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Design thinking as sensemaking—Developing a pragmatist theory of practice to (re)introduce sensibility

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Abstract

Design thinking is based on designers' creative ways of working and is defined as a formal method for creative problem solving aimed at fostering innovation by harnessing "the designer's sensibility and methods." The basic premise is that design "thinking" can be extracted and separated from the situated practice of designing in the studio. This approach has given rise to a widely accepted nomenclature for describing design which has improved communication between designers and managers, leading to massive interest in adoption of design thinking in management settings. However, due to a widespread implicit cognitivism in the literature, scholars find it difficult to explain the cultural and experiential qualities of design thinking and it tends to be presented as a fundamentally cognitive, problem-solving activity. We argue that these cognitivist tendencies preclude proper attention to and theorization of designers' creative practice. We contend that the absence of a theory of practice prevents a deeper understanding of the contribution of design thinking to innovation, loses sight of the sensibility on which it relies, and hampers realization of the promise of design thinking. We develop an alternative theoretical perspective, grounded in a pragmatist theory of practice and the studio culture from which designers' creative practice developed. This theoretical perspective allows design thinking to be understood as sensemaking, foregrounds imagination and improvisation as its core activities, and explains how sensibility is developed and nurtured. We review the design thinking literature through this pragmatist lens and discuss the implications for theory and practice of conceptualizing design thinking as sensemaking.

KEYWORDS
design thinking, practice, pragmatism, sensemaking, sensibility

1 | INTRODUCTION

The most frequently cited definition of design thinking in the innovation management literature (Micheli et al., 2019)

considers it "a discipline that uses the designer's *sensibility* and *methods* to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity" (Brown,

2008, p. 86, emphasis added). This definition was proposed by Tim Brown, former CEO of the design firm IDEO and an influential proponent of design thinking who observed also that designers' ways of thinking and working had begun to "move upstream" and were performing a new strategic role that "pulls 'design' out of the studio and unleashes its disruptive, game-changing potential" in the face of complex business and societal challenges which previously had been beyond the purview of professional design (Brown, 2009, p. 7). This new role for design, he argues, indicates a "natural evolution from *design doing* to *design thinking*" which makes design "too important to be left to designers" (Brown, 2009, p. 8 original emphasis). The gist of his argument is that design "thinking" can and should be separated from design "doing" as it happens in the traditional studio context. The underlying assumption is that this kind of "thinking", although grounded in designers' creative ways of working (i.e., the *practice* of designing), can nonetheless be extracted, transferred, adopted, and applied by non-designers in other contexts, and can lead to innovation. Today, this separation of design thinking from the practice of designing in the studio is well established, and design thinking has come to be accepted as a formal *method* for *creative problem solving* which is spreading rapidly across a wide range of organizations (Dell'Era et al., 2020).

However, this separation of design thinking from the practice of designing is problematic from both a theoretical and a practical perspective. Conceptualizations of design thinking depart from descriptions of design thinking practice but scholars complain that these descriptions are poorly connected to existing theory and leave the relationship between practice and innovation unclear (Auernhammer & Roth, Forthcoming; Carlgren et al., 2016b; Magistretti et al., Forthcoming; Micheli et al., 2019). However, recently the contribution of design thinking to innovation has been linked by some scholars to theoretical constructs such as dynamic capabilities (Appleyard et al., 2020; Cousins, 2018; Dong et al., 2016; Kurtmollaiev et al., 2018; Magistretti et al., Forthcoming), experiential learning (Beckman, 2020; Beckman & Barry, 2007; Ben Mahmoud-Jouini et al., 2016; Elsbach & Stigliani, 2018; Hölzle & Rhinow, 2019), organizational culture (Ben Mahmoud-Jouini et al., 2016; Carlgren et al., 2016a; Deserti & Rizzo, 2014; Dunne, 2018; Elsbach & Stigliani, 2018; Wrigley et al., 2020), leadership (Bason & Austin, 2019; Verganti et al., 2020), sensemaking (Cooper et al., 2009; Elsbach & Stigliani, 2018; Liedtka, 2020; Verganti, 2009; Verganti et al., 2020; Wrigley et al., 2020), and aesthetic knowledge (Stephens & Boland, 2014; Stigliani & Ravasi, 2018). These theoretical contributions all point to the importance of design thinkers' situated creative practice as they interact with people and environments. However, with a few

Practitioner points

- Sensibility tends to be neglected in design thinking initiatives, yet it is critical for successful implementation of design thinking.
- Sensibility needs to be recognized as an essential skill and disposition honed and cultivated through practice.
- Organizations seeking to implement design thinking should not rely solely on methods and tools but also:

  ○ Build on current practices and assist coworkers by offering flexible structures and cultivating supporting cultures.
  ○ Nurture sensibility by training improvisation and imagination skills and developing a local design thinking vernacular.
  ○ Involve professional designers in design thinking teams to offer team members the opportunity to learn with professional designers by imitating their sensibility.

notable exceptions (Carlgren et al., 2016b; Liedtka, 2015; Navarro Aguiar, 2014; Verganti et al., 2020), the notion of "practice" itself is rarely given careful consideration in the design thinking literature and is treated as an unproblematic empirical category associated with the application of methods and tools. This leaves the critical notion of "practice" untheorized in the design thinking literature.

From a practical perspective, empirical studies show that design thinking methods may not be so easily separated from the cultural context in which they emerged, and the particular values associated with that context (Elsbach & Stigliani, 2018; Fayard et al., 2017). Studies show that clashes between the values and behaviors implied by design thinking methods and the traditional working values and the behaviors expected in managerial settings hamper the possibility of design thinking projects reaching their full potential (Bason & Austin, 2019; Ben Mahmoud-Jouini et al., 2016; Björklund et al., 2020; Carlgren et al., 2016a; Elsbach & Stigliani, 2018; Kelley & Kelley, 2012; Kupp et al., 2017; Liedtka, 2018; Wrigley et al., 2020). Several scholars have pointed out that the design thinking nomenclature is based on a cognitivist perspective which separates thought from practical action, and inadvertently downplays the role of the body and the senses which are core to the practice of designing (Kimbell, 2011; Lindgaard & Wesselius, 2017; Stephens & Boland, 2014; Wetter-Edman et al., 2018). Many designers lament that design thinking models fail to represent their work (Iskander, 2018), others complain that the concept

of design thinking excludes the real contribution of the designer's professional aesthetic expertise which is built on years of drawing, building, and modeling training (Mount et al., 2020; Tonkinwise, 2011). As indicated by the cultural clashes that arise with the implementation of design thinking, managers and management scholars confined by professionally bound vocabularies, attitudes, and beliefs find it difficult to understand and accommodate critical aspects of the designer's creative practice (Austin et al., 2018; Deserti & Rizzo, 2014).

The notion of designers' *sensibility* to which Brown (2008) alludes in his definition has become lost in the separation between the practice of designing and design thinking, and the translation into a generic management nomenclature (see Micheli et al., 2019). Bason and Austin (2019, p. 86) put it thus: "The truth is that the same aspects of design-thinking methods that make them difficult for employees to handle are also the source of their power." Verganti (2017, pp. 101–102) is more explicit in warning that "removing felt-sense and aesthetics" from design constitutes a design thinking "lobotomy" which makes it digestible for managers but eradicates the creative power of designers' practice, and risks making design thinkers think more like managers in the past than like designers.

It would seem that the potential contribution to innovation of design thinking (its "power" or "game-changing potential") is embedded in the experiential and cultural aspects of designers' creative practice, or their sensibility, but the cognitivist bias in the design thinking literature is unable to account for these aspects. Consequently, designers' "creative practice" remains undertheorized in the design thinking literature which is unhelpful in understanding implementation failures caused by cultural clashes. Thus, a deeper understanding of the nature of designers' creative practice and their sensibility in particular requires an alternative theoretical perspective which: (1) Draws on a *theory of practice* that departs from the theoretical and practical inseparability between practices (what people do), actors (those doing it), and their enactment (how they are doing it) (Jarzabkowski et al., 2016) which would acknowledge the embodied and situated nature of practice; (2) Draws on an *understanding of creativity* that is derived from designers' cultural context and its associated values and beliefs (Ancelin-Bourguignon et al., 2020; Austin et al., 2018; Michlewski, 2008). In this paper we develop such an alternative theoretical perspective. We examine designers' creative practice from the vantage point of studio culture, the designer's enculturation context which is grounded in a pragmatist theory of practice (Dewey, 1934, 1938, 1958; James, 1909).

We argue that the misinterpretation of designers' creative practice, and the cultural tensions between management and design disciplines stem from the different epistemological and educational traditions in which they are rooted (Barry & Meisiek, 2015; Kolb & Kolb, 2005; Rylander, 2009), and the different "paradigms of comprehension" on which they rely and which inevitably guide modes of conceptualization and theorizing (Nayak et al., 2020). Fundamentally, these different traditions reflect different understandings of "design" (Deserti & Rizzo, 2014; Michlewski, 2008). In the management literature which is dominated by a cognitivist paradigm, *design* evokes associations with predictability, generalizability, and stability of results based on common procedures and methods. Among professional designers, *designing* is seen as a situated, embodied practice in line with the pragmatist paradigm which underlines "the freedom to explore and to follow unexpected but promising leads, while keeping the overall vision as subliminal yardstick for the project's success" (Michlewski, 2008, p. 365). These distinctly different approaches to *design* on the one hand and *designing* on the other are underpinned by markedly different underlying values and assumptions about ontology (what is real), epistemology (what is knowable), apparatus or methodology (how we know), and axiology (what we value). Each paradigm predisposes us to think and theorize in particular ways which exclude other ways (Nayak et al., 2020). Therefore, these paradigms cannot be integrated but must be researched separately to extract the distinctive perspectives and potential contributions of each (Rylander Eklund & Simpson, 2020).

The main contribution of this paper is to extend design thinking theory which currently is dominated by a cognitivist understanding of design thinking as problem solving, by developing an alternative theoretical perspective which explains designers' creative practice, explored within the context of studio culture and grounded in a pragmatist paradigm. We contribute to the design thinking literature in three ways. First, we show that sensemaking rather than problem solving is the basic logic underpinning the practice of designing and highlight imagination and improvisation as core activities. Second, we explain designers' sensibility defining it as a skill and disposition developed through practice and supported by studio culture. Third, by developing a pragmatist theory of practice which explains the critical role of sensemaking and sensibility in design thinking we help to clarify the relationship between practice and innovation in design thinking.

The paper is organized as follows. We first clarify the paradox we have identified in the design thinking literature by discussing the roots and consequences of the separation between design thinking and the practice of designing. We describe the philosophical underpinnings of the cognitivist and pragmatist paradigms to explain how their different conceptualizations of practice lead to a respective focus on problem solving and methods versus

sensemaking and sensibility, and further elaborate the notion of sensibility. We propose a definition and a model to explain how sensibility is developed and sustained through practice in the studio. We propose two different but complementary theoretical perspectives—design thinking as problem solving and design thinking as sensemaking—and show how they invite different interpretations of design thinking. Finally, we discuss the implications of our alternative perspective for design thinking theory, research, and practice.

2 | THE PARADOX IN THE DESIGN THINKING LITERATURE

Although the genealogy of the term "design thinking" has for long belonged to design studies, it started to gain traction in management studies in the early 2000s (Johansson-Sköldberg et al., 2013). The design firm IDEO played a central role by providing foundational definitions and proposing a model of design thinking which became widely influential (Micheli et al., 2019, see also Auernhammer & Roth, Forthcoming). Therefore, the nomenclature of "design thinking" as used in the literature, namely as a thought process supported by methods and tools geared toward creative problem solving, can be attributed to IDEO as the firm that spearheaded the export of creative ways of working from the studio to management contexts: "IDEO's own strategy as a firm has reflected the evolution of design thinking itself: although originally focused on product development, it has expanded to include the design of services, strategies, and even educational and other social systems" (Liedtka, 2015, p. 926). In other words, IDEO's simplification and abstraction of its practice into a marketable process description was the result of a shift in strategic focus from selling the outcome of the creative practice of designing (i.e., manufacturable product designs) to selling "design thinking" as an innovation process which can be applied to anything. While the former demanded and relied on mastery of craft skills to explore novel forms, the latter was taken from the management consultant's playbook and presented design thinking as a form of decontextualized and replicable "best practice". There are likely several dynamics at play in this strategic shift (see Irani, 2018) but the framing of design thinking as a generic process caters to the clientele of corporate decision makers for whom "best practice" and the semblance of structure are important for professional legitimacy.

Although this process description has proven marketable, it does not accurately reflect the situated everyday practice of designing at IDEO. Michael Schrage, who studied IDEO, remarked in a review of *The Art of Innovation* (Kelley & Littman, 2001), authored by IDEO's then general

manager and current partner Tom Kelley: "IDEO as an enterprise is far less about the art of innovation than about a culture of innovation" (Schrage, 2001, p. 150). Cultural values, Schrage (2001, p. 150) observes, are at the heart of IDEO's unique innovativeness as an organization, and guide *how* they brainstorm, rapidly prototype, set up, and run their design teams which he characterizes as "the antithesis of a cookie-cutter replicable process". This link between IDEO's culture and its innovativeness was noted also by Amabile et al. (2014) who describe how IDEO "unleashes its creativity" through a "culture of helping". Therefore, although we have little insight into the embodied practice of designing at IDEO, based on these studies we can assume that the "design thinking" which the firm helped popularize is not easily separated from the firm's "design doing" since it is embedded within the firm's studio culture which helps to guide its practices.

This discord between nomenclature and actual practice is reproduced in the design thinking literature. While definitions of design thinking refer to it both as an "idea" and as a "practice", the numerous descriptions in the academic literature of what design thinking "is" lack coherence and are not able to account for what occurs in practice (Carlgren et al., 2016b). While much effort has been expended on developing a nomenclature which defines design thinking as a management concept, it remains an ambiguous and elusive notion as several reviews point out (see e.g., Carlgren et al., 2016b; Hassi & Laakso, 2011; Johansson-Sköldberg et al., 2013; Micheli et al., 2019). At the overall level, these scholars agree that design thinking offers a human-centered approach to problem solving which can be adopted and applied by non-designers in a variety of contexts to foster creativity and innovation. There are multiple different categorizations of the specific characteristics, attributes, and principles of design thinking but there is some consensus (although the labels may vary) about its pillars which are considered to be *empathy*, *abduction*, and *experimentation* (e.g., Dell'Era et al., 2020; Liedtka, 2015; Micheli et al., 2019; Mount et al., 2020; Seidel & Fixson, 2013; Verganti et al., 2020). According to Brown (2009, p. 55) empathy describes "the effort to see the world through the eyes of others, understand the world through their experiences, and feel the world through their emotions". Abduction is generally considered as highlighting the distinctive kind of creative reasoning at the heart of design thinking and is often presented as "the logic of what might be" in contrast to "what is" (induction) and of "what must be" (deduction) (Martin, 2009, p. 27). Experimentation is typically associated with an ethos of curiosity and a learning-by-doing attitude and uses prototyping and visualization to transform an idea into something tangible that can be tested, and which leads to new opportunities through

various iterative cycles (Carlgren et al., 2016b, Dell'Era et al., 2020; Magistretti et al., Forthcoming). These pillars are often described in terms of tools and methods using language borrowed from science and demonstrating the cognitivist tendencies inherent in the development of design thinking into a management concept. At the same time, as mentioned in the introduction, empirical studies investigating design thinking in practice often point to certain aspects of the sensibility which is the focus of this paper.

It would seem that there is a paradox here: while it is commonly acknowledged that the roots of the design thinking nomenclature lie in the professional practice of designing, efforts to conceptualize and describe design thinking tend to depart from a contrived separation in which the notion of "practice" proxies for the application or implementation of an "idea", and does not encompass the experiential and cultural aspects that ultimately underlie the creative practice of designing. We attribute this shortcoming to the cognitivism that both explicitly and implicitly pervades accounts of design thinking. In this paper we consider pragmatism as an alternative paradigm of comprehension which enables more careful consideration of the practice of designing, approaching "practice" as a key concept for the articulation of the experiential and cultural aspects that are largely missing in the extant literature. The cognitivist and pragmatist paradigms present radically distinct theories of experience, culture, creativity, and practice, and thus offer different explanations of the nature and role of creative practices in design thinking. We maintain that both paradigms are foundational for both the "idea" and the "practice" of design thinking, and that both have influenced the design and the design thinking literatures. However, their influence is mostly implicit and blurred in the literature which reduces their explanatory power and possible contributions to theory. In the following section we clarify the philosophical underpinnings of the respective paradigms and develop two different perspectives for interpreting design thinking from their respective vantage points.

3 | COGNITIVISM AND MANAGEMENT CULTURES

The aim in this section is to make explicit the assumptions of cognitivism to understand how design thinking is generally conceived and applied in management settings as a formal method for creative problem solving. The development of this understanding of design thinking can be traced back to the "Design Methods Movement", an early stream of design research focused on methodology which emerged in the 1960s and was inspired by emergent developments in systems theory and cognitive science. This movement was driven by the impetus to "scientize design," and was further galvanized by Herbert Simon's (1969) seminal book, *The Sciences of the Artificial* which was part of Simon's "broader project of unifying the social sciences with problem solving as the glue" (Huppatz, 2015, p. 29). In essence, Simon's cognitivism presupposes a separation between thought and action which privileges decision, and thus basically portrays design as a decision-making activity rooted in logical, analytical thinking aimed at solving problems. Broadly aligning with Simon's project, subsequent canonical characterizations of design were preoccupied with describing in greater detail the distinctive cognitive style of designers (e.g., Cross, 1982, 2006; Lawson, 1980; Rowe, 1987), reinforcing an idea of design as a fundamentally cognitive problem-solving activity. While the field of design studies has certainly evolved, and the Simonian tradition has been challenged notably by Schön's (1983) work on design as reflective practice, Simon (1969) remains a foundational reference in both the design (Huppatz, 2015) and design-related innovation management literature (Micheli et al., 2019; Verganti et al., 2020). Thus, the design thinking nomenclature is imbued with Simon's "logic of design," and its inherent tendency to repress "judgment, intuition, experience, and social interaction" (Huppatz, 2015, p. 29).

In addition to this heritage in cognitive-oriented design research, the development of design thinking into a management concept has as a matter of course been shaped by the management field's own cognitivist tendencies. According to Lorino (2019), Simon's logic and ideas have been so profoundly naturalized within the field of organizational analysis that researchers and managers unconsciously make tacit use of them, rendering cognitivism a widespread but often implicit inclination in management settings. In other words, cognitivist ideas and assumptions tend to silently permeate management cultures. In this light, it might seem inevitable that the way design thinking is studied and promoted by scholars and practitioners of management will incorporate cognitivist principles. Many efforts to articulate design thinking in its experiential and cultural dimensions have been curtailed by the unwitting embrace of cognitivist theories. For instance, Elsbach and Stigliani (2018) found a recursive relationship between use of design thinking tools and development of particular cultures in organizations—an insight that is articulated by recourse to Schein's (1992) work on culture which is rooted in a cognitivist and behaviorist framework closely aligned with Herbert Simon's thinking. This analytic move encounters difficulties in enunciating experiential and cultural qualities that can be discerned properly only through an alternative paradigm of comprehension. Schein's (1992) cultural framework

quintessentially embodies the cognitivist inclinations of management cultures, and thus serves as a convenient and potent illustration of the lack of coherence that has afflicted the managerial literature on design thinking. Hence, in what follows we dissect this framework to clarify some of the philosophical underpinnings of cognitivism and analyze how they shape notions of culture, practice, and creativity (see Table 1).

Schein (1992, p. 10) defines culture as "the accumulated shared learning of a given group". That is, a group or an organization can be said to have a culture if based on a history of shared experience its members learn and develop shared norms, values, and assumptions which demarcate the "right way" to behave and bind them together into a more or less stable, coherent whole. Schein (1992) identifies three levels of culture: artifacts, espoused values, and basic underlying assumptions (see Figure 1). The level of artifacts constitutes the most superficial manifestation of culture and designates all observable objects, behaviors, and practices produced by a group or organization. Beneath the surface is a middle level of consciously held values encompassing the beliefs, norms, and rules of behavior articulated by group members and used to describe their culture, and which predict much of what can be observed at the level of artifacts. The lowest level of underlying assumptions operates below consciousness and is concerned with the deeper learning which allows group members to internalize behavioral, cognitive, and emotional patterns that underlie espoused values. These assumptions constitute the deepest, most fundamental level of culture. In this way Schein (1992) proposes a structuralist model of culture which places the essence of culture in the human mind. This betrays a form of "culturalist mentalism" whereby the social or collective is equated with the mental (Reckwitz, 2002, p. 247).

Schein's (1992) framework (depicted in Figure 1) turns the study of culture into the study of shared unconscious cognitive structures (level of basic assumptions) and intentional operations in consciousness (level of espoused values) considered to be "inward" causes of the "outward" human behavior (level of artifacts). Here *practices* are regarded merely as an "effect" of relatively stable values and assumptions. That is, practical action (what people do) is considered a rendition of subjacent cognitive states (what people think). Accordingly, non-observable mental structures and operations taking place "inside" precede and drive observable bodily practices and activities taking place "outside". This cognitivist framework endows thought with a higher ontological status and pays small importance to the generative role of practical action in the continuous shaping of culture. Indeed, by framing cognition as the mainspring of practice, Schein (1992) ascribes little agency to action (Hernes, 2014, p. 54). Ultimately, the theory of action underlying this perspective assumes a detached mind that is conditioned by cognitive structures and performs thought operations *before* engaging with the world "out there", reproducing dualistic distinctions between thinking and doing, body and mind, individual and collective.

Like Simon (2001), who viewed creativity as a particular kind of mental activity and a subset of problem solving (see also Kaiser, 2019), Schein embraces an understanding of creativity imbued with cognitivist principles. According to Schein (1993, p. 30), a group can raise its level of creativity "through the gradual creation of a shared set of meanings and a 'common' thinking process." This view

TABLE 1 Paradigms of comprehension

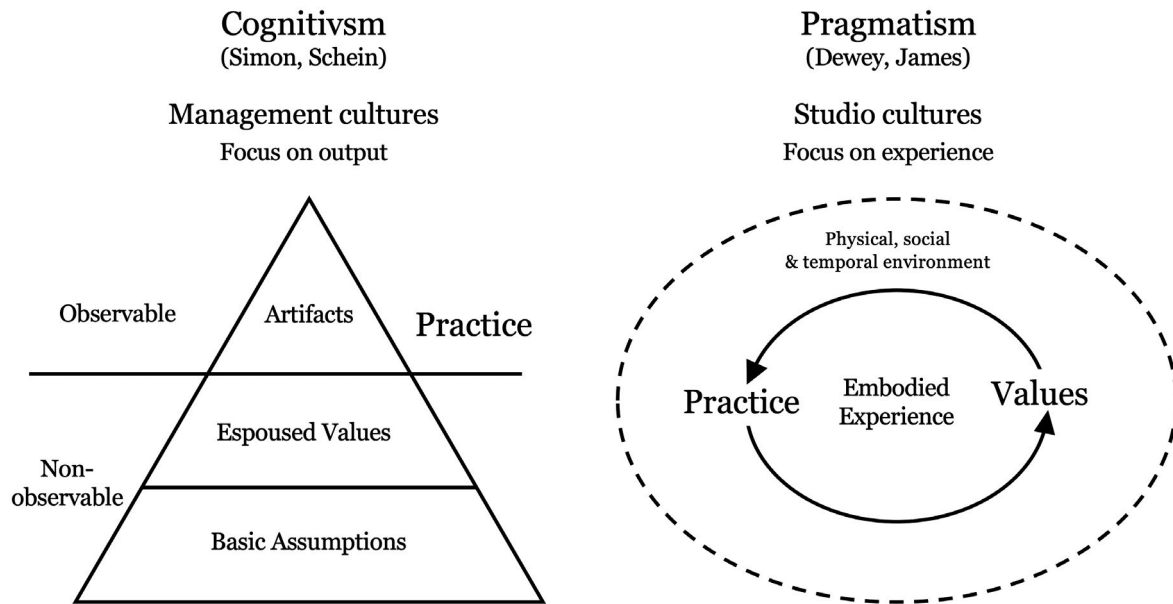| Philosophical underpinnings		
Design as problem solving	Paradigm	*Designing* as sensemaking
Cognitivism (Simon, Schein)	Foundational theory	Pragmatism (Dewey, James)
Entitative, locating reality in substances and artifacts Privileges stability Primacy to *output*	Ontology	Processual, reality is located "in the making" Privileges continuity Primacy to *experience*
Peripheral, agency in cognition Observable Deliberate and causal	Practice	Central, agency in action (making) Embodied and situated Imaginative and improvisational
Shared *accumulated* learning Practices and values are explicit manifestations of implicit assumptions	Culture	Shared *evolving* learning Values and assumptions are enacted and expressed through practice
Related to solving ill-structured problems Emerges from cognitive operations (happens in the mind) Dualist view; separating idea generation from implementation	Creativity	Related to imagining new futures Emerges from embodied, situated, social experience Continuity central; generating and expressing an idea cannot be separated

Cognitivsm
(Simon, Schein)

Management cultures
Focus on output

Pragmatism
(Dewey, James)

Studio cultures
Focus on experience

FIGURE 1 Comparing views of practice and culture

places creativity at the level of cognition, assigning great value to the "sharedness" of mental states as the key to solving problems. Creativity is thus reduced to a matter of cognitive restructuring and alignment in terms of underlying meaning structures and information processes geared towards problem identification and problem solution. This perspective embraces a model of the human mind as a computational machine functioning according to law-like precepts that can be modeled in informational terms (Simon, 2001), thus promoting an understanding of human creativity as fundamentally a computational act (Kaiser, 2019). There is an obvious bias toward stability and control since the ambiguity of creativity in practice is collapsed into a cognitive approach to innovation. Idea generation is separated from implementation in the way the problem is identified and framed before actions to resolve it are undertaken.

When culture is seen as the collective extrapolation of individual mental states (Schein, 1992) and creativity is seen as an essentially computational activity of disembodied thinking operations (Simon, 2001), nurturing a culture of creativity in the organization becomes a matter of expanding the degree of "sharedness" of those mental states and processes through the diffusion of information (see Schein, 1992, p. 301). This is precisely the bias that is evidenced in efforts (scholarly and otherwise) to conceptualize and diffuse design thinking as a disembodied thought process in management settings, including the plethora of corporate programs and courses aimed at achieving an intellectual "transfer" of the design thinking mindset using various tools and methods. These efforts are often characterized by the implicit embrace of a low view of practice which prevents an appreciation of designing as

an embodied, creative activity in which cultivation of sensibility is indispensable. In this sense, the work of Schein (1992) with its reductive notion of practical action is useful to illustrate the tacit cognitivism underlying management cultures, and to explain the recurrent theoretical deficiencies and empirical difficulties present in the design thinking literature related to grappling with the experiential and cultural qualities of the practice of designing.

4 | PRAGMATISM AND STUDIO CULTURES

We next examine the roots of design thinking from a pragmatist paradigm in order to clarify the creative practice of designing and sensibility in a studio culture context. Buchanan (1992) notes that design theory has tended largely toward neo-positivism influenced not least by Herbert Simon and the founders and heirs of the design methods movement but that design practice in the design studio has always tended toward pragmatism. Buchanan (2015) further notes that design practice is distinguished by the principle that focuses on *quality of experience*, sometimes discussed in terms of *design qualities* in design education (Auernhammer & Roth, Forthcoming), in an inquiry focused on *making* (Dixon & French, 2020). John Dewey's theories of inquiry (Dewey, 1938) and aesthetic experience (Dewey, 1934) have been influential sources for design scholars who contend that the practice of designing reflects a pragmatist epistemology (see e.g., Buchanan, 1992, 2015; Dalsgaard, 2014; Dixon, 2019; Melles, 2008; Schön, 1983; Steen, 2013; Wetter-Edman et al., 2018). It is therefore not surprising that design

thinking as a practice which draws on the designer's sensibility and methods, resonates with a pragmatist epistemology. The design thinking literature acknowledges the pragmatist roots of concepts such as experiential learning, aesthetic knowledge, and abduction (e.g., Beckman & Barry, 2007; Kolko, 2010, 2015; Liedtka, 2020; Martin, 2009; Rylander, 2009; Stephens & Boland, 2014; Stigliani & Ravasi, 2018). In addition, Schön's (1983) concept of design as a reflective practice is based on his interpretation of Dewey's theory of inquiry and has been a critical influence on both design and design thinking theories (Micheli et al., 2019).

The philosophical tradition of pragmatism originated in the United States in the late 19th century and calls for reflection on the practical consequences of our beliefs. The classical pragmatists C.S. Peirce, William James, John Dewey and G.H. Mead were inspired by an evolutionary perspective and rejected the Cartesian radical doubt and dualist worldviews which separate mind-matter, thinking-doing, reason-emotion, theory-practice, individual-community, and so forth (Lorino, 2018). Their guiding principle was *continuity* rooted in a processual ontology which views reality as a ceaseless process, as flux and transformation rather than as a stable world of unchanging entities (Nayak & Chia, 2011).

According to pragmatism experience constitutes the foundation for all human activity. For Dewey (1958, p. 8), experience signifies the meeting between the organism and its surroundings, and emphasizes the felt, qualitative immediacy of experience which "recognizes in its primary integrity no division between act and material, subject and object, but contains them both in an unanalyzed totality". It is a continuous process which is situated in a natural and social environment and actively explores and responds to the ambiguities and potentialities of the world. Experience is embodied in the sense that it is conditioned by our biological structures—particularly our motor and sensory organs, as well as the social and physical contexts. It is situated since it takes place in the present although what we pay attention to and how we react are dependent on our past experience and our intentions and desires for the future, and thus dependent on our imagination (Dewey, 1958).

In this tradition, culture is predicated on the pragmatist understanding that our "being in the world" is primarily qualitative rather than cognitive (Alexander, 2013, p. 7). As Figure 1 shows, culture is shared and evolving learning arising from embodied experience via transactions with the physical, social, and temporal environments. To cope with a processual reality that is in constant flux, we develop collective, shared practices allowing us actively to shape a social world required for us to function effectively. From this perspective, practices are not simply "what people do"; rather, they serve to constitute "people" (MacKay et al., 2021). Values, beliefs, and assumptions are performed through "doing" in a never-ending refinement of habits, feelings, and beliefs. Values are not seen as something we "have" as a consequence of our underlying assumptions, rather they are enacted in and through practice. Thus, action manifests what we value based on what we *pay attention to* and how we *make sense* of the world (Dewey, 1939: Hennion, 2015; Weick, 1995).

This action-oriented perspective makes it impossible for an outsider to understand practices by simply "observing" them; it requires experience with the cultural context from which they emerge. By focusing on action in the present, a pragmatist stance allows the drawing together of the habitual and creative aspects of practice while simultaneously transcending the individual and social levels of analysis (Simpson, 2009). It entails a view of creativity that is manifestly different from Simonian cognitivism in which action is a product of cognitive operations. From a pragmatist perspective, action is constitutive of cognition. Reality is seen as an ongoing process through which people try to make sense of and act coherently in the world; thus, creativity is inherent in experience and enacted through practice. As James (1909, p. 264) suggested, such an ontological shift from a focus on the "thing" itself which is stable and confined, to things *in the making*, opens up the range of possibilities of what might become (original emphasis).

Therefore, a pragmatist understanding of designing as a creative practice emphasizes experience and action (making) as the loci of creativity and its dynamic social character (Arjaliès et al., 2013). The notion of abduction is vital for a pragmatist understanding of creativity which arises as a response to uncertain and unanticipated situations that call out changeful action (Arjaliès et al., 2013). The concept of abduction was developed by the founder of pragmatism, Charles S. Peirce, who initially presented it as a logical concept, adding abduction to induction and deduction to be able to account for the source of novelty in scientific inquiry. However, for Peirce whose guiding principle was that our theories must be linked to experience and practice (Misak, 2004), abduction could not be reduced to a mode of inference or "reasoning" but must be seen as a first step in the inquiry. Abduction is triggered by an embodied experience of doubt, fueled by imagination. Indeed, "next after the passion to learn, there is no quality so indispensable to the successful prosecution of science as imagination" (Peirce, 1955, p. 43). Studied through a pragmatist lens, abduction provides a view of creativity as inherent in all action (Joas, 1996), and emerging from embodied, situated social experience. In contemporary organizational contexts which include collaboration and co-creation, abduction is best seen as "a

collective aesthetic experience" for imagining collective futures (Lorino, 2018, p. 219).

The pragmatist paradigm and its emphasis on embodied experience, offers a qualitative lens to explore designer sensibility. The conception of experience as embodied and qualitative emphasizes the central roles of the body and the senses in all forms of inquiry, and of attention to the quality of experience. So, while Simon's view of *design* which focuses on problem solving, is a disembodied process grounded in information processing ("things" are a given in experience and we decide among them), a pragmatist view of the practice of *designing* calls for a focus on sensemaking, emerging from embodied beings with emotions and concerns in complex situations which render it not obvious how to proceed (cf. Cohen, 2007; Verganti et al., 2020). Sensemaking involves structuring the unknown into sensible, sensable events (Weick, 1995), and is about the interplay of action and interpretation in the present moment as opposed to the influence of evaluation and choice (Weick et al., 2005). As Schwandt (2005) notes, while the literal definition of sensemaking is "meaning making" or "feeling making", the word "sense" allows the integration of both cognitive and emotional aspects of the human experience in interaction with the environment. The action of *designing* links sensory systems (sense) with motor action (making), and therefore in practice designing involves "making sense of 'things'" (Krippendorff, 1989) since "things" are in the making.

Sensemaking events are triggered by ambiguity and uncertainty (Weick, 1995), and thus are abductive and inherently creative and imaginative in nature. They "start with chaos" and can be conceived as the experience of being thrown into an ongoing, unknowable, unpredictable streaming of experience in search of answers to the question "what's the story?" (Weick et al., 2005). In such situations *imagination* is essential because it gives form to unknown things (Weick, 2005) and *improvisation* is the necessary modus operandi (Weick et al., 2005). Weick suggests the analogy of improvisation by jazz musicians to understand how sensemaking as opposed to Simon's rational decision-making, is embodied in improvisation as people "act in order to think" (Weick, 1998, p. 547). In improvisation intention is loosely coupled to execution which impels the actor to jump in and see what happens, and to continuously make choices in the moment of action (Weick, 1998).

Table 1 summarizes the philosophical underpinnings of our *design* as problem solving and *designing* as sensemaking paradigms. Both acknowledge culture as critical in providing a disposition to perceive, think, feel, and behave in certain ways; both see shared learning as at the core of cultural development. However, they offer distinctly different directions for theorizing designers' creative

practice. The problem solving paradigm which is underpinned by cognitivism gives primacy to output and locates agency in cognition, and regards practices as separate and observable artifacts. This allows practices to be detached from their cultural origins and the embodied experience of the people performing them. The cultural values and embodied experiences become invisible and thus cannot be theorized which explains the loss of sensibility in the design thinking nomenclature, and the separation of design thinking from the practice of designing. It also explains why the notion of the designer's creative contribution is not explored in the design thinking literature; a cognitivist framing of design thinking as problem solving focuses on the output (the problem to be solved) and overarching process of its achievement which leads to attention to the innovation process at the expense of creativity (cf. Stokes, 2014). The pragmatist paradigm reverses the ontological assumptions underlying cognitivism which privileges actors and entities. It adopts a process ontology which puts embodied practice at the center of design thinking and sees practice as inseparable from its cultural context and designers as enacting their cultural values through practice. This pragmatist paradigm offers a theory of practice which pays specific attention to the quality of experience in embodied social interactions, and thus provides a suitable lens to explain designers' situated embodied creative practice and to explore sensibility. This practice can be understood only within the context of studio culture, the primary setting for the designer's enculturation.

4.1 | Developing sensibility in studio culture

Kolb and Kolb (2005) provide a comparison of the learning cultures in art/design and management education and reveal differences which mirror the above descriptions of the management and studio cultures. Kolb and Kolb (2005, p. 203) conclude that the *locus of learning* differs between the two cultures: "Art education focuses on the learners' inside-out expression; management on outside-in impression". Management education is concerned primarily with problem solving and typically is organized around texts which deliver an authoritative scientific discourse. This text-driven approach contrasts with the experiential learning demonstration-practice-production–critique process in studio pedagogy where the time is spent mostly on the students' expressions of their ideas and skills (Kolb & Kolb, 2005). In management cultures, the focus on formalized methods and tools as critical devices for learning follows as a logical consequence. In studio cultures, the practice of designing is ongoing, situated learning grounded in sensemaking.

Fundamentally, studio-based learning is concerned with open-ended exploration guided by an expressive purpose in which cultivating imagination and expressiveness are core aspects (Dewey, 1934; Eisner, 2002; Kolb & Kolb, 2005). As Yoo et al. (2006, p. 228) put it, design is about "imagining a new world, designing artifacts to put into it, and inspiring others to follow". The focus on "making" in its own right enables this improvisational form of exploration aimed at generating aesthetic expressions of ideas, or imagining new experiential worlds (Eisner, 2002). The outcome is understood as emerging from the actual process of making by "making sense of chaos" through its embrace. In this form of self-directed learning students actively define their own purposes and direct their own activities under their own terms. They eventually become authoritative in their own creative process and learn to trust the emergent process and their judgment of design qualities (Edström, 2008; Farías & Wilkie, 2016; Hennion, 2015).

4.2 | Developing flexible structures to support imagination and improvisation

Studio education is set up to provide a supportive physical, social, and temporal environment for design students to learn how to design *through* experience. With the focus on inside-out expression (imagination) via making (improvisation) learning cannot be guided by predefined goals and formalized methods. Instead, *flexible structures* are put in place embodying the values of the studio culture and supporting the practices that build designer sensibility. Flexible structures include malleable routines, tasks, and arrangements which set the boundaries for action in a specific situation. They exist not to prescribe certain activities or behavior but to enable and facilitate enactment of studio values through practice (Figure 2).

Notably, developing daily habits, routines and rituals over time is one of the main mechanisms of learning and a manifestation of the values, dispositions, and norms of behavior that constitute studio culture (Hetland et al., 2015). Studio assignments are aimed as much at nurturing the individual's aesthetic judgment and disposition as at the acquisition of technical skills (Alexander & Meara, 2019). To encourage an imaginative, exploratory disposition to explore "what will happen if …?" studio assignments are open-ended and focus explicitly on the process of making (Hetland et al., 2015). Students are encouraged to explore the potential of materials, to take risks, and to make mistakes, and as part of their learning to find or develop new techniques. The repetition and continuity of studio assignments lay the groundwork for the ability and disposition to attend to design qualities (Hetland et al., 2015) which are the core of the practice of designing. Since it is difficult to articulate and describe design qualities, studio critiques help students and peers to discuss and debate the quality of the work (Barrett, 2000). By learning how to look at one another's work, hearing how others speak about their work, and verbalizing their ideas about their work designers explore how they and others relate to their own work on emotional and symbolic levels, and identify coherence and integrity in the material expression of their ideas (Hetland et al., 2015).

These flexible structures support the development of sensibility by encouraging its main practices. *Aesthetic experimentation* refers to experimenting with and through different materials and mediums such as paper, wood, digital media, sketching, photography, text, plastic, and clay and enables students to learn to experiment with design qualities (Farías & Wilkie, 2016; Hetland et al., 2015). Aesthetic experimentation integrates bodily senses, thinking, and feeling through the act of "making"', with the aim of achieving the attentive state of mind which has been
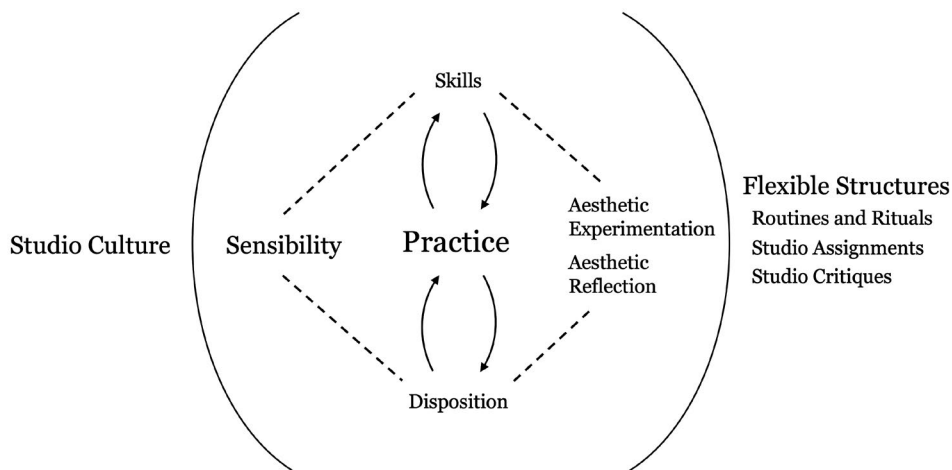

FIGURE 2 Sensibility

described as a "flow" experience (Csikszentmihalyi, 1997). Students learn deliberately to "tune into" feeling and sensory experience through deep engrossment in the present where imagination, physicality, and thought merge in action. The repeatability and conventionality of activities in aesthetic experimentation serve also to address the underlying chaos of the artistic process. The channeling of energy into action through routines and rituals affords a sense of control, and reduces anxiety and stress in the face of uncertainty (Dissanayake, 2000).

Aesthetic reflection allows students to learn how to reflect on the design qualities and expressiveness of their work. Routine studio critiques contribute to a supportive environment for valuing design qualities, learning honestly and openly from one another, and developing a shared "language of qualities", or a design vernacular, intimately connected to "making" and reflecting the values of the designer community (Schön, 1985). The expression of design ideas among members of the design profession in general and in each design studio in particular relies heavily on shared cultural references. Design vernacular used in the practice of designing can only be understood by the members of the community in which it emerged (Eckert & Stacey, 2000).

To conclude, we consider designer *sensibility* as the skills and disposition cultivated during studio education through continuous practice, concerned with design qualities and the open-ended, expressive purpose of imagining new worlds. We have argued that studio pedagogy and culture is grounded in a pragmatist understanding of learning and practice which gives primacy to the role of embodied experience and sustained habits. Designers are trained to pay attention to qualities and (sense)making in the present through aesthetic experimentation and reflection. This allows them to develop the skills and disposition to value, judge, and express qualities (design vernacular), and handle the high levels of uncertainty inherent in the practice of designing.

5 | INTERPRETING DESIGN THINKING AS SENSEMAKING

Each paradigm of comprehension leads to a disposition to interpret the world, and consequently to different ways of theorizing observed phenomena. The implications of the two paradigms for interpreting and theorizing design thinking are summarized in Table 2.

The focus on disembodied cognition and output (problems) explains the disposition to value generic concepts and formal methods in design thinking as problem solving. The cognitivist tradition is concerned with addressing "the flaws of human beings as information processors"

(Liedtka, 2015, p. 930), and design thinkers are understood to achieve the psychological safety necessary to handle the uncertainty inherent in innovation through use of highly formalized structures and methods (Liedtka, 2018, 2020). This notion which is supported by an outside-in view of learning understands formal structures and methods as a kind of "virtual studio" or "proxy" for the prominent role played by the real studio in the formal education of designers (Liedtka, 2020). Based on the cognitivist bias toward stability and control, methods are seen as a means to *tame* the chaos inherent in design thinking practice (Brown, 2008).

In contrast, interpreting design thinking as sensemaking emphasizes imagination and improvisation, and implies a radically different disposition focused on quality of experience. We have seen that the designer's creative practice is geared toward nurturing sensibility. However, design thinking is not design. So, what does sensibility mean for design thinkers? Critically, this perspective recognizes that imagination and improvisation is not something that is extraordinary but rather is central to most people's everyday work as they make sense of new or unexpected situations (Cunha & Clegg, 2018; Mannucci et al., 2021; Weick, 1998). Similarly, the principle of design that focuses on quality of experience apply to all of those served by the organization (Buchanan, 2015). Therefore, the definition of sensibility in the context of designers applies also to design thinkers; skills and dispositions concerned with quality of experience and the open-ended imagining of new worlds. The difference is that typically designers produce expressive objects and design thinkers are often expected to produce abstract concepts (e.g., a product or service concept, a business model, or some form of "solution" or reframing of a "complex problem"). Therefore, while both are concerned with the experiential context of use, their practices work with and through different media; the former focuses primarily on aspects of materiality, the latter primarily on social relations. Accordingly, learning through *making* in the studio is organized around materiality and objects, and focuses specifically on design qualities relating to physical objects or expressiveness. In designing, psychological safety lies in the practice of designing itself and is supported by the studio's flexible structures such as routines and rituals. Design thinking is concerned with quality of experience more generally, and in social interactions specifically. This too requires a disposition which values the principle of quality of experience, nurturing skills for experimenting with and reflecting on qualities. Given the importance of collaboration and social interactions in design thinking, strong social ties and trust in co-workers is particularly important for providing psychological safety in improvisation (Mannucci et al., 2021). This trust is built through sustained practice over

TABLE 2 Theoretical perspectives

Perspectives on design thinking		
Design thinking as problem solving	**Paradigm**	**Design thinking as sensemaking**
Design thinking as methodology for solving complex problems Reflecting management culture	Framing	Design thinking as open-ended exploration to imagine and express new futures Reflecting studio culture
Valuing concepts (design thinking nomenclature) Focus on *methods*; cognition, artifacts, hypothesis	Disposition	Valuing qualities (design thinking vernacular) Focus on *sensibility*; improvisation, senses, imagination
Outside-in *impression* Text-driven approach focusing on problem-solving	Locus of learning	Inside-out *expression* Experiential learning focusing on expression of ideas and skills
Reactive: *Tame* chaos through structure Psychological safety through trust in formal structures and methods	Relationship to uncertainty	Generative: *Embrace* chaos by making in the present Psychological safety through trust in *making* and social ties
Focus on *Methods*	**Design thinking pillars**	**Focus on *Sensibility***
Focus on user experience	Empathy	Focus on embodied experience of the design thinker
Abduction as a form of reasoning for constructing a hypothesis Imagination as cognitive (disembodied)	Abduction	Abduction as a collective aesthetic experience for imagining new futures Imagination as embodied and improvisational
Problem solving as a cognitive act; methods essential Focus on visualization and representation	Experimentation	Sensemaking inherently improvisational and imaginative; sensibility essential Focus on expression and interpretation

time and is supported by flexible structures which allow design thinkers to engage in collective sensemaking, reflection on experience, and development of a shared vernacular to express the quality of their experience in their particular context.

5.1 | Perspectives on the pillars of design thinking

Clarifying the two theoretical perspectives from their respective vantage points helps identify the present and potential theoretical contribution of each perspective. Below we review the literature relevant to the pillars of design thinking to show how the two perspectives lead to fundamentally different interpretations of the design thinking pillars (see Table 2).

As already mentioned, design thinking as problem solving dominates the design thinking nomenclature and has led to the current conceptualization of design thinking as a formal problem-solving method focused on process descriptions, methods, and tools. This cognitivist framing leads to a view of empathy that focuses on capturing user experience which emphasizes field research and user involvement to allow designers to

"draw conclusions about what people want and need" (Kolko, 2015, p. 68). This conceptualization retains a dualist separation between user and design thinker and borrows from scientific language and emphasizes certain methods and tools, such as observation, interviewing, and need finding (e.g., Liedtka, 2020; Meinel et al., 2020; Micheli et al., 2019; Seidel & Fixson, 2013). In design thinking as problem solving, *abduction* is portrayed as a "hypothesis driven process" or a form of "inference" (what might be) in contrast to induction and deduction (what is) as outlined by Martin (2009) and design theorists such as Dorst (2011) and Kolko (2010) (e.g., Björklund et al., 2020; Dell'Era et al., 2020; Knight et al., 2020; Liedtka, 2015; Verganti et al., 2020; Wrigley et al., 2020). The scientific language used presents cognition or reasoning as the essence of design's methodological distinctiveness. Descriptions of *experimentation* in the design thinking nomenclature focuses on tools and methods such as mock-ups, brainstorming, design sprints, roleplay, mapping, and visualizations (Carlgren et al., 2016b; Liedtka, 2011, 2015). The language of representation is used frequently to describe the modeling of ideas and translation of concepts into feasible and testable outcomes; it privileges concreteness and visibility over action and sensibility.

We argue that the design thinking as sensemaking perspective can help us identify the existence and role of design thinker sensibility in the extant literature by inviting a different interpretation of the pillars of design thinking. For instance, Appleyard et al. (2020) studied a team of innovators whose "empathic customer research" consisted of "experienc[ing] the customers' environments and observ[ing] the established ways equipment was being used". This "unique activity led the team to *viscerally understand and value* customers' needs", allowing them to "go *beyond* customer needs'" to *imagine* a "universe of possibilities" (Appleyard et al., 2020, p. 15, emphasis added). These quotes show that empathy is part of the design thinker's embodied experience which is also seen as a source of novelty through imagination. Design thinking as sensemaking thus shifts the focus from the user experience to the experience of the design thinker in relation to empathy. It also points to the embodied and improvisational nature of imagination for exploring "what might be". The literature already assigns importance to imagination, which is often mentioned in parallel to abduction, as design thinkers "imagine solutions" (e.g., Brown, 2008, p. 87; Glen et al., 2014, p. 657), and "programmatically hone imagination into a powerful tool" (Brown, 2009, p. 162). Kolko (2015, p. 71) concludes that "design doesn't solve all problems" but it "works extremely well for imagining the future" implying that imagining futures may be a more appropriate framing. However, what imagination means more concretely in practice is unexplained. Finally, the pragmatist paradigm points to a more profound role of the *act of experimenting*. We noted previously that recent empirical research shows that the experience of using design methods and tools is critical for design thinkers' sensemaking and affects their norms and values (Elsbach & Stigliani, 2018). Engagement in design thinking practice shapes design thinkers' lived experience as innovators; "It shapes them as they create designs that mold the experiences of users" (Liedtka, 2020, p. 58). This transformation requires a leap of faith and willingness to improvise: "You have to jump to the unknown, explore, tolerate risks... you have to trust your intuition" (Björklund et al., 2020, p. 5).

Table 2 offers two complementary theoretical perspectives on design thinking theory. Our review of the pillars of design thinking from each perspective shows that both are present in the literature. However, the cognitivist framing of design thinking obscures the role of sensibility in design thinking theory by excluding embodied experience and detaching practice from its cultural context. Design thinking as sensemaking provides an alternative theoretical perspective for theorizing practice and sensibility.

6 | IMPLICATIONS FOR THEORY AND PRACTICE

This article helps to clarify the relationship between practice and innovation in design thinking by developing a pragmatist theory of practice which explains design thinkers' creative practice. Our alternative perspective entails a shift in focus in relation to how the "game changing potential" of design thinking is "unleashed" (Brown, 2009); it places agency in action rather than cognition, highlights the embodied and situated character of design thinking and identifies the locus of change as *practice* rather than externalized methods, processes, and problems. This shift has profound implications and opens new directions for design thinking theory, research, and practice.

6.1 | Implications for theory

First, we call attention to the need for a *practice theory* in the design thinking literature. For many decades, the notion of practice has been the subject of wider debates in the social sciences, leading to a "practice turn" in social theory (see Schatzki et al., 2001; Reckwitz, 2002) and management theory (e.g., Jarzabkowski & Spee, 2009; MacKay et al., 2021; Miettinen et al., 2009; Simpson, 2009; Seidl & Whittington, 2014). However, despite the centrality of practice in design thinking theory, practice theory is virtually absent in the design thinking nomenclature. While there is much diversity among practice theories, they generally emphasize the processual nature of practice (Simpson, 2009), and the idea that practices are situated and embodied which contrasts with the cognitivist view which positions practice as a consequence of decision-making (Lorino, 2019). Within this practice turn, pragmatism is seen as offering new ways to engage with practice to emphasize its creative and emergent character and avoid problematic separations between the individual and the collective, and between thinking and doing (Simpson, 2009). We argue that our pragmatist perspective which considers design thinking as sensemaking is particularly well suited to explaining designers' sensibility. Our article merely scratches the surface of practice theory but we hope it will inspire further research using practice theory to develop design thinking theory.

Second, we have highlighted the need for a review of the experiential and cultural aspects of design thinking practice through an alternative theoretical paradigm. Several theoretical contributions show the importance of practice in design thinking, and particularly its experiential and cultural aspects (e.g., Elsbach & Stigliani, 2018). However, the cognitivist framing of design thinking and the specific theories invoked prevent a deeper understanding of

these aspects. For example, some scholars show that the contribution of design thinking to innovation lies in its lower-level context-specific organizational aspects (microfoundations) which underpin dynamic capabilities (Appleyard et al., 2020; Cousins, 2018; Dong et al., 2016; Kurtmollaiev et al., 2018; Magistretti et al., Forthcoming). Some studies show that design thinking practices strengthen the capacity for *sensing* opportunities such as customers' latent needs (Kurtmollaiev et al., 2018), and to generate new ideas and possibilities (Appleyard et al., 2020; Dong et al., 2016). However, since the dynamic capabilities framework relies on a cognitivist understanding of capabilities (Nayak et al., 2020), this sensing capability tends to be described as "cognitive acts'" such as "generating and testing hypothesis" (Dong et al., 2016), "careful observation", "needs discovery," and "reframing" (Appleyard et al., 2020). A cognitivist understanding raises problems related to articulating the tacit, nonanalytic, experiential basis of empathy, imagination, and aesthetic experimentation for example. This is because the microfoundations are rooted in tacitly shared and finely honed sensitivities and dispositions which precede cognitive representation, and which typically are disseminated and shared through social and embodied practices rather than formal instructions or templates (Nayak et al., 2020). To theorize these sensitivities and dispositions requires an alternative perspective such as our proposed pragmatist paradigm focused on sensemaking and sensibility. We invite developments of our and other theoretical perspectives that highlight the sensitivities and dispositions underpinning dynamic capabilities.

We find problems also with the way that theoretical constructs such as experiential learning and culture are treated within the design thinking literature. Experiential learning is based on a pragmatist view of learning which departs from Dewey's focus on experience as an organizing focus for learning, on the pursuit of an open-ended purpose and which relies on democratic values and dialogue (Kolb, 2015). When adapted to design thinking framed as problem solving, experiential learning tends to be presented in terms of a process involving a series of specific steps. Although studies have contributed significantly to our understanding of design thinking and acknowledge the pragmatist roots of experiential learning, its ontological underpinnings and their radical implications are rarely addressed, and therefore go unnoticed. For example, in her theory of design thinking as a social technology, Liedtka (2020) refers specifically to Dewey to ground her view of experiential learning which she considers key to realizing the value of design thinking. However, the cognitivist framing of design thinking as "a hypothesis-driven process" concerned with "individual cognition and decision-making" (Liedtka, 2015) has

led to the idea that highly formalized structures and methods are required to provide the psychological safety that enables successful implementation (Liedtka, 2020). Elsbach and Stigliani (2018, p. 2291) exploit pragmatist-informed notions of experiential learning and reflective practice to underscore "the experiential nature of design thinking tools and cultures". They posit that the experience of using design thinking tools contributes to changing the organizational culture. However, their reliance on Schein's cultural framework confines their analysis of cultural change and experiential learning to cognitivist categories and processes which emphasize tools and problem solving and preclude an understanding of the noncognitive dimensions of experience which are foundational to designing. We believe that separating these two theoretical perspectives and exploring experiential learning from a pragmatist paradigm will lead to new insights and different conclusions. We suggest that there is potential for design thinking scholars to engage more deeply with the pragmatist foundations of constructs such as experiential learning and to explore their theoretical and practical implications.

Third, we define the part played by sensemaking in design thinking and highlight its imaginative and improvisational character and the critical role of embodied experience. The importance of sensemaking has been recognized in the design thinking literature but typically is referred to in relation to specific tools or methods or as a cognitive meaning-making activity which gives priority to the symbolic dimensions of sensemaking (Cooper et al., 2009; Elsbach & Stigliani, 2018; Liedtka, 2015, 2020; Micheli et al., 2019; Verganti, 2009; Verganti et al., 2020; Wrigley et al., 2020). By examining the pragmatist roots of the concept of sensemaking we argue that it offers a fundamentally different logic from problem solving and opens new ways of conceptualizing design thinking. Examining sensemaking from a pragmatist paradigm allows exploration of its experiential nature and the implications of the processual ontology which underpins it (Elkjaer & Simpson, 2011). While it might seem obvious that we experience life and make sense of our surroundings in sensory as well as intellectual ways, little work has been done to explore the embodied, sensory aspects inherent in sensemaking (Cunliffe & Coupland, 2012; Stigliani & Ravasi, 2012; Weick, 1995; Weick et al., 2005). The concept of sensibility provides an opportunity to provide deeper insights into these less well-understood aspects of sensemaking and a starting point for research on the experiential, imaginative, and improvisational aspects of sensemaking. We encourage design thinking scholars to continue to explore the role of sensibility in sensemaking.

Finally, we highlight the need for research methods that focus on specific situations of practice in design

thinking. The emphasis on embodied and situated practice calls for longitudinal qualitative research (e.g., in-depth ethnographic research) showing how design thinkers exercise their imagination, improvise in situ, and develop their sensibility over time. From a processual perspective this requires the researcher to have a certain sensibility to draw on all the senses and appreciate the spatial and temporal situatedness of organizational practices (van Hulst et al., 2017). A focus on embodied experience calls also for the development of "sensual methodologies" to study the aesthetic experiences of such practices (Warren, 2008) and experiment with alternative ways of writing about them (Satama, 2020), foregrounding the "felt sense" experienced by participants in a manner that overcomes the aesthetic muteness which often characterizes management cultures (Taylor, 2002).

6.2 | Implications for practice

We argue that both design thinking as problem solving and design thinking as sensemaking are important for theorizing design thinking, and that both play important and somewhat complementary roles in the implementation of design thinking. Design thinking as problem solving is essential for *disseminating* design thinking in management cultures and is a prerequisite for its massive uptake. Its focus on generic processes and methods has enabled an understanding of design thinking from a managerial and organizational perspective, facilitated planning and communication across organizations, and helped position design thinking within or in relation to organizational innovation processes. However, it is not suited to examining and providing support for the creative practice at the heart of *realization* of the promise of design thinking. In contrast, design thinking as sensemaking, focused on situated embodied practice and sensibility is difficult to articulate and communicate but offers important insights to support design thinkers' creative practice. We summarize these insights in terms of the implementation process, sensibility training, and the role of professional designers.

6.2.1 | Implementation process: Start from practice and offer flexible structures

From a pragmatist perspective, reality is constituted and cultural dispositions are shaped through practice. Since practices are embodied and situated, they are tied to their local physical and social contexts. Therefore, design thinking implementation strategies are best explored as *immanent* in established social practices, that is departing from the latent tendencies inherent in practices

(MacKay et al., 2021). These tendencies can be realized if the right support is provided. Thus, the challenge for managers implementing design thinking is not to offer plans, processes, or methods but to provide the appropriate supportive social, physical, and temporal environment and flexible structures which allow co-workers to develop and refine the improvisational and imaginative capacities inherent in their practices.

6.2.2 | Training design thinker sensibility: Take inspiration from improvisational theater and drama

Traditional competency development models are based on structured, individualized learning processes, and therefore are unlikely to apply to the development of sensibility which is dependent on imagination and improvisation and thus is unstructured, uncertain, social, and rooted in interactions with others and with the social environment more broadly (Mannucci et al., 2021). Given the focus on social relations and imagination in design thinking we suggest that theater and drama improvisations are particularly helpful to train design thinkers' sensibility. They are an extreme form of collaboration which requires egalitarian practices; they have no single formal leader—responsibility for the outcome is shared. Critically, the media for expressing meaning (words, posture, facial expressions, tones of voice) are the same as those used in organizations (Vera & Crossan, 2004). Improvisational theater and drama are based on flexible structures similar to studio pedagogy but with the emphasis on social relations to allow for creative action and expression in the situation at hand. For example, exercises based on improvisation (e.g., roleplay, games, simulation, drama) in management contexts can help organizational members "stay with their senses" in sensemaking (Springborg, 2010), by forcing them to pay attention to the quality of experience and remain in the present moment (Taylor & Ladkin, 2014), and refine their ability to express themselves (Corsun et al., 2006). Theater improvisation uses techniques which support a collaborative creative process that is based on agreement and requires each improviser to accept, support, and enhance the ideas expressed by others and be attentive to one another (Vera & Crossan, 2004). The sensibility skills developed through dramatic improvisation are directly aligned to the kind of self-organized and collaborative forms of leadership required for design thinking (Gagnon et al., 2012). Providing time and space for these exercises allows design thinkers to develop shared rituals and routines over time, develop a shared design thinking vernacular, and eventually become skilled design thinking practitioners.

6.2.3 | Role of designers: Learn with designers

The call to start from practice and engage in experiential learning and improvisation to nurture sensibility points to the important role of professional designers with studio training. Several studies find that the ethos of the studio culture remains with professional designers who continue to enact the artistic values of expressiveness and originality, reflecting an open-ended purpose (Andriopoulos & Lewis, 2010; Boland et al., 2008; Elsbach, 2009; Kornberger et al., 2011; Michlewski, 2008). Training sensibility typically starts with imitation. As Mannucci et al. (2021) show, novices develop their improvisation skills first by imitation (mirroring the actions of others). Only after mastering these imitation skills can they develop the skills and psychological safety required to acquire the kind of generative improvisational skills typically associated with creative designers. Professional designers can provide design thinkers with an opportunity to learn *with* them as they enact their sensibility for example through immersion in a user context or through experimentation with and reflection on qualities. Learning sensibility requires sustained practice over time, and both flexible structures and opportunities to learn from skilled practitioners are essential to support this learning. For this reason, studios initially were based on the master-apprentice learning model. Therefore, ideally each design thinking team should involve a skilled designer. However, it is also important to understand and respect the limits of design thinking. Non-designers can learn to become more creative and develop their sensibility but that does not make them designers. Designers are primarily experts in sensibility in relation to their specific material expertise (products, interfaces, etc.), and their main contribution lies not in the practice itself but in the outcome of that expressive practice. Design thinkers who have developed their own sensibility are better placed to understand and value the aesthetic expertise and possible contribution of professional designers.

CONFICT OF INTEREST

The authors declare that they have no conflict of interest.

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The authors have read and agreed to the Committee on Publication Ethics (COPE) international standards for authors.

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