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THE DISTINCT DOMAIN OF (DESIGN SCIENCE OF) ENTREPRENEURSHIP

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ABSTRACT

In understanding entrepreneurship, we could seek to explain individual action by losing sight of its outcomes; or we could seek to explain outcomes by losing sight of action. This paper directs attention to the acting entrepreneur, seeking to make his or her action intelligible. It articulates the intentional space of action (opportunity) as a holistic triangle of person, venture concept, and theory of change. This sets the stage for design science of entrepreneurship as “entering” the opportunity triangle and aiming to improve its art and skills. It consists of the activities of framing, modelling, and performing, whose interplay creates the skeleton of entrepreneurial inquiry.

INTRODUCTION

In the mid-1970s, a man hunted for a ticket for Spain’s National Lottery with 48 as its last two digits. He found a ticket, bought it, and won the lottery afterwards. When asked why he had been so intent on finding this particular number on the ticket, he replied, “I dreamt of the number 7 for seven straight nights. And 7 times 7 is 48.”¹

This story demonstrates two points. First, personal beliefs and intentions have causal effects on actions and are thus indispensable for explaining why the man acted as he did and how he ended in possession of the winning ticket. Second, they have no necessary role in explaining the broader outcomes of those actions, such as winning the lottery. We might say that the man underwent a journey from the initial idea of his dream to purchasing the ticket. He could have bought a different ticket had he gone to different places. And a different ticket could have been drawn to win the lottery. In a parallel with the open-ended nature of an

¹ Story as told by Mauboussin (2012).

entrepreneurial journey, the only constant in that journey was the man's intent (McMullen and Dimov, 2013). As external observers, we could simply state that the man had a particular intent and it helped make his actions intelligible; or we could evaluate the intent directly and conclude it had been based on the wrong premise.

The paper by Venkataraman (1997) marked a watershed moment in entrepreneurship research. It marked off the domain of entrepreneurship research from the domains of economics, strategy, and psychology, drawing attention to the fact that those domains did not look to the discontinuity of the future and thus could not explain where entrepreneurial success came from. It posited the powerful imagery of a nexus between enterprising individuals and lucrative opportunities to be discovered, created or exploited. Fundamental to this view is the idea that entrepreneurship is driven by human initiative, but explaining its outcomes requires broader considerations. While the linguistic description of opportunities as discovered and created has prompted scholars to seek direct grasp of their nature and premises (e.g., Davidsson, 2015; Ramoglou and Tsang, 2016), this has come at the expense of losing sight of the action space of the entrepreneur (Dimov, 2011; 2020a), which requires privileging the action-theoretic level of analysis. In other words, we could seek to explain action by losing sight of its outcomes; or we could seek to explain outcomes by losing sight of action.

This paper directs attention to the acting entrepreneur, seeking to make his or her action intelligible, while acknowledging that the ultimate outcomes to entrepreneurship – its success or failure in the broader social realm – lies beyond the scope of the entrepreneur's control and is thus part of a different explanatory account. Making action intelligible is a fundamental premise for a design science of entrepreneurship (Berglund, Bousfiha, and Mansoori, 2020; Dimov, 2016) in that it enables evaluation, reflection, and learning. It is essential that a model of action matches the way in which action could be deliberated.

The starting point for the paper are several nested and largely intuitive premises about

entrepreneurship that enable us to identify and zoom into an area of theoretical focus. First, entrepreneurship implies a person. It is something done by people, a human activity. While every entrepreneur is a person, not every person is an entrepreneur. And someone who is deemed to be an entrepreneur is not such all the time. Second, a person is deemed an entrepreneur not by virtue of who s/he is, but by virtue of what s/he does. We thus speak of entrepreneurship as the undertaking of entrepreneurial action or as the broader activity that such actions comprise. Third, an action is deemed entrepreneurial not by virtue of its performativity – i.e., what a person does or says – but by virtue of its meaning in the sense of what the action is about. Finally, a meaning becomes entrepreneurial when it reflects a certain intended future state of affairs. It is apt to use the term ‘opportunity’ here in the sense of something that the acting entrepreneur articulates as a broader motive for his or her actions. This closes the circle of person-action-meaning by looping meaning back to the person. I will explore this loop in the next section by examining first the link between meaning and action and then the link between action and person.

MEANING, ACTION, PERSON

Meaning and action

I will explore first the relationship between meaning and action. For this, I will use a seminal idea by Vygotsky (1978) that the use of signs (symbols) acts as a mediator of behavioural acts and thus enables humans to exert psychological control over their behaviour from the outside. In this way, the control of action moves away from biological development towards a culture-based psychological process. Signs can act as artificial (i.e., man-made) stimuli in a given situation and can serve as immediate causes of behaviour.

This happens through the role of signs as conduits for meaning. Vygotsky highlights a special feature of human perception, namely the perception of real objects, which involves not only colour and shapes, but also meaning. This is associated with the use of language and

thus the particular culture in which one lives. He expresses this figuratively as a ratio-like manner as $(\frac{Object}{Meaning})$. For a small child, the object initially dominates this ratio, with meaning subordinated to it. This is an early age of development when perception is not independent but an integrated feature of motor reaction. This union of motives and perception makes the child constrained by the situation in which she finds herself. At a crucial development stage, children begin to act independently of what they see: in play, they separate thought from objects and motivate their actions from ideas rather than things. This leads to divergence of the fields of meaning and vision, whereby children begin to act in an imaginary situation. This represents an inversion of the $(\frac{Object}{Meaning})$ ratio, with meaning now dominating: $(\frac{Meaning}{Object})$.

With the development of abstract thought, meaning similarly begins to dominate action in the sense that action plays an instrumental role in an imaginary world of aspirations, goals, and values: $(\frac{Meaning}{Action})$. Imagination is a specifically human form of conscious activity that enables humans to rise above situational constraints: in an imaginary situation, it is not the immediate perception of objects that guides action, but the meaning of the situation. Thought acquires causal power because it infuses meaning. In this way, action becomes a pivot through which a person can move in a field of meaning. This underpins the development of will and intentional behaviour, whereby one acts for the sake of an idea as some abstract aspiration.

This conceptual framework enables us to see a person as acting in different fields of meaning, each defining the actions that occur within it and each associated with a different social role the individual plays, such as parent, husband, teacher, architect, manager ... or entrepreneur. This is illustrated in Figure 1.

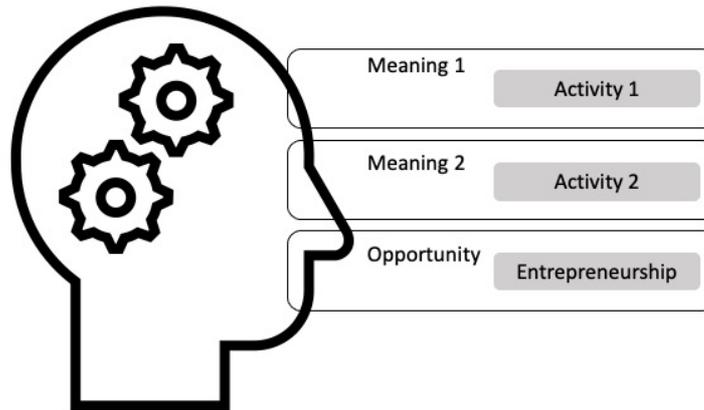


Figure 1: Activities and fields of meaning

Action and person

In the spirit of the preceding discussion, what distinguishes action from mere bodily behaviour (e.g., a twitch) is intention. To understand intention, I will use the work of Searle (1983) that conceptualizes intention as part of a broader set of mental states or events with the property of intentionality, that is their being directed at or being about objects and states of affairs in the world. Such mental states include beliefs, desires, intentions, fears, hopes, etc., all characterised by their aboutness or directedness. In developing his theory, Searle makes a number of key distinctions to help make systematic sense of intentional states. First, there is the distinction between the state and what the state is directed at or being about. Searle refers to the former as the psychological mode of the state and to the latter as its representative content. He uses the notation $S(r)$, whereby S marks the psychological mode and r the content. Thus, loving Sally and believing that it is raining can be represented as follows through such notation: Love (Sally) and Believe (It is raining).

Second, there is distinction of intentional states in terms of different directions of fit. Searle carries this over from his seminal theory of speech acts (Searle, 1969). Assertive acts such as statements and descriptions have a “word-to-world” direction of fit. In this sense, they can be true or false. Commissive or directive acts such as promises and requests have a “world-to-word” direction of fit. In this sense, they can be fulfilled or unfulfilled. Carrying

over this distinction to intentional states, Searle suggests that belief-like statements can be true or false and thus can be deemed to have “mind-to-world” direction of fit. In contrast, desires and intentions cannot be true or false but fulfilled / carried out or unfulfilled, which implies a “world-to-mind” direction of fit.

Finally, to the extent that an intentional state entails a proposition and has direction of fit, it has conditions of satisfaction, that is conditions that must obtain for the state to be satisfied, such as being true, fulfilled or carried out. These conditions are defined by the objects or states of affairs reflected in the propositional content of the intentional state, and by the psychological mode, which sets the direction of fit. Importantly, the conditions of satisfaction for a given intentional state depend on the place of this state in a wider network of intentional states as well as on a background of (social) practices and preintentional assumptions. These reflect the complexity of a person’s ecology of intentional states as well as the implicit premises provided by one’s experience and cultural context.

With these fundamentals in place, we can now discuss intention as an intentional state of mind. Simply put, one expresses an intention when one states “I intend to do A” where A represents some specific action. The intentional content of this state is the experience of acting or performing A and, in this sense, the intention is satisfied when one performs A. However, the relationship between intention and action is more nuanced and, to articulate this nuance, Searle draws the distinction between intention in action and prior intention. This distinction is easiest to understand through the characteristic linguistic expressions “I am doing A” and “I will do A”.

All intentional actions have intentions in action. This means that one is aware of what one is doing and can thus reply to the question “What are you doing now?”. While the action is being performed, the intention in action is the intentional content of the action and in this sense action and intention are inseparable. At the same time, not all intentional actions have

prior intentions. For instance, any spontaneous action is performed without the formation of prior intention. Similarly, one can form a prior intention but not act on it, rendering it unsatisfied.

The distinction between prior intention and intention in action matters for understanding the conditions of satisfaction of an intention. This condition includes not only the actual performance of A – i.e., the experience of doing A – but also that the intention in action when doing A is actually caused by the prior intention. It is possible that an action subject to prior intention, when performed, is done so with an intention in action not caused by the prior intention. For instance, I may have had the intention of meeting someone at a conference; when helping someone with their luggage at the airport, it turns out they were the person who I had planned to meet. So, I meet the person, but not by carrying out my prior intention. Therefore, it is essential for the fulfilment of an intention that there be a causal self-reference between the intentional state (prior intention) and the conditions of its satisfaction. In addition, as indicated earlier, the direction of fit of such satisfaction is world-to-mind, meaning that the prior intention cannot be true / false but fulfilled /unfulfilled.

One immediate implication of the necessary causal self-reference is that one can intend only what one's intention can cause. For instance, one cannot intend that it rains. This implication is important when we consider the complex intentions associated with the performance of complex tasks, i.e., tasks that consist of a series of inter-related actions. Searle defines complex intentions as “those where the conditions of satisfaction include not just a bodily movement *a*, but some further components of the action, *b*, *c*, *d*, . . . , which we intend to perform by way of (or by means of, or in, or by, etc.) performing *a*, *b*, *c*, . . . , and the representation of both *a*, *b*, *c*, . . . and the relations among them are included in the content of the complex intention” (1983: p. 99).

In our language, we have the ability to describe our actions as narrowly or as broadly as

we please, a phenomenon aptly termed “accordion effect” (Feinberg, 1970). This means that one can expand the true description of one’s action when this action is part of a broader complex task or project. Thus, one’s intention in action can be deemed complex in the sense that the question “What are you doing now?” can be answered at different levels of description of the action. One can say (1) talking to a customer; (2) developing a product; (3) designing a business model; and (4) launching a new venture; and all of these would be true descriptions of one’s intention.

When we consider new venture development as a complex task, we can describe broadly the carrying out of this task as a series of milestones and each milestone as a series of steps or basic actions. Searle defines basic action as follows: “A is a basic action type for an agent S iff S is able to perform acts of type A and S can intend to do an act of type A without intending to do any other action by means of which he intends to do A” (1983: p. 100). This definition makes basic action relative to an agent’s skill in the sense that what is a basic action for one agent may not be such for another. Importantly, the basic action is one about which one can form intentions and that can be caused by its prior intentions.

In order to capture the link between a basic action and the broader complex task of which the action is part, I introduce the notion of “theory of change” as a representation of how broader, long-term goals are mapped into necessary preconditions by outlining the requisite causal links (e.g. Funnel and Rogers, 2012). Theory of change is used as a methodological tool in social policy and organizational development in order to evaluate the impact of an intervention by consideration of how it was intended and implemented. It is through an implicit or explicit theory of change that one can describe one’s intention as doing a basic action A or a complex task B, e.g., talking to a customer or launching a new venture. Figure 2 provides an illustration of this idea. It portrays the complex task of new venture development as an “accordion” that outlines specific milestones and action steps, linked together by a

theory of change.

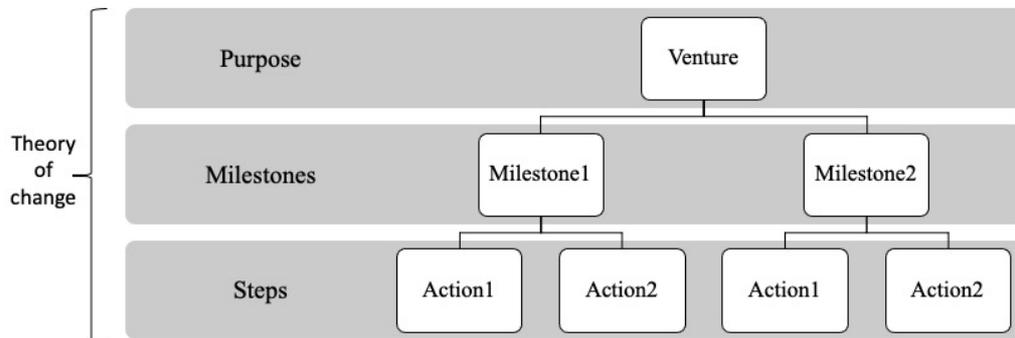


Figure 2: The "accordion" of new venture development

ACTION SPACE OF ENTREPRENEURSHIP

We are now in a position to deploy the earlier discussion of meaning and action to define the action space of entrepreneurship. The first step relates to resolving the key ambiguity between idea and opportunity.

Idea and Opportunity

A venture idea or a venture concept (Vogel, 2016) can now be seen as propositional content, i.e., an imagined future state of affairs in which certain economic transactions will take place. As a standalone propositional content, a venture idea lacks a psychological mode via which it would become the content of an intentional state (of someone). In other words, a venture idea – simply stated or articulated – is not something about which or towards which one has formed an intentional state. When that happens, i.e., when someone brings the certain psychological mode of intention towards this propositional content, we can speak of opportunity as a sense of possibility to be enacted. In this sense, an opportunity represents an intentional stance, a combination of propositional content and a psychological mode of intention to do what is implied in the propositional content. The opportunity becomes satisfied when the venture concept becomes realized.

Furthermore, the ontology or mode of existence of a psychological mode is that of a first-person. That is, a psychological mode – a belief, desire, intention – is always someone’s belief, desire or intention. It has a first-person ontology in the sense that it may be causally reduced to certain neurophysiological states, but it cannot be deemed ontologically to be nothing but such states (Searle, 1994). We should note here that we can speak of the content of a belief – its propositional content – in an a-personal sense, just like we can speak of a venture idea in an a-personal sense. But given the distinction drawn earlier between an intentional state and its content (i.e., what it is about or directed at), to speak of something as an intention (an intentional state) implies a psychological mode and thus a specification of the first-person, i.e., whose belief it is. Therefore, to speak of opportunity inevitably brings in the person, whose intention defines the opportunity.

Finally, realization of the venture concept is a complex task and, therefore, the intention towards it is a complex one, comprising many milestones and individual steps towards them. As such, it is underpinned by the theory of change that the person uses to translate the broader aspiration behind the venture concept into some specific immediate basic action.

These three considerations imply that an opportunity lies at the intersection of a venture concept, individual, and theory of change. This in turns means the following: (1) there is no opportunity if there is no idea; (2) there is no opportunity if there is no individual (psychological mode); (3) there is no opportunity if there is no theory of change. These express the sense in which every opportunity entails an idea but not every idea can be deemed an opportunity. It is also the sense in which an opportunity is inseparable from the entrepreneur who pursues it. What we can separate is the idea (the content), but by doing this we necessarily remove the aboutness and directedness that comes with intentional state. It becomes just a statement or standalone belief about what is possible. There is also a sense that without a theory of change we have a desire to launch a venture, without this being translated

into concrete, immediate action. Indeed, we often discuss entrepreneurial intention as a general intention of launching a venture one day. Such intention lacks a specific venture concept and a theory of change and, in this sense, it is perhaps nothing more than a desire.

Searle (1983) make this point more broadly as follows:

“Biologically speaking, the primary forms of Intentionality are perception and action, because by their very content they involve the organism in direct causal relations with the environment on which his survival depends. Belief and desire are what is left over if you subtract the causal self-referentiality from the Intentional contents of cognitive and volitive representational Intentional states. Now once you subtract that feature the resulting states are much more flexible. Belief, unlike memory, can be about anything and not just about what could have caused it; desire, unlike intention, can be about anything and not just about what it can cause” (p. 105).

In other words, we can freely discuss a general idea or a more specific venture concept as something that is believed and desired. But unless this is translated into an intention that can lead to (cause) specific actions in the pursuit of that idea, we cannot really speak of opportunity. This is another way of stating the earlier point that one can only intend what one’s intention can cause. Without this causal link, we are left simply with a desire, which is unbounded in terms of its intentional object.

As a manifestation of intention, opportunity has a world-to-mind direction of fit. This means that its satisfaction is not about being true but about being realized or carried out. The condition of satisfaction is the future state of affairs as specified in the content, i.e., the venture idea or concept. Because intentional states can involve imaginary objects (such as Santa Claus or the King of France), Searle (1983) deems it crucial to distinguish between the content of an intentional state (i.e., the proposition of a belief or intention) and the objects of that state. In this sense, the discussion of whether such objects are real, discovered or created is separate from the propositional content in which they are implicated.

This definition of opportunity as lying at the intersection of a venture concept, person, and theory of change gives substance to the notion of opportunity as an umbrella construct

(Wood, 2017). It also suggests that certain linguistic forms of discussing opportunity are superfluous. We typically state that an entrepreneur pursues, develops, discovers or creates an opportunity. This has been an unfortunate turn of phrase that, due to its grammatical structure, suggests a separation of entrepreneur and opportunity, leading to much discussion of the standalone nature of opportunity. What this overlooks – and what the current definition makes clear – is that opportunity is a relational terms that implicates an individual, a venture concept, and a theory of change. This is similar to the concept of teacher, which readily implies that one is a teacher of something (a subject) and of someone (a student). Therefore, just as it is superfluous to say “a teacher educates a student” so it is superfluous to say “entrepreneur pursues opportunity”.

The current definition can shed light on a recent discussion of opportunity as language-dependent and subject to calibration of meaning in the earliest stages of an entrepreneurial process (Dimov, 2020a). Early on, as the content of an entrepreneur’s intention, an opportunity can only be expressed in words. Such linguistic articulation already implicates the individual involved (i.e., the entrepreneur making the articulation) and the resulting dialogue with some stakeholder community seeks the clarification or elucidation of the other two elements, namely venture concept and theory of change. In other words, when someone proclaims to be an entrepreneur, we – as the audience – are alerted to the opportunity this implies and, having identified the individual, seek to identify its remaining components. This suggests that the venture concept and theory of change are dynamic nodes of a triangle, in which the third node (the person) remains fixed.

The conceptualization of opportunity as an intentional space is illustrated in Figure 3.

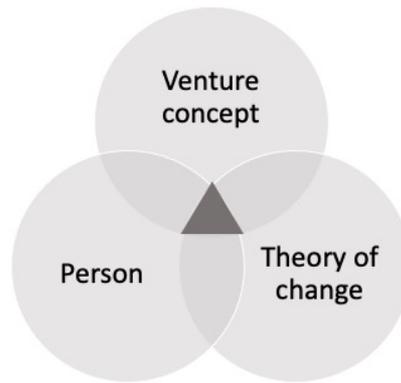


Figure 3: Opportunity as intentional space

Entrepreneurship

We can now put the strands of thought together to reconnect with and clarify the opening notion of entrepreneurship as action with specific meaning. This meaning is reflected in the notion of opportunity as someone’s intention, combining a venture concept as propositional content (a future state of affairs) with an implicit or explicit theory of change that links immediate actions with the broader goal represented by the venture concept. In this sense, we have a person whose actions are directed at the state of affairs represented by the venture concept and linked together by a theory of change. Importantly, in this conception of entrepreneurship, we can distinguish the action, the person, the venture concept, and the theory of change but to speak of entrepreneurship is to speak of their holistic totality.

In this articulation, the terms “entrepreneurial action” and “action toward opportunity” acquire a more specific meaning. To refer to entrepreneurial action is to suggest that an action is done by an individual who has a venture concept in mind and a theory of change that connects the action with the venture concept. Similarly, action toward opportunity implies that the action arises from individual intention that comprises a venture concept and a theory of change. It is in this sense that an opportunity can be deemed a symbolic blueprint for action (Dimov, 2011).

The holistic nature of the triangle of person, venture concept and theory of change

suggests that to speak of entrepreneurship is to speak of actions that are simultaneously performed (1) by a particular individual, (2) towards a particular venture concept, and (3) as part of a causal map of a theory of change. These three elements define the distinct meaning of the action as entrepreneurial. I will use the notion of opportunity triangle to refer to these three elements. In the sense of Aristotle’s (1981) four causes, to the extent that an action can be deemed an efficient cause of a new venture, the nodes of the triangle supply the material, final, and formal causes of the venture. An efficient cause implies that, without the action, there would be no venture outcomes. A material cause implies that any venture outcomes reflect the skills and efforts of the entrepreneur. A final cause implies that the venture outcomes reflect the ultimate purpose of the action. A formal cause implies that the venture outcomes reflect the map or blueprint according to which the actions had been performed.

This conception of entrepreneurship is illustrated in Figure 4.

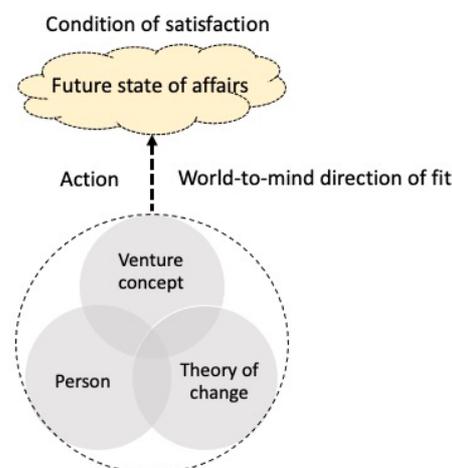


Figure 4: Entrepreneurship as future-oriented action

Scholar and entrepreneurship

To the picture of entrepreneurship just presented, we can now add the academic scholar of entrepreneurship. The scholar studies or observes entrepreneurship as action that is embedded in an opportunity triangle. To complete the picture, we could also articulate the future state of affairs – an operating venture - as the condition of satisfaction of the complex

entrepreneurial intention. This state of affairs is external to both scholar and entrepreneur and I will refer to it simply as future. We thus have a new triangle: scholar, entrepreneurial action, and future. Each of its edges can define distinct types of scholarship.

First, scholars can study the future directly, as an outcome of entrepreneurial action but without direct observation or conceptualisation of the specific instances of entrepreneurship. It is in this sense that Klein (2008) deems opportunity to be a superfluous concept. We can consider this *future* science of entrepreneurship in the sense that it aims to describe, explain and predict the future as an outcome of entrepreneurial activity, whereby such activity is discussed in an agentic, a-personal sense, detached from specific persons and contexts. The future thus becomes the direct content of an intentional stance by the scholar. In terms of psychological mode, this stance is best described as a belief or a theory as a set of propositions. Importantly, as a belief, a theory has a mind-to-world direction of fit, i.e., it can be rendered true or false by how the future turns out. In a similar sense, a scholar can identify a specific new venture as a particular future state of affairs and articulate beliefs about whether it represents a viable entrepreneurial opportunity. This belief is expressed in an a-personal or third-person sense, as an opportunity for someone (McMullen and Shepherd, 2006).

Second, scholars can study the entrepreneurial action as an external phenomenon, to be described and explained. This approach is exemplified by the Panel Study of Entrepreneurial Dynamics (Reynolds and Curtin, 2008), which seeks to document the actions taken by nascent entrepreneurs, i.e., those in the process of starting a new business. Studying the opportunity triangle from the outside, we can readily observe only the individual as part of that triangle and the actions undertaken. We can consider this *behavioural* science of entrepreneurship. It seeks to explain, describe and perhaps predict the behaviour of entrepreneurs by constructing theories that seek to account for the observable actions. This provides a third-person theory *of* entrepreneurship that renders the scholar a detached, impartial observer.

Although a behavioural approach to entrepreneurship can make reference to the elements of the opportunity triangle, because this is done from an external stance, the resulting verbal statements are not direct representations (as an entrepreneur would make) but representations of representations. Such statements are intensional (with an S) in the sense that they report another person's intentional content (Searle, 1983). Unlike intentional (with a T) content, which commit one to the conditions of satisfaction in accordance with the implied direction of fit, intensional content does not create similar commitment to those conditions. Therefore, when we report in a behavioural sense that a certain person has proclaimed "I am an entrepreneur", "This is my venture concept", and "This is my theory of change", the truth value of our reports pertains simply to the fact that the person has made these utterances. It involves no direct evaluation of the opportunity triangle.

Finally, scholars can study entrepreneurial action from the driving seat of the specific opportunity that defines it. This approach aims to get inside the opportunity triangle and thus understand the entrepreneurial process holistically, in terms of its four causes. We can consider this *design* science of entrepreneurship (Dimov, 2016) in the sense that it studies a phenomenon in the making rather than one taken as given. Design science aims to improve the art and skills of the discipline (Niiniluoto, 1983), which in this case pertains to the personal skills of the individual, the articulation of the venture concept, and the formulation of theory of change. The opportunity – in its holistic, triangular sense – represents an artifact that can be designed (Berglund et al., 2020). It arises at the interface between a person (the entrepreneur) and the world and reflects the person's purpose (venture concept) as well as fundamental assumptions about how to engage with the world and go about realizing that purpose (theory of change). The scholar's direct engagement with this design process represents a second-person stance towards the entrepreneur, resulting in direct dialogue (Dimov, Schaefer, and Pistrui, 2020). The theory that the scholar creates is a theory *for*

entrepreneurship, i.e., one aiming to inform and facilitate entrepreneurial action.

The scientific relationships between scholar and entrepreneurship are illustrated in Figure 5.

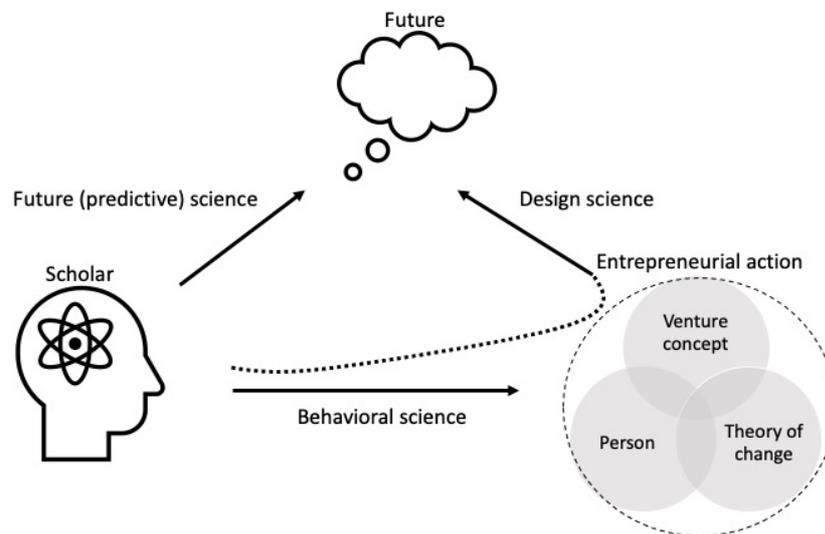


Figure 5: Scientific relationships between scholar and entrepreneurship

In summary, as scholars we stand in a certain relationship with the entrepreneurial persons we study. We can ignore them, treating them as invisible generic agents and focusing instead directly on the future as an outcome of their activity. We can treat them as *objects* of study, to be explained – a collection of external, established facts to be weaved into a theoretical story of causal relationships to other facts. Equally, we can treat the entrepreneurs as *subjects* to be addressed, understood and edified rather than explained. Thus, as scholars we have a choice of whether to look *at* entrepreneurs or *with* entrepreneurs (Dimov, 2020b). In the next section, I will focus on this third form of engagement as the distinct domain of design science of entrepreneurship.

DESIGN SCIENCE OF ENTREPRENEURSHIP

Simon (1996) drew a seminal distinction between natural and artificial phenomena. Natural phenomena are defined by *necessity*, as something taken for granted and assumed to exist. Artificial phenomena are defined by *contingency* in that they are seen as arising at the

interface between human goals and purposes on the one side, and external constraints on the other. The contingency is expressed in the counterfactual consideration that they could turn out differently under different circumstances. In this sense, fields such as engineering, medicine, business, architecture, painting, planning, economics, education, and law are concerned with design, that is not with how things are, but with how things ought to be.

To engage with entrepreneurship as an artificial phenomenon, in a design sense, is to focus on an entrepreneurial effort as gateway to a different future and thus to facilitate its practical purpose. Unlike basic research, which aims to create scientific knowledge without concerns with specific practical application, this is about applied research as aiming to create knowledge to fulfil particular practical purpose. While basic research pursues the ‘epistemic utilities’ of truth and information, applied research considers in addition the ‘practical utilities’ of simplicity and manageability to generate instrumental value for human activity (Niiniluoto 1983).

To elaborate the differences between basic and applied research, Niiniluoto draws further distinction between descriptive and design science. The former describes facts about the world and thereby generates scientific explanations. The latter aims to create instrumental knowledge that enhances human art and skill. Niiniluoto thus distinguishes a profession (e.g. an accountant), from the related practice (accounting), art or skill needed in the practice (e.g. art of accounting), and a design science aimed at improving the art (e.g. accounting science). So defined, design science offers normative statements – technical norms – that, while lacking truth value, constitute knowledge by virtue of offering a relation between means and ends. The difference between design and descriptive sciences lies in that technical norms offer not descriptive statements about the world, but suggestions for what the world ought to be in order to attain certain goals.

Most importantly for our purpose, Niiniluoto argues:

“It should be emphasized that the border between descriptive and design science splits many scientific disciplines. Let S be some activity which can be studied by science, e.g., S might be farming, nursing – or science itself which is the object of "science studies". Then descriptive research of S includes at least the history of S, the psychology of S, the sociology of S, and the economics of S. Basic research about S tries to describe the present state of S and to establish some systematic regularities about S - in this way, we may speak about basic research within technical sciences, life sciences, medicine, social sciences, and jurisprudence. Design science contains only a part - the practical kernel, so to speak - of these disciplines” (1983, p. 14).

This argument reinforces the distinction made in the previous section among future, behavioural and design science of entrepreneurship. The first treats entrepreneurship as a set of outcomes, the second as a behavioural phenomenon, and the third as a distinct practice of art and skill. Design science is about studying systems that do not yet exist, about exploring whether something will work rather than whether it is true (Romme 2003). As such, it must be grounded in real-world problems and create artifacts that serve human purposes. As March and Smith (1995) argue, design and descriptive / explanatory science are interrelated in three ways: (1) the artifacts created through design can become the subject of descriptive / explanatory scientific inquiry (i.e., into something that already exists); (2) artifacts are created with understanding of the laws (explanations) established by descriptive / explanatory science; (3) the effectiveness of artifacts can provide substantive tests and impetus for further descriptive / explanatory science research (e.g. generating new explanations to accommodate the new facts and explain why things worked or did not work).

The distinction between descriptive / explanatory and design science, and thus between a third-person and a second-person stance towards entrepreneurship reflects a dual role of theory as a representation of the interplay between person and world. A theory OF the world devises constructs and models to describe and explain it; alternatively, a theory FOR the world can be used as a gateway for engaging with the world and creating entirely new objects (Romme and Dimov, 2020). Romme and Dimov (2020) refer to the first use as theorizing and to the second as framing.

By engaging in design science of entrepreneurship, we enter the opportunity triangle. The three edges of the triangle define distinct research activities, reflecting the interplay of the two nodes they connect as distinct causes (material, final or formal). *Framing* captures the edge between the individual person (entrepreneur) and the venture concept. It defines the final cause in the sense of establishing what the entrepreneurial effort is about, as a premise for further action. *Modelling* captures the edge between the venture concept and the theory of change. It defines the major milestones and contiguous steps necessary to reach the final outcome, in the same sense that a building blueprint provides a link between an architectural model and a construction plan. Finally, *performing* captures the edge between the entrepreneur and the theory of change. This is about carrying out the actions necessary to reach the milestones specified in the theory of change. The three activities are embedded in the broader context of social practices that substantiate their enactment. Figure 6 illustrates this idea.

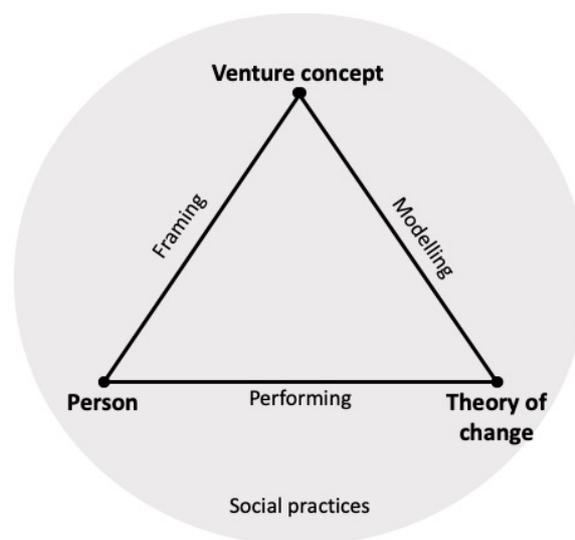


Figure 6: Design science of entrepreneurship

The holistic nature of the opportunity triangle means that the activities of framing, modelling, and performing are entwined and thus interdependent. What is defined through framing needs to be modelled and then performed. But to the extent that the performance falls short, the model might be reassessed. And to the extent that the model turns out to be

unrealistic, the frame needs to be revisited. Therefore, the dynamic interplay between framing, modelling, and performing represents an engine for the entrepreneurial journey and thus provide mechanisms through which we can speak of opportunity as being developed. Its venture concept may be refined or modified; its theory of changed may be refined or modified and its entrepreneur can learn and improve his or her skills.

More broadly, by entering the opportunity triangle we find ourselves in a world of inquiry in the sense articulated by Dewey (1938): “the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole.” (p. 104). The dynamic nature of the opportunity triangle reflects Dewey’s denial of the dualism between logic and methodology in enquiry, i.e., the idea that logical requirements are imposed on the methods of inquiry from the outside. For Dewey, rationality or logic pertain to the relation between means (methods) and consequences (conclusions). In this sense, an inquiry can develop its own logical forms by which it can enable and judge further inquiry.

The activities of framing and modelling create the skeleton or postulates of the entrepreneurial inquiry. As Dewey notes, “A postulate is also a stipulation. To engage in an inquiry is like entering into a contract. It commits the inquirer to observance of certain conditions. A stipulation is a statement of conditions that are agreed to in the conduct of some affair. The stipulations involved are at first implicit in the undertaking of inquiry. As they are formally acknowledged (formulated), they become logical forms of various degrees of generality.” (1938: p. 16).

In other words, the postulates of the entrepreneurial inquiry are not something we take as given but ours to define and articulate. This is where the ‘science’ of design science comes in, in its ability to evaluate, synthesize and make accessible prior knowledge related to the activities of framing, modelling, and performing. Again, Dewey makes this clear: “A postulate

is thus neither arbitrary nor externally a priori. It is not the former because it issues from the relation of means to the end to be reached. It is not the latter, because it is not imposed upon inquiry from without, but is an acknowledgement of that to which the undertaking of inquiry commits us” (1938: p. 17). Framing defines the aspired end of inquiry; modelling enlists the means by which such ends might be reached; and performing determines whether the specified means are operable or achievable.

We can think of the knowledge accumulated through design science of entrepreneurship in the spirit of how the relationship between law and experience has affected pragmatist thought (Misak, 2013). Specifically, Misak discusses the ideas of Oliver Wendell Holmes who saw courts as engaged in a business of inquiry, searching for the best answer given the time and circumstances. This makes law an evolving, growing enterprise. In Wendell Holmes’s view of common law, “the law does not consist of a fixed body of doctrines and syllogisms derived from them, but rather, it is an organic structure that has come together in response to experience” (Misak, 2013: 78).

In this sense, our inquiry can search for precedent in the form of principles, methods, frames, concepts established in prior inquiry that be used to subsume the current inquiry in their light and thus create its postulates. The design scientist thus engages in search and synthesis of prior knowledge as well as in the formulation of new knowledge in the forms of principles, methods, frames, and concepts that have proved useful in the current inquiry and that can be deployed to the benefit of future inquiry.

CLINICAL APPROACH TO INQUIRY

Commitment to design science implies clinical scholarship (Dimov, 2020b), whereby a scholar takes a holist and generalist stance towards entrepreneurial practice. This entails familiarity with a broad range of problems and tools, with the goal of bringing these together under a systemic view of the task at hand. The emphasis is on the broader purpose that the

entrepreneur pursues, on how it can be broken down into specific problems, and on how these problems can be kept in alignment over time. Clinical scholarship is thus driven by a systemic view of the entrepreneurial effort, aiming to bring together a range of relevant models, each informing a different problem. It involves working closely with an entrepreneur as an engaged stakeholder in their purpose.

Clinical scholarship entails focus on synthesizing good practice and formulating improvements. Its holistic perspective develops sensitivity to how different parts fit together towards the broader purpose. Current challenges are taken not as given problems to be solved, but as symptoms to be explored, for their underlying problems to be diagnosed.

The distinct contribution of clinical scholarship lies in bringing the underlying framing / problem definition to the fore, seeking to detach it from the entrepreneur by making it explicit. It demonstrates that different problems could be posed in a given situation, which would lead to different actions. Therefore, it examines the merits of the framing of the situation given an overarching purpose. Problems are not given but are defined / framed as part of the inquiry, thereby giving meaning to the situation and assigning priorities. A frame thus represents a working assumption or hypothesis to be tested, refined, discarded or replaced.

Teaching and learning are also major routes for clinical contribution. The focus here is on the development of reflective skills for understanding and honing one's judgment in entrepreneurial situations. One aspect of this is what Schon (1987) describes as reflection-in-action, i.e., thinking what one is doing while doing it. This entails continuous consideration of current choices and the tree of further choices they open up. Possible moves are evaluated in terms of the desirability of their consequences, conformity to implications set by earlier moves, and in terms of their potential for opening new problems and moves. It makes one sensitive to the path-dependent nature of choices:

“At some point, he must move from a “what if?” to a decision, which then becomes a design note with binding implications for further moves. Thus, there is a continually

evolving system of implications within which the designer reflects-in-action.” (Schon 1987, p. 100)

A second reflective skill pertains to stepping mentally out of the process to evaluate its overall course. Schon describes this as reflection-on-action, which informs the next moves to be made. The consequences of action – whether what happens can be deemed a ‘good’ or a ‘bad’ outcome – generate information about (1) the situation, (2) suitability of the framing, (3) suitability of the action (Argyris et al. 1985). Thus, in observing that a particular approach does not really work, we could reflect on the features of the context that make the approach ineffective, on the way we have posed or framed the problem, or on the particular way in which we have carried it out.

Clinical scholarship recognizes that action can play multiple roles: (1) to test a hypothesis, (2) to explore the situation, (3) to change the situation (Schon, 1983). These roles invite awareness and reflection at different levels and enable us to improve the activities of the opportunity triangle by formulating tentative action principles for future situations.

CONCLUSION

Describing someone as ‘entrepreneur’ tells us nothing about what this means, about the opportunity that gives meaning to their actions. We need to knock at the door of their first-person ontology and enter the opportunity triangle.

Embracing design science as a form of inquiry is about looking forward to cope with the world, focusing on the possible better and working on ways to improve the art and skills of entrepreneurship. We would take existing theoretical frameworks and ask how they can be used and in what situations they can be useful. This invites leaps of imagination and creative expression. In this sense, validity arises not from getting something right but from showing that it is useful, that it works in enabling further action and opening things up. Usefulness is

always for a purpose and this would make us sensitive to the purposes and situations in which the knowledge we develop can be used.

As design scientists we engage with and address entrepreneurs. We look at the world with them, bringing the inter-disciplinarity of different perspectives and seeking to merge isolated pockets of knowledge into a holistic picture. Engaging with entrepreneurs invites a complex interplay of multiple theoretical perspectives, each of which can provide only a partial understanding of their situations. As scholars, we can play an instrumental role in synthesizing such perspectives and evaluating their roles as guides to action.

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