value creation dynamics in academic entrepreneurship' (Simeone et al., 2018, p. 435).	(Secundo et al., 2020; Simeone et al., 2017, 2018)

2019) or negotiating and shaping the future (Berglund & Dimov, 2023).

In this interpretation, the first emerging theme views *design science as an entrepreneurship research method*. This growing body of research argues that entrepreneurship studies can benefit from the use of design science as a research method (Muñoz & Cohen, 2018; A.G.L. Romme & Holmström, 2023; Guerineau et al., 2022). Design science involves investigating phenomena and evaluating the results to generate knowledge that can inform entrepreneurial choices (Van Burg & Romme, 2014; A.G.L. Romme & Reymen, 2018). This view addresses the epistemological relationship between entrepreneurship and design by leveraging design principles (Dellermann et al., 2019; Suh & Chow, 2021) and propositions (Bertrand et al., 2021; Gilsing et al., 2010) to design and construct models, systems, artefacts and instantiations to be evaluated and assessed in a real-world context (Dimov et al., 2023; Hevner & Gregor, 2022).

A second emerging theme depicts *design as a mode of entrepreneurship research* (Nzembayie et al., 2019). According to this perspective, entrepreneurship research involves envisioning new ideas by studying the real-world context, participating in the creation of entrepreneurship (Futonge Nzembayie & Buckley, 2020) and designing and modifying solutions as artefacts by studying behaviour in real time (Agogué et al., 2015). Design as a mode of entrepreneurship research is evident in action-based research that follows design steps (e.g., problem formulation, building interventions and learning from testing) as scholars continuously interact with entrepreneurs (Wyrtki et al., 2021).

The third emerging theme presents *prospective enquiry as entrepreneurship research*. This theme is based on the view of design as the creation of things, as opposed to

the making of choices (Berglund, 2021; Pandza & Thorpe, 2010; Zhang & Van Burg, 2020). Drawing on this view, entrepreneurship scholars assume that design can help build the world and the future (Berglund & Dimov, 2023; Sarooghi et al., 2021). Scholars have argued that, according to this view, entrepreneurship needs to be studied 'in the making' (Hor, 2023; O'Shea et al., 2021) rather than retrospectively. Table 3 offers illustrative excerpts from the articles that view *entrepreneurship research as design research*—that is, interpreting design as an *epistemology* of entrepreneurship.

Design as a phenomenology of entrepreneurship

The third philosophical assumption presents design as a phenomenology of entrepreneurship. The articles in this category focus on how individuals *experience* entrepreneurship as the act of designing something. Scholars adopt a phenomenological view of the role of design in explaining entrepreneurship, as phenomenology is concerned with how individuals experience reality, interpreting entrepreneurship as design. In this context, phenomenology denotes the lived experience of entrepreneurship as a means to design (something). This interpretation proposes a view of design based on parallels between the individual experience of entrepreneurship and the nature, mindset and attitude of the designer (Bianchi & Verganti, 2021), the experimental approach to learning (Sull, 2004) and the teaching of design theory and practise (Christensen et al., 2023; Tiberius et al., 2023).

The first theme views the *entrepreneur as designer*. Articles interpreting the individual entrepreneur's experience as that of a designer focus on the development of an entrepreneurial mindset based on a design attitude (e.g., seeing constraints as creative stimuli rather than obstacles) (Amit & Zott, 2015; Cautela et al., 2014). In doing so, the entrepreneur develops visions of the future (Bianchi & Verganti, 2021) and assesses the internal and external environment (Dimov, 2021), leading to a personal reflection on where to invest resources (Klenner et al., 2022).

The second theme is *entrepreneurship via experimentation*. Scholars argue that when navigating uncertainty, as is typical of entrepreneurship (González-López et al., 2019; Selviaridis et al., 2023), entrepreneurs employ experimentation (Hsu et al., 2017; Sull, 2004), a widely adopted design practise that consists of revealing latent assumptions and empirically testing ideas to reduce uncertainty (Straker et al., 2021). In this way, they see the entrepreneurial experience as characterised by the constant testing of ideas in the real world.

The third theme is *design-focused entrepreneurship education*, which includes the possibility of exposing future entrepreneurs to an entrepreneurial mindset through design, design thinking courses (Tantawy et al., 2021) and studio-based teaching (Neck & Greene, 2011; Van Horne et al., 2021). In this research stream, several studies illustrate how a student-centred approach based on a constructivist view helps future entrepreneurs learn by doing, rather than being taught how things should work (Christensen et al., 2023; Fassbender et al., 2022; Okudan & Zappe, 2006). This theme also emerges in studies that show how design thinking is a practical way for students to develop entrepreneurial skills (Daniel et al., 2017; Garbuio et al., 2018; Reis et al., 2019). Indeed, design thinking shares principles and skills with entrepreneurship, such as prototyping, testing, crafting and focusing on challenges (Iandoli, 2023). Table 4; Lynch et al., 2021; Seet et al., 2018 presents illustrative excerpts from articles viewing *entrepreneurship as a means to design*—that is, interpreting design as a *phenomenology* of entrepreneurship.

Design as a logic of entrepreneurship

Another group of studies views design as a logic of entrepreneurship, aiming to explain entrepreneurs' *reasoning*. Articles taking this stance emphasise design as the logic behind entrepreneurial reasoning, that is, entrepreneurship *by* design. When viewed as a logic-based approach, design offers plausible explanations for the reasoning behind entrepreneurial decisions (V. Rindova & Courtney, 2020). Contributions to this view have shown that entrepreneurial reasoning can integrate core design rules and principles, such as user-centredness (Mansoori & Lackéus, 2020), reasoning by storytelling (Khaire, 2019; V. Rindova & Courtney, 2020) and involving target stakeholders in the design process (Mahato et al., 2021).

The first theme to emerge from the analysis of this interpretation is *entrepreneurial reasoning based on design rules*. Scholars have shown that design explains entrepreneurial reasoning by being non-predictive, non-adaptive and non-teleological, based instead on what works in the environment (Sarasvathy 2004a; Sarasvathy et al., 2008; P.C. Kamble et al., 2023; Patel & Jayaram, 2014). Indeed, design rules, such as focusing on value creation for others, can unpack the entrepreneurial logic behind opportunity identification (Gilbert-Saad et al., 2018; Lehtonen et al., 2022; Mansoori & Lackéus, 2020). Furthermore, the service design logic has been recognised as a reasoning approach that helps untrained designers (i.e., entrepreneurs) search for opportunities (Chakrabarti & Henneberg, 2023; Gruber et al., 2015).

The second theme is *entrepreneurial reasoning via narratives*. The articles within this theme concern the logic of shaping intentions by creating narratives as a clear design logic (V. Rindova et al., 2009; V.P. Rindova & Martins, 2022) that applies to entrepreneurs trying to face the uncertainty of the future (V. Rindova & Courtney, 2020). Here, the design logic of abstraction helps entrepreneurs embody ideas into artefacts and give shape to opportunities (Ricciardi et al., 2021; V.P. Rindova & Martins, 2021).

The third theme in this interpretation is *entrepreneurial reasoning via collaboration*. Scholars have shown how a participatory logic, typical of the design profession, can help explain entrepreneurship (Piterou & Coles, 2021; Sapsed et al., 2007). By adopting a logic of reasoning that revolves around human-centredness, different stakeholders and individual designers make collaborative decisions about what to do, just as entrepreneurs consider their customers (Onyemah et al., 2013), investors and other audiences when testing their business ideas and defining the value propositions they want to offer to the market (Mahato et al., 2021; Vassallo et al., 2023). Table 5 summarises illustrative excerpts from the articles reflecting an understanding of *entrepreneurship by design*—that is, interpreting design as a *logic* of entrepreneurship.

Design as a methodology of entrepreneurship

The fifth interpretation of design in the entrepreneurship literature concerns how entrepreneurs *do* entrepreneurship. Articles in this category argue that entrepreneurship is enacted via design practises, tools and principles, that is, entrepreneurship *through* design. In other words, design is a methodology that can be applied in entrepreneurship. Numerous scholars argue that the entrepreneurial process should be carried out using structured ways of designing, such as design thinking (Magistretti et al., 2023) and practises borrowed from the design domain (Sarasvathy, 2004a), such as 'getting out of the building' as a way of interacting with customers (Bergman & McMullen, 2020; Newbert et al., 2020), creating artefacts to promote critical reflection and materialise thoughts (Thompson & Byrne, 2022) and supporting knowledge translation processes (Simeone et al., 2017).

The first theme emerging from our analysis is *entrepreneurship through design routines* whereby entrepreneurs adopt sets of activities and routines native to the design world (Magistretti et al., 2023; Marion & Meyer, 2011). For instance, like designers, entrepreneurs prototype extensively by building minimum viable products (MVPs) that can be tested with customers and others (Corner & Wu, 2012; Santamaria et al., 2024; Vogel, 2017). This group of studies has shed light on how design as a set of routines can help structure entrepreneurial action (Boni et al., 2009; S. Hodges & Link, 2019; Patel & Mehta, 2017).

A second theme focuses on *entrepreneurship through specific design practises*. For example, entrepreneurs mirror user-centred design principles by 'getting out of the building' and interacting with customers (Bergman & McMullen, 2020; Newbert et al., 2020; Yan, 2018) and engage in critical thinking to develop context-relevant solutions (Ericson, 2022; Lopez et al., 2019). Just as design involves learning from first-hand experience, entrepreneurs learn from enactment (Heusinkveld & Reijers, 2009).

The third theme, *entrepreneurship through artefacts*, focuses on the role of artefacts in the entrepreneurial process (Baker et al., 2003) and how they help transform ideas into products that can be introduced to the market (V.L. Glaser & Lounsbury, 2021). By visualising entrepreneurial ideas and structuring their formulation (Thompson & Byrne, 2022), artefacts make opportunities tangible (Dimov, 2020; Gruber & Tal, 2024).

The fourth theme, *entrepreneurial translation through the application of design principles*, focuses on how design principles can be followed to translate the needs of different stakeholders into functional requirements in academic entrepreneurship (i.e., efforts to create new ventures based on academic research) (Simeone et al., 2017). Core tenets of design such as collaboration and visualisation help to align value creation dynamics and translate personal interpretations into group goals in academic entrepreneurial endeavours (Secundo et al., 2020). Table 6; Simeone et al., 2018 provides illustrative excerpts from the articles analysing *entrepreneurship through design*, that is, interpreting design as a *methodology* of entrepreneurship.

Design in entrepreneurship: Five modes of enquiry

Each philosophical assumption we identified in the literature is associated with a distinct research approach: artefact-based enquiry, prospective enquiry, experience-based enquiry, cognition-based enquiry and practise-based enquiry (see Figure 3 for a visual summary). *Artefact-based enquiry* is associated with the view of design as an ontology of entrepreneurship and involves studying entrepreneurial objects as design artefacts, such as prototypes or products, to understand the essence of entrepreneurship (Ding, 2019). *Prospective enquiry* is associated with the view of design as an epistemology of entrepreneurship and involves engaging in speculative research by means of interventions and future-oriented research focused on

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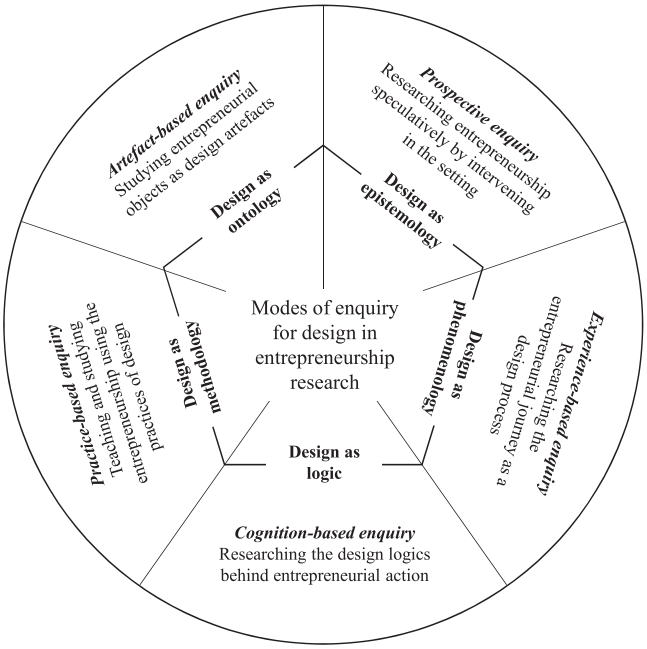

FIGURE 3 Modes of enquiry for research on design in entrepreneurship.

entrepreneurial processes (Van Burg & Romme, 2014). *Experience-based enquiry*, aligned with the view of design as a phenomenology of entrepreneurship, involves exploring the entrepreneurial journey as a design-driven process, investigating how entrepreneurs experience and navigate uncertainty (Bianchi & Verganti, 2021). *Cognition-based enquiry*, reflecting the understanding of design as a logic of entrepreneurship, involves examining the reasoning patterns and design logics underlying entrepreneurial decision-making and action (Mansoori & Lackéus, 2020). Finally, *practise-based enquiry*, rooted in the interpretation of design as a methodology of entrepreneurship, involves examining the application of design practises and tools as both a unit of analysis and a means for understanding entrepreneurial behaviour in research and education (Magistretti et al., 2023).

These five modes of enquiry and the resulting framework synthesise prior research and provide a foundation for future studies, offering actionable pathways to advance the understanding of design in entrepreneurship (A. Rauch, 2020).

DISCUSSION

Our review has shown that scholars have adopted different interpretations of design in entrepreneurship. In turn, they have studied the role of design in entrepreneurship through distinct modes of enquiry, each rooted in a different philosophical assumption. Uncovering the multiplicity of interpretations and modes of enquiry has important implications for scholars and entrepreneurs alike. Consider the example of a research team that seeks to better understand design in the context of a newly established, high-growth artificial intelligence start-up. The researchers could venture into this emerging field in a quest to better understand the nature of technology entrepreneurship, an ontological question motivated by the desire to understand the true essence of organised life. They may conclude that entrepreneurship in their empirical case is really about the design of a new venture that can shape its environment by spearheading the development of AI technology, rather than leveraging the technologies developed by other firms. Once they have adopted this view of entrepreneurship as design, they may contemplate the best way of studying this type of entrepreneurship, which is a question of epistemology. The researchers may focus their attention on new venture creation or pivoting, potentially finding that some entrepreneurs experience them as design processes akin to designing products or services. These considerations relate to the phenomenology of how entrepreneurs experience the world. The researchers may zoom in on the start-up's founders and investigate how they think, that is, what logics they adopt and whether or not these resemble a design logic. Lastly, the research team could seek to understand how the entrepreneurs and other actors in the start-up practise entrepreneurship (e.g., design thinking) and may conceptualise these practises as design practises, thereby providing insights into their methodology. Unearthing and reflecting on these different interpretations shape research enquiries, and in turn, the knowledge scholars are able to produce. Hence, our study not only constitutes an important effort to systematise the current state of the design in entrepreneurship literature but also directs attention to the multiple choices researchers must make when investigating the concept.

In addition to directing scholars' attention, our review responds to growing calls for research on how to advance the field of entrepreneurship studies (Shane & Venkataraman, 2000; A. Rauch, 2020). Our systematic literature review addresses theoretical fragmentation by providing a framework for understanding design's multifaceted role in entrepreneurship. We present a future research agenda that builds on the five interpretations of design and accounts for the five modes of enquiry identified in our review. In doing so, our study provides a solid foundation with the potential to facilitate contributions to existing conversations on design in entrepreneurship and support cumulative theoretical insights (Breslin & Gatrell, 2023). Specifically, our systematic literature review makes three main contributions to the ongoing theoretical debate.

First, we have provided an overview of the multiple interpretations of design in entrepreneurship research. We have uncovered the role of design as an *ontology*,

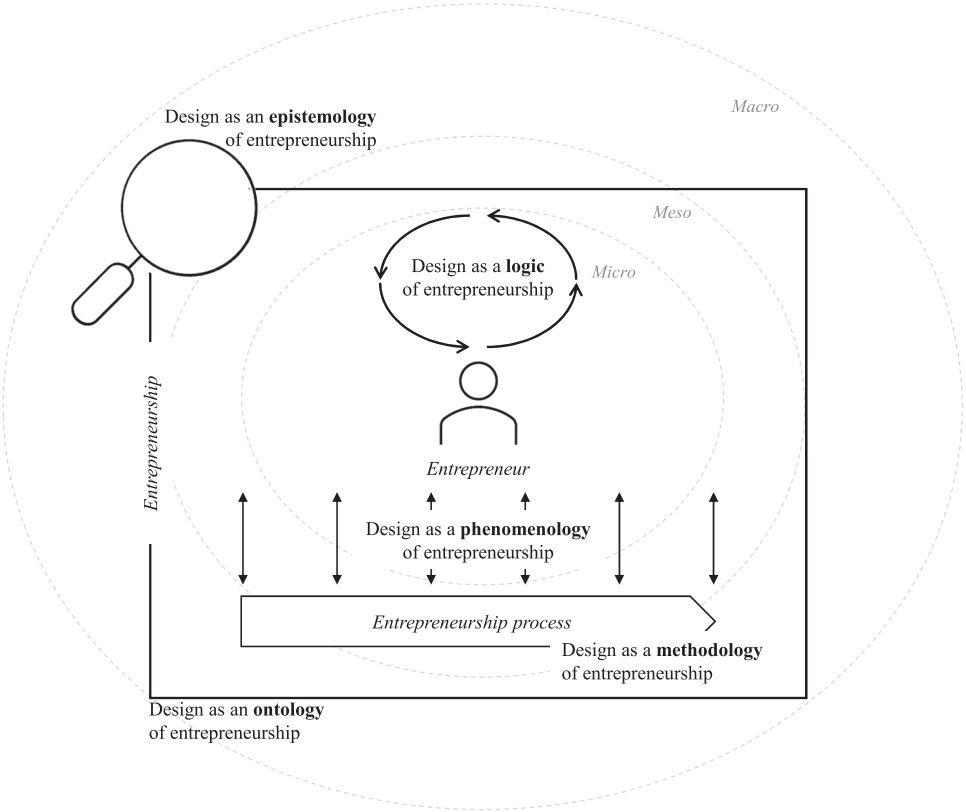

FIGURE 4 An interpretive framework of the multilevel interpretations of design in entrepreneurship.

which clarifies the essence of entrepreneurship (Berglund et al., 2018); an *epistemology*, which guides how researchers study entrepreneurship (van Burg & Romme, 2014); a *phenomenology*, which points to the importance of entrepreneurial processes and experiences (Bianchi & Verganti, 2021; Klenner et al., 2022); a *logic*, informing how entrepreneurs reason and make decisions (Mansoori & Lackéus, 2020); and a *methodology*, referring to how entrepreneurs do entrepreneurship (Ericson, 2022).

By identifying the five interpretations of design and their underpinning philosophical assumptions, we have clarified that design operates at different levels in entrepreneurship research. When adopting an institutional perspective and studying entrepreneurship at the macro level, design relates to what entrepreneurship is (ontology) and how it should be studied (epistemology). When adopting a behavioural perspective of entrepreneurship and studying entrepreneurship at the meso level, design relates to how entrepreneurship should be practised (methodology). When adopting a cognitive perspective on entrepreneurship and viewing entrepreneurship at the micro level, design relates to the human side of entrepreneurship, focusing on reasoning (logic) and lived experiences (phenomenology). Figure 4 illustrates these multilevel considerations of design and visualises their positions when studying entrepreneurship.

Second, our review provides a compelling alternative view of the entrepreneurship literature. Specifically, it demonstrates the philosophical assumptions of researchers that are moving from a perspective focused on competitive advantage and opportunities—typical of an entrepreneurship view rooted in economics and strategy (McMullen & Shepherd, 2006)—towards a project-based and human-centred approach intrinsic to a design perspective (Elsbach & Stigliani, 2018). This perspective shift refocuses research towards adopting a human-centred paradigm, valuing the individual characteristics of entrepreneurs (micro-dimensions) and their lived experiences of entrepreneurial processes and practises, rather than focusing solely on outcomes. This is akin to studies on design that highlight the centrality of a design culture (Gemser et al., 2023) and mindset (Garbuio & Lin, 2021) over the outcomes of design itself. Our framework emphasises the centrality of the individual (i.e., the entrepreneur) and their experience of the entrepreneurial process. Consequently, we theorise that adopting a design lens in entrepreneurship research may lead to a redefinition of entrepreneurship, aligning with a socio-constructivist view of entrepreneurship as the transformation of entrepreneurial artefacts (Berglund et al., 2020). By emphasising the importance of humanity and appreciating the multilevel nature of design, we see clear

potential for shaping future studies of entrepreneurship as both a human endeavour, a discipline that is driven by human agency and a deeply humanistic phenomenon.

Third, by defining the distinct interpretations of design in entrepreneurship and unpacking their various levels of analysis, our framework offers a theoretical foundation (A. Rauch, 2020) for advancing the understanding of how design, as a flexible and adaptable concept, can be applied to advance not only entrepreneurship but also the broader management field. Indeed, the multilevel aspects of design, spanning from the centrality of human experience to ontological considerations of design, are not confined to entrepreneurship. Scholars have already explored the value of adopting design to advance innovation (Verganti, 2008), strategy (Liedtka, 2000) and general management (Gruber et al., 2015; Pandza & Thorpe, 2010). However, current research lacks a clear and integrated perspective on how design, with its various interpretations, can systematically advance management and its subdisciplines. Our interpretive framework addresses this gap and underscores the need to further explore design's interdisciplinary relevance. We envision a future in which scholars will use our research as a practical tool to advance management research, extending and growing well beyond entrepreneurship.

AN AGENDA FOR FUTURE RESEARCH

The research agenda we propose is organised around the five philosophical assumptions and the modes of enquiry we identified in the literature. The aim of this research agenda is to advance cumulative theory building within and beyond the current philosophical assumptions in entrepreneurship (A. Rauch, 2020).

First, we observed the dominance of theoretical work when reviewing research that views design as an ontology (e.g., Berglund et al., 2020; Dimov & Pisturi, 2023). To advance this line of research, we encourage scholars to conduct empirical studies that adopt and substantiate this view with empirical evidence. In particular, empirical approaches, such as longitudinal case studies (Langley et al., 2013), can help uncover how design, as an approach to creating artefacts, overlaps or differs from the entrepreneurial process of crafting opportunities. To consider entrepreneurial action as an act of design, we argue that scholars should adopt artefact-based enquiry in future studies. So far, research has presented entrepreneurial opportunities as artefacts (Berglund et al., 2020), which entrepreneurs, acting as designers of the real world (Dimov, 2024), create and shape through entrepreneurial action. Building on this perspective, the theory of affordances (Hutchby, 2001), which has been applied in previous entrepreneurship studies (Ademi et al., 2023; Autio et al., 2018; Meurer et al., 2022), could offer the theoretical scaffolding to explore how design facilitates the recognition, creation and exploitation of opportunities through the interaction of entrepreneurs, their environment and artefacts. This view also resonates with previous studies in adjacent fields that have explored the prevalence of artefacts in the enactment of strategy-making (e.g., Spee & Jarzabkowski, 2009; Kaplan, 2011; Knight et al., 2018), future-making (Comi & Whyte, 2018) and organizational sensemaking (Stigliani & Ravasi, 2012).

Second, our analysis has shed light on the different terminologies used by scholars adopting an epistemological perspective, ranging from design science (A.G.L. Romme & Reymen, 2018) to action design research (Nzembayie et al., 2019). Based on these considerations, we suggest that scholars should clarify terminology and epistemological differences between seemingly related methods and explore additional research methods that may be of value to the field. To study entrepreneurship as a design science, we argue that researchers need to explore the still unknown implications of adopting design as a prospective mode of enquiry in entrepreneurship. More specifically, a more speculative, imaginative and interventionist perspective (Berglund & Dimov, 2023) could enrich the current understanding of design as a research method in entrepreneurship. Building on this assumption, adopting design science as a research method could advance the economic view of entrepreneurship (McMullen & Shepherd, 2006) by shifting the focus of research towards understanding how entrepreneurial knowledge is generated and adopting a prospective and introspective stance toward entrepreneurial action, rather than focusing solely on how entrepreneurship affects external systems and economic growth. This view is in line with recent calls for more prospective theorising in management (Gümüsay & Reinecke, 2024). Indeed, adopting a design perspective may be one way to address the criticism that management is a prescriptive, as opposed to an explanatory social science (Pandza & Thorpe, 2010).

Third, the literature in which design is viewed as a phenomenology of entrepreneurship is relatively underdeveloped. In a notable exception, Klenner et al. (2022) examined professional designers who ventured into entrepreneurship, focusing on the designers' skills that helped them in their entrepreneurial journeys. However, few researchers have focused on the micro level, such as the psychological aspects or individual traits that influence an entrepreneur's experience of acting and feeling like a designer. To investigate this further, studies adopting diary methods (M. Rauch & Ansari, 2024) could provide insights into the individual-level experiences of entrepreneurs. Furthermore, we lack research that focuses

on the experience of enacting entrepreneurship as a process of design, given its context specificity, the relevance of where and why it happens and who is involved (Welter, 2011). This stream of research aligns with the growing relevance of the experience economy for entrepreneurship (Pine & Gilmore, 2011), emphasising the importance of studying entrepreneurship as a lived process of action and interaction (Venkataraman et al., 2012). This view also resonates with recent calls for more research focusing on experience as a unit of analysis that adopting a design perspective on management unlocks (Gruber et al., 2015).

Fourth, articles viewing design as a logic of entrepreneurship predominantly use design rules to understand reasoning in entrepreneurship. However, within this literature, little is known about the temporal aspects that characterise the use and effectiveness of adopting a design logic in entrepreneurship and entrepreneurial endeavours. Interestingly, only one study in our review addresses the opportunities offered by abductive reasoning in the context of entrepreneurship (Garbuio et al., 2018), but only in relation to educational programmes. Hence, observational and ethnographic studies (Van Maanen, 1988) of contexts in which entrepreneurs think and act as designers could offer insight into entrepreneurial logic 'in action', consistent with entrepreneurship as a discipline of organizations 'in creation' (Katz & Gartner, 1988, p. 492). In this sense, studies on logics have gained traction in entrepreneurship (Cardon et al., 2009) and design has been recognised as a mindset (Elsbach & Stigliani, 2018). To advance our understanding of design as a logic of entrepreneurship, scholars should study how different design logics may better capture entrepreneurial action by adopting a cognition-based mode of enquiry. Doing so could contribute to the development of effectuation theory (Perry et al., 2012; Sarasvathy, 2001) by complementing the entrepreneurial perspective with an understanding of how design logics, including abductive reasoning and iterative decision-making, shape entrepreneurial cognition and guide action under uncertainty. Specifically, scholars might focus on how individual cognition drives the adoption of certain design logics in entrepreneurship and how design logics affect entrepreneurial reasoning.

Fifth, research in which design is interpreted as a methodology of entrepreneurship is one of the most popular and influential streams in the literature. Although this area has received more contributions than others, significant gaps remain regarding the performance implications of design methodologies. Quantitative studies that measure the impact of design practises, such as prototyping or collaborative problem-solving, could greatly enhance our understanding of their efficacy. For example, experimental methods such as randomised controlled trials (e.g., Camuffo et al., 2020) could provide a suitable method to evaluate the relative efficacy of different design-led innovation approaches (e.g., design thinking vs. design-driven innovation) for supporting the success of entrepreneurial endeavours. This view aligns with the broader practise movement in management studies (Vaara & Whittington, 2012) and entrepreneurship (Thompson et al., 2020), emphasising how practises shape entrepreneurial action. Thus, future research could contribute to practise theory (Johannisson, 2011; Thompson et al., 2020) by studying how design practises are enacted in entrepreneurial contexts and how entrepreneurs navigate the interplay of individual agency and socio-material conditions. Table 7 presents a list of proposed research questions organised by philosophical assumption, interpretation and mode of enquiry.

CONCLUSION, IMPLICATIONS AND LIMITATIONS

Our review of the literature on design in entrepreneurship has revealed the coexistence of multiple perspectives grounded in different philosophical assumptions. In this burgeoning literature, several different interpretations have been introduced and multiple conversations have evolved over time. Scholars have used similar or almost indistinguishable terminology to indicate fundamentally different meanings of design. We have highlighted how design has been used as an ontology, an epistemology, a phenomenology, a logic and a methodology of entrepreneurship and have elaborated the resulting interpretations and themes that have emerged in the ongoing debate.

Drawing on our review, we have synthesised extant knowledge into a framework that clarifies the different philosophical assumptions underpinning the understanding of design in the entrepreneurship literature. We have identified five interpretations of design in entrepreneurship—*entrepreneurship as design, entrepreneurship research as design research, entrepreneurship as a means to design, entrepreneurship by design* and *entrepreneurship through design*—to help scholars position their contributions within this evolving domain and approach the study of entrepreneurship through the lens of design with greater intentionality. Building on these five interpretations, we have identified five modes of enquiry in previous studies: *artefact-based, prospective, experience-based, cognition-based* and *practise-based*. Building on this understanding, we have discussed the theoretical contributions and implications of our findings and offered a research agenda to stimulate enquiry at the intersection of design and entrepreneurship. We hope this research agenda will foster cumulative theory-building and advance the scholarly conversation on how design enriches our understanding of entrepreneurship.

TABLE 7 Suggested research questions to advance the design in entrepreneurship literature.

Philosophical assumption	Interpretation		Definition	Suggested research questions
Design as an ontology of entrepreneurship	Literature gaps	Entrepreneurship as design	Entrepreneurship is seen as equivalent to design	• How and why does a design-based approach provide a more comprehensive explanation of entrepreneurship compared to prediction models? • Which design processes and principles best explain the nature of entrepreneurship? • When and why do entrepreneurial endeavours share practises with design? • Which research methods and frameworks are most effective in studying entrepreneurship as a form of design? • How does affordance theory enhance our understanding of entrepreneurial artefacts when adopting a design ontology?
	Mode of enquiry	Artefact-based enquiry	Studying entrepreneurial objects as design artefacts	• What are the most common design artefacts in entrepreneurship, and how do they influence entrepreneurial processes? • How can different artefacts facilitate exploration and exploitation activities in entrepreneurial endeavours? • How can longitudinal case studies of entrepreneurial ventures uncover the role of artefact creation in the processes of opportunity recognition, development and exploitation?
Design as an epistemology of entrepreneurship	Literature gaps	Entrepreneurship research as design research	Entrepreneurship as a field of research is studied using a design approach	• What are the methodological and theoretical differences between design science research and action design research? • How does adopting design as a research method transform the epistemological frameworks for generating and validating entrepreneurial knowledge? • How and why does design-based research differ from other methodological approaches to entrepreneurship research?
	Mode of enquiry	Prospective enquiry	Researching entrepreneurship speculatively by intervening in the setting	• Which innovative experimental design methods can assess the effectiveness of different prospective research approaches in entrepreneurship studies? • How can experimental design methods contribute to the study of entrepreneurial endeavours? • How can scholarly interventions in the research setting help entrepreneurs adopt a design process to tackle grand challenges?

(Continues)

TABLE 7 (Continued)

Philosophical assumption	Interpretation		Definition	Suggested research questions
Design as a phenomenology of entrepreneurship	Literature gaps	Entrepreneurship as a means to design	Entrepreneurship is experienced as the act of designing something	• How do different individual characteristics influence the experience and/or success of entrepreneurs who act as designers? • How do entrepreneurs' lived experiences in the context of the experience economy shape their perceptions, decision-making and interactions? • Which processes enable entrepreneurs to adopt a designer role in creating solutions to grand societal challenges? • How can entrepreneurs and entrepreneurial ventures effectively engage in design practises, such as developing empathy with their target audiences (e.g., customers, beneficiaries, investors)?
	Mode of enquiry	Experience-based enquiry	Researching the entrepreneurial journey as a design process	• How and why can a design process influence the success of entrepreneurial endeavours? • Which strategies can entrepreneurs use to design meaningful entrepreneurial experiences for their employees? • How do designerly practises influence the entrepreneurial experience? • How can diary methodologies provide insights into the psychological traits and lived experiences of entrepreneurs engaging in design-like processes?
Design as a logic of entrepreneurship	Literature gaps	Entrepreneurship by design	Entrepreneurial reasoning follows design logics	• When and how do entrepreneurs use design logics in their entrepreneurial endeavours? • How do temporal dynamics influence design as a logic in entrepreneurial processes? • How does the application of design logics influence the performance and outcomes of entrepreneurial ventures? • How does incorporating abductive reasoning into entrepreneurial frameworks enrich effectuation theory and entrepreneurial cognition? • How can design as a logic support the development of an entrepreneurial mindset in nascent entrepreneurs?
	Mode of enquiry	Cognition-based enquiry	Researching the design logics behind entrepreneurial action	• How can design logics support entrepreneurial cognition, such as entrepreneurial intelligence, judgement and decision-making? • Which design logics underpin entrepreneurial reasoning? • How does adopting a designerly mindset affect entrepreneurial cognition and decision-making processes? • How can ethnographic studies reveal the cognitive mechanisms and design logics driving decision-making in uncertain entrepreneurial contexts?

(Continues)

TABLE 7 (Continued)

Philosophical assumption	Interpretation		Definition	Suggested research questions
Design as a methodology of entrepreneurship	Literature gaps	Entrepreneurship through design	Entrepreneurship is done using design practises, tools and principles	• How do design methodologies, including their principles and tools, affect entrepreneurial performance? • How do design processes and practises enhance legitimacy among investors and external stakeholders? • What design practises and processes can influence the performance of entrepreneurial endeavours? • How can experiment-based studies assess the effects of different design methodologies on the performance and success of entrepreneurial endeavours? • How does adopting a practise-based approach to design methodologies advance practise theory by revealing the socio-material conditions influencing entrepreneurial action?
	Mode of enquiry	Practise-based enquiry	Teaching and studying entrepreneurship using design practises	• What theoretical and practical implications arise from viewing entrepreneurship through a design-as-practise lens? • What aspects of practise theory can help highlight distinctive entrepreneurial dynamics? • What are the processes through which design practises are implemented in new ventures? • How can quantitative studies measure the impact of design practises, such as prototyping and collaborative problem-solving, on entrepreneurial outcomes and venture performance?

Implications for practise

Our review has important implications for entrepreneurial practise and entrepreneurship education. In particular, our review taps into the growing interest in practical approaches that can support entrepreneurs, intrapreneurs or would-be entrepreneurs in developing their entrepreneurial endeavours. Often, these approaches are based on or borrow from design logics, principles, practises and tools. Examples include, among others, design thinking (Brown, 2008), design sprints (Knapp et al., 2016) and the lean startup methodology (Ries, 2011). Our review can help practitioners broaden their understanding of design, highlighting design as a multifaceted concept that can explain and advance entrepreneurship through different lenses and for different purposes. Similarly, educators can benefit from our review by recognising the multiple roles that design can play in entrepreneurship education and by borrowing from the rich repertoire of design methods, practises, principles and logics to support students throughout their learning journeys to broaden their portfolios. Whereas our research highlights the benefits of using design as an analogy for entrepreneurship, it also provides practitioners and educators with a rich, multifaceted understanding of this concept, thereby promoting its effective use in practise.

Limitations

We conducted a systematic literature review of design in entrepreneurship literature. Although we followed a rigorous process of searching, selecting and synthesising extant studies, our research has three main limitations. First, systematic reviews help to organise the literature in a specific field, synthesise existing knowledge and identify gaps for future research. However, they often suffer from limited scope and may fail to capture broader areas of research. In future studies, scholars could address this issue by taking a more integrative approach to reviewing the literature, including how design researchers view entrepreneurship and the relationship between entrepreneurship and design and how design can drive societal transformation and efforts to address grand challenges. Researchers also could employ bibliometric analyses (e.g., document or author co-citation, co-word analysis) to highlight central authors and dominant schools of thought in the ongoing debate and illustrate the evolution of dominant themes and terminologies within the scholarly conversation. Second, we adopted an adjudicative stance in our analysis (Cronin & George, 2023) organising and categorising the literature and highlighting inconsistencies (Breslin & Gatrell, 2023). Scholars could address the limitations of these choices by adopting a redirecting or 'prospector' stance, developing new analogies and metaphors or even merging the entrepreneurship and design literatures and studying their nexus through an integrative review. Finally, our review sheds light on how different philosophical assumptions underlying the literature offer multiple interpretations of design in entrepreneurship. Although we considered this perspective to be the most informative for the purpose of our study, given the pluralism of ongoing conversations within the field, scholars could employ different lenses to reveal new and unexpected gaps and different directions for future research.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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