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Elaboration on the Systemic Abductive Method: Practical Recommendations and Methodological Foundations

Ayoob Sadeghiani
Diversity Institute, Toronto Metropolitan University – Toronto/Canada

Abstract

Recently, the Systemic Abductive Method was introduced to help scholars with redefining controversial concepts in managerial, social, and behavioral sciences. This paper elaborates on the Method and its logic in relation to different schools of scientific thought and argues why the Method is pluralistic. Moreover, we suggest a set of practical recommendations based on a case study. Our contributions to theory-building include: 1) Arguing why researchers should use the terms concept, construct, and variable interchangeably. 2) Juxtaposing different approaches to conceptualizing abstraction levels. 3) Arguing systems thinking and abduction help theory building at the intersections of different schools of thought.

Keywords: Systemic Abductive Method, Systems Thinking, Abduction, Concept, Construct Clarity

1. Introduction

If scholars do not agree on the meaning of the concepts and constructs, when they report on a particular concept/construct, in fact, they are reporting on different things, and therefore, their findings are prone to be invalidated. In other words, such a particular concept/construct does not pass the clarity criteria, while construct clarity is a prerequisite for all forms of validity (Locke 2012; Suddaby 2010). Despite the importance of construct clarity, there is a gap in some social and behavioral disciplines such as management and organization regarding this critical issue, and scholars have been invited to pay more attention to it (Molloy and Ployhart 2012; Podsakoff et al. 2016; Suddaby 2010).

The Systemic Abductive Method was presented to fill this gap (Sadeghiani et al. 2022). However, the Method needs more operational techniques methodological positioning. In this paper, we aim to fill these gaps. In doing so, we 1) elaborate on the fuzziness of the terms 'concept', 'construct', and 'variable', which was taken as the ground for suggesting the pragmatic use of these terms interchangeably in the Systemic Abductive Method; 2) show why the Method is methodologically pluralistic; and 3) suggest some new practical techniques for concept refinement.

2. The Method at a glance

With the aim of reconstructing unclear constructs, the Systemic Abductive Method was presented based on systems thinking and Pierce's abduction. The deliverable of this method is a constructive literature review including two main sections: 1) a critical section organized based on testing the scholars' definitions and interpretations of a focal concept/construct against six clarity criteria; 2) a constructive part including a new definition of the nature of the concept and its application domain, what it is not, and what is not included in the application domain.

This method includes a big picture, a conceptual model presenting the relationships of the real world's observables and phenomena, the semantic system including terms, theories, and frames, and the research system including methods, tools, and observers. This method also includes four other components; a representation of the implicit inductive-abductive reasoning logic that is used in the process of concept refinement; an explicit procedure demonstrating the research activities and steps; six construct clarity criteria controlling the critical conceptual review of the definitions and cases, and a set of recommendations.

One main recommendation is ignoring the previous scholars' emphasis on differentiating the concepts and construct from variables. This recommendation is important because the difference between variable and construct is a commonly accepted rule in the process of defining conceptual models and nomological networks. In the subsequent section, we show why

this difference is not a rigid rule. Then, we present an example of an unclear concept and finally discuss the philosophy of the Method.

3. Theories and Terms

Theory is a hypothetical correspondence between a definitional system/framework and a set of empirical observations (Guttman and Greenbaum 1998). Theories are stated in terms of concepts, and concepts are interpreted based on experience.

Kaplan (1973) discussed three influential semantic empiricisms. 1) Logical positivism is about the verifiability theory of meaning; it emphasizes meaning as the mode of verification. It supposes a term as a meaningful term, only if it is capable of verification. 2) Operationism, as the most influential form of semantic empiricism in the behavioral and social sciences, is about operational definitions and measurement. Its concern is to specify an operation or a measure for applying a concept. 3) Pragmatism as the third form of semantic empiricism asks if meaning is true, so what difference it makes. Indeed, a term should be capable of verification, operationalization, and difference-making. Accordingly, terms such as 'concept', 'construct' and "variable' should have the same capabilities in research and theory building.

Kaplan (1973) supposed four types of scientific terms to be located in a continuum from empirical terms to theoretical terms. While most scholars use the terms "concept", "construct", and "variable" to explain phenomena, Kaplan placed "observational terms", "indirect observables", "constructs", and "theoretical terms" on an empirical-theoretical continuum. According to Table 1, these terms have been used not only overlapping but also somewhere conflicting. For example, "hypothetical construct" was interchangeably used with both "indirect observable" and "theoretical term"; or MacCorquodale and Meehl (1948) discussed how we should make a distinction between "hypothetical constructs" and "intervening variables".

Osigweh (1989) introduced a three-level abstraction breakdown structure for positioning and repositioning the

concepts in organization science. Bacharach (1989) used the terms variable/event, construct, and concept to show different levels of abstraction. He supposed that variables are located at the lowest level of abstraction and concepts at the highest level. He believes that we should not use the terms variable and construct as synonyms because a variable is the operational configuration of a construct while a construct is a mental configuration of a phenomenon in a higher level of abstraction. Accordingly, 'construct' was defined as an abstraction of the observable categories (Suddaby 2010), and it is reflectively/formatively observed through collecting data on these observable categories or indicators (Aguinis and Vandenberg 2014; Bisbe et al. 2007; Edwards and Bagozzi 2000). Some scholars applied the term variable in the definition of the term construct (Nunnally and Bernstein 1994).

Van de Ven (2007) supposed that the continuum of observational-theoretical terms includes three terms: 1) at the highest level of abstraction: theoretical concept (e.g. organization's social structure) – that is defined in association with other terms that are not directly observable; 2) at the middle level of abstraction: theoretical construct (e.g. formalization of rules) – that constitutes indirect observable components of a concept; and 3) at the lowest level of abstraction: observable variable or event (e.g. the number and specificity of rules in job manuals) – that is the operationalized component of construct and specifies the operations needed for measurement. Considering these terms, he defined three relevant levels of theories: grand theories, middle-range theories, and operational theories. Bacharach (1989) supposed theories to be a continuum from empirical generalizations, which are rich in detail, to grand theories, which are abstract and lack observational detail. He believes that constructs are related to each other by propositions, and variables are related to each other by hypotheses.

Table 1: Theoretical Terms; Modified from Kaplan, (1973, 55-59)

	Observational Term	**Indirect Observable**	**Construct**	**Theoretical Term**
Reference to	Direct observation	Indirect observation	Observables	Theory
Contrasting 1	Empirical (descriptive)	Empirical (descriptive)	Empirical (descriptive)	Theoretical
Contrasting 2	Observational	Observational	Symbolic	Symbolic
Alternative Terms	Concreta, empirical terms, phenotypes, descriptive terms, experimental variables	Illata, genotypes, hypothetical constructs	Limiting concepts, auxiliary symbols, intervening variables, abstracta	Explanatory terms, hypothetical constructs
Example(s)	Dream report, marked ballot	Dream	Instantaneous velocity, frictionless engine, government	Castration complex, marginal utility, protestant ethic
Definition(s)	"Observational terms are those whose application rests on relatively simple and direct observations."	Indirect observables are terms whose application calls for relatively more subtle, complex, or indirect observations, in which inferences play an acknowledged part. Such inferences concern presumed connections, usually causal, between what is directly observed and what the term signifies.	Constructs are terms which, though not observational either directly or indirectly, may be applied and even defined on the basis of the observables... They are definable at least in principle by observables, though in practice we may give them only partial and perhaps shifting anchorage in concreta	For theoretical terms a full definition by observables is even in principle impossible. A theoretical term has systemic meaning... This systemic quality is what makes the analysis of theoretical terms so difficult: what begins as the effort to fix the content of a single concept ends as the task of assessing the truth of a whole theory

In sum, while scholars suggested not to use the terms concept, construct, and variable interchangeably, they could not persuasively differentiate the terms from each other, trying to describe them using a continuum. Therefore, when scholars suggest clear concept categorization as a construct clarity criterion (Sudabby 2010), they should first categorize the terms they use in the construct clarity literature. Indeed, the terms concept, construct, and variable are fuzzy terms describing a continuum, and therefore, the recommendation of taking these terms synonymous not only is not an impromptu recommendation in the Systemic Abductive Method but also it is rooted in the literature of research methodology regarding their overlaps in the abstraction continuum and their states of "climbing and descending a ladder of abstraction" (Osigweh 1989, 584).

Theory formation and concept formation go hand in hand (Gerring 2012). Concepts, constructs, and variables can be seen as the building blocks of theories (Bacharach 1989). Even, some scholars take concepts as methods (Mir and Greenwood 2021). While the definition of a concept is taken as the minimal method/tool of researching the phenomenon in the Systemic Abductive Method, it also can be seen as a theory. What is discussed about the nature, depth, and application domain of the concepts in the Systemic Abductive Method is some sort of theory according to a recent typology of theories (Sandberg and Alvesson 2020). For example, Sadeghiani and Anderson (2023) defined the nature of the concept 'pivot' as 'substitution'. This is a comprehending theory according to Sandberg and Alvesson (2020). Also, three dimensions of the Business Value Triad were included in the application domain of the concept pivot. While delineating the application domain of the concept helps clarify the meaning, and therefore, it is a comprehending theory, it also is an ordering theory, as the three dimensions of the Business Value Triad are three pivot types.

Our concern in this paper is not to define theory. However, as discussed, concepts, constructs, and variables are mapped to different levels of theories including grand theories, mid-range theories, and operational theories according to Van de Ven (2007) or a continuum from grand theories to empirical

generalizations according to Bacharach (1989). It also was discussed in the Systemic Abductive Method that clarity is a systemic outcome of the relationships between the concept, its definition, research question, intended observable, research tools, etc. It seems that the clarity issue of these relationships has led the theorists of theory building to introduce different typologies of theories and relate different theory types to concepts, constructs, and variables (Bacharach 1989; Van de Ven 2007). If the phenomenon/observable is more concrete, these theorists use the terms hypothesis, variable, operational theory, and empirical generalization, and if it is abstract, they tend to use the terms concept/construct, proposition, and grand theory. Similarly, while Sandberg and Alvesson (2020) introduce explaining, comprehending, ordering, enacting, and provoking theories to respectively explain, comprehend, categorize, (re)produce, and challenge phenomena, they argue that phenomena respectively referred to as more or less given out there, socially defined but more or less given, indeterminate and ambiguous, processually constructed, and constructed and reconstructed through perspectives and vocabularies. Indeed, rather than talking about different types of theories, they are talking about different types of observables/phenomena based on the level of their complexity/clarity/abstraction for the observer. In the Systemic Abductive Methods, concepts, variables, and constructs are taken interchangeable to pragmatically ignore jargon on the abstraction level. 'Pivot' was labeled as a dichotomous variable, and in the same way, all the concepts, constructs, and variables are supposed to be a variable in the Method. Similarly, we do not suggest different levels/types of theories such as grand, middle-range, and operational ones. Even, at the least level of categorization, two types of descriptive and explanatory questions are inter-embedded (Gerring 2012). Also, differentiating hypothesis from proposition (Bacharach 1989) is alike and it is some sort of tautology. In this regard, a comparison between the Systemic Abductive method with the extant literature was shown in Table 2.

Table 2: Different conceptualizations of the abstraction continuum

	Term	**Theory**	**Hypothesis / Proposition**
Bacharach (1989)	Concept Construct Variable/event	- Grand theories Empirical generalizations	- Proposition Hypothesis
Van de Ven (2007)	Theoretical concept Theoretical construct Observable variable or event	Grand theories Middle-range theories Operational theories	- - -
Kaplan (1973)	Theoretical terms Construct Indirect Observable Observational Term	- - - -	- - - -
Osigweh (1989)	Traveling concept/Stretched concept Generalizable nonuniversal concept Configurative situational concept/Taxonomic	- - -	- - -
Systemic Abductive Method	Variable = Construct = Concept	Theory (one level)	Hypothesis = Proposition

4. Abduction and Systems Thinking

Deduction and induction are the two common reasoning forms. The former starts with a true rule and the latter aims to end with a true rule. Abduction is an open reasoning form, in which the possibility of alternative rules is presumed (Peirce, 1878). According to of Park (2015), different scholars have studied different aspects of abduction and suggested several classifications (Gabbay and Woods 2005; Hoffmann 2011; Magnani 2009, 2011; Schurz 2008). For example, Magnani's classification can be seen as three distinct points of viewing abduction: a) theoretical vs manipulative abduction b) creative vs selective abduction, and c) sentential vs model-based abduction. However, different classes of abduction share some assumptions, more or less: 1) the possibility of multiple alternative explanations, 2) doubt about previous findings, 3) interrelationship with induction and deduction. Despite these shared, scholars disagree on the explanatory/descriptive nature of abduction. This may root in Peirce's definition: "Abduction is the process of forming an explanatory hypothesis" (Peirce 1974,

106). Indeed, the "process of forming" is different from the "explanatory hypothesis", and therefore, scholars such as Gabbay and Woods (2005), Magnani (2009), and Park (2015) point to the descriptive aspects of abduction in addition to explanation. Even scholars who do not like to broaden the scope of abduction to non-explanatory abduction implicitly confess that there is some sort of non-explanatory abduction; for instance, Thagard coined the term "gabduction" for generalizing explanatory abduction to non-explanatory ones (2010). Indeed, abduction is a stage in every explanatory and non-explanatory inquiry, and scholars and philosophers conflate it with induction and similar forms of inference such as inference to the best explanation (Park 2015). Similarly, in management practice, ascending and descending a T-shaped ladder of abstraction to use abduction, deduction, and induction in the process of innovation is widely supported (Dorst 2011; Kazmi and Naaranoja 2015; Serrat 2017). In management inquiry, abduction is considered to be implicitly or explicitly a part of every inquiry, which provides first suggestions for deductive or inductive inquiries considering the active role of researchers and their cognition in forming the first suggestion (Bamberger 2019; Mantere and Ketokivi 2013). This first suggestion, which is based on surprising and new distinct facts, is widely embedded in different methodological strands of social sciences. For example, case study includes an implicit abductive reasoning process that searches for new facts. Consistently, new explicit abductive case studies, action, and other methods search for differences between cases based on abduction (Conaty 2021; Dubois and Gadde 2002; Halecker 2015; Halpin and Richard 2021; Patokorpi and Ahvenainen 2009). As an extreme methodological example, the practice lens in the social science inquiry, which is widely used in the management field under notions such as "entrepreneurship as practice" and "strategy as practice" is founded on abduction and supposes every case as a distinct case embedded in its own unique context, and therefore, needs distinct explanation (Antonacopoulou and Fuller 2020; Jarzabkowski 2004; Jarzabkowski and Spee 2009 Johannisson 2011; Steyaert 2007). Similarly, notions such as "replication 2.0" aim to replicate

previous studies not to confirm them but to find differences and inconsistencies between the studies (Tierney et al. 2020).

Consistent with Gerring (2012), the Systemic Abductive Method presumes a descriptive question embedded in every explanatory question. If we explore a 'pivoting' phenomenon to find some first sugge02.stions about pivot's triggers, we first implicitly or explicitly ask what pivot is. Indeed, we explain the phenomenon and simultaneously describe the explanation.

According to Barton and Haslett (2007, 143), "the scientific method is most usefully interpreted as a dialectic between analysis and synthesis supported by the triadic logic of C.S.Peirce, and that the role of systems thinking is to frame this dialectic." Moreover, abduction is the logic behind the formation of the explanatory hypothesis based on surprising facts and the possibility of alternative explanations. "a variety of approaches have evolved in systems thinking that assist the abductive phase of forming a hypothesis" (Barton and Haslett 2007, 150). For example, action research was founded on abduction and open systems thinking (Barton, Stephens, and Haslett 2009).

Among different approaches in systems thinking, Singer's process of "swiping in" is very similar to what is used to synthesize the surprising facts in the Systemic Abductive Method (Barton and Haslett 2007, Churchman 1979, 1981; Linstone 1984). Systems thinking leads the researcher to take a holistic lens; go a higher level of abstraction; see the phenomenon in relation to the other phenomena, and find more and more surprising facts embedded in the complex relationships affecting the system and its entities. Systems thinking provides a holistic standing point of viewing the reality for ascending and descending the ladder of abstraction to synthesize and analyze. While systems thinking helps researchers with better abductive hypothesis forming, simultaneously, there is a set of reciprocal touchstones, which helps researchers with interpreting systems and systems thinking via the lens of Peirce's pragmatism (Barton 1999, 7):

- The rejection of atomistic thinking and the spirit of Cartesianism, in favor of a structure of thinking which acknowledges the existence of wholes within the context of a continuous world view.

- The pragmatic maxim and the identification of systems by their emergent properties.
- The role of abductive inference and its relation to action learning.
- The implication that a complete methodology for systems inquiry must have a way of identifying systems, the framework of ideas which in particular, express "a logic of wholes", and a method of applying this framework to the system of interest.
- The use of symbols in the description of systems.

5. Practical Recomendation: A case

In this section, we introduce the concept 'pivot' as a vague case. 'Pivot' was first used by Ries in 2009, in a blog post, as a change in startup direction after failing in the market (Sadeghiani and Anderson 2023). Then, he (2011) defined it as a change in strategy without any change in vision. He also defined it as "a structured course correction designed to test a new fundamental hypothesis about the product, strategy, and engine of growth" in The Lean Startup book (Ries 2011, 149). In another definition, it was defined as "a major change to one of the nine business model hypotheses based on learning from customer feedback." (Blank and Dorf 2012, 25) This term was first used to describe a phenomenon in the early stages of startups (Ries 2011; Blank and Dorf 2012). Then, others tried to define it as a strategic change in other contexts such as and the early history of the automobile industry (Pillai et al. 2020).

In this section, based on the findings of a critical constructive review of the concept "pivot" (see Sadeghiani and Anderson 2023 for details), we discuss how the Method's recommendations work. Twelve recommendations were provided in the Method, which are listed in Table 3 besides some new recommendations. Based on the Method, pivot definitions and interpretations were critically reviewed using the Method's first two clarity criteria: 1) concept categorizer and 2) delineator of the application domain. In the literature on 'pivot', when the scholars use the terms "a sharp turn", "a special kind of change", "a substantial change", "a reorientation", or "a revolutionary change" they are trying to define the nature of change and separate it from other kinds of change or similar concepts. Also, when scholars write "change

of …" or "change in …", the rest of their phrases is about the application domain of the concept.

Accordingly, it was concluded that the nature and depth of the concept pivot is not clear because it was defined as a particular kind of change while the nature and the depth of this change were not clearly differentiated from other kinds of change such as diversification. Also, its application domain was not persuasively delineated. It was applied to strategy, business model, product, or one or more components of business model. Indeed, different scholars have applied this concept to different domains, from a change in one component of a business model to discontinuing a business and starting a new business instead (Sadeghiani and Anderson, 2023).

To discuss the roots of such vagueness in defining and interpreting the nature and application domain of the concept, we used the next four clarity criteria, according to the third recommendation of the Systemic Abductive Method: 3) context-free; 4) age-fitted 5) clear relations to the associated concepts, and 6) consistency with the overall theoretical argument. Based on the Method's recommendation, we identified business model, strategy, and vision as the second-hand concepts and business value mechanisms (value proposition, creation, delivery, and capture) as the third-hand constructs in relation to pivot as the first-hand or focal concept. The first- or second-hand concept in this example does not necessarily concern hierarchy, level of abstraction, or inclusion. These concepts are the scope of the review (Recommendation 2).

Based on Clarity Criteria 3 to 6, we concluded that 1) pivot definitions and interpretations were confused with processual concepts (e.g. evolution vs revolution); 2) it was over-contextualized within the scope of a particular industry, early stage of the life cycle, and some entrepreneurship methodologies, and therefore, it is not well-generalizable; 3) scholars do not agree on the pivot's relationships to the main associated concepts (i.e. strategy, business model, vision, and business value mechanisms).

To reconstruct the concept pivot, in addition to reviewing all the definitions and interpretations in the literature (Recommendation 1), we distanced ourselves from the

startups' world and transferred the concept to the everyday microbusiness and small business context and tried to conceive of a broader scope including all the literature's previous contexts and the new context (Recommendation 5). We parsimoniously redefined the nature of pivot as 'substitution', which means replacement. Accordingly, this is a categorical dichotomous variable taking only two values of yes/no. This is consistent with Recommendations 9 to 12, and the pragmatic use of the term variable instead of concept or construct. This also would resolve the divergent scale development endeavors for measuring this concept where some 4-degree and 7-degree scales being proposed regarding the unclear nature and depth of the change.

We delineated the application domain of the concept pivot as at least one dimension of these three dimensions: 1) the array of value propositions and/or target customers, 2) value production, distribution, and/or consumption, and/or 3) value promotion and capture. We also abbreviated these combinations as 1) value protarget, 2) value prodisumption, and 3) value procapture consistent with Lakoff's (2014) framing technique suggesting new terms instead of established prior mind frames. We excluded the terms business model and strategy from the definition, as they were unclear and controversial. Also, we grouped business value mechanisms into three groups according to Recommendations 4, 6, 8, and 17.

Some pivot definitions were confused with the terminology and inputs and outputs of the experimental and processual views. We deleted related terms from the main definition and discussed them according to Recommendations 7, 14, and 15. We also discussed 'pivot' in relation to 'pivoting' according to Recommendations 18. Moreover, we excluded fuzzy terms such as substantial change, major change, minor fine-tuning, etc., from our refined definition according to Recommendation 16.

Seven recommendations of the nineteen recommendations are some heuristics that arose when we were critically reviewing the pivot literature. Similarly, others may recommend new heuristics. However, the researchers may or may not apply some of these recommendations depending on

their case under refinement. Also, we suggest researchers review other scholars' recommendations (e.g. Locke 2012; MacKenzie et al. 2011; Podsakoff et al. 2016; Suddaby 2010; Zhang et al. 2016). Regardless of the recommendations that are used, scholars should pay attention to the overall explicit procedure and both inductive and abductive reasoning approaches that are embedded in the implicit cognitive logic of reconstruction in the Method (Sadeghiani et al. 2022).

Table 3: The Recommendations Set of the Systemic Abductive Method

Recommendation 1: Consider all the previous definitions of the concept and instances of the reference observable as the available data; try to reach the best explanation of the data; provide an inclusive definition rather than a distinct contextualized definition.
Recommendation 2: Specify the focal construct; list the second-hand constructs being used in different definitions of the focal construct; list the third-hand constructs being used in different definitions of the second-hand constructs. This provides you with a set of related concepts as the scope of your critical conceptual review.
Recommendation 3: Organize the critical review of the construct based on the six clarity criteria; use the first two criteria to show the conflicting perceptions and the next four criteria to show the roots of the conflicts.
Recommendation 4: Use dialectical analysis and synthesis. Analyze based on dissimilarities and categorize the concepts. Synthesize based on similarities and group the overlapping concepts in a new concept. Use both speed and accuracy of concept mapping (to the observables), as criteria for deciding the depth of categorization.
Recommendation 5: If you are defining a concept to use in a research project, conceive of the contexts broader than the population under study; distance from the context of your research, transfer your concept to the other contexts, and assure the applicability of your definition to the other contexts in addition to your particular research context.
Recommendation 6: Group and/or synthesize the conventional terms to reflect the integration of the reference observables of those terms in the new era.
Recommendation 7: List the antecedents, consequents, inputs, outputs, mediators, and moderators, and separate them from the focal construct.
Recommendation 8: Discuss the utility of the concepts and constructs being applied in the definition of the focal construct and test them against the six clarity criteria.
Recommendation 9: Do not presume general abstraction levels to differentiate concept, construct, and variable from each other. Feel free to use the terms concept, construct, and variable interchangeably with one another.
Recommendation 10: Instead of using 'concept', 'construct', and 'variable'

for difference making, use different types of categorical and quantitative variables.

Recommendation 11: In explanatory research, ask descriptive questions (e.g. is this …? how much is it a …? how many …? "what … is (are)?) before the explanatory questions.

Recommendation 12: Consider the definition of a concept as an instrument for observing and measuring the reference observable of the concept. Imagine it as a measurement tool in operation, and try to improve its observation power.

Recommendation 13: Use conceptual models based on systems thinking to situate the constructs among other related concepts. The conceptual models should present the explanatory aspects of the focal construct in relation to the other related concepts.

Recommendation 14: Exclude contextualized terms from your definition. This helps you with generalizing and transferring your concept to other contexts.

Recommendation 15: Use negation to delineate the nature and application domain of the concept and differentiate it from similar concepts, antecedents, consequents, and mediators.

Recommendation 16: Replace fuzzy terms and qualifiers with parsimonious words as much as possible to prevent unnecessary surplus meaning and conflicting perceptions.

Recommendation 17: If the second-hand constructs being used in the definition of the first-hand construct are controversial, exclude these second-hand constructs and directly define the first-hand construct in terms of the third-hand constructs.

Recommendation 18: Discuss the focal concept in relation to its derivatives (e.g. management vs managing, organizing vs organization, entrepreneurship vs entrepreneuring) to avoid confusing process, event, state, and entity with one another.

Recommendation 19: juxtapose your new definition and the related conceptual model with the previous definitions and related conceptual models.

6. Methodological Foundations

Theory is a system of constructs that are related to each other in nomological networks as the interlocking systems of laws (Bacharach 1989; Cronbach and Meehl 1955; Schwab 2005). Indeed, "constructs exist only in referential relationships, either explicit or implicit, with other constructs and with phenomena they are designed to represent." (Suddaby 2010, 350). Systems thinking helps researchers use scientific method, as the logical dialectic between analysis and synthesis, to give more explanation power to the constructs (Barton and Haslett 2007). Moreover, constructs have systemic as well as

observational meanings. Meaning openness results in partial and uncertain interpretations. Sometimes, a term has systemic openness, and it is meaningful only as it is used together with other terms in a system of related terms. Some terms have 'dynamic meanings', and their meanings change as our knowledge of phenomena grows and our conceptions of things are modified (Kaplan 1973).

Systems thinking and scientific thinking are twin components (Checkland 1981), and the Soft System Methodology links the systems thinking approach to behavioral science (Checkland 2000; Checkland 1989; Wilson 2001). The rationale behind this methodology is that systems thinking resolves the complexity of the behavioral phenomena. In the Systemic Abductive Method, we utilize this rationale and some related practices of the Soft System Methodology such as conceptual modeling. When we are organizing concepts and reconstructing constructs, scientific imagination matters. Systems, models, fiction, metaphors, diagrams, and computational structures are used to support the imagination ability of the researcher (Godfrey-Smith and Levy 2019). Indeed, we utilize the systems thinking rationale and tools to resolve the flaws in the mainstream reductionist approaches, based on the complementary roles of synthesis and analysis (Ackoff 2000; Johannessen and Olaisen 2005a, 2005b). We will go beyond reductionism; however, we will not be rejecting analysis, rather we utilize dialectical synthesis and analysis (Ritchey 1991).

While a remarkable part of methods of researching social systems such as action research has been developed to operationally support systemic interventions (Barton, Stephens, and Haslett 2009; Midgley 2000), the Systemic Abductive Method is a qualitative method with the aim of providing a basis for designing pluralistic systemic interventions and other research methods that are used to support explanation. Indeed, in the Method, we consider a socioeconomic system such as a business as a system with interconnected parts, emergent forms and phenomena, boundaries, and environment; and methodologically base our critical review and constructive definitions on such considerations (Johannessen and Olaisen

2005a, 2005b; Midgley 2000). This method provides a semantic and schematic representation of a phenomenon in relationship with other phenomena of the business or organization as a system in relation to its environment (Emery 2000). For example, in the case of 'pivot', according to Recommendation 13, the Observable Business Model was introduced to represent the business as a system and to situate the intended phenomenon among the other business phenomena (Sadeghiani 2022). This representation is a relatively more powerful explanatory tool separating the phenomena from antecedents, consequents, inputs, and outputs if it is compared to the other models and representations according to Recommendation 19. It also can explain similar models. For example, Figures 1 and 2 show the commonly used Business Model Canvas, which is descriptive, and our Observable Business Model, which is explanatory in addition to being descriptive.

Epistemologically, it is supposed that our knowledge of reality is mediated by the observers' perceptions and beliefs. As discussed, the implicit logic of redefining concepts in the Method is dialectical abduction-induction. Therefore, the Method can be seen as a holistic manifestation of dialectical critical realism (Bhaskar 2008; Roberts 2014). Indeed, critical realism is fundamentally systemic in nature, and systems thinking lies at the heart of critical realism. Simultaneously, critical realism and systems thinking provide a philosophical foundation for the Method (Mingers 2011, 2014). According to Mingers (2011), this method shares three elements with critical realism: 1) holism: the authors went up and presented a holistic view of the coevolution of the semantic system, system of observables and phenomena, and observation system and discussed how (re)definition takes place at the intersections of these systems. 2) causality: broadly speaking, the cause-and-effect relationships between the three systems were discussed. Stricter, the recommendations on separating inputs and outputs from the construct, applying conceptual models in showing causality, and considering both descriptive and explanatory questions in the process of critical review, emphasize causality. 3) emergence: it was discussed how meaning emerges and changes in relation to the emergence,

evolution, and changes in the system of observables and phenomena and the changing knowledge of the observer. Moreover, the aim of the researcher in the Method is to discuss conflicting perceptions of a concept that is used to describe and explain a situation/reality and bring about an agreed definition. Indeed, the researcher uses all the previous definitions as the available data and synthesizes them based on dialectical abductive-inductive logic to reach the best explanation. This is consistent with 'retroduction' and 'generative causality', and according to Mingers (2014), this mode of reasoning is at the heart of critical realism.

The researcher investigates a systemic reality, and the systems concept is pluralistic and consistently dialectical (Houghton 2009). As discussed in the Method, terms, concepts, meanings, observables, phenomena, and research methods and instruments may emerge. Therefore, 'emergence' plays a critical role in the coevolution of the observation system, semantic system, and system of observables and phenomena. The emergent components of these systems are not independent of human practice. Indeed, human theories and conceptualizations as the outcome of her/his inquiry practices affect the reality of emergence. Therefore, pragmatism could be seen as another philosophical foundation of the realist interpretation of the reality of emergence (El-Hani and Pihlström 2002). Moreover, Peirce's pragmatic abductive inference which shares some forms of abduction with realist inference is used in the Method (Bertilsson 2004; Bhaskar 2013; Chiasson 2005; Lipscomb 2019; Niiniluoto 2018). Via this lens, the Method can be categorized under pragmatic realism. However, with respect to our discussion about the systemic nature of meaning and meaning openness, meanings of the words depend on how they are used. For example, to better situate the 'pivot' concept, the business model components were reorganized from Figure 1 to Figure 2 to reflect new meanings and interpretations. Indeed, the concepts and words get new meanings if their relations to the other words change. This is the main foundation on which the neopragmatists who emphasize linguistic pragmatism, build their methodology (Hildebrand 2005; Koopman 2007; Rorty 1999). Therefore, the

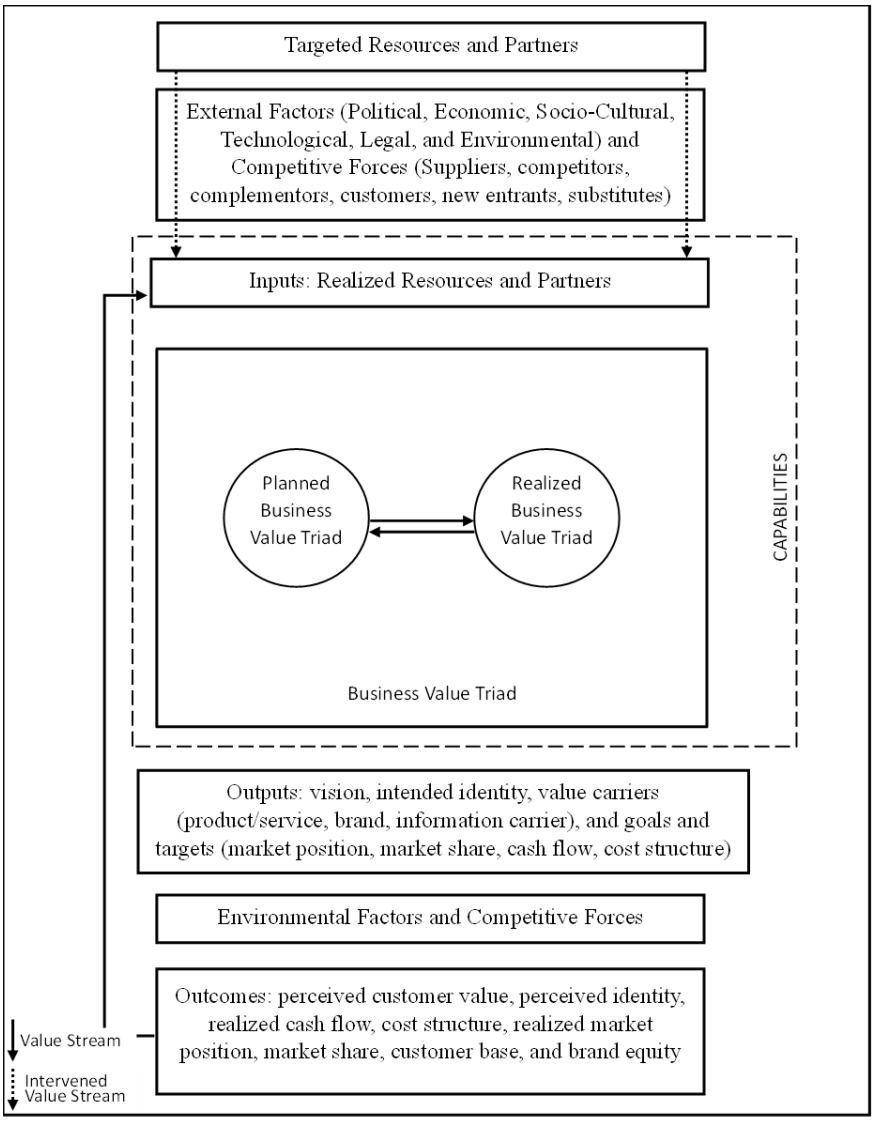
Method is not limited to classical pragmatism (Dewey 1997, 2002, 2018; Shook and Margolis 2006) and can be described under neopragmatism, too (Hildebrand 2005; Rorty 1999; Shook and Margolis 2006). The Method discussed the failure of dichotomous direct-indirect observation to explain the phenomena. This discussion and the suggestion of interchangeability of the terms 'concept', 'construct', and 'variables' lie at the heart of neopragmatism.

The Systemic Abductive Method utilizes Peirce's abductive reasoning and reviews the literature with doubt but not a universal doubt. Rather, it critically builds on others who have claimed certain findings; and seeks better explanations (Anderson 2006). Moreover, this method does not oppose positivism. Because the mainstream interpretations of systems thinkers such as Bertalanffy and Simon generally fall in the scope of positivism; indeed, the Method is critical of the epistemological foundations of positivism only to better explain the phenomena but not to reject positivism (Nodoushani 1999). Also, abduction is utilized to reach a better explanation of the phenomena as a basis for positivist research methods such as experimental designs. Therefore, it also aims to empower the researchers who see the world via the lens of positivism. Moreover, it utilizes the rationale behind social constructivism to reconstruct socially constructed terms such as 'pivot' that come from practice to academia; and it coins new terms to disentangle the prior mind frames but not to exclude the context. Indeed, while we exclude the contextualized terms from the new definition, we do not exclude the context from the domain of the application of the concept; but open the concept's doors to new contexts.

Figure 1: Business Model Canvas (Osterwalder and Pigneur 2010)

<table>
<tr><td rowspan="2">Key Partners</td><td>Key Activities</td><td rowspan="2">Value Propositions</td><td>Customer Relationships</td><td rowspan="2">Customer Segments</td></tr>
<tr><td>Key Resources</td><td>Channels</td></tr>
<tr><td colspan="3">Cost Structure</td><td colspan="2">Revenue Streams</td></tr>
</table>

Figure 2: The Observable Business Model (Sadeghiani, 2022)



In the Method, four types of dialectic are implicitly or explicitly utilized: 1) a dialectic between a priori concepts and the new concepts that are developed, 2) a dialectic between the current researcher/theorist and the researchers/theorists who are being reviewed, 3) a dialectic between synthesis and

analysis, and 4) a historical cross-age dialectic. As a research method, this follows abduction in relation to induction (Fann 2012). Therefore, it aims at inference to the best explanation (Douven 2017; Hobbs, Stickel, Appelt, and Martin 1993). To reach such an explanation, we should follow both historical dialectic and systematic dialectic of a whole system. Therefore, we observe phenomena and their relations beyond the capacity of sole analytical reasoning (Arthur 1998).

In sum, the Systemic Abductive Method is open to all the schools of thought and works based on the dialectical relationships of the schools. It does not work based on dichotomies such as positivist-interpretivist, rather it is an accumulative outcome of different schools of thought. Table 4 shows some grounds of this methodological pluralism.

Table 4: The Systemic Abductive Method is pluralistic: Juxtaposition with the schools of thought

The grounds of juxtaposition of the Systemic Abductive Method with the schools of thought**	Positivism	Critical Realism	Interpretivism	Postmodernism	(Neo)Pragmatism
Some terms have 'dynamic meanings', and their meanings change as our knowledge of phenomena grows and our conceptions of things are modified.					
Systemic nature of meaning and meaning openness, meaning of the words depends on how they are used.					
We will not be rejecting analysis.	*				
Coevolving of the three systems of observation including semantic system, system of observable and phenomena, and observation system (including the researcher).			*		
Three systems of scientific observation and interpretation (holism, emergence, causality)		*			
Three systems of scientific observation and interpretation (causality)	*				
The emergent components of the three systems are not independent of human practice. Indeed, human theories and conceptualizations as the outcome of her/his inquiry practices affect the reality of emergence.					*

Abduction based on surprising facts					*
The implicit logic of redefining of concepts in the Method is a dialectical abductive-inductive reasoning.		*			
Interchangeability of the terms 'concept', 'construct', and 'variables'					*
Failure of dichotomous direct-indirect observation to explain the phenomena					*
"Develop a contextual understanding by gaining in-depth insights into the setting, while retaining a critical distance from it"				*	
The aim of the researcher in the Systemic Abductive Method is to discuss conflicting perceptions regarding a concept ...				*	
Challenging the dominant definitions of concept				*	
Suggesting a new definition of the concept based on researchers' interpretations of the cases and other definitions			*		
** These are some grounds to show the Systemic Abductive are pluralistic. You may map a specific ground to several schools of thought as these schools are a continuum.					

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Ayoob Sadeghiani: Ph.D. in Management, Information Technology. He studies concept formation and maturation, practice thirdness, and text as practice in business and technology arenas. He is also a Persian poet.

Address:
Ayoob Sadeghiani
Toronto Metropolitan University
350 Victoria Street, Toronto, ON M5B 2K3, Canada
E-mail: ayoob@torontomu.ca