Paper to be presented at the Summer Conference 2010

on

"Opening Up Innovation:
Strategy, Organization and Technology"
at
Imperial College London Business School, June 16 - 18, 2010

A CRITICAL REVIEW OF IMPROVISATION IN ORGANIZATIONS: OPEN ISSUES AND FUTURE RESEARCH DIRECTIONS

Ludovica Leone
Bologna University, Department of Management
ludovica.leone@unibo.it

Abstract:
Organization and management studies have recently increased their interest in improvisation process and in unplanned behaviors. Despite this intense attention, research needs a clearer conceptualization and understanding of what improvisation means and how it unfolds in organizational contexts at different levels.
The major aim of this paper is to clear up the conceptual confusion about improvisation through a systematical literature review dealing with improvisation in its different facets. In particular, the work enlightens the most relevant discriminant conceptual differences between improvisation and other strictly related constructs and concepts, such as bricolage, innovation, creativity and experimentation, which scholars often confuse with improvisation. Moreover, this work offers an overview of the principal unanswered questions related to improvisation and identifies possible future directions for both theoretical and methodological improvements.

JEL - codes: L20, -, -

A critical review of improvisation in organizations:

open issues and future research directions

Introduction

Improvisation, one of the mechanisms through which individuals and organizations accomplish routine breaking (Cunha, Cunha & Chia, 2007), is becoming increasingly hot in the organizational and strategic field. The recent attention paid by academic scholars to improvisation surges from the observation that in some artistic contexts, such as jazz and theatrical performances, innovation processes often successfully unfold through improvisation (Weick, 1998).

One of the reasons to approach a study on improvisation is the very promising explanatory potential of this concept, although the relatively youth of academic contributions implies a better conceptualization (the first empirical contributions are dated 1998). As a matter of fact, the fermenting research activity on improvisation led to some overlapping of contributions in different empirical settings, based on multiple theoretical frameworks. The result is a considerable confusion in defining what improvisation is, how it can be interpreted, and which are its antecedents and consequences.

Actually literature still offers multiple definitions of improvisation, even if it is quite possible to identify several common aspects that scholars usually relate to this concept. In this work improvisation is basically considered as "the deliberate and substantive fusion of the design and execution of a novel production", following the definition given by Miner, Bassoff and Moornan (2001: 314). People can improvise for necessity, in spur of the moment, because of a lack of time for planning and designing. Nevertheless, individuals and organizations sometimes may also transform improvisation in an effective emergent strategy, or in a precise organizational state of mind, capturing improvisation capabilities in everyday organizational activities (Vera & Rodriguez-Lopez, 2007).

A central explanation to inquire improvisation resides in its role in management practices, even if improvisation per se does not determine effective results. Actually its impact on

organizational practices depends on how it is managed and led, as it potentially creates both harmful and beneficial results (Vera & Crossan, 2004; 2005; Baker, Miner & Eesley, 2003).

Previous researches considered organizational improvisation as a medium to obtain positive outcomes, while less emphasis has been placed on the contingencies and boundaries conditions leading to effective improvisation (Vera & Crossan, 2005; Magni, Proserpio & Provera, 2008). Consequently, some organizations, promoting experimental culture and emergent learning (Moorman & Miner, 1998b) captured improvisation principles in their cultures, strategies or structures of "designed chaos" as a state of mind (Vera & Rodriguez-Lopez, 2007). This issue currently appears considerably relevant, in view of the evolution of organizational practices, especially in new product development and innovative contexts, where organizations increasingly need improvisational capabilities to react to environmental turbulence in market competition (Brown & Eisenhardt, 1997; Moorman & Miner, 1998b).

Outcomes of improvisation rely on experience and consolidated routines (Miner et al. 2001; Cunha et al., 2007). This process involves a specific learning loop (Argyris & Schon, 1978) based on existent knowledge and routines that are mixed up through intuition (Crossan, Lane & White, 1999), to reach a reconfiguration of new routines and knowledge (Vera & Crossan, 2007). Improvisational capabilities are often related to path breaking capacities or even to the individual ability to recognize differently external and extemporaneous stimuli, and transform them in opportunities through previous knowledge (Shane, 2000; Eckhardt & Shane, 2003; Alvaretz & Barney, 2007).

The main purpose of this paper is to clear up the conceptual confusion about improvisation, by laying out a review of the existing literature dealing with improvisation in its different facets. In this regard, I will enlighten similarities and differences between improvisation and other related constructs and concepts, with a special focus on *bricolage*, a concept that remains still extremely underdeveloped (Baker et al., 2003; Cunha, 2006).

Moreover the review tries to enlighten some open critical issues of this organizational topic and possible directions for future research.

What does Improvisation mean?

The first challenge that arises studying improvisation is the tricky tentative to define what does improvisation mean and how it does unfold. A convincing explanation of this issue will be given through a review of how and when this concept has been introduced in management literature, and after a clarification of the critical points related to this topic.

Specifically, improvisation is "the deliberate and substantive fusion of the design and execution of a novel production", following the definition given by Miner et al. (2001: 314). Under this perspective, the degree of improvisation depends on the substantive (more than temporal) convergence between planning, designing and implementation activities. Actually, "the more improvisational an act, the narrower the time gap between composing and performing, designing and producing, or conceptualizing and implementing" (Moorman & Miner, 1998a: 702).

One of the purposes of this work is suggesting a clear identification of the multiple dimensions remarked by seminal studies dealing with improvisation (e.g. Weick, 1998; Moorman & Miner, 1998a; 1998b; Miner et al., 2001; Baker et al., 2003). A deeper exploration into the existing definitions of the construct shows several recurrent factors related to improvisation. In particular improvisation is a *creative* process, characterized by *spontaneity* and *extemporaneity*, peculiar features that have been often overemphasized by literature (Moorman & Miner, 1997; Crossan, 1998; Weick, 1998). Improvisation is guided by *intuition* (Crossan & Sorrenti, 1997) and characterized both by *real time and deliberate nature of the action* (Cunha, Cunha & Kamoche, 1999; Vera & Crossan, 2004; 2007). In this regard, despite improvisation might arise as a consequence of serendipitous events, it is most

likely an intentional process involving consciousness of action or a mindful deviation (Garud & Karnøe, 2001). Improvisation is a process of thinking and doing almost *simultaneously* (Baker et al., 2003). Acting by improvisation means that the design, planning and execution phases of action are perfectly *converging* (Moorman & Miner, 1998b) in an *ongoing process* to obtain a *novel* outcome (Miner et al., 2001; Gong, Baker and Miner, 2006; Cunha et al., 2007), where novel means the generation of new solutions/products/behaviors, and it does not necessarily imply a certain degree of deviation from existing products. Sometimes improvisation involves the use of resources at hand (*bricolage*), especially in cases of high time pressure, when resource seeking becomes unachievable (Baker & Nelson, 2005). To sum up, the fundamental dimensions that signal the occurrence of improvisation are:

- a creative exercise, where creativity is "the generation of new and useful ideas" (Amabile, 1996);
- the substantial convergence of designing, planning and execution in an ongoing process (Moorman & Miner, 1998b);
- the novelty of the process/outcome (Baker & Nelson, 2005), because we are dealing with a creative exercise;
- an intuition as initial stimulus (Crossan & Sorrenti, 1997);
- the extemporaneous and deliberate nature of the action (Moorman & Miner, 1997; Vera & Crossan, 2004);
- the absence of plan in the action (Moorman & Miner, 1998b);
- unplanned bricolage (Baker & Nelson, 2005, Baker, 2007).

In order to give a complete overview of the extensive use of improvisation in different research contexts and empirical domains, Tables 1 to 4 show most of the uses and definitions of improvisation existing in literature.

Table 1– Definitions of improvisation across the literature, starting from Moorman and Miner (1998a) and Cunha, Cunha and Kamoche (1999)

Definition	Author	Domain
A. Organizational perspective on improvisation		
"Improvisation occurs when the design and execution of novel activities converge"	Baker, Miner and Eesley (2003)	Entrepreneurship
"Fabricating and inventing novel responses without a prescripted plan and without certainty of outcomes; discovering the future that [action] creates as it unfold"	Barrett (1998)	Management
"The acts of composing and performing are inseparable, and each composition/performance is different from all previous compositions/performances"	Bastien and Hostager (1992)	Organizational communication
"Organizational improvisation is a type of short-term learning, where experience and related change occur at or near the same time"	Bergh and Lim (2006)	Finance
"Respond to whatever the situation itself - both social and physical throws at people…building, ad hoc and collaboratively, robust models that do justice to particular difficulties in which [people] find themselves"	Brown and Duguid (1991)	Organizational learning
"Improvisation in the present…to stay focused on current conditions…while maintaining project schedules"; "combining limited structure with extensive interaction and freedom [to make changes] on current products" "an organizing strategy of `making it up as you go along' "; "it means creating a product while simultaneously adapting to changing markets and technologies"	Brown and Eisenhardt (1997)	NPD
"Efficiently generate new combinations of resources, routines and structures which are able to match the present, turbulent circumstances"	Ciborra (1996)	Organization structure
"Action taken in a spontaneous and intuitive fashion"	Crossan (1998)	Management
"Intuition guiding action in a spontaneous way"	Crossan and Sorrenti (1997)	Management
"Organizational improvisation is a type of short-term learning, where experience and related change occur at or near the same time"	Crossan, Cuhna, Vera and Cuhna (2005)	Organization Theory
"Making decisions and adapting to changing needs and conditions" "ideas emerge in new and creative ways not planned by the performer".	Crossan, White, Lane and Klus (1996)	Strategy

Table 2– Definitions of improvisation across the literature, starting from Moorman and Miner (1998a) and Cunha, Cunha and Kamoche (1999). Continuing

Definition	Author	Domain
"Making do with minimal commonalities and elaborating simple structures in complex ways"	Eisenberg (1990)	Organizational communication
"Use structure in creative ways that enable the altering the structural foundations of performance" "making structure implicit and discover what they are able to express - it is a structure that supports, but does not specify"	Hatch (1999)	Organization
"Improvisation may be seen as relating to how thoughts and action develop over time and in response to environmental cues and stimuli"	Leybourne and Sadler-Smith (2006)	Project Management
"Improvisation - the casting around for a precedent of referent that will enable someone to deal with a circumstances for which no script appears to be immediately to hand"	Mangham and Pye (1991)	Management
"Substantive rather than temporal convergence of planning and execution"	Miner, Bassoff and Moorman (2001)	Organizational learning
"Extemporaneous and deliberate organizational action"	Moorman and Miner (1995)	Marketing and Organization
"Composition converging with execution"	Moorman and Miner (1998a)	Organizational memory and innovation
"When the composition and execution of an action converge in time" "Actions, both spontaneous and novel, that result in the creation of something while actions are unfolding"	Moorman and Miner (1998b)	NPD
"Enacting an ongoing series of local innovations that embellish a prescripted structure, respond to spontaneous departures and unexpected opportunities, and iterate or build on each other over time"	Orlikowski and Hoffman (1997)	Organizational development
"To be composed while performed"	Perry (1991)	Management
"On the spot surfacing, criticizing, restructuring, testing of intuitive understandings of experienced phenomena." "Knowing-in-action" "Reflection-in-action"	Schön (1983)	Management/education
"We define improvisation as the spontaneous and creative process of attempting to achieve an objective in a new way. As a spontaneous process, improvisation is extemporaneous, unpremeditated, and unplanned. As a creative process, improvisation attempts to develop something new and useful to the situation, although it does not always achieve this."	Vera and Crossan (2004)	Organization Theory

Table 3– Definitions of improvisation across the literature, starting from Moorman and Miner (1998a) and Cunha, Cunha and Kamoche (1999). Continuing

Definition	Author	Domain
"A just in time strategy."	Weick (1987)	Management
"There is no split between creator and interpreter; and no split between design and production"	Weick (1993a)	Management
"Improvisation implies attention rather than intention drives the process of designing"	Weick (1993b)	Management
"Thinking and doing unfold simultaneously". "Retrospective sensemaking"	Weick (1996)	Firefighting management
"Dealing with the unforeseen, without prior stipulation, with the unexpected"; "Improvisation involves reworking precomposed material and designs in relation to unanticipated ideas conceived, shaped and transformed under the special conditions of performance, thereby adding unique features to every creation" (quoting Berliner, 1994)	Weick (1998)	Organizational theory
"No distinction between composition and performance, … structure from process, plans from implementation, process from product and prospect from retrospect"; "disciplined imagination"; "thinking both compositionally and spur of the moment at the same time"	Weick (1999)	Organizational theory
B. Musical perspective on improvisation		
"Imagination guiding action in an unplanned way, allowing for multitude of split second adjustments"	Chase (1988)	Music
"Improvisation follows not the blueprint method but this second approach. The improviser may be unable to look ahead at what he is going to play, but he can behind at what he had just played"	Gioia (1988)	Jazz/management
"The spontaneous creation of music"	Kernfeld (1995)	Music
"Free from the effects of previous training; the opposite of pure composition"	Pressing (1984)	Music
"Unlike compositional creativity, which involves a long period of creative work leading up to a creative product, in improvisational creativity, the creative process and the resulting product are co-occuring"	Sawyer (1992)	Music
"Playing extemporaneously, i.e. without the benefit of written music"	Schuller (1968)	Music

Table 4– Definitions of improvisation across the literature, starting from Moorman and Miner (1998a) and Cunha, Cunha and Kamoche (1999). Continuing

Definition	Author	Domain
"Improvisation involves making decisions affecting the composition of music during its performance." "Discovery and invention of original music spontaneously, performing it."	Solomon (1986)	Music
"The art of spontaneously creating music while playing or singing	Toiviainen (1995)	Neural network theory applied to music
"The spontaneous act of constructing or reconstructing; using any immediate or available properties (material or immaterial) into either material or nonmaterial forms used for a specific purpose (function or need)"	Zinn (1981)	Music
C. Theater perspective on improvisation		
"To substitute…staid and preconceived notions for the unforeseen, the improvised, the unknown, the world of imponderables"	Knapp (1989)	Theater
"Playing the game; setting to solve a problem with no preconception as to how you will do it; permitting everything in the environment to work for you in solving problem"	Spolin (1963)	Theater
E. Other perspectives on improvisation		
"Reading and reacting in parallel". "dual tasks". "Perspective-in-action" and "thinking-in-action"	Bjurwill (1993)	Sports
"Not having a stable response to external stimuli, but rather create different responses according to circumstances". "Embodying different senses of person in different situations"	Machin and Carrithers (1996)	Anthropology
"Role improvisation is defined as the extent to which the organization and meaning of roles are invented by people immediately involved in a relationship"…"actor reinterpret, redefine, and re-structure their relationships during the on-going process of interaction"	Powers (1981)	Sociology
"Immediate and spontaneous...process of creation"	Sharron (1983)	Sociology
"Rapid unplanned change"	Volkman (1994)	Anthropology

Improvisation in management and organization literature

The recent academic attention conferred to improvisation raised since scholars tried to understand how individuals innovate through improvisational processes in artistic fields (e.g. 1998 *Organization Science* Special Issue on Improvisation). In particular, Weick reported: "the emphasis in organizational theory on order and control often handicaps theorists when they want to understand the processes of creativity and innovation" (1998: 543). According to this, scholars tried to transpose to an organizational context, as metaphors, the key characteristics observed in some of the most improvisational environments, such as jazz music, theatrical performances, sports, and public speaking (e.g. Weick, 1993b; Barrett, 1998; Meyer, 1998). This massive use of metaphors is one of the main critics moved to the bases of improvisation literature framework. In fact, the first studies focused on this topic suffer properly from an over-reliance on the excessive use of metaphors (Cunha et al., 1999; Cornelissen, 2006) because they are in part based on insights from jazz and theatrical improvisation (Vera & Crossan, 2005). This view sometimes has tended to obscure the notion that "improvisation is more than a metaphor" (Crossan, 1998: 593).

As a consequence, scholars attempted to define a formal theoretical framework (Kamoche, Cuhna & Cuhna, 2003), initially through the construction of grounded theories (Baker et al., 2003; Baker & Nelson, 2005) and lately through the identification and empirical testing of some of the antecedents and consequences of improvisation (Moorman & Miner, 1998b). Moreover it is necessary and useful to signal that, even if improvisation has been firstly studied in artistic fields, the occurrence of improvisational activities and behaviors has been fully detected in multiple organizational contexts. This insight supports the idea that improvisation might take place moving from contexts where improvisation is expected, to more counterintuitive settings. Specifically, empirical studies settings go from new product development (e.g. Moorman & Miner, 1998b), to firm founding processes (Baker et al.,

2003), to public administration (Vera & Crossan, 2005).

As argued above and detailed in Tables 1 to 4, academic researchers adopted some different definitions of improvisation, without a common alignment between scholars, even more in the operationalization of the underlying construct. This issue becomes remarkable considering that improvisation may occur to different organizational levels (individual, team, project, organizational) and with different intensities.

Prior contributions in management research reflect the complex attempt to inquire these different levels and degrees. Specifically, some researchers described improvisation as conducted by individuals. Weick is one of the first scholars that inquired how individuals improvise (1993b; 1998). Improvisation has been studied also in entrepreneurial processes, considering for example in founding processes (Baker et al., 2003) its tie with opportunity recognition patterns or examining how proclivity to improvisation may conduct to future entrepreneurship intentions (Chen & Ma, 2005; Hmieleski & Corbett, 2006; 2008). Eventually, individuals have been considered in improvisation studies also inquiring the role of team leaders in this kind of process (Vera & Rodriguez-Lopez, 2007).

In addition to individual improvisation, scholars found out that improvisation may arise at group level. Scholars approaching a team level study must consider other factors apart from individual improvisational capabilities that may influence team improvisation, such as team characteristics, team dynamics, and contextual influences. Although collective, team or group improvisation are built on individual improvisation, "team improvisation is more than the sum of individual improvisations, because the joint activities of individuals create a collective system of improvisational action" (Vera & Crossan, 2005).

Finally, several contributions focused on organizational improvisation, which includes improvisation by groups, departments, or whole organizations (Moorman & Miner, 1998b). These works, starting from the assumption that the individual improvisation is the base for

organizational improvisation, considered in some cases the organization as a macro-team, or as a cultural entity. In other cases organizational improvisation has been related to organizational culture and strategy (Vera & Crossan, 2005).

Furthermore, researchers registered that improvisation occurs at different intensities or degrees of the same continuum, as for example: low/moderate/high level of improvisation (Cuhna et al., 1999); incremental improvisation and radical improvisation (Vera & Rodriguez-Lopez, 2007); from interpretation, minor deviation, embellishment, to full-fledged improvisation (Weick, 1998; Moorman & Miner 1998a); or even different degrees compared with musical genres (Zack, 2000).

Concepts recurrently confused with improvisation

Literature often confused conceptually improvisation with *bricolage*, which can be defined as "making do by applying combinations of the resources at hand to new problems and opportunities" (Baker & Nelson, 2005: 333). This concept has been introduced in social sciences by Lévi-Strauss (1967) and has been more specifically adapted to managerial studies by several contributions (e.g. Baker et al., 2003; Garud & Karnøe, 2003), as an explanation of the persistency of some entrepreneurial firms in apparently constrained environments. In its first definition bricolage has three main features: a) the presence of resources at hand - available resources even not in use or for a different use; b) the recombination of resources for new processes; c) the making do (Lévi-Strauss, 1967).

Bricolage encompasses unforeseen results (as serendipitous combination of existing resources) but it is a conscious process (as improvisation) and just similarly to improvisation it involves specific capabilities to "pursuit opportunity through close regard to the resources at hand" (Baker & Nelson, 2005: 359). As bricolage literature detected, there are three types of bricolage – technical, symbolic, and hybrid – each of them representing a process of dynamic

innovation, where innovation itself is considered as "a process of bricolage, resembling the Schumpeterian earlier idea of combination" (Campbell, 1997: 22).

Despite most of the existing contributions considered the two concepts as interchangeable synonymous (see for example the review conducted by Cuhna et al., 1999), some eminent works suggested a difference between improvisation and bricolage (Miner, et al., 2001; Baker et al., 2003). In fact, even if improvisers often engage in bricolage due to time constraints in resource seeking, bricolage can also be accurately planned. However, considering cognitive, affective, and social resources in the bundle of available resources at hand, improvisation naturally invokes bricolage of existing routines and knowledge as disposable resources.

Moreover, improvisation differs in nature from other kinds of action such as *adaptation*, defined as the adjustment of a system to external conditions (Campbell, 1969; Stein, 1989) and *serendipity*. This last concept has been adapted from the phenomenon that sometimes a scientific researcher may encounter when the observation of an unforeseen, anomalous, strategic data, gives the occasion to develop a new theory. It looks like an apparent incongruence that stimulates the researcher to give a sense to data. Serendipity can be thought as a lucky and sagacious discovery of valid results that you did not foresee to find before (Merton, 2002).

Finally improvisation, as a learning process, can be easily confused with *experimentation* and *trial-and-error*. Actually improvisation does not foresee previous planning of multiple experimental situations. Moreover repeated actions related by their consequences, which are typical in trial-and-error, do not substantially exist in improvisation.

In order to avoid misinterpretations about the coincidence of improvisation with other similar constructs and concepts, it will be useful to delineate an illustrating schema with distinctions and similarities (Table 5).

Table 5 – Conceptual discriminant validity among improvisation and related constructs (adaptation and integration from Miner et al., 2001)

Comparative constructs	Definition	Comments about comparison and differences
Adaptation	Adjustment of a system to external conditions (Campbell, 1969; Stein, 1989).	Adaptation does not necessarily involve temporal or action convergence. It can be achieved through planning or deploying existing routines appropriately. Some improvisations may involve adaptations to
Bricolage	"Making do by applying combinations of the resources at hand to new problems and opportunities" (Baker & Nelson, 2005: 333).	"While improvisation may imply bricolage, bricolage also occurs in the absence of improvisation, and that it is therefore important to recognize that they are separate constructs"…"it is entirely possible to plan to do something by combining the materials that will be at hand at a later time"…"bricolage may be a cause of improvisation" (Baker, 2007: 698).
Creativity	"The generation of new and useful ideas" (Amabile, 1996).	Creativity may involve absolutely no improvisation as when a plan or design is itself creative. A creative idea might never be executed. Improvisation however implies creativity, while creativity may occur for instance also through trial and error experimentations or planning (Cunha et al., 1999).
Experimentatal learning	The actor deliberately creates contrasting situations in order to generate systematic experience (Cook & Campbell, 1979).	In experimenting, people deliberately varied activities and conditions. The nature and degree of this variation is typically planned in advance and designed to elicit general, explicit knowledge about causal factors. When improvising, people typically seek no more variation than was needed to address the immediate situation (Miner et al., 2001).
Innovation	"The adoption of any device, system, process, problem, program, product or service that is new to the organization" (Dougherty 1996, 424).	This construct shares with improvisation its focus on relative novelty, but innovation may be planned and scheduled (Cunha et al., 1999). Improvisation may be a process leading or not to innovative outcomes and products. At the same time improvisation
Serendipity	Serendipity can be thought as a lucky and sagacious discovery of valid results that you did not foresee to find before (Merton, 2002).	Serendipity does not imply consciousness of action and does not imply convergence of design, planning and execution.
Trial and error learning	Trial and error learning refers to a process in which an actor or an organization takes action "on-line" and the consequences of that action lead to a change in action or knowledge base (Miner et al., 2001). The actor may repeat the action and reflect to the consequences.	A complete improvisational episode occurs when the improvised production is complete. The improviser cannot and does not wait to know the consequences of the improvised production while executing it. In contrast, a complete episode of trial-and-error learning occurs only after outcomes of action have been experienced, and new actions or inferences arise, specifically based on the consequences of completed action (Miner et al. 2001).

Furthermore, the following table sums up in details the differences and the common patterns between improvisation and bricolage.

Table 6 – Conceptual discriminant validity between improvisation and bricolage (adaptation from Gong et al., 2006)

Construct Characteristics	Improvisation	Bricolage
Definition	"The deliberate and substantive fusion of the design and execution of a novel production"... "Substantive convergence implies temporal convergence" (Miner et al., 2001: 314).	"Making do by applying combinations of the resources at hand to new problems and opportunities" (Baker & Nelson, 2005: 333).
Susbtantive convergence	Improvisation assumes substantive convergence between design and execution. Actor must design the pattern and enact the pattern in the same activity.	Substantive convergence is not a necessary feature as actors or organizations may carefully design the action in advance of executing it.
Temporal convergence	Improvisation implies temporal convergence as design, planning and execution also converge in time.	An actor may plan ahead to enact bricolage.
Scope of resources	Not limited to resources readily at hand. Can create "new-to-the–world" elements during improvisation. Bricolage may occur often however, because while improvising firm may draw on close by resources.	Limited to resources readily at hand.
Link to preexisting routines	Preexisting routines do not constitute improvisation; there must be some degree of novelty in the design.	Bricolage often involves recombination of preexisting routine elements.
Relationship to the other construct	Improvisation increases the chances that bricolage will occur because there is less time to obtain appropriate resources in advance.	Bricolage may also sometimes produce improvisation, particularly when the resources at hand did not behave as anticipated.

Improvisation and planning

As already mentioned, improvisational behavior means the convergence of design/thought/execution (Moorman & Miner, 1998), a simultaneous identification of challenges and response generation (Fisher & Amabile, 2008). These patterns apparently reduce the role of *planning* in organization. While the dominant image in innovation and in entrepreneurship literature reflects the linear and sequential framework "design that precedes execution", actually the improvisational framework, essentially as a complementary way, considers a convergence of design and execution phases. In this perspective the individuals do not act following a structured process with clear goals independent from action (Baker et al., 2003). As Moorman and Miner suggested, "there are cases when the composition and

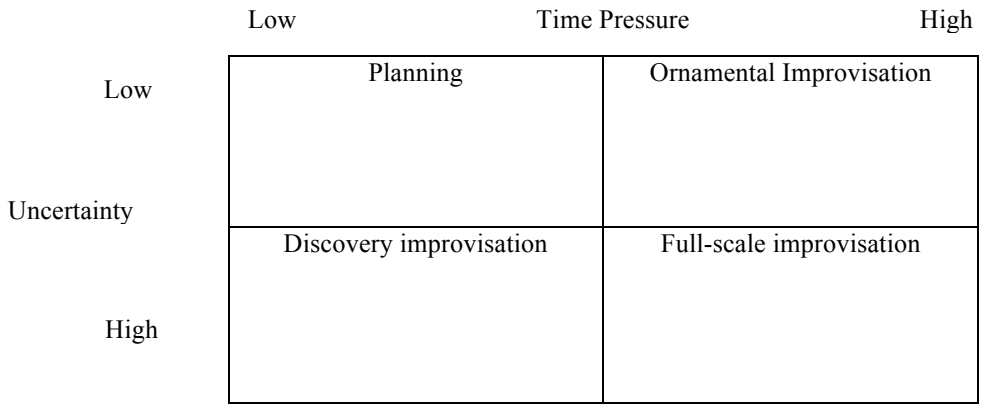
execution of an action converge in time so that, in the limit, they occur simultaneously" (1998b: 1). In these circumstances the occurrence of improvisation is not in contraposition with planning practices, it plays most likely a complementary role to usual planning.

According to this, organizations should consider improvisation as a potentially effective tool paired with planning, "but that, because of its creative and spontaneous nature, is not necessarily tied to success, the same way planning is not necessarily associated with success" (Vera & Crossan, 2004: 748). This vision is completely consistent with the belief that strategy development is a behaviorally based action, often occurring without much advance planning and available information (March, 1976; March & Sevòn, 1988).

Therefore planning and improvisation are considered as complementary by outlining general strategy and direction for the firm. This complementarity has been reported for example in new product development contexts (Hmielesky & Corbett, 2006), where there is both an increasing need of combined flexibility and efficiency, and planning plays a central role (MacCormack, Verganti & Iansiti, 2001). In this specific context researchers noted that preliminary planning can have a positive influence on projects achievement, but at the same time may become a constraint to the ability of react to changes, that may be conversely achieved through improvisational capabilities (Stockstrom & Herstatt, 2008). In such cases, improvisation and low structuration become good complements to planning (Vera & Rodriguez-Lopez, 2007; Vera & Crossan, 2007).

As Crossan, Cunha, Vera and Cunha noted (2005) there are three main cases in which improvisation may arise instead of complete planning. Figure 1 shows these different scenarios that vary for the time pressure and uncertainty levels.

Figure 1 – Scenarios of Improvisation in Organizations – Adapted from Crossan, Cuhna, Vera and Cunha (2005).



In the first scenario (*ornamental*), improvisation may overcome in cases of urgency to respond to an unexpected event, but with low levels of uncertainty. In these situations improvisation is characterized by high level of spontaneity and a strong influence of prior experiences and routines. In the second case (*discovery*), there is high level of uncertainty but low time pressure. In such circumstances, which can be for example typical in new product development activities, planning is unlikely to overcome (or it is completely overlapping with action) since individuals have too few or too many possible interpretations of unexpected events. Under these circumstances, improvisational capabilities let retrospective sensemaking possible and effective. This kind of improvisation is characterized by high level of creativity, low spontaneity and a rich combination of past knowledge. The last improvisational scenario (*full-scale improvisation*) shows that planning is impossible for time constraint and the environment is undecipherable. This scenario characterizes crisis situations and rapidly changing environments.

Improvisation, innovation and creativity

The role of spontaneity and improvisation as a way to achieve innovation attracted growing attention in literature, especially in new product development activities where improvisation plays an essential role for the need to cope with environmental turbulence (Brown &

Eisenhardt, 1997; Eisenhardt & Tabrizi, 1995; Moorman & Miner, 1998b; Miner et al., 2001; Akgün, Byrne, Lynn & Keskin; 2007). This becomes intensely relevant in view of the quickly changing market conditions and ambiguity circumstances that characterize those contexts. As in fact Brown and Eisenhardt mentioned (1995) product development and innovation are on the one hand an essential process for success, survival and renewal, on the other they represent a very uncertain path through foggy and shifting markets and technologies, particularly for firms in either fast-paced or competitive markets. Following this line of research, Kamoche and Cuhna (2001) depicted a product innovation model in which improvisation, combined with experimentation, represents one of the principal features. The Authors stated that, as in jazz improvisation, "the improvisational model of NPD would be aiming to achieve planning and execution contemporaneously. The need for this has been accentuated by the fact that the co-evolution of markets and technologies today has increased the difficulty of forecasting" (Kamoche & Cuhna, 2001:749).

Improvisation is often seen in literature as one kind of innovation (Moorman & Miner, 1998a); both these creative dimensions incorporate together the search for novelty and usefulness (Vera & Crossan, 2005), but they are not synonymous as Moorman and Miner (1998b) successfully tested the discriminant validity between these two constructs. Treating them as synonymous could lead us to confound the degree of improvisation with the degree of innovation, which are two different things (Moorman & Miner, 1998a). Nevertheless improvisation per se is a special case of intraorganizational innovation (Moorman & Miner, 1998b), where innovation is the deviation from existing practices, knowledge or design (Rogers, 1983; Zaltman, Duncan & Holbeck, 1973).

As the review of Cuhna et al. underlined (1999) innovation, creativity (Amabile, 1996) and improvisation share their focus on novelty and usefulness, but what differentiate improvisation from these similar concepts, as just remarked above, are the spontaneity and the

real-time nature of the action (Vera & Crossan, 2005), while innovation and creativity may arise also through perfectly planned and scheduled activities. In this context, a recent contribution by Fisher and Amabile (2008) outlined an integration between improvisation and creativity: the *improvisational creativity*, defined as the opposite of *compositional creativity* (Sawyer, 2000). Improvisational creativity can be evoked by emergent crises and unexpected opportunities. Moreover it can be embedded in compositional creativity and it is based on the responsiveness to proximate stimuli as one of the key element of the framework.

Improvisation, knowledge and routines

According to the statement that good improvisation is built upon traditional skills and consolidated knowledge (Crossan, 1998), one of the most relevant aspects that scholars accounted in this stream of literature is the influence that prior routines and knowledge exert on improvisation (Berliner, 1994). In this perspective, memory and routines cover both a central and an ambiguous role in improvisation literature. As Moorman and Miner (1998a) investigated, both declarative memory (for facts, events or propositions) and procedural memory (for how things are done) have a contradictory influence on improvisation. While procedural memory may increase the possibility of coherent and rapid action, it can also lead to automatic behavior. At the same time, while declarative memory permits more complex meanings and connections, it also makes timely improvisation less likely, since it demands substantial search time (Moorman & Miner, 1998a: 712).

Additionally, even if improvising leads to the creation of new routines and capabilities (Vera & Crossan, 2005), strongly consolidated and institutionalized practices may be apparently seen as an inhibitor of improvisation. Despite such intuition, Vera and Crossan (2005) conversely stated that effective improvisation needs routines construction and improvisational capabilities. In support of this, it seems reasonable that improvisation

sometimes becomes a need, for example in circumstances where there is no time to gain more expertise to face incoming or unexpected problems.

Further, Gong et al. (2006) observed that there is a path in which capabilities, sustained by improvisation, precede their own supporting routines. Capabilities may not always be composed by routines (Dosi, Nelson & Winter, 2000), and at the same time routines are not always the building blocks of capabilities. According to this, organizational improvisation can occasionally form an important foundation for learning and capabilities building.

The relationship between improvisation and learning remains still unexplored in literature. Actually, despite literature has considered improvisation as a mechanism of knowledge and routines recombination, it is still unclear how this recombination is achieved and how improvisation becomes a systematic form of unplanned experimentation.

Vera and Crossan (2007) stated that improvisation is a route to learning where changes in behavior precede changes in cognition. In this context improvisation has often been related to exploration and learning by doing and it has been considered as a mechanism of organizational knowledge transfer. As already outlined, much preparation is needed in order to achieve effective improvisation: according to Miner et al. (2001) improvisation not only draws on prior learning, but may be both a special type of short-term learning and a factor that influences other longer-term organizational learning activities (Miner et al., 2001: 306). In particular, improvisation sometimes serves as the first step for higher-level processes of long-term trial-and-error learning.

Cunha et al. (2007) tried to solve this learning paradox, proposing an interpretation of improvisation as a dynamic capability. The Authors pointed out that even if repetition (the base for routines foundation) and improvisation are almost antonyms in management research, routines might be the outcome of some reinforcing processes of improvisation. One process includes the improvisation that seeks to create conditions for repetitive work. The

other process includes those practices that seek to create the conditions for employees to develop their improvisational skills. Thus improvisation implies a reconfiguration of individual (and organizational) routines and knowledge in order to reach novel outcomes through an interaction of freedom and structure (Vera & Crossan, 2007).

Improvisation and performance

The relationship between improvisation and performance appears equivocal. One of the most critical issues dealing with improvisation concerns the over-reliance on the success of improvised actions with the significant risk of considering improvisation as a generic managerial solution (Vera & Crossan, 2005). Actually, as Crossan et al. (2005) noted, researchers took for granted improvisation as a way to achieve superior performances, even if "improvisation is not inherently a good thing" (Crossan et al., 2005: 131). As a matter of fact, improvisational behaviors may conduct to more or less effective results where most of the times effectiveness and success of improvisation are primarily based on the improviser ability and cumulated domain knowledge (Hmieleski & Corbett, 2008).

Vera and Crossan (2004; 2005) stated that there are several factors that may influence the effectiveness of improvisation at organizational level, such as experimental culture, real-time information and communication or memory, and some individual factors as expertise and teamwork skills that may affect for instance the performance at team level. Actually there is a common alignment on the assumption that highly effectiveness of improvisation depends on the skills of the improvisers (e.g. Vera & Crossan, 2005; Leybourne & Sadler-Smith, 2006).

Part of improvisation literature examined empirically the impact of improvisation on different levels and kinds of performance. The common conclusion of these studies is the absence of a direct effect of improvisation on performance. As a consequence literature made an effort to indicate the most significant moderators of this relationship. Vera and Crossan

(2005) for example conducted a study on team level improvisation and innovative performance, showing how improvisation leads to good performance when combined with team-work quality, team expertise and experimental culture. Akgün et al. (2007) studied NPD team improvisation and analyzed the impact of improvisation on performance in terms of new product success, which indicates the market performance of a new product after the launch. Leybourne and Sadler-Smith (2006) measured the impact of improvisation as mediator between intuition and project success, finding no statistically significant relationship between improvisation and satisfactory project outcomes. Finally Moorman and Miner (1998b) found that the relationship between improvisation and product effectiveness, as a performance measure in NPD, is moderated by variables such as environmental turbulence and real-time information.

There are several attempts to study the impact of individual improvisational behavior on performance. Hmieleski and Corbett (2008) for instance inquired the relationship between improvisational behavior of firm founders with both the performance of their startups and their individual level of work satisfaction. In this specific case the Authors did not find a direct effect of improvisation on performance, but in this relationship a specific moderating role has been played by entrepreneurial self-efficacy.

Critical points and open issues

Several critical points rise from this brief review on improvisation in organizational contexts. First of all, the earliest literature shows an over-reliance on artistic metaphors (Crossan, 1998), which causes consequently a scarceness of empirical studies. Moreover, almost the totality of the collected works adopted only qualitative descriptive methodology, since I have detected few empirical quantitative studies through the entire review (e.g. Moorman & Miner, 1998b, Vera & Crossan, 2005; Leybourne & Sadler-Smith, 2006; Akgün et al., 2007; Magni

et al., 2008; Magni, Prosperpio, Hoegl & Provera, 2009).

Although recent improvisation studies have been conducted in multiple empirical and theoretical contexts such as arts and history (e.g. Weick, 1998; Zack, 2000; Kamoche et al., 2003; Vera & Rodriguez-Lopez, 2007); firms founding processes (Baker et al., 2003); product innovation teams and product development projects (Eisenhardt &Tabrizi, 1995; Moorman & Miner, 1998b; Miner et al., 2001); project management (Leybourne & Sadler-Smith, 2006); restructuring actions (Bergh & Lim, 2008); organizational learning (Moorman & Miner, 1998a; Vera & Crossan, 2007) or unlearning (Akgün et al., 2007); routines and knowledge management (Gong et al., 2006; Cunha et al., 2007); technology in organizations (Orlikowsky & Hoffman, 1997), relevant gaps in this literature are still remarkable. Scholars should clear up some open issues, in order to pursue a more complex understanding of improvisation. In particular, given the complexity and the multidimensionality of improvisation, there is a necessity to build a framework of how improvisation unfolds, under which circumstances and what are its consequences.

Recent literature contributions tried to formalize an improvisation theory (Baker & Nelson, 2005; Crossan et al., 2005), starting from the critical assumption that the main part of these studies is based on artistic metaphors and on qualitative evidences. In spite of this, most of the times these studies failed in their purposes because still relying on transpositions from the jazz field (Kamoche et al., 2003). As a result, there is a call for a definition of a general framework of improvisation. However this is not immediately achievable, in particular because of the complex nature of improvisation in organizations, and also because of the involvement of different levels and degrees of analysis.

In the tentative of defining a general framework, some Authors inquired how certain external and organizational determinants, such as environmental turbulence, communication flux, and organizational memory (Moorman & Miner, 1997; 1998a; 1998b) influence the

incumbency of improvisation and its effectiveness at organizational level. Despite these efforts, most of the times improvisation antecedents have not been inquired, especially at an individual level, which is considered as the basis for organizational improvisation.

Actually, most of the existing quantitative studies pointed the attention on improvisation unfolding at team level (e.g. Moorman & Miner, 1998b; Vera & Crossan, 2005; Akgün et al., 2007; Magni et al., 2008), or at project level (Moornan & Miner, 1997; Leybourne & Sadler-Smith, 2006; Stockstrom & Herstatt, 2008), but there are still few studies that explore individual factors as determinants of improvisation (Baker et al., 2003; Vera & Rodriguez-Lopez, 2007; Hmieleski & Corbett, 2008). Moreover, the literature has not evidently distinguished how improvisation acts as a systematic form of unplanned experimentation that depends on existent routines and capabilities. In particular, the way through which improvisation operates as a routine breaker and at the same time a capability builder it is still foggy because it is not clear how improvisation becomes a way of strategizing, and an organizational state of mind.

Above all, the efforts of future research should be directed to refine the issue of improvisation under a conceptual and explanatory point of view. Only once the differences between improvisation and other related constructs would be conceptually described and empirically tested, researchers should move to a deeper understanding of the antecedents and consequences of improvisation.

Specifically there is a need to disentangle some emerging unresolved issues dealing with the way improvisation unfolds as a creative process and in particular dealing with the way individuals conduct this process, breaking and recombining existing routines and knowledge. Moreover there is a need to understand the association between improvisation and its antecedents in the individual process. Specifically, researchers should focus on the reasons that lead people to improvise regularly, even in absence of urgency and resources constraints.

As literature focuses on cumulated knowledge and experience as a necessary base for improvisation, future researches should understand the role that individual previous knowledge plays in improvisation. According to the relevance that previous literature confers to routines and existing knowledge in improvisation unfolding, the nature of cumulated experience may be an important feature affecting improvisation. Actually, the heterogeneity of experience in personal career, defined as the "accumulations of information and knowledge embodied in skills, expertise and relationship acquired through a sequence of work experience" (Bird, 1994: 326), may influence the ability and the cognitive resources needed to achieve improvisation. Yet, experienced workers represent a source of advantage, bringing in diverse knowledge and skills applied to current work. At the same time, people with high previous related experience is considered as a source of advantage for the organization (Dokko, Wilk & Rothbard, 2008). As Taylor and Greve asserted (2006), the more diverse information and knowledge from multiple domains and the deeper the knowledge in a specific domain, the more creativity and innovation are likely to arise. As stated by these Authors, the role of career experience in generating unique stocks of knowledge is especially important in creative and innovative contexts, such as product development areas and creative industries.

In NPD team context there is a huge debate dealing with the relevance of individual past experience as a predictor of performance and team dynamics (e.g. Horwitz & Horwitz, 2007; Mathieu, Maynard & Gilson, 2008). Actually different individual backgrounds and experiences are considered as a way to increase cognitive resources and ability. In addition individual characteristics have been usually related to different kind of outcomes, such as innovativeness measures (quality and quantity of new product developed) (Bell, 2007). This perspective can be integrated with the results from improvisation studies. In particular some evidences demonstrated that managers with higher experience improvise more than those with less experience (Leybourne & Sadler-Smith, 2006), showing that the spontaneous action is

not completely untied from routines and past experience. In some way, the more experienced actors make improvisation look easy and natural (Vera & Crossan, 2005). Individuals recombine existing rules and plans of action through intuition and creativity, on the basis of experience and "knowledge corridor" (Shane, 2000), whereby bricolage may become the process of reworking pre-composed routines and resources to handle present challenges, folding the past into the present (Crossan, 1998; Crossan et al., 2005). Despite these evidences and assumptions, there are no studies that have inquired the influence that the specific kinds and variety of experiences (job and educational) exert on improvisation.

Finally, it appears that the relationship between improvisation and innovation has not been totally explored. As remarked above, it is important to note that despite improvisation as every creative process involves novelty or innovation in the design of the action/process (Miner et al., 2001) and leads to new solutions/practices/products, the degree of deviation of these novel outcomes from the existing ones is not given. Miner et al. (2001), distinguishing between novelty and the degree of outcome divergence from the past, stated: "an episode might involve a large proportion of innovative activity, as when most parts of a new product are improvised, but still exhibit low radicality as when the improvised new parts are similar to parts in prior products" (Miner et al., 2001: 329). This perspective is totally consistent with creativity literature that suggests different ranges and levels of deviation in creativity and innovation outcomes (Audia & Goncalo, 2007).

Despite the remarked centrality of the relationship between improvisation and innovation this point remains still unexplored and foggy, in particular the degree of novelty and deviation of improvisation outcomes from habitual processes or products has never been inquired.

Some methodological open issues

There is a precise call coming from the ultimate literature on improvisation for mixed methodology studies (e.g. Vera & Crossan 2007). This kind of method allows researchers to delve deeply into the micro-foundation processes behind the paradoxes of improvisation through a first explorative qualitative phase. This phase let researchers investigate issues dealing with the way improvisation unfolds through the learning paradox depicted in the review section. In particular qualitative inquires help understanding how improvisation takes form, how it works as a learning process and what are the differences between improvisation and other creative processes such as planned experimentation and trial-and-error.

On the other hand quantitative studies help testing empirically the relationships between improvisation and the antecedents and consequences emerging from qualitative inquiries. In this perspective the literature review uncovered few studies that have empirically measured improvisation (see for example Moorman & Miner, 1998b, Vera & Crossan, 2005; Leybourne & Sadler-Smith, 2006; Akgün et al., 2007; Magni et al., 2008; 2009). These papers have not adopted a common measure and improvisation is sometimes measured as a personal proclivity (Hmieleski & Corbett, 2006). Moreover, the review of the already tested measures shown that some Authors have not omitted certain biases in the construction of the items composing the whole measure, because they often have required evaluating sentences as "I am able to improvise" (e.g. Hmieleski & Ensley, 2004; Hmieleski & Corbett, 2008; Akgün et al., 2007), despite the improvisation meaning in literature is in part different from the common sense of the word. Moreover, the individual self-perception may be different from the actual improvisational behavior. Additionally, the already existent scales of improvisation do not capture all the possible dimensions of this complex construct. As a consequence one of the future direction that improvisation studies should follow is the definition of a new measure of improvisation. However, it should be probably more correct to talk about

measures of improvisational behavior or proclivity to improvisational behavior, rather than mere improvisation measure. In fact the processual nature of improvisation is more likely to be caught through qualitative inquires.

The need to formulate a new measure for improvisation comes also from the observation that the current scales do not consider all the dimensions that literature relates to improvisation. Obviously the new scale must be able to measure the construct more completely than the existing scales, hence it should have a better psychometrical and theoretical validity than the previous tested scales.

References

Akgün, A.E. Byrne, J.C., Lynn, G.S. and Keskin, H. 2007. New product development in turbulent environments: Impact of improvisation and unlearning on new product performance. ***Journal of Engineering and Technological Management***. 24: 203–230.

Alvaretz S.A. and Barney J.B. 2007. Discovery and creation: alternative Theories of entrepreneurial action. ***Strategic Entrepreneurship Journal***, 1: 11–26.

Amabile, T.M., 1996. ***Creativity in Context***, Boulder, CO: Westview Press.

Argyris, C., and Schon, D. 1978. ***Organizational learning: A theory of action perspective***. Reading, MA: Addison-Wesley.

Audia, P. A., and Goncalo, J. A. 2007. Past Success and Creativity over Time: A Study of Inventors in the Hard Disk Drive Industry. ***Management Science***, 53(1): 1-15.

Baker, T., Miner, A.S. and Eesley, D.T. 2003. Improvising firms: bricolage, account giving and improvisational competencies in the founding process. ***Research Policy***, 32: 255-276.

Baker, T. and Nelson, R. E. 2005. Creating Something from Nothing: Resource Construction through Entrepreneurial Bricolage. ***Administrative Science Quarterly***, 50: 329–366.

Baker, T. 2007. Resources in play: Bricolage in the Toy Store(y). ***Journal of Business Venturing***. 22 (2007) 694–711.

Barrett, F. 1998. Creativity and improvisation in jazz and organizations: Implications for organizational learning. ***Organization Science***. 9 (5): 543–555.

Bastien, D. T. and Hostager, T. J. 1992. Cooperation as communicative accomplishment: A symbolic interaction analysis of an improvised jazz concert. ***Communication studies***, 43: 92-104.

Bell, S.T. 2007. Deep-level composition variables as predictors of team performance: A meta-analysis. ***Journal of Applied Psychology***, 92, 595-615.

Bergh, D.D., and Lim, E.N. 2008. Learning how to restructure: Absorptive Capacity and

Improvisational views of Restructuring actions and performance. ***Strategic Management Journal***, 29: 593–616.

Berliner, P. F. 1994. ***Thinking in Jazz: The Infinite Art of Improvisation***. Chicago: University of Chicago Press.

Bird, A. 1994. Careers as repositories of knowledge: a new perspective on boundary-less careers. ***Journal of Organizational Behavior***. 15: 325-344.

Bjurwill, C. 1993. Read and react: the football formula. ***Perceptual and Motor Skills***, 76: 1383-1386.

Brown, J.S. and Duguid, P. 1991. Organizational learning and communities-of practice: toward a unified view of working, learning and innovation. ***Organization Science***, 2 (1): 40–57.

Brown, S.L. and Eisenhardt, K.M. 1995. Product Development: Past Research, Present Findings, and Future Directions. ***The Academy of Management Review***, 20 (2): 343-378.

Brown, S.L. and Eisenhardt, K.M.1997. The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly Shifting Organizations. ***Administrative Science Quarterly***. 42 (1): 1-34.

Campbell, D.T. 1969. ***Variation and selective retention in socio-cultural evolution***. General Systems, 16: 69–85.

Campbell, J.L. 1997. Mechanisms of evolutionary change in Economic Governance: Interaction, Interpretation and Bricolage, in L. Magnusson and J. Ottoson (Eds.), ***Evolutionary Economics and Path Dependence*****,** Cheltenham, UK: Edward Elgar Publishing Limited.

Chase, M.P., 1988. ***Improvisation: Music from the inside out***, Berkley, CA: Creative Arts Book Company.

Chen, J, and Ma, J. 2005. ***The Role of Improvisation in Entrepreneurial Processes***. Paper

presented at 2005 IEEE International Engineering Management Conference.

Ciborra, C.U. 1996. The platform organization: recombining strategies, structures and surprises. ***Organization Science***, 7(2), 103–118.

Cornelissen, J.P. 2006. Making sense of theory construction: Metaphor and disciplined imagination. ***Organization Studies***, 27: 1579-1597.

Crossan, M. 1998. Improvisation in action. ***Organization Science***, 9(5): 593-599.

Crossan, M., Cunha, M. P., Vera, and D. Cunha, J. 2005. Time and organizational improvisation. ***Academy of Management Review***. 30 (1): 129–145.

Crossan, M., Lane, H., and White, R. 1999. An organizational learning framework: From intuition to institution. ***Academy of Management Review***, 24, 522-538.

Crossan, M., and Sorrenti, M. 1997. Making sense of improvisation. In J. Walsch and A. Huff (Eds.). ***Advances in strategic management***, 155-180. Greenwich, CT: JAI Press.

Crossan, M., White, R.E., Lane, H.W. and Klus, L. 1996. The improvising organization: where planning meets opportunity. ***Organizational Dynamics***, 24 (4): 20–35.

Cunha, M. P. 2006. Bricolage in Organizations, Unpublished paper.

Cunha, J. V., Cunha, M. P. and Chia, R. 2007. Routine as deviation, Unpublished paper.

Cunha, M.P., Cunha, J.V., and Kamoche, K.. 1999. Organizational improvisation: What, when, how, and why. ***International Journal of Management Reviews***, 1 (3): 299–341.

Dokko, G., Wilk, S.L., and Rothbard, N.P. 2008. Unpacking Prior Experience: How Career History Affects Job Performance. ***Organization Science***, *Articles in Advance*, 1-18.

Dosi, G. Nelson, R.R. and Winter, S.G. 2000. Introduction: The nature and dynamics of organizational capabilities, in G. Dosi, R.R. Nelson, S.G. Winter (Eds.) ***The Nature and Dynamics of Organizational Capabilities***. Oxford University Press, New York, 1-22.

Eckhardt J.T. and Shane S.A. 2003. Opportunities and Entrepreneurship, ***Journal of Management***, 29 (3): 333–349.

Eisenberg, E.M. 1990. Jamming: transcendence through organizing. ***Communication Research***, 17(2), 139–164.

Eisenhardt, K. M., and Tabrizi, B. N. 1995 Accelerating adaptive processes: Product innovation in the global computer industry. ***Administrative Science Quarterly,*** 40 (1), 84-110.

Fisher, C.M. and Amabile, T. 2008. Creativity, improvisation and organizations, in T. Rickards, M. Runco, and S. Monger (Eds.) ***The Routledge Companion to Creativity***, Routledge.

Garud, R. and Karnøe, P. 2001. Path creation as a process of mindful deviation, in R. Garud an P. Karnøe, ***Path dependence and creation***, Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Garud, R. and Karnøe, P. 2003. Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship, ***Research Policy***, 32: 277–300.

Gioia, T. 1988. ***The imperfect art***, New York: Oxford University Press.

Gong, Y., Baker, T., and Miner, A.S. 2006. ***Capabilities and Routines in New Organizations: Evidence from the Field***. Unpublished Paper.

Hatch, M. J. 1999. Exploring the empty spaces of organizing: how improvisational jazz helps redescribe organizational structure. ***Organization Studies***, 20 (1): 75-100.

Hmieleski, K. M. and Corbett, A. C. 2006. Proclivity for Improvisation as a Predictor of Entrepreneurial Intentions. ***Journal of Small Business Management***. 44(1): 45–63.

Hmieleski, K. M. and Corbett, A. C. 2008. The contrasting interaction effects of improvisational behavior with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction. ***Journal of Business Venturing***. 23: 482–496.

Hmieleski, K. M., and Ensley, M. D. 2004. An investigation of improvisation as a strategy for exploiting dynamic opportunities. In W. E. A. Bygrave (Ed.), ***Frontiers of***

Entrepreneurship. Wellesley, MA.

Horwitz, S. K. & Horwitz, I. B. 2007. The Effects of Team Diversity on Team Outcomes: A Meta-Analytic Review of Team demography. ***Journal of Management***, 33: 987-1015.

Kamoche, K. and Cunha, M.P. 2001. Minimal structures: From jazz improvisation to product innovation. ***Organization Studies***. 22 (5): 733–764.

Kamoche, K., Cunha, M.P. and Cunha, J.V. 2003. Towards a theory of organizational improvisation: Looking beyond the jazz metaphor. ***Journal of Management Studies***. 40: 2023–2051.

Kernfeld, B. 1995. ***What to listen for in Jazz***, New Haven and London: Yale University Press.

Knapp, B. 1989. ***Machine, metaphor and the writer***, University Park: PA, Pennsylvania State University Press.

Leybourne, S. and Sadler-Smith, E. 2006. The role of intuition and improvisation in project management, ***International Journal of Project Management*** 24: 483–492.

Lévi-Strauss, C. 1967. ***The Savage Mind***. Chicago: University of Chicago Press.

MacCormack, A., Verganti, R. and Iansiti, M. 2001. Developing Products on "Internet Time": The Anatomy of a Flexible Development Process, ***Management Science***, 47 (1): 133-150.

Machin, D. and Carrithers, M. 1996. From interpretative communities to communities of improvisation. ***Media, Culture and Society***, 18: 343–352.

Magni, M., Proserpio, L., Hoegl, M. and Provera, B. 2009, The role of team behavioral integration and cohesion in shaping individual improvisation, ***Research Policy***, 38: 1044–1053.

Magni, M., Proserpio, L. and Provera, B. 2008. Improvisation in geographically dispersed teams: does distance matter? Paper presented at IX Workshop dei Docenti e dei Ricercatori di Organizzazione Aziendale, 7 – 8 Febbraio 2008, Università Ca' Foscari – Venezia.

Mangham, I. L. and Pye, A. 1991, ***The doing managing***, Cambridge, MA: Basil Blackwell.

March J.G., 1976. The technology of foolishness, in J.G. March, J.P. Olsen ***Ambiguity and Choice in Organizations***, Bergen, Norway, Universitetsforlaget.

March, J., and Sevon, G. 1988. Behavioral perspectives on theories of the firm. In W.F. Van Raaij, G.M. Van Veldhoven and K.E. Warneryd (Eds.), ***Handbook of Economic Psychology***, Dordrecht, Holland: Kluwer Academic Publishers.

Mathieu J., Maynard M. T. & Gilson L., 2008. Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse Into the Future, ***Journal of Management***, 34 (3): 410-476.

Merton, R.K. 2002. Conseguenze inattese e idée sociologiche simili: un commento personale, in ***La serendipity nella ricerca sociale e politica: cercarne una cosa e trovarne un'altra***. In R.K. Merton and S. Fallocco, Luiss Edizioni.

Meyer, A. 1998. Antecedents and consequences. Organizing for improvisation: The backstage story of the Vancouver jazz concert and symposium. ***Organization Science***. 18: 511–522.

Miner, A.S., Bassoff, P. and Moorman, C. 2001. Organizational Improvisation and Learning: A field Study, ***Administrative Science Quarterly***, 46 (2): 304-337.

Moorman, C. and Miner, A. S. 1995. ***Walking the Tightrope: Improvisation and Information in New Product Development***. Report No. 95–101. Cambridge, MA: Marketing Science Institute.

Moorman, C. and Miner, A.S. 1997. The impact of organizational memory on new product performance and creativity. ***Journal of Marketing Research***. 34: 91–106.

Moorman, C. and Miner, A.S. 1998a. Organizational improvisation and organizational memory. ***Academy of Management Review***. 23 (4): 698–724.

Moorman, C. and Miner, A.S. 1998b. The Convergence of Planning and Execution: improvisation in New Product Development, ***Journal of Marketing***, 62 (3): 1-20.

Orlikowski, W.J. and Hoffman, J.D. 1997. An improvisational model for change management: the case of groupware technologies. ***Sloan Management Review***, 38(2), 11–21.

Perry, L.T. 1991. Strategic improvising: how to formulate and implement competitive strategies in concert. ***Organizational Dynamics***, 19 (4): 51–64.

Powers, C. 1981. Role-imposition or role-improvisation: some theoretical principles. ***The Economic and Social Review***, 12(4), 287–299.

Pressing, J. 1984. Cognitive Processes in Improvisation. In W.R. Crozier and A.J. Chapman (eds.) ***Cognitive processes in the perception of art***, 345-363, Amsterdam: North-Holland.

Rogers, E. 1983. ***The Diffusion of Innovations***. New York: The Free Press.

Sawyer, R. K. 1992. Improvisational Creativity: An analysis of jazz performance, ***Creativity Research Journal***, 5: 253-263.

Sawyer, R.K., 2000, Improvisation and the Creative Process: Dewey, Collingwood, and the Aesthetics of Spontaneity, ***The Journal of Aesthetics and Art Criticism***, 58 (2): 149-161.

Shane, S.A. 2000. Prior Knowledge and the Discovery of Entrepreneurial Opportunities, ***Organization Science***, 11 (4): 448-469.

Sharron, A. 1983. Time and space bias in group solidarity: action and process in musical improvisation. ***International Social Science Review***, 58 (4): 222–230.

Schön, D. 1983. ***The reflective practitioner: How professionals think in action***. New York, Basic Books.

Schuller, D. 1968. ***Early jazz: Its roots and its development***. New York: Oxford University Press.

Solomon, L. 1986. Improvisation II. ***Perspective on New Music***, 24: 224-235.

Spolin, V. 1963. ***Improvisation for the theatre: A handbook of teaching and directing techniques***, Evaston, IL: Northwestern University Press.

Stein, D. L. 1989. Preface. In D. L. Stein (ed.), ***Lectures in the Sciences of Complexity***: xiii-xxiii. Redwood, CA: Addison-Wesley.

Stockstrom, C. and Herstatt, C. 2008. Planning and uncertainty in new product development. ***R&D Management***. 38 (5): 480-490.

Taylor, A. and Greve, H. R. 2006. Superman or the fantastic four? Knowledge combination and experience in innovative teams. ***Academy of Management Journal***. 49 (4): 723-740.

Toiviainen, P. 1995. Modeling the target-note technique of bebop-style jazz improvisation: an artificial neural network approach, ***Music Perception***, 12: 399-413.

Vera, D. and Crossan, M. 2004. Theatrical improvisation, Lessons for organizations. ***Organization Studies***, 25: 727-749.

Vera, D. and Crossan, M. 2005. Improvisation and Innovative Performance in Teams. ***Organization Science***. 16(3): 203–224.

Vera, D. and Crossan, M. 2007. ***Reconciling learning paradoxes through improvisation***. Proceedings of OLKC 2007.

Vera, D. and Rodriguez-Lopez, A. 2007. Leading Improvisation: Lessons from the American Revolution. ***Organizational Dynamics***, 36 (3): 303–319.

Volkman, T.A. 1984. Our Garden in the Sea: Contingency and Improvisation in Mandar women's work. ***American Ethnologist***, 21: 564-585.

Weick, K. E. 1987. Substitutes for strategy. In D.J. Teece (Ed.) ***The competitive challenge: strategies for industrial innovation and renewal***, 221-233, New York, Harper & Row.

Weick, K.E. 1993a. Organizational redesign as improvisation. In Huber, G.P. and Glick, W.H. (Eds.), ***Organizational Change and Redesign***. New York: Oxford University Press, pp. 346– 379.

Weick, K.E. 1993b. The collapse of sensemaking in organizations: The Mann Gulch disaster. ***Administrative Science Quarterly***. 38 (4): 628–652.

Weick, K.E. 1996. Drop your tools: an allegory for organizational studies, ***Administrative Science Quarterly***, 41: 301-313.

Weick, K. E. 1998. Improvisation as a mindset for organizational analysis. ***Organization Science***. 9 (5): 543–555.

Weick, K.E. 1999. The aesthetic of imperfection in orchestras and organizations. In M.P. Cunha, and C.A. Marques, (Eds.), ***Readings in Organization Science***. Lisbon: ISPA.

Zack, M. H. 2000. Jazz improvisation and organizing: Once more from the top. ***Organization Science***. 11 (2): 227–234.

Zaltman, G., Duncan, R. and Holbek, J. 1973. ***Innovations and Organizations***. New York: Wiley.

Zinn, D. 1981. ***The structure and analysis of the modern line***, vol. 1, New York, Excelsior Music Publishing.