



The complexity of improvisation and the improvisation of complexity: Social science, art and creativity

Alfonso Montuori

ABSTRACT

The concept of improvisation has become increasingly popular in the discourse of organizational theory. This paper explores the several aspects of improvisation, in the context of musical, organizational, and everyday activities, in order to address some of the philosophical issues relevant to this emerging interest. It addresses, for instance, the way the term improvisation has fallen into disrepute, referring to something that is, ultimately, a pale and messy copy of the 'correct' way. It argues that in western music, this can be traced to the modernist valorization of the order provided by a written musical score, perfectly representing the composer's wishes, and the concomitant devalorization of the spontaneity and creativity of musicians who, before approximately 1800, improvised a substantial amount of their performances. Connections are made between the modernist concept of organization and postmodern or complexity-based approaches that stress creativity as an emergent property of the relationship between order and disorder. It concludes by suggesting that the study of improvisation demands a profound immersion into (inter-)subjectivity, emotions, time, aesthetics, performance, and social creativity, none of which have traditionally been the focus of organization and management studies, or the social sciences in general.

KEYWORDS

aesthetics ■ complexity ■ creativity ■ disorder ■ improvisation ■ order
organizational theory ■ social science

We social scientists would do well to hold back our eagerness to control that world which we so imperfectly understand. The fact of our imperfect understanding should not be allowed to feed our anxiety and so increase the need to control. Rather, our studies could be inspired by a more ancient, but today less honored motive: a curiosity about the world of which we are part. The rewards of such work are not power but beauty.

(Bateson, 1972: 269)

Introduction

This article was sparked by my attendance at a conference in Rio de Janeiro. The location was obviously enticing, and even more important, perhaps, was the theme of the Rio conference: complexity, and in particular the more epistemological and philosophical work on complexity found in the staggering, encyclopedic work of the French 'thinker' Edgar Morin. At the heart of this article is my belief that there is an important and potentially fruitful connection between improvisation and the lived experience of complexity, and that improvisation and creativity are capacities we would do well to develop in an increasingly unpredictable, complex, and at times chaotic existence. The writing style of this article is unusual for some academic publications, as it incorporates first-person narratives. It reflects my belief that in order to understand, and also live the phenomenon of improvisation, and in order to draw from the arts as a metaphor for both organization and for social science, it behooves us to incorporate 'performative' and other 'subjective' elements into our own scholarship. In that way, we may perhaps speak of the social arts and sciences, rather than simply the social sciences, heeding Bateson's (2002: 237) warning that 'rigor alone is paralytic death, but imagination alone is insanity' (Manghi, in press).

Despite the inroads of feminist and postmodern scholarship, the discourse of social science, and organization theory in particular, has historically privileged objective over subjective, rational over emotional, and theory over experience (Polkinghorne, 1983; Rosenau, 1992). Arguing for the relevance of psychoanalysis to organization studies, Gabriel (2001: 140) states that we still think of organizations as 'orderly places where people behave in a rational, business-like way.' This is particularly interesting when we consider our own lived experience of organizations. I suspect that most of us would admit that a rational and orderly view of organizations hardly does justice to the Byzantine complexities of life in academia or the private sector. In his valorization of aesthetics in organizations, Strati (1999) has

similarly critiqued the discourse of organization theory and management studies as putting forth an ideal type that is fundamentally rational, logical, mental (perhaps in both senses of the term), and deeply disembodied. Anything (or anyone) emotional, subjective, or aesthetic was considered fundamentally unsuitable for organizations and for the study of organizations, according to Strati.

I believe that the concept and the practice of improvisation pose a clear challenge to traditional ways of thinking about social science, organization, and action. As I use it here, it is a musical metaphor, and therefore brings in all the elements from the arts that were successfully avoided by the social sciences. Jazz improvisation valorizes subjectivity, emotion, the aesthetic, but also the openness and uncertainty that go against the fundamental goals of prediction and control so highly valued by the traditional sciences. A defining quality of creative improvisation is precisely the generation of the unpredictable, the unusual, the unforeseen, within the pre-existing structures of the song form, navigating the edge between innovation and tradition (Berliner, 1994). In jazz improvisation, a commonly shared goal is to create within a musical and social context, requiring both control and spontaneity, constraints and possibilities, innovation and tradition, leading and supporting.

Improvisation and creativity are, as we shall see deeply paradoxical processes. Taking improvisation seriously arguably means addressing the very way we think. In Rio, Morin passionately articulates his vision of 'complex thought.' Critiquing the stress on reductionistic, decontextualizing, and disjunctive ways of thinking, he proposes the need for a thinking that recognizes both part and whole, contextualizes, and connects, as articulated in his magnum opus, the five-volume *La méthode* (Morin, 1977, 1980, 1984, 1991, 1992, 1994, 2001). He argues that in order to understand complexity we need to change the way we think: a thought that privileges simplicity and reduction and is predicated on the elimination of complexity is not suitable for addressing many complex phenomena because at the heart of their complexity lies precisely the irreducibility of that complexity. One key element is breaking down limiting hierarchical binary opposition such as science/art, innovation/tradition, serious/playful, order/disorder. In a similar vein, Beech and Cairns (2001) have critiqued dichotomous thinking in these pages and proposed postdichotomous ways of thinking that reflect the complexity of life, and do not attempt to reduce it to the mutilated simplicity and disjunction of binary oppositions. This project embarks on a similar journey and is sympathetic to the efforts of these fellow travelers. It is in the context of Morin's complex thought that I present the following ideas, and with a nod and a wink to my brothers in Strathclyde, Rio is my point of departure for this essay.

The soul of Rio

It's one o'clock in the morning, and we are walking back to the Hotel Gloria in Rio de Janeiro after a gargantuan dinner in a Churrascheria just off the beach at Copacabana. There's five of us here, part of a larger Italian contingent in Rio for an international conference. As with any conference, we are here also to enjoy each other's company, traveling thousands of miles to spend time with friends we rarely see, and certainly not in such a spectacular setting. Caught up in the legend of Brazilian football, and fueled by a few caipirinhas, a lovely and deceptively potent concoction of sugar cane fire-water, sugar, and limes, we can't pass up the opportunity to head for the beach and look for a game. We find two local boys kicking a ball around, and before we know it we are playing football on the sand where so many legendary players enjoyed their first games. We are eager to show off to the boys and to each other, but we soon become aware of the very different conditions the sand creates. The ball reacts quirkily, unpredictably. Our balance is unsteady in the sand, the ground beneath our feet gives way. This is not grass, or any kind of turf we're used to. The skills that worked so well on grass, or on any hard field, somehow do not carry over to the sand of Copacabana. On top of that, our rusty skills are more than weighed down by staggering quantities of Brazilian meat, lubricated by numerous caipirinhas. It's almost as if we are playing a different game.

The conditions lead us to modify our game, to deal with unforeseen elements, with the complexity and uncertainty of a new and different environment. We begin to improvise. We explore the constraints created by the new conditions, but also the possibilities they offer. A breakdown in our normal way of practicing the game of football has elicited a renewed challenge to our capacities. It is inviting us to draw on our ability to go beyond the already known, and explore the possibilities of the present. We are improvising our game. We know the basic rules of football, but like so many before us, we improvise a goal with jackets instead of goalposts, and because we're not playing a game with 11 players on each side, we improvise a (tacit) set of 'rules.' These tell us when it is appropriate to shoot at goal, when we should pass the ball to someone else, and what constitutes annoyingly hogging the ball as opposed to simply clowning around. We improvise the way we handle the ball, we make up new ways of playing within the context of the skills and rules we already know through years of playing . . .

Life in a complex world, and a life which reflects and values the complexity of *both* self and world, requires the ability to improvise – to deal with, and indeed to create, the unforeseen, the *surprise*. Interestingly, the Latin root of improvisation is *improvisus*, or unforeseen. Increasingly, it seems, life in

or out of organizations requires of us the ability to both *react* appropriately to unforeseen events, and actually *generate* those events – to act creatively and innovatively. Football players have to react to surprising moves from the opposition, and also generate moves that catch opposing players off guard. They have to feed off the opposition's mistakes, the contingency of the bouncing ball, and the condition of the pitch. A jazz musician both generates novelty, by making rhythmic, harmonic, or melodic choices that are surprising, and reacts to the novelty generated by his or her fellow band-members. A piano player might place an unusual chord behind a soloist in what would normally be a predictable harmonic progression. This creates a slightly different context, a surprise, which can lead the experienced improvising soloist to find new ways to navigate a song. This kind of creative dialog is at the heart of much of what makes jazz a unique art form. It is an example of self-organizing social creativity in small groups (Bailey, 1993; Berliner, 1994; Hatch, 1999; Monson, 1996; Montuori & Purser, 1999). Creativity and improvisation might be said to serve at least a dual role, therefore. They allow us to adapt in our own way to complex environments, and they allow us to express our own (inner) complexity through the performance of our interaction with the world. The concept of improvisation is, I believe, crucial to the existential reality of complexity.

The challenge of complexity and creativity

In Rio, many speakers remind us of how our lives today are riddled with complexity, with the unforeseen, the ambiguous, the uncertain – in science, in the economy, in ethics, and indeed just about every aspect of life. Indeed, disorder, uncertainty, and individual subjectivity are increasingly being studied in the human and natural sciences (Morin, 1994; Ogilvy, 1992, 1989; Polkinghorne, 1983; Rosenau, 1992). Homogenizing, ordered and ordering visions of the universe, of human civilization, of nature and of progress are being dismantled (Bocchi & Ceruti, 2002; Morin & Kern, 1999). The sciences of chaos and complexity and the discourse of postmodernism show us the profound role of disorder, chance, uncertainty, and contingency in the world (Taylor, 2001).

In the traditional Newtonian scientific paradigm, order was king, privileged above disorder, chaos, and noise. Our understanding of the relationship between order and disorder was in terms of a binary opposition, and indeed a hierarchical opposition. One of the most interesting shifts in recent scientific thinking, in particular through the sciences of chaos and complexity, has been a deeper understanding of the mutually constitutive relationship

between order and disorder, information and noise. This shift also reflects a transition from a fundamentally static worldview to one that is process oriented. Rather than seeing order as fundamental and unchanging, we are now seeing an ongoing process of order–disorder that is the hallmark of self-organization (Morin, 1992). As Taylor (2001: 121) writes, ‘disorder does not simply destroy order, structure, and organization, but is also a condition of their formation and reformation.’

Self-organization has been defined variously as making meaning out of randomness (Atlan, 1986), or the spontaneous emergence of a coordinated and collective behavior in a population of elements (Gandolfi, 1999). One of the key aspects of self-organization is the creation of order out of chaos, the integration of elements perceived as disorder into a larger, more encompassing organization. We might think of Kuhnian paradigms as an analogy. What is inside the paradigm is considered order, what is outside is disorder. Anomalies on the edge of the paradigm, those things the paradigm cannot account for, may initially seem like noise, disorderly phenomena that cannot be accounted for. Indeed, the history of chaos theory itself (Gleick, 1987) shows how turbulent phenomena such as water flowing out of a faucet were rejected out of hand as subjects of study for the longest time because they seemed simply inexplicable. Yet it is the study of these anomalies that led to the development of the new science of dynamical systems, also known as chaos theory. In this sense, chaos theory as a field of study was itself a self-organizing process, the spontaneous emergence of a coordinated and collective behavior in a population of elements (researchers), making meaning out of (apparent) randomness.

Research on creativity has some very relevant things to say about this. It shows that ‘creative individuals are more at home with complexity and disorder than most people’ (Barron, 1958: 261). In fact, they have what is called a preference for complexity over simplicity – they are intrigued, puzzled, excited by complexity rather than afraid of it. Creative thought is marked by the active search for phenomena that destabilize order, that puzzle cognitive schemata and cannot be immediately understood. Creativity involves constant organizing, dis-organizing, and re-organizing. It involves actively breaking down assumptions, givens, traditions, pushing boundaries and moving out of comfort zones.

‘At the very heart of the creative process,’ writes Barron (1990: 249) ‘is this ability to shatter the rule of law and regularity in the mind.’ Creativity means shaking things up, both inside ourselves and in the world around us, and constant re-organizing of both cognitive schemata and, to a greater or lesser extent, the domain of the creative person’s activity. The term ‘ego-strength,’ as used by Barron (1990), refers to the capacity to rally from

setback, to learn from experience, to be a constantly dis-organizing and re-organizing system without falling apart completely. Creative thought seeks to make sense of phenomena that appear to be chaotic, and seeks to create a higher order simplicity – one that incorporates the complex, disorderly phenomena in a broader, more inclusive, more open perspective. Creative individuals, it seems, are ready to abandon old classifications, in an ongoing process of creation and re-creation. Self-organization in creative persons becomes what Morin (1994) calls *self-eco-re-organization*, suggesting that the nature of the organization changes as well, and that it is an ongoing process of self-renewal that always happens in a context, in an environment, never in isolation and abstraction (Montuori, 1992).

Following Morin, we can think of knowing as an ongoing process of *self-eco-re-organization*. Self-, because knowing involves a knower; Eco-, because a knower always exists in a context, in a given (but not necessarily 'known') world; Organization, because our knowledge is in fact organized, often with principles we are hardly aware of, because of history, habit, culture, reflection, and so on, but organized in some form or other; Re-, because knowing involves a constant active process of creative exploration and re-organization, and because our organization of knowledge is regularly re-organized through the process of existence and participation in the world. Knowing arises through the interplay of subject and object. Inquiry into the world and self-inquiry become interwoven in a process of self-eco-inquiry. In that case, if I accept that knowledge is always *my* knowing situated in a context, then the issue is not cleansing myself of exogenous elements to achieve pure, objective knowledge. Rather, the challenge becomes making my self more transparent in the process and acknowledging who I am in all of this.

Am I *observing* the universe, or am I *participating* in it (von Foerster, 1990) Am I standing outside it, or am I in the middle of it? Am I watching the football game, or am I playing it? Am I listening to the music or am I performing it? If life is the game, or the song that we are playing, then, Von Foerster argues, we are also playing it, not only watching or listening.

A participatory view suggests that we are embodied and embedded in this world, not observing it dispassionately with a God's eye view from nowhere (Nagel, 1989). No self without an eco. No text without context. Even if I just observe life, it is always me observing it, with my history, my choices, my feelings, my relationships, my choices. In our everyday lives, we cannot eliminate exogenous variables, we cannot eliminate emotions, subjectivity, contingency, chance, we cannot replicate the pristine environment of the laboratory. To participate in life clearly does not mean that one cannot reflect on it. But one cannot reflect on it with a privileged view that transcends all

contexts and all situatedness, or with the hope of being able to control and predict the way we might control and predict the behavior of machines. 'Life is not like that,' as Bateson (1972: 438) famously stated in reference to the dream of linear control (Manghi, in press).

Life is participation and participation is creation and improvisation, because life does not occur in a vacuum, it occurs always in a network of inter-retro-actions and of organization, in a constant play of order, disorder, and organization and ongoing learning. Improvisation and the creative process may be viewed as an ongoing process of learning and inquiry, learning-in-organizing, as Gherardi (1999) calls it, a distributed, provisional, embodied process.

Presenting Rio

Back at the Rio conference, our improvisations move into a new realm, as we participate in the presentations we have all come to attend. Many lengthy and fascinating papers have been read by the presenters while other presentations were extemporaneous. My friends and I have no intention of reading anything to our captive audience. There is something profoundly different about a paper that is read, and a presentation that emerges extemporaneously in the moment. We choose to improvise. But what does this mean? Surely it does not mean that we say just anything that comes into our mind, or that we choose to do a sloppy job, that we are not knowledgeable about our subjects, or that we have temporarily mislaid our papers. It does not mean that the written paper represents the culmination of our work, of which the extemporaneous presentation is merely a pale copy, an inferior derivative.

No, to improvise (or extemporize) here means something else. It means that we have chosen to think on our feet, to embody our presentation in the moment, including remarks which could only be made within the specific context of the conference, the previous speakers, with references to events, ideas, and moods that could simply not have been predicted when actually writing the paper. To improvise means to draw on all our knowledge and personal experience, and focus it on the very moment we are living in, in that very context. It requires a different discipline, a different way of organizing our thoughts and actions. It requires, and at its best elicits, a social virtuosity which reflects our state of mind, our perception of who and where we are, and a willingness to take risks, to let go of the safety of the ready-made, the already written, and to think, create, and 'write' on the spot. Is this an inferior form of intellectual 'production,' or is it in fact an alternative form,

grounded in the existential, temporal, and contextual reality of human interaction?

I struggle to decide whether I really can improvise in French, one of the languages of the conferences along with Spanish and Portuguese. Italian, Dutch, and English, my main languages, are not an option. To improvise freely, I feel I need to be able to let go of worrying about syntax, about vocabulary. I must be able to let go of my language and not be constantly self-conscious about it, in the same way that a great jazz improviser does not continually have to think about the technical dimensions of his or her playing, and can thus simply create. Morin storms ahead in what he calls 'Fritagnol,' his all-purpose 'Mediterranean' language combining 'Fr-Français-ita-Italien-gnol-Espagnol.' Miraculously, he is understood not just by the French-, Spanish- and Italian-speaking contingent, but also the Portuguese speakers. I decide to go with my approximation of French, a language I read well but very rarely get the chance to speak.

Improvisation: A dance of constraints and possibilities

In the popular mind, improvisation is often misunderstood (Sawyer, 1999). When we say something is improvised we often mean something that was done to face some unforeseen circumstance, going back to the *improvisus* of the Latin etymology. It is not uncommon that the improvised is still seen as ultimately inferior. In some cases, the original program that was to be followed had to be deviated from, and the improvisation is seen as the next best thing. Improvisation can mean we had to do something for which there was no pre-established set of rules, no recipe, or that there was a breakdown in the correct procedure. The message is, things will be right again when the proper procedures are in place, when the order is restored.

One definition of the word extemporize – a synonym of improvise – in Webster's dictionary tells us it means to do something in a 'makeshift' manner. Makeshift, in turn, is defined as doing something in a crude and temporary manner. Improvisation is thought of as making the best of things, while awaiting a return to the way things should be done. Improvisation is an exception, something we can 'fall back on' when things don't go the way they should.

But can we really say that being able to speak without notes at a conference is somehow 'less' than the written word? That the presentation is inferior? Or does it show it different set of skills and capacities in the speaker? The kind of thinking that relegates improvisation to a lesser status operates within a disjunctive paradigm in which order is privileged over disorder, a

paradigm of either/or, dichotomous thinking. In a dialogical relationship of order–disorder improvisation takes on a whole new meaning. It shows the potentially generative function of disorder, and its continual presence in our world, not only in our need to react to external aleatory, chance events, but also in our need to create, (Gabriel, 2002).

Improvisers tell a story – they *are* a story (Kearney, 1988). They participate in the world, rather than simply observing it, and create a narrative that, interwoven with other narratives, develops a tapestry of stories. The improvisational process is one of laying a path down in walking, a co-evolutionary process which is not deterministic either because of ‘laws of nature,’ or because of the ‘nature of laws’ as outlined by some sociologists. But it is not random, either: the improvisational process occurs in a context, and it is performed by someone, with a history, with cultural, economic, political, and philosophical contexts, with perspectives, habits, and eccentricities, with the ability to make *choices* in context, which choices in turn affect the context.

Jazz musicians obviously improvise not because they cannot read music, or because they have temporarily mislaid the music. They have a completely different perspective and set of values. Their assumption is not that there is one correct way of doing things, one score, one right set of notes to play, one order, but rather that we can collaboratively create through the interaction of constraints and possibilities rather than *either order or disorder* (Ceruti, 1994). In their tradition, they go beyond the score, which is often minimal by the standards of western classical music, beyond interpretation of the notes to melodic and harmonic (re-)interpretation of the song itself. Improvisation involves a constant dialogic between order and disorder, tradition and innovation, security and risk, the individual and the group and the composition. In a jazz group, the degree of discretion for the individual musicians is considerable. The musician knows s/he has to get from A to Z, but how s/he does it, how a solo is performed, or even how a soloist is supported (by the rhythm section, the drummer’s rhythmic accents, the piano player’s choice of chords or ‘comping’), is, within certain mutually agreed upon constraints (the group’s aesthetic, mood of the piece, but also technical competence, etc.) wide open. And the creative ways in which the musician deviates from the expected are one of the main criteria for assessing mastery.

Within the context of a shared harmonic and social framework (in the sense of a community of practice), and certain well-developed personal and technical capacities, improvisation frees musicians to interpret and create together in a musical conversation. One need only listen to a jazz ‘standard’ like ‘My Funny Valentine’ in the interpretations of three different jazz musicians, say Billie Holiday, Miles Davis, and Coleman Hawkins, to see

how the same basic song has been transformed into three totally different emotional, technical, and aesthetic performances while using fundamentally the same harmonic framework. The interpretations reflect the individual musician's, and the band's, aesthetic sense, subjectivity, and emotional, stylistic, and technical interpretation. A jazz musician must have a 'sound,' a 'personality,' to a far greater extent than a classical musician, because the latter has no choice about which notes to play. The musicians take a 'traditional' piece, a 'standard,' and re-interpret it, adding their own musical perspective by reharmonizing the chord changes, using new and different instrumentation, slowing the song down or speeding it up, and so on. This provides a context for their collective improvisation – a form of musical dialog, requiring constant attention, negotiation, listening (Purser & Montuori, 1994). In creative improvised collaboration, both the creative process and the creative product are an emergent property of the interactions.

I find the same process in the long walks I take with my colleagues along the beaches of Rio. We have a shared background of knowledge – a horizon – and a personal knowledge base, and we are attentive to each other, spurring each other on in explorations and speculations, occasionally poking critically at some ideas, laughing, playing with ideas as we walk around the Jardim Botânico plotting books and other projects (Manghi, in press). It's clear to me that these are collective improvisations. Sometimes conversations sound great, other times the 'band' doesn't gel. Maybe somebody plays too loud or too long, or is just boring, or there isn't that shared rapport, or we're just tired. But the dialog, the performance of our knowledge – and our friendship – is an art as well as a science. In the performing, the two are united.

The loss of improvisation – and more

How did improvisation get a bad name, and disappear from western music? Improvisation is central to most forms of music around the world (Bailey, 1993). It was standard practice in western music until about 1800, when it was displaced by two key events (Goehr, 1992). Before 1800, soloists improvised and embellished during their performance. Keyboard bass parts were largely improvised, and figured to suggest no more than a very basic chordal outline, in much the same way that it is in jazz. Composers from Clementi to Mozart to Beethoven to Chopin were renowned improvisers, and even engaged in what jazz musicians call 'cutting contests': pitting the improvisational abilities of musicians against each other. The great Franz Liszt felt far too much time was devoted to the performance of notated music, and not nearly enough to virtuoso extemporization, at which he excelled.

After 1800 or so, with the birth of the concept of the 'genius composer' and of copyright, musicians began increasingly to perform scores strictly as written. Even cadenzas, historically an opportunity for the soloist to extemporize or improvise, began to be written out. The composer's musical vision became of paramount importance, and could be 'enforced' with copyrighted musical scores that ensured musicians performed the score as intended by the composer. The cult of the genius (Montuori & Purser, 1995) that arose along with copyright brought with it the desire to hear the score performed exactly as it was intended by the composer, without the interjections of the performers, whose role was subsequently redefined and reduced. Musical performance was now completely controlled, in order to ensure that it would reflect accurately the composer's intentions. What we gained in the correct performance of great works also entailed a concomitant loss in the value placed on improvisation, and the self-organization of performance by the performers.

A third, organizational factor comes into play. With a written score a musician can be monitored for the performance of every note. Symphonic music is performed by an orchestra with a clearly hierarchical organization. The composer is at the top, like the founder of a large corporation, viewed as the one source of creativity, the 'brains' of the organization. Then we move down to the conductor, the soloist, the first violin, the section leaders, and so on, who are literally the organization's 'hands.' Without in any way wishing to downplay the skill, creativity, and art involved in the production of symphonic music itself, the organization created to produce it is closely parallel to what we typically think of as a bureaucratic hierarchy, and the historical parallels are considerable (Attali, 1985). The range and extent of contributions from individual performers is far more limited in symphonic music than in jazz: the degree of *discretion* is much more limited. The degree of *control* and *prediction* is much greater.

Higgins (1991) discusses the effects of the focus on performing scores on music and aesthetics in the West by pointing out that musical aestheticians began focusing on the musical score, and the correct performance of the musical score, at the expense of performance, emotion, context (where is the performance held), and subjectivity. She goes on to state that improvisation came to be viewed as an aberration, precisely because it reflected a lack of score, a valorization of subjectivity and emotionality which was, among other things, associated with more primitive and African elements. Improvisation became somewhat of a dirty word, referring to a less developed, pre-literate form of music that had been superseded by the order and rationality of the western form (Goehr, 1992; Sawyer, 1999). This development parallels a trend in the west to focus on the objective, the measurable, the rational and the ordered, at the expense of that which appears subjective, qualitative,

emotive, and disordered. It also reflects the privileging of certain special individuals as composers, others only as performers, and others as listeners, much the same way that social science has privileged the knowledge of expert researchers of that of those being researched. Much of social science thinking, and in consequence, much of the literature of management and organization theory, has been deeply influenced by this approach, although critiques have been emerging with increasing conviction over the past few decades.

The phenomenology of expertise and the experience of improvisation

The research of Dreyfus and Dreyfus (1986) into the phenomenology of expertise, developed specifically in reaction to the computer metaphor of expert systems, shows clearly that experts in any subject, whether chess players or racing car drivers or musicians, achieve a level of proficiency whereby they are constantly improvising. They know the rules, but do not have to think about them. They have developed the ability to act spontaneously and intuitively without needing to refer to rulebooks, without feeling they always have to stick to the rules (independence of judgment), and viewing mistakes as opportunities – tolerating, in other words, the ambiguity of unusual situations. The intuitive capacity Dreyfus and Dreyfus speak of is perhaps most apparent in chess masters who can play 15 or more games simultaneously, and spend only seconds looking at a board before they make a move and literally move on. There is little if any conscious reflection going on here. Rather, they respond in much the same pre-reflective way that a good driver would to a road hazard, a footballer to a scoring opportunity, or a musician to the context of his or her improvisation.

In musical improvisation, a genius like Miles Davis would utilize a ‘mistake’ (a note that from a certain perspective might be thought of as a mistake) of his, or of a fellow player, to explore different possibilities (Chambers, 1998). It’s also apparent in games like football, where a bounce of the ball, or a mistake by an opposing player is utilized to create new possibilities, and in speaking a language, where grammatical constraints actually provide us with a set of possibilities for communication. Constraints themselves become avenues for possibilities (Ceruti, 1994).

Research into the phenomenology of jazz improvisation (Nardone, 1996) has stressed this ongoing dialogical nature of the process, this dance between two extremes. Jazz musicians immerse themselves in the technical aspects of the music only to let go of any conscious concern for them

during performance. They stress the importance of being able to solo, but must also be capable side-persons, and support others. They respect – and indeed are in often in awe of – the tradition, and their forefathers and mothers – but are also looking to push the art forward. Indeed, Nardone's research suggests that the key element of the phenomenology of improvisation is precisely a series of 'dialectical paradoxes,' between immersion in the tradition and taking risks, between standing out as an individual voice and being supportive of others' voices. This brings us to a key point in this article: in order to understand creativity and improvisation, it is necessary to develop a different way of thinking, one which might be described as post-formal, paradoxical, dialectical, post-dichotomous, or complex.

Complexity and going beyond binary opposition

Nardone's phenomenological research of the lived experience of improvisation in jazz musicians found that 'dialectical paradoxes' were a central element. In other words, the musicians trust their own skills enough to take risks, they sustained, and were sustained by musical others, and explored musical territories that were both familiar and unfamiliar (because interpreted anew during every performance). A recurring theme in the literature on creativity and improvisation is that the creative person and the creative process both have these seemingly paradoxical qualities. I want to suggest that one reason why improvisation and creativity have been so problematic in our society – mythologized, pathologized, misunderstood, glorified, and trivialized (Hampden-Turner, 1999; Montuori & Purser, 1995) – is that paradoxical phenomena are hard to understand because we are not used to 'thinking together' terms that we have, culturally and historically, come to view as oppositions. We have, following Morin's terms, thought about these phenomena in ways that are simplistic, disjunctive, and decontextualized. I have touched on many of these oppositions throughout this article, focusing for instance on the importance of a dialogical understanding of order–disorder to the new science of complexity and the phenomenon of self-organization. Other terms might include risk/security, discipline/spontaneity, individual/group. Traditionally, we think of them disjunctively as either/or (either you're secure or at risk, disciplined or spontaneous), when in fact in creative persons they might manifest as being secure enough (in one's musical capacities) to take risks, being disciplined enough to be spontaneous (walking the line between being rigid and chaotic). Order without any unpredictable, disordered elements is complete homogeneity. Disorder without any order is

chaos, in the popular sense of the word. In his discussion of complexity theory, Kauffman (1995) echoes the earlier findings of creativity researchers (Barron, 1990) regarding order and disorder, and generalizes them to all complex systems. He writes that 'Networks near the edge of chaos – the compromise between order and surprise – appear best able to coordinate complex activities, and best able to evolve as well' (p. 26).

Hampden-Turner (1999) points to the recursive, cybernetic relationship between the characteristics associated with the creative person. He summarizes the research by writing that

The creative person is by turns open and closed, tentative and certain, and flirting with disorder to create a better order. He or she is intuitive but then passes this over in favor of the rational mind for thorough assessment. The creative person scores higher on manifest anxiety, reporting more often despair, depression, anger, sorrow, and doubt; yet the creative person also recovers from these states far faster, showing ego-strength and reporting hope, elation, delight, happiness, and confidence. In other words, creatives rally more easily from setback, shift more readily between moods, and seem to destabilize more readily in order to reach higher equilibria. They are, from a mental health standpoint, both 'sicker' and 'healthier,' more vulnerable to what happens around them yet more able to solve the problems that arise. (p. 19)

According to the research, creative persons score higher both on measures of pathology and of psychological health. In other words, they have access to a much broader range of human experience. In the area of gender the research indicates that creative individuals are not limited by stereotypical gender behaviors. They do not have either stereotypically 'male' or 'female' personality characteristics. Rather, they move freely across a spectrum of possible 'human' behaviors.

Based on his extensive research, Barron (1964) states that the creative process itself embodies an ongoing tension. Creative individuals 'exemplify vividly in their persons the incessant dialectic between integration and diffusion, convergence and divergence, thesis and antithesis.' The creative process can be likened to a dialectical process, in which in special moments common antinomies are resolved or synthesized.

The creative process seems to share many characteristics with so-called 'post-formal thought,' an advanced developmental stage of cognitive maturity (Kegan, 1982) beyond the generally accepted highest stage of cognitive development (formal). Koplowitz (1978: 32, in Kegan, 1982) writes

that 'Formal operational thought is dualistic. It draws sharp distinctions between the knower and the known, between one object (or variable) and another, and between pairs of opposites (e.g., good and bad). In post-formal operational thought, the knower is seen as unified with the known, various objects (and variables) are seen as part of a continuum, and opposites are seen as poles of one concept.' Post-formal thought displays characteristics that involve openness, a dialectical process, contextualization, and ongoing reevaluation, characteristics that they share with the findings of creativity research, and with Morin's 'complex thought.' All of these perspectives point to the need to go beyond a certain kind of dichotomous, decontextualizing, and simplifying thinking and develop capacities for postdichotomous, dialogical, contextualizing, complex thought. As I suggested earlier, I believe one of the reasons creativity and improvisation have remained so mysterious is precisely because of their paradoxical qualities. Developing a better understanding of the paradoxical nature of creative thought may allow us to approach creativity and improvisation more creatively.

Farewell to Rio

The sun sets over Rio as I take my cab to the airport. I carry with me a few photos of my friends and I in Rio. I take with me memories of Corcovado, of the beaches at Ipanema, of the red beach of Praia Vermelha, a little jewel right under the startling Sugarloaf, that seems like a tiny and remote fishing village in the heart of Rio, of discussions and friendships, of warm nights spent by the pool of the Hotel Gloria, of days watching and listening to the brilliant improvisations of Edgar Morin and my friends in the lecture hall of Candido Mendes University, and a CD of Brazilian music, rather appropriately titled *The Heart of Rio*, a gift from a new Brazilian friend.

Brazil seems a like a good place to ponder the nature of complexity and improvisation – a country known for very improvisational forms soccer and music. Brazilian music also captures *saudade*, a feeling that has no translation in the English language. Bittersweet, perhaps, or, as the Belgian jazz harmonica player Toots Thielemans put it, between a tear and smile. Brazil holds within itself shocking joy and joie de vivre, and shocking suffering and abject poverty. It is a country of great extremes, and experiencing them all at once certainly does give a hint of *saudade*, of gratitude and sorrow for all the beauty and the misery right there under the open arms of the huge statue of Jesus, on Corcovado overlooking the city. A complex feeling if ever there was one.

Ogilvy (1989: 9), has argued that 'The pressure toward postmodernism is building from our lack of ability to overcome certain dualisms that are

built into modern ways of knowing.’ In this article I have pointed to many of these dualisms or oppositions, and argued that, in many cases, they prevent us from understanding phenomena such as improvisation and creativity that according to the research are paradoxical, complex, and involve cybernetic, recursive relationships between order and disorder, health and pathology, constraints and possibilities, and so on. I have also attempted to sketch out why I think that in order to understand improvisation in jazz and in life it is important for researchers to address subjectivity, and specifically their own subjectivity, since they are participating in the research process and not standing outside it. Research is both discovery and creation, an ongoing dialog between subject and object, with the researcher both subject and object of the process. I have gone further and suggested that there may be different ways of thinking – postdichotomous (Beech & Cairns, 2001), post-formal (Kegan, 1982), or, following Morin, complex, that allow us to view the recursive and interdependent nature of these apparent oppositions, situating them in a larger context, and viewing them as ‘dilemmas’ (Hampden-Turner, 1999) to be reconciled anew every day, opportunities for creativity and improvisation.

Coda

As I write these pages it becomes painfully clear to me that, on the one hand, the traditional academic writing style is useful but dreadfully limited and limiting since it leaves out so much of who we are, originating as it did in a time when for science to be science, the author’s individuality and subjectivity had to be eliminated in favor of universality and objectivity. On the other hand, finding new ways to write that are both scholarly and personal, both ‘science’ and ‘art’ if that’s not too pretentious, is extremely difficult, as I’ve come to find out writing these pages. It’s actually easier to leave all the personal, ambiguous, contextual material out. It is ultimately easier, I believe to present just the context of justification, and leave out the messy context of discovery – or creation. But it is also a tremendous creative challenge to be more transparent, to be more fully present in one’s work, a challenge that is beginning to be tackled by some scholars, and particularly by anthropologists and feminist scholars. Perhaps one key challenge is to find, like jazz musicians, a voice, or voices, that incorporate both subjective and objective, rational and emotional, theory and experience, risk and trust. This makes the task of being a social scientist/artist also a task of self-development, of finding one’s own identity in dialog with and through the world one is studying. Then indeed our work can become an inquiry into the dialogical and recursive

relationship between subject and object, self and other, head and heart, an ongoing invitation to, and navigation of, the paradoxical nature of the creative process.

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Alfonso Montuori, PhD, is Associate Professor at the California Institute of Integral Studies. His research has focused on creativity and innovation, improvisation, and the epistemology of complexity. A former professional musician, his most recent books are *Social creativity, Vols 1 & 2*, co-edited with Ron Purser. He is Associate Editor of *World Futures*, and Series Editor of *Advance in Systems Theory, Complexity, and the Human Sciences* at Hampton Press.

[E-mail: montuori@inreach.com]

