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5º RELATÓRIO APRESENTADO NO SEMINÁRIO DE DISSERTAÇÃO DO CURSO DE MESTRADO EM COMPORTAMENTO ORGANIZACIONAL DO INSTITUTO SUPERIOR DE PSICOLOGIA APLICADA

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A contribution for a grounded theory of organizational improvisation

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Lao-Tzu said:

"The bad leader will be despised,

The good leader will be praised,

Of the greatest of leaders, his follower will say:

'I did it myself'."

Miguel, I did it myself.

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Note: Most of the people I have to acknowledge for the making of this thesis are Portuguese and thus this section is (mostly) in that language (except for a copule of acknoledgements to international scholars).

Uma tese é, muitas vezes, menos parecida com um trabalho para completar um determinado grau académico e mais com uma fotografia do seu autor numa determinada altura da sua vida.

Eu sinto-me muito assim em relação a esta tese – ela representa muito do que eu sou, do que quero ser e, se calhar (sem eu saber) do que virei a ser e nem sequer suspeito. Por isso, vou optar por uma secção de agradecimentos relativamente longa que sirva de legenda à fotografia de trezentas páginas que se segue.

Esta tese é, esssencialmente, o resultado da fé (apesar de me sentir muitas vezes tentado de lhe chamar credulidade quase irresponsável) de três pessoas: a minha mãe, a Isabel Guimarães e do Miguel Pina e Cunha.

A minha mãe, não sei porquê, acreditou desde a minha nascença (apesar de eu pensar que existiram alguns momentos de dúvida no seu íntimo em algumas etapas da minha vida) que eu era dotado de alguma inteligência: algo que nunca foi provado e de que, devo confessar, às vezes tenho sérias dúvidas. De facto, o meu interesse pela investigação começou quando a minha mãe, um par de anos depois de eu ter nascido, decidiu mostrar-me um par de livros do Tio Patinhas (o meu interesse pela gestão despontou também nessa altura) e começou-me a ensinar que uns bonequinhos a preto e branco que eram muito menos giros do que os patos e os cães que faziam de gente

queriam sempre dizer a mesma coisa. Comecei a querer saber mais e mais sobre esses bonequinhos e descobri que se os conseguisse identificar na presença de adultos ganhava sempre qualquer coisa – desde umas risadas estridentes (que para mim na altura tinham um valor muito negativo) até um balão ou, melhor ainda, um boneco de plástico ou pano igual aos dos livros. A partir dessa altura os livros passaram, para mim, a ser sinónimo de coisas boas e muitos sorrisos.

A minha mãe não se ficou por aqui. Quando, junto com ela e com os meus irmãos, fomos viver com o meu pai para a Venezuela (para onde tinha imigrado um par de anos antes) tomou, com o meu pai, uma decisão que qualquer observador imparcial consideraria largamente irresponsável mas que eu acredito ser a principal responsável pelos bons resultados que sempre tive a sorte de ter na minha carreira académica – quer enquanto aluno quer enquanto docente e investigador. Os maus pais puseram-me a estudar num colégio francês no ano em que eu ia para a primeira classe. Neste sítio falavam uma língua de que eu nem sequer tinha ouvido falar e da qual muito menos conhecia uma palavra. A minha mãe, mais uma vez, teve fé que eu ia conseguir (sem qualquer base racional para o fazer) com uma pequena ajuda dela que, durante o mês que antecedeu a minha entrada para a escola me ensinou francês a partir de um livro com poucos bonequinhos (a não ser daqueles sempre iguais e a preto e branco) e onde a única côr era um dourado roçado das letras da capa de pano. A minha mãe deve ser uma pedagoga fantástica, muito para além do que eu, que ensino por profissão, serei algum dia porque eu consegui mesmo perceber o que é que as pessoas diziam nas aulas (!) No entanto, no primeiro dia, percebi pouco e, por isso, adormeci na aula.

A fé da minha mãe continuou inabalável e nunca me perguntou se eu já tinha feito os trabalhos de casa e nunca me perguntava pelas notas a não ser que eu as

mostrasse. Quando, no 7º ano, voltei para Portugal, a minha mãe não comprou nenhum livro azul de letras amarelas para me ensinar português (que eu nunca tinha escrito na vida!) – confiou apenas em mim, no João.

Para além dessa confiança a minha mãe fez por mim sacrifícios que não me atrevo a descrever porque são nossos – dela, meus e dos meus três irmãos – e de mais ninguém. E quero dizer que eram sacrifícios mesmo. Sacrifício não quer dizer apenas algo doloroso ou difícil, mas também algo de sagrado (vem das palavras '**sacr**o' e '**ofício**'). Para a minha mãe, julgo eu, as coisas difíceis que fez por mim, por nós, não as fez de cor – sem perguntar porquê – mas sim consciente de que, como quem põe uma moeda de cem escudos numa caixinha guardada no fundo da secretária, estava a prescindir do contributo fabuloso que tenho a certeza que poderia ter dado enquanto ser Humano para o progresso do planeta para que outras quatro pessoas, o João, o Paulo o Zé António e o Nelson o pudessem fazer. Não sei se estou à altura de substituir o contributo de uma pessoa como era, é e será a minha mãe mas passo cada dia e cada hora a tentar e tenho a certeza que viverei até aos duzentos anos porque acho que, à beira dela sou um ser humano pequenino e por isso tenho muito, muito, muito para fazer até dar ao Planeta um contributo comparável ao que ela poderia ter dado.

A Isabel Guimarães foi a pessoa que, de uma forma pouco intencional, é a principal responsável pelo meu crescente interesse no comportamento organizacional. No primeiro ano, quando foi minha professora de Sociologia, a Isabel perguntou se alguém tinha ouvido falar do Drucker. Eu já tinha visto o nome dele numa revista (sem ter realmente lido nada dele) e, como sempre, falei mais do que devia e respondi 'eu!'. Ela mandou-me dar uma aula sobre o assunto na semana seguinte. Eu aceitei, um pouco a contra-gosto a pensar no problema que me tinha criado: tinha que dar

uma aula sobre um escritor qualquer de quem sabia apenas o nome. Fui à biblioteca do Porto procurar e encontrei um livro dele, em português. Achei um bocado chato, mas tinha que preparar a minha aula, e foi o que fiz. Era uma aula muito bocejável.

Na véspera da aula, o fogão de minha casa avariou. Fomos ao Shopping buscar uma pizza e, no caminho parei, com o meu pai numa livraria. Encontrei um livro do Tom Peters, com letras douradas e capa azul (era o Thriving on chaos). O meu pai insistiu em comprá-lo e eu, nessa noite, deitei for a a aula do Drucker e devorei (figurativamente) o livro do Peters. O Peters escreve para a geração 'Nintendo', não para a geração 'xadrez' e por isso não pude evitar ficar contagiado com o entusiasmo que preenche os espaços dos 'As', 'Bs', 'Ds', 'Es', e 'Os'de todas as páginas do que o Peters escreve. A minha aula no dia seguinte foi sobre isso. Em retrospectiva, devo ter feito um dos piores argumentos de venda de banha da cobra da História, mas os meus colegas pouco se interessaram e, com 18 anos, tal como eu, não sabiam a diferença. A Isabel surpreendentemente gostou (se calhar mais do facto da minha aula em si do que do conteúdo). Incentivou-me a dar outra aula. Na semana seguinte, quando saí o meu ego já não cabia pela porta – a Isabel tinha-me desfiado a apresentar aquilo a toda a faculdade. Fiz uma apresentação digna do Peters, não na forma nem no conteúdo, mas no tempo. Durou quatro horas e meia. Poucos resistiram até ao fim. A Isabel, o Rui Lourenço e a minha família (mãe e irmãos), são os que me lembro. Lembro-me de uma pessoa em especial que saiu muito cedo e que considerou o prolongamento de um evento para 4 horas e meia resultante não paixão um 'teenager' por um conhecimento que aprendia a descobrir, como um acto de arrogância. Isso deixou-me triste porque julgo que tingiu, na sua mente, tudo o que eu fiz pelo sítio onde estudei de arrogância ou irrelevância. A vida não é um concurso de popularidade.

A Isabel encorajou-me a continuar e disse-me para eu escrever qualquer coisa. Fiz um resumo de 180 páginas do livro do Peters. Ela disse-me que ia ser publicado pela Universidade. Não foi. Tive pena, mas o que aprendi (ou memorizei) ao resumir o Peters ajudou-me a surpreender os meus professores e a ter boas notas às cadeiras 'comportamentais' até ao fim do curso. A Isabel terá sempre um lugar especial na minha memória por ter acreditado em mim, e ter lá ficado as 4 horas e meia.

O Miguel Cunha teve um impacto extraordinário na minha vida. Devo-lhe o que sou profissionalmente. Um amigo do Miguel diz que ele é 'o melhor terráqueo'. Concordo. Lembro-me da primeira vez que vi o Miguel. Foi no Encontro de Comportamento Organizacional de 1997. Eu tinha acabado de entrar para o mestrado. Estive no Encontro um dia inteiro e só gostei de duas apresentações a do fernando Gonçalves e a dele. Tinha alguma coisa a ver com esponjas. Lembro-me de lhe ter feito uma pergunta. Depois nunca mais o vi, mas ouvia os professores do mestrado falar muito dele. Lembro-me, numa aula com o Carlos Marques, de pensar como seria uma oportunidade fabulosa se eu pudesse trabalhar com o Miguel e aprender a ser um investigador daqueles que têm artigos em revistas com nomes de mais de uma palavra. Um dia começaram as aulas com o Miguel. Na primeira aula disse-nos que tínhamos que escolher um caso / texto para apresentar e que tínhamos de fazer essa escolha até a próxima aula. Na próxima aula eu não podia ir. Pedi a uma colega que dissesse o caso que eu queria. Na lista vinham um par de textos de alguém chamado Weick, lembrava-me do nome dele do 'Liberation' (do Tom Peters). Escolhi um dos dois textos dele que estavam na lista. Na semana seguinte, a minha colega disse-me que tinha ficado com o texto que eu queria. Alguns dias depois comecei a estudá-lo. Era um texto chato, que eu não percebia bem sobre um incêndio. Lá preparei a aula. Tinha tudo pronto até que uma semana antes, descobri que afinal não era aquele texto

que eu devia apresentar! Era outro que falava numa coisa chamada improvisação e que tinha muitos exemplos do jazz. Achei giro. Tive pouco tempo para o preparar. Fi-lo praticamente na véspera. A apresentação correu muito bem. As pessoas gostaram, e eu também. O Miguel, no fim, disse-me que tinha um desafio para me propor. Fiquei entusiasmado, e durante uns dias só pensava nisso. Apeteceu-me muitas vezes telefonar-lhe a perguntar o que era. Esperei pacientemente.

Por essa altura, dar aulas em Braga já me estava a deixar profundamente deprimido. Sentia-me mal e sub-aproveitado lá e por isso tentei sair da vida académica e entrar para uma empresa. Foi um par de dias antes de eu me decidir a abandonar a vida académica que o Miguel, no fim de uma aula pediu para falar comigo. Ele esperou que a sala estivesse o suficientemente vazia para podermos conversar. Disse-me que queria desafiar-me a escrever um artigo sobre improvisação. Eu fiquei radiante. Tentei controlar-me, controlar a alegria que senti por aquilo que achava que era uma oportunidade fabulosa (e que hoje considero um dos pontos de viragem mais importantes da minha vida). Eu agora podia ser um académico a sério. Um daqueles que escrevem para as revistas com nomes com mais de duas palavras. Não contive a emoção e, desajeitadamente, estendi a minha mão para o Miguel. Ele ficou surpreendido com o gesto, que não tinha razão de ser na altura porque é um gesto que se faz para cumprimentar alguém e nós estávamos no meio de uma conversa. Lembro-me que ele me apertou a mão com um sorriso e me disse: 'done deal' (negócio feito). Foi aí que me apercebi do desajeitado que tinha sido o meu gesto. Mas sorri e repeti duas vezes: 'done deal, done deal'. Lembro-me de ter saído do ISPA com um sorriso de orelha a orelha e de ter tido dificuldade em meter o meu ego no autocarro para casa. Pela terceira vez, alguém tinha acreditado que eu era capaz de fazer uma coisa que, pensando bem, não é esperado de um recém-licenciado,

de um académico amador. Mas o Miguel teve fé em mim, e digo fé porque a única prova que tinha da minha capacidade para fazer o que me pediu era uma mão-cheia de comentários que tinha feito nas aulas e uma apresentação de 15 minutos sobre o assunto. Muito pouco para avaliar o que seria capaz de fazer como académico.

Desisti imediatamente de ir para uma empresa: A partir daquele momento eu era um académico! Passei um par de meses a ler quilos e quilos de papel em que a improvisação se entretinha a brincar às 'escondidas' até que finalmente fiz o meu primeiro artigo. O Miguel gostou. Entretanto, num dia em que o Miguel me pediu para ir à Nova ter com ele para alinharmos a estratégia para esse artigo falou-me da possibilidade de fazermos alguma coisa empírica sobre isso da improvisação. Despedimo-nos. A caminho do Metro o meu pensamento passou para a minha tese sobre qualidade de serviço, e foi então que a conversa com o Miguel, que tinha deixado entreaberta a porta por onde tinha saído, aproveitou o espaço entre dois pensamentos e entrou de rompante, triunfante a dizer 'aqui estou eu!'. Nessa mesma noite disse ao Miguel que queria fazer a tese sobre improvisação. A partir dessa altura, o Miguel impôs-me um ritmo de trabalho ofegante. Os prazos passaram de três meses, para um mês, um par de semanas e, por vezes, até 24 horas.

E a cada página, eu ficava mais e mais emaranhado, apaixonado até, por este mundo de pessoas que atrás de um ecrã de computador, num gabinete, ou de bloco de notas na mão, no 'campo', a viver o dia a dia de uma organização, acordavam cada dia na esperança de descobrir, no meio de páginas e páginas de textos, na gravação de uma entrevista, ou no quotidiano de uma pessoa, alguma coisa que lhes permita contribuir para construir melhores organizações. Algo que, ainda hoje, acredito ser um dos pontos de alavancagem mais importantes no progresso da Raça Humana.

Trabalhar com o Miguel é trabalhar com alguém que, apesar de já ter aportado de forma significativa para este mundo, não para de insistir em fazer, mais, mais e mais.

A Mary Parker Follett, dizia, no princípio do século, que um grande líder não é aquele que me mostra que *ele* é capaz de grandes feitos, mas sim aquele que me mostra que eu sou capaz de grandes feitos. O Miguel é, pelo menos comigo, um grande líder. As coisas que conseguimos juntos: as publicações, a participação em conferências importantes foram coisas em que eu sinto que desempenhei um papel fundamental. Acredito que o meu contributo foi decisivo para esses grandes feitos, que eu não acreditava ser capaz de conseguir em tão pouco tempo. O Miguel mostrou-me que eu era capaz disso, mostrando-me ao mesmo tempo que os melhores académicos, são da mais profunda humildade. Só conheço dois assim: o Miguel e o Karl Weick. Só não fui eu apresentar as nossas comunicações nas conferências internacionais porque a Nova só financia essas actividades aos doutorados. O Miguel deixava-me, e encorajou-me, a ser eu a apresentar. Eu fiquei muitas vezes espantado com isso. Gosto de pensar que no lugar dele faria o mesmo mas, para ser honesto, tenho sérias dúvidas.

Além desta capacidade de exercer uma liderança que está muito para além dos exemplos do Tom Peters que nos fazem exclamar UAU!; o Miguel transmite, pelo menos comigo, que quer, de facto e genuinamente, que tudo corra o melhor possível e que ele estará lá quer seja assim ou não.

A este respeito, a minha primeira comunicação académica ficar-me-à sempre gravada na memória. A recordação mais importante que tenho dela é o Miguel ter assistido a 4 horas e meia de apresentações bocejáveis para assistir aos meus 10 minutos de fama (que, eventualmente, não terão sido menos bocejáveis). Sinto-me

muito afortunado por poder trabalhar com 'o melhor terráqueo do planeta' para quem olho como um líder, e que me honra ao olhar para mim como um colega.

O meu fascínio pelo mundo das organizações teve origem, no entanto, muito antes de conhecer o Miguel – deve-se especialmente ao meu pai. Desde os 12 ou 13 anos de idade que acompanhava o meu pai, a pedido dele, às inúmeras visitas que ele fazia a empresas do mais variado tipo. Nessa altura eu ficava um pouco desconcertado com tudo aquilo. Não percebia como é que o meu pai ganhava dinheiro só a falar com pessoas. Hoje consigo o mesmo, apesar de o fazer de forma diferente. Além disso, devo ao meu pai o interesse pelo lado académico da Gestão. Lembro-me que ele me oferecia livros sobre gestão, mesmo quando eu era muito novo e depois conversava comigo sobre eles. Lembro-me em especial de um livro que gostava muito. A primeira vez que o li bocejei muitas vezes, mas era o que tinha a capa mais bonita e contava histórias de empresas a sério. Eu gostava das histórias e da capa vermelha com letras douradas a dizer 'Na Senda da Excelência'. Também gostava de ver o sorriso de aprovação e algum orgulho na cara do meu pai quando eu lhe contava as histórias a ele. Foi assim que aprendi a gostar de ler histórias em que em vez de imperadores maus e príncipes bons aparecem o Ford e o Peters. O meu pai esteve muito tempo longe. Quando voltou fizemos quatro viagens para Lisboa, muito importantes para mim e aí pusemos as histórias em dia. Essas viagens foram importantes e uma delas foi o princípio desta tese.

Se o meu pai foi importante em despertar em mim o interesse pelas organizações, então o meu irmão Paulo, foi que ajudou esse interesse a manter-se vivo e em rápido crescimento. Desde os primeiros anos da Universidade que eu e o Paulo tínhamos longas conversas sobre o assunto e discutíamos os livros que íamos lendo. Era o Paulo que tinha a iniciativa de comprar os livros que iam construindo o que eu

ia sabendo sobre organizações. O Paulo, ainda hoje me surpreende com ideias sobre estes assuntos que eu considero simplesmente brilhantes e, para ser honesto, falar com ele vai mantendo o meu nível de humildade bem alto porque não me acho capaz de fazer os raciocínios que ele faz. Julgo-me privilegiado por poder ouvi-lo, e alguns dos pontos mais importantes desta tese, como a descoberta do novo modelo de mudança e as entrevistas de sensibilidade teórica resultam directamente de ideias do Paulo. Espero que o interesse dele por estes assuntos nunca morra, para que eu possa partilhar (e, devo dizê-lo, beneficiar) das ideias que lhe vão surgindo.

Cada um dos meus outros dois irmãos me ensinou coisas importantes. O Zé António ensinou-me a olhar para as organizações com preocupações estéticas e a comunicar o pouco que sei sobre elas não só através da Ciência, como também através da Arte. O Nelson ensinou-me que quando olhamos para a vida (das organizações) com a razão, é uma comédia, e quando olhamos para ela com os sentimentos, é uma tragédia. Felizmente, eu uso a razão, a maior parte das vezes.

Esta tese beneficia também da oportunidade que tive de ser aluno de algumas pessoas que me têm servido de modelos em alguns aspectos do trabalho científico. O Rui Lourenço, que é hoje também um amigo mostrou-me como, de facto, o que ensinámos pode ser posto em prática a começar por nós mesmos. O João Menezes ensinou-me que, ao contrário do que muita gente pensa, quem trabalha nas organizações não é estúpido nem imbecil, apesar de cometerem estupidezes e imbecilidades – algo que hoje tento também ensinar aos meus alunos. O Engº Pinto dos Santos ensinou-me uma das mais simples, mas se calhar a mais valiosa, das lições que aprendi até hoje: ensinou-me a perguntar 'porquê' com uma ingenuidade muito poderosa. No mestrado, para além do Miguel, o José Manuel Fonseca teve um impacto enorme em mim – não só porque é a ele que devo a oportunidade de estudar

com tanta intimidade o caso Prometheus – como também pelo cientista exemplar que é. Muitas vezes ouço-me a falar em 'carne limpa' aos meus alunos e lembro-me das aulas dele no Mestrado. O José Manuel Fonseca é uma referência muito importante para mim.

O apoio do Carlos Marques, e o seu interesse pelo meu trabalho foi também um motivador importante para conseguir começar e acabar esta tese num par de semanas. Ensinou-me também uma coisa importante: a procurar relevância para o que faço enquanto cientista. O Marc Scholten fez, desde os primeiros relatórios de tese, críticas construtivas que acabaram por ser incorporadas neste texto. Os comentários da Manuela Faia Correia à primeira versão do artigo da improvisação também afinaram o meu pensamento sobre o assunto.

For a do mundo académico, o Engº Joaquim Menezes foi instrumental para o sucesso desta tese por todo o apoio que me tem vindo a dar, pelas oportunidades que me tem propiciado e pelo interesse que tem demonstrado pelo meu trabalho. Ao trabalhar com ele, penso que gostava mais que a GE tivesse lá um Menezes do que ter um Welch nas organizações que estudei. Os membros destas, em especial o JS e o COO da TheCenter que suportaram de bom grado a minha intromissão nos seus ambientes de trabalho. A Brunhilda, que me porpocionou o acesso ao caso Valhalla merece um destaque especial. Sinto também uma enorme gratidão em relação às pessoas que entrevistei para a parte de 'sensibilidade teórica'. A sua disponibilidade em conversar comigo sobre um assunto que lhes era pouco familiar foi exemplar de uma grande generosidade.

Duas outras pessoas foram extremamente generosas comigo: a Maria Manuel Vairinho e a Gabriela. Partilhámos desalentos e alegrias, fracassos e sucessos ao longo de um par de anos. Partilhar os meus com elas ajudou-me a manter a minha

sanidade e o meu ego dentro dos parâmetros desejáveis. A atitude fraterna e por vezes maternal que têm tido comigo deixou-me muitas vezes comovido, apesar de nem sempre ser fácil ouvir o que tinham para dizer. Esforcei-me por o fazer sempre, como se poder ler por trás das entrelinhas nas páginas seguintes.

Os agradecimentos finais que, ao fim de doze páginas, poucos terão a persistência para ler são dos que tem mais significado para mim. São para a minha esposa, Ilda, e para o meu filho Filipe (MicroJoão).

Dedicar o meu pensamento à ciência foi sempre aquilo que deu mais significado à minha vida, dedicar os meus sentimentos à Ilda ampliou esse significado para lá de algo que eu não imaginava antes. Esta tese, o meu trabalho, estaria vazio de sentido sem o recente aparecimento da Ilda na minha vida. Segundo a Ilda, esta tese obrigou-a a sacrificar-se (pelo menos é o que ela diz) ao passar quinze dias sem quase falar comigo (eu estava fechado na sala de estar onde comia, dormia e trabalhava) apenas uma semana depois de termos casado. Não acredito que a privação da minha companhia seja grande sacrifício para alguém. Muito menos para alguém por quem tenho tanta admiração como tenho pela Ilda. Mas ela fez muito mais por esta tese do que esse sacrifício. Todos os dias jantávamos juntos e eu fixava o olhar da Ilda durante uns segundos e esforçava-me por o memorizar. Quando acordava, à medida que as estrelas se deitavam, a memória desse olhar aparecia e ia-se tornando mais nítida, dando-me a energia sobre-humana e a inspiração que poucos têm o privilégio de usufruir (apesar de, na verdade, não me pertencer) que me permitiram fazer este trabalho em tão pouco tempo.

O meu filho [MicroJoão (Filipe)] renovou a minha fé no significado que a investigação pode, de facto, ter. Não tenho a presunção de mudar a forma como as

organizações funcionam, com esta tese. Mas acredito, tenho fé, que este trabalho pode inspirar alguém que o faça.

Juntamente com esta renovação de fé, o MicroJoão trouxe-me uma alegria que multiplicou os efeitos que a memória do olhar da Ilda tinham sobre mim. Muito obrigado aos dois, é um privilégio partilhar a minha vida com a vossa.

Por último, como sou um académico, devo-me ter esquecido de alguém importante. Para essa(s) pessoa(s): muito obrigado! Além disso, o José Manuel Fonseca ensinou-me que os efeitos mais significativos advém de pessoas de quem nem sequer nos lembramos (teoria da complexidade: uma borboleta a bater asas no Japão faz um furacão em Miami). Para todos aqueles que 'bateram asas' e me ajudaram a fazer este 'furacão', a minha mais profunda gratidão.

Pronto. Acabou.

Escrever esta secção de agradecimentos deixou-me a pensar. Tanta gente fez tantas coisas boas por mim. Como é que eu posso pagar isso' Achei que não podia, mas afinal já sei como é que vou fazer. Vou-vos fazer uma promessa a todos: prometo que vou fazer a outros o que vocês me fizeram a mim. Muito obrigado. Espero ser digno de tudo o que depositaram em mim.

As palavras finais deste agradecimento são as seguintes: obrigado, Miguel.

João Vieira da Cunha

Lisboa, 22 de Outubro de 1999.

A CONTRIBUTION FOR A GROUNDED THEORY OF ORGANIZATIONAL IMPROVISATION

ABSTRACT

Change has been a phenomenon of growing popularity among those studying organization science because of its increasing pervasiveness in most domains of organizational reality and life itself.

Authors on change and learning have been touting a phenomenon they label organizational improvisation as a competence / skill necessary to survive, let alone to thrive, in environments where change is a constant. Literature on this phenomenon is abundant in theoretical discussion and metaphorically grounded theories but scarce in cumulated knowledge and empirically grounded models.

In an attempt to make a contribution to widen the empirical basis of research on organizational improvisation, this study follows a 'weak-constructivist' paradigm and draws on three sources to build a grounded theory of this phenomenon: the development of an organizational innovation, a public performance of a company's team and a series of interviews of academicians acdemicians-practicioners and consultants.

The first source, which is in fact an embedded multiple-case study constitutes the core data set of this study, the second aims at establishing a distinction between organizational and jazz improvisation (the most widely used metaphor on this topic) and the third aims at building the theoretical sensitivity necessary for grounded theory.

From these sources sixty-four variables emerged, which are grouped under five constructs. These variables are presented by discussing the major conceptual issues associated with them, providing evidence of their presence in the cases and discussing how they were measured. These variables are then linked together via fifty-four propositions, resulting in a grounded model of improvisation in organizational settings.

Additionally, the data show that organizational improvisation allows for a synthesis to emerge in two of the major debates on organizational change – punctuated vs. incremental change and emergent vs. deliberate change – by proposing 'punctuated incrementalism' and 'deliberate emergence' as legitimate and pervading change modes. Most importantly, the data also corroborate that improvisation constitutes is in fact a new theoretical model of change, filling one of the slots Van de Ven an Poole (1995) left vacant when developing an integrating framework for studying change.

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INTRODUCTION: WHAT TO STUDY IN ORGANIZATION SCIENCE

No aspiration is a more important source of motivation and, I daresay, of inspiration to a researcher, regardless of his or her scientific interests, than to make a visible and significative contribution to his or her field of study.

In the field of organizational behavior, few research topics provide such a fertile ground for that contribution as that of organizational change. In fact, change underlies most, if not all, of the major research topics on this field in recent years and probably those of years to come (Rousseau, 1997).

In a recent interview to Gautam Ahujua, published in the newsletter of the Organization and Management Theory (OMT) division of the Academy of Management, Paul Hirsch, recipient of the 1998 OMT distinguished scholar award, argued that "[organizational theorists] should conceive (even reclaim) change as a major topic, moving beyond the statics of reinforcing routines and a preference for isomorphism, and encourage more studies to encompass present-day organizational dynamics" (Gautman, 1997: 2)

The overwhelming amount of normative books on organizational change is also a strong indicator of the relevance of this topic for practitioners and academics alike.

A final piece of evidence towards this argument is that the current 'heroes' in management literature – Richard Branson and Percy Barnevik, in Europe; Ricardo Semler, in South America; and Bill Gates, Jack Welch, Ted Turner and the late Sam Walton – are admired for their ability to produce change (Jackson, 1996; Peters, 1987, 1992) a departure from earlier heroes of industry, such as Chester Barnard and John Rockefeller, who were acclaimed for achieving efficiency and stability in their industries (Barnard, 1938; Chandler, 1962; Galbraith, 1973).

Change also lies at the heart of the themes to drive contemporary inquiry in organizational studies, but it is also expected to constitute the core of those that are expected to drive it in the future. Of the seven issues Rousseau (1997) recently extrapolated as the future of research in organizations (new employment relations, performance measurement and management, the transition from goal-setting to self management, changes in information processing, organizational learning, organizational change, and leisure), four are directly related to change. Organizational change is the most evident of all, followed by the transition of goal-setting to self management and changes in information processing, topics which explicitly include the word 'change' or a synonym (e.g. transition). Organizational learning is also, in essence, a change process. Weick and Westley equate learning with "disorganize and increase variety" (1996: 440) and Cook and Yanow define it as "acquiring, sustaining and *changing*, through collective actions, of the meanings embedded in the organization's cultural artifacts" (1993: 384; my emphasis).

In short, change appears a (if not *the*) central topic in organizational research and its probably here to stay.

The popularity of change: Three explanations

The importance of change, which at this point amounts to little more than a realization, can be explained by three complementary rationales: a 'rational' one; a 'fashion' one; and an 'autistic' one.

The rational argument

The rational argument for the omnipresence of change in both the academic and the popular business press lies on the pervasiveness all-too-familiar phenomena

of hipercompetition and turbulent environments (D'Aveni, 1995; Emery & Trist, 1965), which has been leading to the growth, in both number and complexity, of the environmental contingencies that organizations have now to observe.

In truth, the increase in competition, putting aside demand factors inasmuch as they are often restricted to a limited set of industries, can be traced to changes in the qualitative nature of the value of within-industry competition, espoused by the governments of developed countries. In North America, this change dates from the more conservative approach to anti-trust laws esposed by the Reagan Administration, which allowed for concentration in industries where none was possible before and thus creating stronger – and, necessarily – more aggressive competitors (because the law still punished severely monopoly and heavier forms of collusion) (Rousseau, 1997; Porter, 1982). In Europe, the anti-trust policy of the Union has been producing this same effect as only the more severe cases of monopoly and collusion are deterred allowing for practices that, whereas allowing a relatively high degree of concentration, still push some competition (Sauter, 1998) – the banking industry is but one of a number of examples. Again, markets get populated by a relatively small number of big competitors in hard confrontation with each other.

Notwithstanding, this increased competition alone is not enough to account for the emergence of a 'turbulent field'. In this type of environments, change comes not only from the actions of its inhabitants but from discontinuities in the environment itself (Emery & Trist, 1965). However, the latter half of this century has proven prodigal as far as these changes are concerned. Technological breakthroughs, the most famous of which is the computer (Zuboff, 1988); profound changes in the implicit psychological employment contract (Capelli, 1995; Pfeffer and Baron, 1988); and important shifts in social trends (Drucker, 1996) have determined the emergence of

'new (and ever-shifting) competitive landscapes' which boost the chaos of hipercompetition a couple of notches above – and into the realm of complexity (Bettis and Hitt, 1995).

The emergence of turbulent environments, together with the increasing legitimization of the structural contingency theory that, although being only a distant memory for management researchers because of its lack of fitness with reality (Schoonhoven, 1981; Pfeffer, 1997), it is still much in the foreground of management practitioners' beliefs, partially because of its popularity among consultants and consultancies (Micklethwait & Wooldridge, 1996), has spurred an interest in literature on change. The assumption here is that if organizations must fit their environments and if these environments do nothing but change, then the organization also needs to make change its central tenet as, most researchers and practitioners believe, academics should.

The 'fashion' argument

The interest on change does not stem only from such a logically sound argument. Change is also very fashionable. In fact, drawing on the work of Abrahamson (1991), one can argue that the interest in change, both in academia and in business circles, does not only emerge from such a reason-grounded approach as the one presented above, but also from faddish and fashion dictums.

Saying that the focus on organizational change is a fad means arguing that this interest comes from imitation. For managers, this translates on perceiving change as the 'right thing' to do without questioning the real need to accomplish it and, most importantly, the ability to do so. An important source of this type of belief is popular business press, who awes at those that are able to perform vast and radical

organizational changes, instituting them as the *de facto* heroes of today's business world. Books upon books are written explaining how these corporate 'Herculeses' were able to turn a lagging 'me-too' into a world-class standard-setter, establishing them as the role models for those hoping to access the top levels of managerial ability (Micklethwait & Wooldridge, 1996).

For academicians, this process is quite similar. Top researchers' major publications are focused on issues related to change (Pfeffer, 1997) and, lately, the more visible academic events implicitly seem to be pushing this topic. One has to look no further than the themes of the 1999 and 2000 meetings of the Academy of Management: '*Change* and Development Journeys into a Pluralistic World' and 'A *New* Time', respectively.

Some scholars, as the Paul Hirsch's quote above shows, even call for this focus explicitly – urging budding researchers to "be true to [themselves] and just do it!" ('it' being researching on change) (Ahuja, 1997: 6). Furthermore, because of the nature of tenure process in most universities, academicians are impelled to look into 'politically correct' topics and methods and thus, because of its growing popularity, towards change.

Turning now to look at the interest on change as a fashion, meaning a trend that is imposed by outsiders to the environment (Abrahamson, 1991), it can be argued that consultants and consultancies are playing the role of the 'couturiers' and that of the 'maison' respectively (to use a fashion metaphor). In fact, several authors have shown that consulting companies promote administrative technologies and 'intellectual thrusts' to organizations, most often than not, without any apparent consideration for their adequacy to their clients' problems and organizations (Shapiro, 1995; O'Shea & Madigan, 1997). In this manner, the centrality that the need for

change exerts in the mind of most managers seems to more be more a result of consultancies push for the perception of an ever-changing world and less a result of their own 'objective' analysis of the trends affecting their organziation's performance.

For academicians, focusing on change as a research topic can be a fashion insofar as it results from a demand-pull exerted by practitioners. The strength of this pull comes not from the importance that academic research has as an input for managerial practice, but instead from the role of consultants that academicians often play (Pfeffer, 1997). In this sense, their will to command more consulting contracts would lead researchers to investigate those topics that are on the foreground of managerial attention – namely organizational change.

The autistic argument

Finally, and drawing on a less orthodox theory, one can argue that although this interest of change is legitimate inasmuch as it comes from the fact that managers have to face unprecedented levels of it in their organization's environment, this change is self-induced because of the autistic that characterizes human perception. In fact, drawing on the concept of autopoiesis (Maturana & Varela, 1980) one can state that organizations, and human systems for that matter, are actually closed and not open systems. The argument supporting this statement is grounded on the assertion that there is not an objective reality but only a set of disparate stimuli that is subjected to interpretation and enacted into a worldview (Smircich & Stubbart, 1985). This worldview is then used as an uncontested input for action and decision-making by individuals, organizations and societies. In this light, turbulent environments can be just a social construction of the business community, amplified by a positive feedback system enacted as practitioners act on a perception of turbulence and researchers

investigate that action without ever questioning that turbulence in the first place, crystallizing it into a fact. The importance of change for both practitioners and academicians could thus be a social construction of this community with a very thin grounding on actual events.

Ultimately, whatever argument or set of arguments we espouse as having created this interest on change, the truth is that this is an important phenomenon for organizations, independently of being based on 'reality' or just on a collectively enacted worldview. In fact the complex texture of most environments where organizations dwell has grown in sterility for successful performance as the mortality rates of new products clearly show (Cooper, 1979). Moreover, social trends are altering the shape of the individual-organization relationships in a close fashion to Handy's 'cloverleaf organization' (Davis-Blake & Uzzi, 1993). Organizations cannot just stand still without risking extinction (DeGeus & Senge, 1997).

In conclusion, change is an important topic for research on management and one that may allow it to have a *de facto* impact on its practice and is thus a worthy endeavor as any for a scientist aiming at providing organizational theory with a sound contribution for organizational practice.

Improvisation: A fertile ground for research on change

If change is such a relevant topic for research in organizations, then one should expect this issue to be the object of numerous research efforts and thus a sterile ground for all but inconsequential investigation. In reality it is not so. There are several important debates on organizational change that remain unresolved. The contention between incremental and punctuated equilibrium models (Weick & Quinn,

1999) and its close relative, that over emergent change versus planned change (Mintzberg & McHugh, 1985; Stacey, 1991) are the most salient ones (Van de Ven & Poole, 1995). Additionally, Van de Ven and Poole (1995) developed a set of logically possible theories of change and development in which two 'slots' remain blank and thus offer a fertile ground for scientific inquiry.

Recently, a number of researchers have been studying a phenomenon commonly labeled organizational improvisation (e.g. Weick, 1999a; Crossan & Sorrenti, 1997; Hatch, 1999; Moorman & Miner, 1998a; Kamoche & Cunha, 1997) which we believe to hold the potential for a major contribution towards the advancement of knowledge on organizational change. In fact, organizational improvisation has the potential to contribute towards the resolution of both the punctuated / incremental change and the deliberate emergent change debates. Additionally, improvisation fits neatly in one of the two theoretical slots that Van de Ven and Poole (1995) left vacant in their building of a framework for studies organizational change.

First potential contribution: The punctuated / incremental change synthesis

The debate between punctuated / episodic and incremental / continuous change is essentially a debate about the pace and magnitude of change in organizations.

Advocates of the punctuated perspective argue that organizations are characterized by periods of stability followed by bursts of change aimed at fitting the organization with its environment to allow for a further period of stability, and so on (Gersick, 1991). The most widely know punctuated change model is Lewin's (1951) unfreeze-change-refreeze model which, as argued by Hendry (1996), underlies most

models in this category. Additionally, drawing on the work of Weick and Quinn (1999), one can state that the actor behind this type of change is the visionary leader who conceives and implements change, focusing on a short term adaptation to hostile external and / or internal conditions.

Advocates of the incremental perspective contend that change is inherent to daily organizational activity, in the process to accommodate to the continuous state of flux that characterizes turbulent environments holding the organization in a perpetuous state of evolution. It is hard to find a landmark author for this kind of change model, although if we were to divide it in discrete phases we would first witness a moment in which mental models or schemas are rendered visible (Senge, 1990). This would be followed by a stage where these schemas would be questioned and alternative ones would be produced, creating a wider set of 'realities' upon which to act (Stubbart & Smircich, 1985). Finally, a stage of unfreezing where more informed action would ensue allowing for mindful change (Weick & Quinn, 1999).

The change actor behind continuous change processes is a person who attributes meaning to daily events inscribing them with a call for change, focusing on a long-term adaptability.

Organizational improvisation results from a synthesis between these two models. Improvisation-driven organizational change acknowledges that turbulent environments launch a series of daily disruptions to which the organization must accommodate and the risk of witnessing its competitive position eroding at a variable pace (Brown & Eisenhardt, 1997). Nonetheless, it does not ignore that there are indeed disruptive events that cannot be tackled through daily adjustments alone (Pearson, Clair, Misra & Mitroff; 1997; Crossan & Sorrenti, 1997).

At this point, it is important to point out that most authors on organizational improvisation equate it with the 'continuous change' approach, arguing that environmental discontinuities are but the compounded result of small incremental changes – the famous 'butterfly effect' from chaos theory is the most common example of this argument.

Although it amounts to a logically sound argument, this perspective leaves out important discontinuities that no incremental accommodation could have prepared organizations for. Technological breakthroughs are the most common cases of such discontinuities: how could one have incrementally prepare for the dawning of the internet-based economy? No matter how well an organization adapts to its environment on a daily basis, it will never be able to preempt changes that occur outside that environment's frontiers (Bettis & Hitt, 1995; Stacey, 1996).

Improvisation could thus be positioned as a punctuated incrementalism change model. This is possible because organizational improvisation uses a plan as rigid and teleological as Lewin's change model (Lewin, 1951) to serve as a minimal structure upon which requisite variety for adaptability is built. In the words of Weick (1999a: 13-14; comparing the minimal structure to a jazz song) "the song also frees up people to concentrate on ways to vary, manipulate, augment, diminish, fragment and regroup the seed pattern of the melody into new variants". Thus, if we want to compare incremental, punctuated and improvised change we could say that the latter uses the structure of punctuated change to boost adaptability and flexibility beyond those offered by continuous change.

Again, it is not easy to find a landmark author for improvised change process. Nonetheless, integrating research on this phenomenon allows the building of a model whose first stage would be the creation of a minimal structure (Brown & Eisenhardt,

1997; Eisenhardt & Tabrizi, 1995). Following this stage one would witness an interplay between action and adaptation to both continuous and discontinuous change.

The change actor behind an improvisational change process is a person who creates structure and promotes variation, allowing for change that fosters local continuous adaptation and builds global adaptivity.

Second potential contribution: The deliberate / emergent change synthesis

Closely related to the debate between punctuated / episodic and incremental / continuous change is the one between deliberate and emergent change – a contention that essentially addresses the degree of intention behind changes in organizations.

Advocates of the 'deliberate change' perspective argue that change in organizations is a conscious effort – a carefully charted process that leads to *a priori* designed outputs.

These authors acknowledge that obtaining the desired (and planned for) results is not an easy endeavor, because of the turbulent nature of the environment. They regard those deviations as undesirable and aim at seeking ways to achieve a more effective implementation of the planned course of action so that these unintended outcomes can be eliminated (Barnard, 1938). Most management books, be they academically (Stoner & Freeman, 1992) or practitioner (Peters & Waterman, 1982) oriented, are still wedded to this approach.

This approach is closely linked with the punctuated equilibrium model inasmuch as it is grounded on an explicit plan for change to occur. Consequently, the role of the change agent resembles closely the one depicted in this model – that of creating and articulating a desired future state for the organization and carefully

laying out the plans for this state to be implemented, in a step-by-step search for adaptation.

However, as can be inferred from the above description of the conditions necessary for the appearance of unplanned action, the emergent side of organizational action seems to be very significant and can even jeopardize any relationship between intended and realized action.

In fact, Mintzberg and Waters (1982) argue that a linear correspondence between these two categories of organizational action is unattainable in practice, since it would demand that the strategic apex of the organization to issue clear and precise instructions, that would be transmitted to the remainder of the organization, which in turn would be able to perceive it exactly as the apex intended and would be able to implemented them without any interference neither from external factors (market and competitors) nor from internal ones (organizational politics, resources) – an unreal conception considering human cognitive limitations (Simon, 1990, 1992; Tversky & Kahneman, 1974; Senge, 1990) and the uncertainty embedded in most organizational environments today (Stacey, 1996; Bettis & Hitt, 1995). One must thereupon recognize that any action has a non-deliberate element that should not be ignored and conceptually discarded.

In this light, we can position organizational action in a continuum bounded by entirely deliberate action and by entirely emergent action (imposed by the environment), as can be seen on table A1 (in appendix A).

Still more relevant is that, when positioning either cross-sectional or longitudinal observations of organizational action and strategies in this continuum, we will probably face a distribution biased towards those where the emergent element is

somewhat stronger than the deliberate one, essentially because of the rationale presented above (Stacey, 1996; Mintzberg & McHugh, 1985; Bettis & Hitt, 1995).

Departing from the statement that realized organizational action has an important emergent and unplanned component, that can even distort the very intentions of the organization, bringing to its action unexpected and unplanned circumstances, several authors (e.g. Peters, 1992) argue for populating the organization with the highest level of diversity possible in order to ensure that enough variety of will be produced, regardless of its coesion with organizational goals, in order to guarantee adaptability to any unexpected event that might occur, in a similar fashion to the principle of requisite variety put forth by Weick (1979).

These authors regard emergent change as the major source of adaptation to turbulent environments, foregoing any attempt to pursue deliberate courses of action and looking at 'planning' as a dirty word and as a practice that amounts to little more than a ceremonial ritual akin to a corporate rain dance (Mintzberg, 1994).

This approach is closely related with the continuous change model inasmuch as it is grounded on an attempt to accommodate to the continuous flow of change that characterizes turbulent environments, holding the organization in a perpetuous state of evolution.

Consequently, the role of the change agent is very similar to that described in the incremental model – that of attributing meaning to daily events inscribing them with a call for change, focusing on a continuous search for long-term adaptability.

Improvisation emerges as a synthesis between these two opposing poles. Improvisational change aims at increasing the degree of deliberateness of the emergent side of organizational action.

This approach sees emergent events as opportunities to implement the organization's deliberate strategy which, as argued when discussing the role of improvisation in the incremental versus punctuated change debate, departs from traditional plans because it aims at increasing, instead of constraining, diversity.

In this light, the change actor behind an improvisational change process has the responsibility of creating a minimal structure that promotes 'restrained variety' (Weick, 1993a), allowing for a higher degree of deliberateness in the organization's emergent action thus fostering local continuous adaptation and building global adaptivity.

In the end, the study of organizational improvisation seems to be potentially useful to address these both debates in the organizational change arena, not by tilting the argument towards one position or another, but instead by allowing a third synthetical approach to emerge resulting from turning two opposing stances into poles of a dialectical conflict.

Third potential contribution: Discovering a new mode of change

The final contribution of organizational improvisation to the field of organizational change is, in our view, the most significant one: organizational improvisation constitutes a new form of organizational change that remains unnamed as such and is thus deprived from integrating the toolbox of practitioners wanting to advance organizations and that of researchers wanting to advance knowledge.

In fact, in order to attempt to create an integrating framework for studies in the field of organizational change, Van de Ven and Poole (1995) found that two logically possible theories on this subject remained devoid of any research effort. These two

theories are composite models, meaning that they result from a combination of several change motors. One of these theories incorporates teleological, dialectical and evolutionary change and the other is built from life-cycle, dialectical and evolutionary change.

Improvisation, because it incorporates teleological, dialectic and evolutionary change, is able to fill the first of the gaps that Van de Ven and Poole (1995) found in organizational studies on change.

Improvisation: An instance of teleological change

For a change mode to be built from a teleological change motor, it has to conform with three characteristics: it has to result from reflexively monitored action; it has to have an identifiable process of social construction / sensemaking of goals; and it has to obey to a set of requirements and constraints (Van de Ven & Poole, 1995).

In order to assess the compliance of organizational improvisation with these characteristics, we will draw on two variations of this phenomenon: improvisation in the presence of an explicit plan and improvisation in the absence of one.

When improvisation happens in the locus of a pre-determined plan of action, reflexive monitoring comes from the awareness of that plan, which is used as the basis for the creativity and variation needed to attain the goal or goals articulated in it (Weick, 1999a). The role of a plan in reflexive monitoring is thus the exact opposite of that in traditional planned change, where it serves as the basis for compliance and standardization believed needed for the attainment of the goal or goals it prescribes (Mintzberg, 1995). Reflexive monitoring, in improvisational change, results therefore from using the articulated plan for positive feedback – the plan is the norm that

pushes action to depart from it, exerting thus a centrifugal force. Conversely, in planned change, the articulated plan exerts a centripetal force serving as a norm that pulls action towards it – regulating the course of change via negative feedback.

The presence of an identifiable process of social construction / sensemaking of goals is also found when change results from improvisation over a plan. In fact, in this instance of organizational improvisation everything happens as with planned organizational action – the process goals result either from a sensemaking or decision-making process that happened *a priori* to the change itself and are thus treated as givens. The challenge thus rests in being able to trace the path of these goals, a task to which improvisation adds no more difficulties than planned action does. Nonetheless, there are two important distinctions between the goal conception process in improvised and planned change that have to be articulated.

Firstly, although goals are givens both for improvised and planned change, sensemaking / making sense of the outcomes of improvisational actions may alter these very goals during change implementation, something inconceivable in traditional planned change (Barrett, 1998; Mintzberg & Waters, 1982).

Secondly, in improvised change, goals are part of a minimal structure that aims at increasing variety and creativity; in planned change goals are part of a total structure that aims at reducing variety and pushing standardization (Lewin, 1951; Benson, 1977). It logically follows that improvisational change requires qualitatively different goal formulation than planned change does, because of the symmetrical role goals play in each of these instances.

Finally, and although it may be counterintuitive, one can also find obedience to a set of requirements and constraints in improvised change, although these are qualitatively very different than those in planned change.

In improvised change, constraints are essentially of two types: social and task related (Erickson, 1982).

Social based constraints are those that are determined by the broader organizational and social environment that serves as the context for individual improvisation. The most common enactments of these constraints are culture (national, organizational, and professional) (Crossan & Sorrenti, 1997; Weick, 1979, 1995); technology (Sewell, 1998); and explicit or implicit goals (Brown & Eisenhardt, 1997).

Task based constraints are those that are determined by the nature of the task / change process faced by the individual / team. The most important task constraints found in the literature are: milestones and deadlines (Eisenhardt & Tabrizi, 1995); leadership (Orlikowski & Hoffman, 1997); and task roles (Orlikowski, 1996; Powers, 1981).

Again, a closer look at these constraints shows that their role is, in essence, to promote the urgency needed for improvisation to be triggered Moorman & Miner, 1998a) and to create a low enough level of coordination for requisite variety to emerge, while maintaining it high enough for that variety to be enacted into action, in order to maximize the deliberateness of the emergent side of realized change (Hedberg, Nystrom & Starbuck, 1976). We cannot help but to notice one more time that this is a very different part from that played by the constraints associated with traditional planning, which aim at maximizing coordination and standardization in order to have plans enacted into reality, ignoring or attempting to annihilate the emergent side of realized change.

Having presented a rationale for including in organizational improvisation in the context of an *a priori* plan, a teleological change motor, we now turn to argue towards the same conclusion when improvisation happens outside that context.

When no formal plan is available to serve as a basis for reflexive monitoring, this role is occupied by the larger goals of the organization, be they explicit (like those in a vision statement, for example) or implicit (immanent in the organization's culture). These goals, which are most often than not implicit in a shared (and in most cases unstated) view of the organization's role in its larger environment (be it making profits or building a better world), are more prone to serve as inputs for positive / centrifugal feedback than written goals (Weick, 1993a) but equal the latter in their reflexive monitoring ability, as their lack of articulation does not diminish their strength as elements of a minimal structure of agreement (Hedberg et al., 1976) and as a mechanism of equivocality reduction (Weick, 1979).

The detection of an identifiable process of social construction / sensemaking of goals is, in 'planless' improvised change, a more daunting – but nonetheless possible – task to tackle. This is because, where there is no plan underlying improvisation, goals are not created but emerge, and can only be articulated after they are accomplished (Weick, 1999a) – goal setting in this type of changing is thus a pure sensemaking activity. Consequently, determining the process that gave birth to these goals is a matter of tracing back the path followed as sensemaking was being enacted – a path that, although surely to be filled with invisible instances of rationalization, is still passive of articulation.

As far as constraints go, social based ones, which are mostly independent from the existence of a plan, they remain unaltered: culture, both national, organizational,

and professional; technology; and explicit or implicit organizational goals are not dependent on specific change plans.

Task based constraints, on the contrary, are heavily grounded on plans and prescribed courses of action. In this light, milestones and deadlines are likely to be absent and thus must either emerge or be imposed by the task itself (Erickson, 1982); leadership may be more informal, because there is no plan saying who will be in charge (and, in fact, there's nothing to be in charge of) (Crossan, White, Lane & Klus, 1996); and, finally, task roles will either emerge during action or follow organizational ones (Bastien and Hostager, 1988). In conclusion, although qualitatively different, constraints are still present in organizational improvisation, even when no underlying plan is to be found.

From all of the above, one can thus assert that there is in fact a teleological motor underlying organizational instances of improvisation.

Improvisation: An instance of dialectical change

If teleological change is present in organizational improvisation then dialectical change is even more so (Weick, 1999).

According to Van de Ven and Poole (1995), a dialectical motor requires at least two entities that contradict each other, it further requires that the opposing entities actually engage in conflict and that a different entity emerges from that conflict.

Organizational improvisation is characterized by the presence, and individual awareness of, conflicting demands upon action. In fact, the literature on this phenomenon, drawing heavily on jazz improvisation, has unearthed a series of thesis

and antithesis that individuals and teams feel compelled to oblige when improvising, and are in fact able to do so.

The most salient dialectics organizational improvisation enacts are: group versus individual; structure versus freedom; planning versus creativity; effectiveness versus efficiency; and thinking versus action.

Because exploring each of these dialectics would take a paper on its own, we will make only a cursory review of them, deep enough for the sake of this argument.

The group versus individual conflict stems, on the one hand, from the need for a positive self image, apart from that of the group (Rijsman, 1996) and from the need of peer consideration / 'admiration' (Brown & Duguid, 1991), and, on the other, from the need for affiliation present, with higher or lower intensity, in all human beings (Baker, 1994; McAllister, 1995) and from the need to establish reciprocity imbalances in the informal organization (Krackhardt & Hanson, 1993; Pffefer, 1992).

The structure versus freedom dilemma echoes the classical integration versus differentiation one in organizational theory. Structure is necessary to integrate individual efforts towards common goals. Its objective is to fight on a permanent basis the organizational tendency towards entropy and disaggregation (Mintzberg, 1995). However, by definition, the more structure the less the differentiation (since structure is essentially a means of standardization) (Handy, 1976). Nonetheless, increasingly turbulent and complex environments demand for an increasing level of intra-organizational variety (Stacey, 1991; Hannan & Freeman, 1989).

Another immanent conflict in organizations is that between the need for planning and the need for spontaneity. On the one hand, planning appears to be necessary in order to ensure that the organization's goals are attained and that some degree of efficiency is maintained. Furthermore, research on new product

development has shown that following plans leads to better process outcomes (Cooper, 1979). Nonetheless, the emergence of hipercompetition (D'Aveni, 1995) and of the so-called new competitive landscapes (Bettis & Hitt, 1995) created the perception that little can be planned and that organizations need to be able to respond spontaneously to unexpected and 'unplanned for' developments in its environment and, sometimes, even in itself.

Still another classical conflict in organization theory is that of effectiveness versus efficiency. Some authors (e. g. Bennis, 1989) have equated this dilemma with the difference between a leader and a manager: the leader is concerned with effectiveness – doing the right thing – and the manager is concerned with efficiency – doing things right. Efficiency is a factor of the utmost importance for companies: higher levels of it lower cost and thus rise profits. Turbulent environments have, however, questioning the value of efficiency: companies fear producing at the lowest cost products that no one wants anymore (Peters & Austin, 1986). Managers are called to differentiate and to 'wow' the customer (Peters, 1987, 1995) – to concentrate on providing products and services in an effective manner. Nonetheless, pushing effectiveness is no panacea: making a product that everyone wants but no one can afford is not a better strategy than the blind pursuit of efficiency.

A final conflict that concerns organizational members is that between thinking and acting. Thinking and planning are important, especially in complex environments, where mental models are always simplifications that can prove dangerous when they are questioned by unexpected events (Pearson et al., 1997; Weick, 1993b). Organizations are thus called to learn and to inquire their assumptions and schemas of reality in a never ending quest for learning (Senge, 1990). However, this same turbulent environments demand speed (Eisenhardt, 1989a) and action (Crossan, 1998)

and leave little time for reflection to happen in organizations. But if reflection is forfeited then an organization can be working as quickly as it is able in the opposite direction of survival, let alone success. Again, a balance is hard to find and harder to implement.

Having shown that there is a series of two-entity conflicts underlying organizational improvisation, proof of actual 'engagement' between these entities is necessary for arguing there is a dialectical motor underlying this phenomenon.

The confrontation between the two opposite factions underlying organizational instances of improvisation unfolds as this phenomenon is triggered. In fact, when an unexpected, 'unplanned-for' event occurs, and if this event calls for fast action by an organization and / or its members, then antithetical entities are brought into a synthesis by the act of improvisation itself. In fact, before improvisation is triggered only the 'structuring' faction (team, structure, planning, efficiency and thinking) is present in a somewhat latent state, as the organization relies on its learned routines to handle expected and / or 'planned-for' events (Moorman & Miner, 1998a, 1998b). When improvisation is triggered, then variety, creativity, action, orientation towards the self, and effectiveness-seeking behavior emerge, coexisting with planning, structure, thinking, team orientation, and efficiency seeking behavior. The co-existence of such antithetical phenomena ends up in a synthesis that arises from a confrontation between these two factions in the minds of those improvising. A dialectical motor is thus brought to bear.

To conclude the argument towards the presence of such a motor underlying organizational improvisation, it is still mandatory to show that the results from the confrontation depicted above are different from each faction.

Indeed, organizational improvisation results from a synthesis between thesis and antithesis, resulting in an approach that incorporates high levels of each of the factions put forth earlier in the argument.

Regarding the tension between team and self orientation, a closer look at jazz improvisation, which has been widely used as a model for understanding this phenomenon in organizational settings, shows us that we can find high-performance groups which include players regarded individually as top performers (Mirvis, 1998), fostering a phenomenon of 'teamed individualism' where there is no trade-off between individual notoriety and overall team performance, but instead a dynamic where one feeds the other in a positive reinforcement cycle.

In the integration versus differentiation conflict, improvisation, 'escapes the square' by using structure (an integration mechanism) to promote differentiation. This is accomplished by creating a level of structure that is high enough to avoid entropy but that is low enough for variety and creativity to emerge (Hedberg et al., 1976). One has to point out, though, that this structure is qualitatively very different from the traditional standardization / differentiation parameters, relying on a more unobtrusive set of controls to fight disaggregation.

In what concerns the planning / spontaneity dilemma, research on organizational improvisation has shown that plans can have a very different role from that traditionally ascribed to them. What is more, they can in fact be used to enhance the organization's ability to respond effectively in a spontaneous manner to emergent and unexpected events. In this sense, plans play, in organizations, a similar role to that of music scores in jazz: serving as the basis that allows for the spontaneous creation of music (organizational action) (Weick, 1999a), preserving the song's (organization's) integrity.

Regarding the conflict between effectiveness and efficiency, improvisation seeks for 'efficient effectiveness' or, more wordily, it aims at doing the right things right. This is accomplished in two ways. Firstly, one of the components of the organizational improvisation construct is the concept of bricolage, which means using whatever resources are available (as opposed with waiting for optimal resources) to tackle the challenges at hand (Levi-Strauss, 1966). This means that the novelty created by the organization, results from using existent resources. This allows for efficient effectiveness since we are using more of the same resources (thus increasing efficiency) to deliver new outcomes (thus increasing effectiveness). Secondly, the role of novelty in improvisation is not the same it plays for those advocating pushing effectiveness. Organizational improvisation produces 'bounded novelty' meaning that variations are bounded by a minimal structure that leads them to contribute as inputs for further action (be it improvisational or not), thus avoiding the all-too-familiar phenomenon of opportunity traps, where an organization spreads itself too thin over a too large number of opportunities, failing to reap each one's benefits and thus forfeiting efficiency (Miner, Moorman & Bassoff, 1996). This way, in the long run, the results of improvisation driven exploration will be exploited by the organization, thus generating tangible and positive results.

Finally, organizational improvisation tackles the dilemma between thinking and action by allowing again for a synthesis to emerge. Improvisation has been defined in the literature as the convergence between planning / thinking and action (Moorman and Miner, 1998a, 1998b). In fact, through improvisation, organizations can use their actions as learning places (Weick and Westley, 1996).

Improvisation allows organizations to learn in two distinct ways.

Firstly, it allows them to better understand themselves and their environments by acting on them, thus constructing meaning from action or, in other words, by performing sensemaking (Weick, 1979). This form of learning is likely to produce very robust mental models because it is entirely grounded on reality and because any leap of abstraction performed by the organization is immediately tested through action (Weick, 1995).

Secondly, improvisation allows organizations to learn from small losses or small failures (Sitkin, 1992). The point here is that, because improvisational outcomes are only loosely coupled with *a priori* plans, some failures are probable to take place (Weick & Westley, 1996). However, these failures are not dangerous to the organization since they are bounded by a minimal structure (Weick, 1999a) and may in fact prove beneficial inasmuch as they allow learning to occur. In fact, small failures prevent escalating feelings of invulnerability (Janis, 1971), fostering a healthy skepticism about currently held mental models (Cameron, 1984). Furthermore, a small failure provides a clearly identifiable target for change, increasing the likelihood of corrective learning (Sitkin, 1992). In the end, small failures are unique learning opportunities for organizational members.

Taking all of this into consideration, we can state that a dialectic motor does underlie organizational instances of improvisation.

Improvisation: An instance of evolutionary change

The final step in proving our contention that organizational improvisation does indeed fit one of the slots found empty by Van de Ven and Poole (1995) is presenting arguments that show that, in addition to the two motors addressed before, evolutionary change is also to be found underlying this phenomenon.

According to Van de Ven and Poole (1995), an evolutionary change motor is said to be present: when a population of entities competes for limited resources which each entity needs for survival; when there are identifiable mechanisms for variation, selection and retention of entities in the population; and when the parameters for these mechanisms are set at the macro-population level.

The population feeding the evolutionary change motor underlying organizational improvisation is made up of alternative courses of action. That is to say that 'entities' in this population are procedural routines for handling the variety of tasks the organization has to handle throughout its existence.

The limited resources for which procedural routines compete are memory and usage. The rationale behind this statement is that if a given routine is not used for a considerable time it will likely be gradually dropped from memory, because of human and organizational cognitive limitations, and hence will perish into oblivion (Tversky & Kahneman, 1974; Moorman & Miner, 1995, 1998a, 1998b).

As far as the mechanisms for variation, selection and retention are concerned, they are not only related with memory.

A minimal structure is the cornerstone of improvisation's variation production. This type of structure, discussed in more detail above, aims at serving as a centripetal, variety inducing, element upon which individual members can conceive novelty (Weick, 1999a). This novelty is created not through abstract reflection, but instead by two alternative real-time processes.

The first of these processes is action. By acting bounded by the minimal structure, organizational members are able to create the necessary variety for tackling unexpected and 'unplanned-for' events demanding fast action which, via sensemaking, will allow for new procedural routines to emerge (Orlikowski, 1996).

The second of these processes is conversation, in which new routines emerge not by acting on the situation at hand but by socially constructing a meaning that organizational members then ascribe to that situation. This, in turn, allows them to recombine existing routines into new ones, by the means of bricolage (Scribner, 1986; Berry & Irvine, 1986, Weick, 1993a; Levi-Strauss, 1966).

The selection of variations emerging from these processes obeys to a very simple mechanism. If the improvised procedure works, then it will be selected, if an improvised routine (or one already stored in memory, for that matter) fails then it won't (Miner, Moorman & Bassoff, 1996; Barrett, 1998; Crossan & Sorrenti, 1997).

Retention comes from the storage of a newly created routine into procedural memory and its use in future problems and opportunities, thus becoming a standard routine / procedure. This usage need not be literal, meaning recurring directly to it to tackle the task at hand, but may also take the form of bricolage, where the routine is used as an input for creating new (composite) ones (Levi-Strauss, 1966).

Finally, in what concerns the need for macro-level determination of the aforementioned parameters, one can state that it is met by organizational improvisation.

In fact, in what concerns variation mechanisms, these are not determined at the micro level of a specific population of routines (e.g. procedural memory of an R&D team) but instead at the macro-population level of the organization and the society at large. A close look at the elements that constitute the minimal structure shows us that those related to its social aspect come mainly from filtering national and professional cultures through the interpretative lenses of that of the organization. The task related ones normally derive from organizational policy on deadlines and leadership, among other factors. Selection and retention mechanisms are also determined by macro-

population characteristics related to organizational and individual cognitive limitations together with the degree of desirability of action / conversation outcomes and their individual salience.

All the conditions for ascribing an underlying evolutionary change motor to improvisation are thus met and, drawing on our previous argument, so are those necessary to look at this phenomenon as an alternative to fill the empty slot of a tri-motor change theory encompassing teleological, dialectic and evolutionary change, unearthed by Van de Ven and Poole (1995).

Studying improvisation

Considering the first part of this argument, which highlighted the central importance of change in organizational studies, together with its second part from which improvisation emerged as a fundamental topic for research in organizational change, not only because it has an important contribution to make towards two important debates going on in this area of research, but also because it constitutes an newly found instance of change in organizational settings, one could state that organizational improvisation amounts to an important topic for organization studies.

Departing from this realization, one cannot help but wonder whether this topic constitutes a fertile ground for doing meaningful and significative research or if it has already been investigated to a point which the only task remaining for science, short of a paradigm shift, is to increase the percentage of explained variance.

All that jazz

Even the most cursory review of the existing literature on this topic reveals with an astounding salience that jazz in general, and jazz improvisation in particular,

have been the driving engine in theory development on organizational improvisation. In fact, with the notable exception of Moorman and Miner (Moorman & Miner, 1995), most landmark writings on this topic are heavily grounded in jazz (Barrett, 1998; Crossan et al. 1996; Hatch, 1999; Pasmore, 1998; Weick, 1999a). It is important to point, however, that this only refers to articles *explicitly* addressing organizational improvisation. Indeed, there are several other (earlier) articles that describe this same phenomenon without labeling it as such, and that don't even mention jazz or any other metaphor, for that matter (Brown & Duguid, 1991; Hutchins, 1991; Johnson & Rice, 1984).

In the end, the presence of texts that do not draw on any kind of metaphor does not hinder the pervasiveness of jazz in writings on improvisation in organizational settings. In fact, a look at table A2 (in appendix A) shows us that the number of articles explicitly addressing improvisation drawing on the jazz metaphor is close to the double of the number of those that do not. This concern is amplified by the fact that those that are considered to be landmark authors on this field, are still heavily grounded on the jazz metaphor. In fact, two of them, Weick (1998) and Hatch (1997), when commenting on more empirically-oriented research on this topic, argued that it was still too limited by contrasting its findings with what happens in jazz. This is an arguable point, to say the least, but one that has the power to influence the course of theoretical development of this field, due to these authors' visibility in it.

Apart from articles, most of other academic events where improvisation has been explicitly addressed also seem to push jazz as the normative basis for studying this topic in organizational settings. The most visible of these events was the 'Jazz as a metaphor for organizing in the 21st century' symposium at the 1995 Academy of

Management Meeting in Vancouver (Hatch, 1998; Meyer, 1998) where, as its title eloquently states, jazz was pushed as *the* metaphor for improvisation in organizations.

The centrality of metaphor in theoretical development on this emergent topic in organization studies, and the importance of the jazz metaphor in particular, has yielded several benefits for research. Nonetheless, this can also raise some legitimate concerns especially in the light of the apparent difficulty that researchers seem to have to outgrow jazz improvisation as a tool for building theory on this phenomenon in organizational settings.

In order to assess the benefits and costs of the centrality of jazz in current research, we have to look into the findings that this metaphor has yielded, try to find potential competing metaphors, and compare their findings with those resulting from direct empirical research on this phenomenon in organizations, not without first looking at the issues underlying metaphor-based theory development.

The limits of metaphor

When looking at an area where metaphor-based theory building is so abundant as in organizational improvisation, one cannot help but wonder why do social scientists need metaphor to advance their knowledge of such phenomena.

Metaphor is indeed a useful tool for theory development, and some authors (e.g. Burrell & Morgan, 1979) even claim that it is *the* best (if not the only) tool for such an endeavor. Metaphor can be defined as "*a way of thinking* and *a way of seeing* that pervade how we understand our world generally" (Morgan, 1997: 4, emphasis in the original). This 'way of seeing / thinking' allows us to draft major antecedents, processes and outcomes of a phenomenon by studying another that fulfils two conditions. Firstly, we must perceive it as being similar to the original object of our

study. Secondly, it must be a topic with which we are much more familiar / knowledgeable than with the original.

Few have called for metaphor based theory development as clearly as Weick when he asserted that "if you want to study organizations, study something else" (1999a: 6). In the end, metaphor is useful because it allows us to study a phenomenon we do not understand by the means of another of which we have a deeper knowledge.

In spite of all these advantages, using metaphors to develop theory has several important shortcomings.

Firstly, a metaphor always distorts the object under investigation. This is because by using metaphor we are paying attention *only* to those factors that are similar between metaphor and object, while being blinded to those that are not.

In fact, if we look closely upon one of the most well known examples of the use of metaphor to build theory in organizational science, Burns and Stalker's (1961) categorization of organizations as organismic and mechanist structures, we can see that if managers use the mechanist metaphor to understand organizations, as shown in Figure 1 (in appendix B), then they will see them as a closed system of interrelated parts. This will probably lead them to pursue efficiency and adherence to norms and standards as central goals. Nonetheless, those same managers will be literally blind to the fact that the organization is ultimately made up of people, and that efficiency can be improved dramatically if due attention is paid to them (Mayo, 1933, Deming, 1986). Moreover, machines have clear given ends and boundaries – can we say the same about organizations? In the end metaphors are a great way to have an accurate – but limited – perspective of any phenomenon under scientific investigation.

This limitation of metaphor has dangerous implications for practice. If a manager espouses a certain metaphor of organization, then this metaphor will tend to

determine its daily practice, by pervading his or her mental models of the organization and its environment (Senge, 1990). It is worthy to point out that espousing a metaphor can be done in a direct or indirect (by adopting a set of practices that share the same metaphor) fashion. Managerial fads are one of the best examples of indirect metaphor adoption. Reengineering, for example, is a methodology strongly grounded on the mechanistic metaphor (Vasina & Taillieu, 1997) and organizational complexity is based or the organismic one (Stacey, 1996).

Although relying on metaphor is not harmful *per se*, it can have serious consequences when managers take action. Because their perception of reality is filtered through metaphor, they will tend to act on organizations as if they could be simplified to those elements shared with managers' metaphor-in-use (Argyris & Schon, 1992). In fact they will only be acting upon a caricature of the organization and its environment, and not upon the 'real' organization, which is in fact much more complex – thus leading to the emergence of a wide set of unintended (and, more often than not, hard to understand) consequences of seemingly 'predictable' action (Mintzberg & McHugh, 1985; Morgan, 1997).

In the process of helping us seeing organizational phenomena from one point of view, metaphors blind us from all others – this is the nature of metaphor, it does not result from its misuse by either researchers or practitioners.

Secondly, over time, metaphors 'die' by loosing their generative properties (Derrida, 1978). In fact, although metaphors have a powerful generative property at the onset of the study of a new phenomenon, they gradually rigidify meaning and become more and more closed to empirical research (Letiche & Van Unden, 1998). Concepts and constructs get sedimented, being givens to empirical research without ever having withstood the test of exploratory scrutiny. Variables and relationships

among them are assumed without ever verifying if they are part of the intersection between metaphor and reality or if they do in fact belong to that area that only concerns metaphor and thus blinds researchers to the complexity of their object of study (Burrell & Morgan, 1979).

Researchers are thus called to develop an ability to detect whether a given metaphor has already been explored sufficiently to allow theory to be built around the similarities between metaphor and object, and is now rigidifying – loosing its generative power and attracting research activity in a way that it hampers further theoretical development by closing major avenues for empirical investigation (McCourt, 1997).

Thirdly, and finally, overreliance on metaphor can hamper theory building because English (and most languages, for that matter) is not a *langue bien faite*, and thus the same word / metaphor can have very different meanings to different people. In truth, most languages do not posses a biunivocal relationship between signification and signifier – the same word can have various meanings depending on its perceiver (Ricoeur, 1978). This apparently only threats theory diffusion, not theory building. Nonetheless, if we regard the scientific community as a community of practice (Brown & Duguid, 1991), then we can see that published material of one author is often used as an input to the research endeavors of several others. This offers ample possibilities for misunderstanding, as familiarity with a given metaphor varies from researcher to researcher (Letiche & Van Uden, 1997). Furthermore, a quick look at the table of contents of *Images of Organization* (Morgan, 1997) shows that metaphors in organization science have been drifting apart from 'imagery' close to common sense – machines and organisms – to more 'specialized' imagery like 'psychic

prisons', 'instruments of domination' and 'political systems', thus increasing the potential for misunderstanding.

These three important shortcomings of metaphor can thus seriously hamper the quality of theory development in all areas of scientific endeavor, including organization science. In this light, the overreliance on a single metaphor (namely, jazz improvisation) that has characterized the study of improvisation in organizational settings can threaten the soundness of research on this topic, producing distorted – one is tempted to say, flawed – models that will serve as an input for practice and for future research.

If this is so, we, as organizational scientists, may choose a path in a continuum, according to our espoused scientific paradigms, to escape this conundrum. This continuum is bounded by two 'extreme' stances.

The first argues that reality is *entirely* socially constructed and that quantitative / positivist research has no place in organizational inquiry (Letiche & Van Uden, 1998). To those closer to this point of view, the challenge for developing a robust theory of organizational improvisation lies in finding new metaphors to build it upon.

The second contends that reality is partially socially constructed and that insights derived from metaphor should be complemented with quantitative / positivist research for organization theory to advance (McCourt, 1997). To authors closer to this point of view, the challenge for developing a robust theory of organizational improvisation lies in gathering field data to build it upon.

Here we will address both. Therefore, we will first present the major characteristics of jazz improvisation, *as perceived by authors on its organizational counterpart*, followed by a threefold set of alternative metaphors drawing on areas

where improvisation plays a role as central as it does in jazz, thus evaluating the need of (and the gains obtained from) further metaphor-based theory development on this phenomenon. We will then draw on empirical research on it, in organizational settings, in order to assess the need for empirically-grounded research on this topic.

Dissecting a metaphor

Since our concern is to address the metaphor of jazz improvisation, we are not concerned, at this point, to present the findings that came out from transposing lessons from improvisation in jazz to organizations. Instead we aim at presenting the characteristics of jazz, *as organizational researchers studying this topic understand them* – thus our sources will come more from articles published in journals dealing with organizations and management *vis-à-vis* those published in journals covering music theory. For the sake of clarity, we will group these under five headings: antecedents, conditions, influencing factors, outcomes and other findings.

Regarding antecedents, jazz improvisation appears to be somewhat limited, comparing with the plethora of triggers of this phenomenon in organizational settings (Sharron 1991; Weick 1993a). In fact, jazz improvisation only happens because of a *deliberate* attempt to pull the musical performance away from what was planned, from the score of the song in order to entertain and demonstrate artistic achievement (Berliner, 1994). In truth, jazz benefits of what Weick (1999a) calls an 'aesthetic of imperfection'. This means that, contrary to what happens in most other forms of music, the quality of a jazz performance is roughly measured by its performers' ability to deviate from the score. The quality of the individual players is also measured by this same standard. Nonetheless, it is arguable that the occurrence of improvisation in jazz is always deliberate – one is tempted to say planned – meaning

that it always (and only) happens when the performer wants it to happen (Gioia, 1997). The only case when a jazz musician may be 'forced' to improvise, is when a some fellow member of the band starts an improvisation inadverterly. Nonetheless, viewed at the group level, improvisation continues to be triggered purposefully.

The will to improvise is still not enough for it to be actually performed. There are several conditions that must first be met. Firstly, what is often labeled a minimal structure must be present (Eisenberg, 1990). This minimal structure refers to a shared knowledge among members of a community of practice, such as that of jazz that allows for members of that community to depart from canonical practice, especially when acting together (Brown & Duguid, 1991). In jazz, this minimal structure can be decomposed into three parts. The first part refers to 'jazz standards' meaning the knowledge of a shared repertoire of songs and, in some instances, of famous variations – this is jazz's task structure. The second part, the social structure, refers to a shared, and limited, set of social norms that rule interactions during actual performances. These rules come both from membership in a community of practice and from explicit agreements before performance (Bastien & Hostager, 1991). Finally, improvisers must share the song they are currently playing, which often serves as the only coordination mechanism for their actions (Weick, 1999a).

There are two additional conditions for improvisation to happen. One is a culture that tolerates, or better, promotes mistakes by considering them a way to learn and to take advantage of opportunities that couldn't be tapped in any other way. Another refers to the belief that action is the primary way to tackle challenges. In jazz this means that new music is not created by sitting at a piano and 'planning' a creation into a musical score. Instead it is done by playing around a theme in real-time, in front of an audience (Berliner, 1994).

If none of these conditions is present, then planning will be preferred to improvisation, even if the will to improvise is there.

After having discussed the triggers and necessary conditions for improvisation, we will now present a set of elements that can affect the quality of the improvisational performance.

Leadership factors can strongly influence the quality of a jazz band's performance (Gioia, 1997). A 'servant' leadership (Greenleaf, 1979) seems to be an important determinant of the quality and degree of an improvisation, allowing to fight phenomena such as solipsism (Hatch, 1999). This, in turn, also favors a rotating leadership style, in which each band member takes turns at deciding the direction the collective improvisation takes (Bastien & Hostager, 1991).

In addition, several of the group members' characteristics can also have an impact in the quality of their improvisations. High levels of skill, especially in what concerns adroitness at playing an instrument, give the improviser a higher proficiency in improvisation, compared with others with lower levels of this skill. This advantage is, sometimes, even physical, in the sense that the musician can play a set of notes (when possessing a high skill in playing the saxophone, for example) that are physically inaccessible to a less experienced player, especially due to the relative difficulty that playing those instruments that are common in jazz.

Creativity is another such characteristic. It is linear to observe that higher levels of creativity allow for lengthier departures from a written score. Lower creativity levels may limit the player's ability to imagine a rich set of variations, constraining his or her performance to a limited set of embellishments (Powers, 1981).

A final, but relevant individual trait, is the improviser's ability to deal with affective stress. There are several sources of such stress in jazz. The first one is the exposure that results from creating while performing in front of an audience and of fellow band members that one may have never interacted with before, but that will, at that moment, form a representation of each other that will, more often than not, be of a lasting nature (Bastien & Hostager, 1988) Composing while playing also generates high levels of anxiety, with which the improviser has to be able to deal with, at the expense of compromising the quality of his performance (Weick, 1999a). Finally, the transient nature of relationships that characterizes this community of practice is potentially stressful, from an affective point of view, especially when individuals have predominant 'dependence' relational styles (Kets de Vries & Miller, 1984).

Communication is another factor that can seriously affect the quality of an improvisation, when it is a group phenomenon. Real-time group composition requires that members' are willing and able to listen cooperatively to each other, not talking, but performing (Berliner, 1994). Fluid communication thus plays a central role in improvisation in the sense that it is the vehicle through which members negotiate variations upon the minimal structure they chose.

Memory also plays an important role in determining the degree of improvisation. A high declarative memory, meaning knowing many songs and their major variations, gives the improviser a wider repertoire from which to improvise for. Nonetheless, a high level of this memory can seriously hinder an individual's (and a group) ability to improvise because of the temptation to fall back on what is previously known and, thus, more comfortable than creating something new. This turns the will to depart from memory a determinant factor in how novel an improvisation will be, with its importance rising together with the level of declarative

memory. Finally, practice is also relevant to the quality of an improvisation, because it fosters the building of a broader declarative memory (through the expansion of the repertoire of variations), a broader skill base (through increased familiarity with the instrument) and an opportunity to train deliberate departures from memory.

Another important tenet of jazz improvisation, is an ability shared by members of this community of practice, to perform together and, most importantly, to improvise together, without the need for any prior interaction. Although arguable (as we will contend below), this characteristic of jazz as a community of practice (possible because coordination grounded on minimal shared structures) is one of the most appealing to organizations today, when work with fleeting teams composed by members outside the hierarchical power of the organizations are quickly becoming the norm (Katzenbach & Smith, 1992).

A final condition affecting the quality and degree of improvisation is group size, with too large groups having lower levels of improvisation, explainable through loss and distortion of communication, among other factors (Voyer & Faulkner, 1989). Additionally, in jazz all improvisation is collective. Even when a player improvises during his or her solo, he or she is doing so in the context of a group, which is, in this instance, engaging in *comping* behavior. This means that playing in a jazz band is a mostly cooperative activity, and in fact several authors consider this to be one of the major traits of jazz improvisation (e.g. Weick, 1999a; Bastien & Hostager, 1988; Hatch, 1999). Cooperation among members is thus one of the most salient characteristics of this art.

Having discussed the major factors affecting the quantity and degree of improvisation, we now turn to the discussion of its major outcomes, both positive and negative.

Positive outcomes from jazz improvisation are: flexibility, learning, a personal feeling of transcendence, and an increasing motivation to improvise.

Flexibility means that, through improvising, group members can and will adapt to each other and to the situation at hand. They are able to create novelty in a group that never existed as such before (Bastien & Hostager, 1988). Moreover, they are able to adapt to an audience and, most importantly, they are able to turn any mistake into an opportunity to create music that no one has ever heard before, and that probably no one will again.

Learning means that, through improvisation, musicians are able to augment both their procedural (how to?) and declarative (what?) memory. In this way they expand their capability to improvise, by moving away from previous physical limitations or action routines. What is more, they expand their repertoire of variations, thus gaining a broader basis to improvise upon.

Improvisation, by relying on fluid group interaction, and a mastering of the minimal structure, especially in what refers to the song, may convey to individuals a feeling of personal transcendence (Barrett, 1998). In Eisenberg's words "in these moments, participants experience something akin to the French *presque vu* – an unquestionable feeling of rightness. The relatedness problem is solved; through activity with others, people can transcend their separateness and live not only in themselves but also in community" (1990: 147).

Flexibility, learning and transcendence, among other characteristics of improvisation, expand the individuals' will or motivation to improvise. Thus, positive improvisational experiences may feed on themselves to foster 'routine improvisation', meaning that improvisation can be assumed to be *the best way* to handle most challenges, including playing in front of a live audience (Eisenberg, 1990).

Despite of all these positive outcomes, improvisation in jazz can also have negative results. The motivation to improvise can quickly be turned into an 'addictiveness' for this mode of playing, and the musician may outright question the value of 'playing by the score'. Nonetheless, 'playing by the score' is an important form of art, that contributes to the conservation and diffusion of a declarative memory of standards and main variations, and a musician that refuses to do it, may end up hurting jazz's collective memory (Hatch, 1999).

Additionally, improvisers may feed on each other's improvisations, amplifying emergent creation, in such a way that they depart from the score just enough to loose it as a minimal (but enabling) structure and fail to 'find themselves' on the music, a phenomena labeled 'trainwreck' (Gioia, 1997).

There are still other characteristics of jazz improvisation that are worthy of mentioning.

Firstly, there are several degrees of improvisation that can be distinguished, which range from interpretation to full-fledged improvisation (Weick, 1998). In the first case, little variation is added to the minimal structure. Conversely, in the latter, there is little structure to be found, even to the trained eye (ear?). The usefulness of distinguishing these various levels is to ground the ranking of players and performances. Those that are closer to the 'improvisation' end of this continuum are more highly regarded than those further away from it.

Secondly, by definition, a jazz musician can't possibly know what music he or she is going to create, until the performance is over. This is because, in jazz, performance is not constrained by the score but expanded by it, while in other musical styles, everything is planned for in advance and codified into it. In a jazz

performance, form is created retrospectively instead of prospectively, like in a classical orchestra (Weick, 1993a).

Thirdly, improvisational ability, even at the group level, cannot be implemented but must be grown. This means that even in a jazz band composed by 'virtuosos' with high levels of declarative memory and strong improvisational skills, improvisation does not start at once, but is pursued in small incremental steps that start with interpretation, and move through embellishment and variation, until full scale improvisation is reached (Bastien & Hostager, 1991).

The relationship between jazz players and their audience is also worth mentioning. In fact, jazz artists, especially when improvising, have a very distant relationship with the audience, meaning that they seldom react / adapt themselves to the mood / feel of their listeners (Bastien & Hostager, 1988), relying only in their interaction as bandmembers to feed (and judge) the variations from the explicit musical score.

Another important trait of jazz performance is that it is explicable, meaning that anyone with knowledge in standard musical notation could listen to a jazz improvisation and 'write it' on a score without major difficulty (provided that person had a good 'musical ear').

Finally, and borrowing from sociology, jazz is a *time biased* form of group interaction grounded on organic solidarity (Durkheim, 1933). It can be said that a jazz band is coordinated by organic solidarity due to the fact that it benefits from a highly complex division of labor, because every single member plays several roles in sequence (Bastien & Hostager, 1988). In a single performance, the same player plays leader and follower, melody and rhythm. Moreover, harmony, melody and rhythm are the responsibility of the entire group and not of any individual musician (Berliner,

1994). This is a kind of "all for one and one for all [music] and no instrument or section can be said to play exclusively on of these components" (Sharron, 1983; 228). All this complexity is only 'manageable' because rhythm provides the minimal constraining task structure for collective improvisation to be possible in jazz music. Rhythm is the, *de facto*, coordinating mechanism among jazz musicians and is seldom improvised upon, and when so, in a most limited fashion (Bastien & Hostager, 1995; Hatch, 1999). Jazz musicians thus need time to engage in the social togetherness that allows collective improvisation to occur.

This set of characteristics of jazz performance, when considered either as a whole or separately, is indeed appealing to those that manage organizations in fast changing environments. This happens for two main reasons. First they identify themselves with the imagery associated with jazz: not knowing what will happen next, staking their reputation in almost each decision (performance), and extremely demanding and anxiety-inducing tasks seem to be becoming more and more commonplace among those in managerial ranks, nowadays (Peters, 1992).

Secondly, the professional culture of jazz musicians, when considered a community of practice, seems to be just right to tackle this set of challenges and seems somewhat more moderated than the 'all horizontal / no rules' organization that most gurus proclaim today (Micklethwait & Wooldridge, 1996).

Partially for these very reasons and because of the growing appeal that metaphor has been having in organization studies (e.g. Morgan, 1997), organizational researchers, as we stated before, have been drawing heavily on the jazz metaphor to build the theory of organizational improvisation.

Early research on improvisation in other fields than music performance (including management) has, however, already provided evidence that there might be

more to improvisation than jazz accounts for and that this phenomenon's shape in organizations has significant differences from that in music. In this vein, advancing the study of this phenomenon in organizational settings seems to call for considering further metaphors that can arise from studying these fields and for contrasting them (and jazz) against what has already come out from the few empirical studies that organizational researchers have conducted on this topic, so far.

Different sights, different sounds

There are many alternative metaphors for studying improvisation. We will present three metaphors of improvisation (Indian music, improvisational therapy and role theory) that differ significantly from the characteristics of this phenomenon in jazz settings presented above. Improvisational theater, another pervasive metaphor in articles or organizational improvisation, is not included in this set of alternative metaphors because of its similarity to jazz (e.g. Crossan et al., 1996).

Improvisation in Indian music

We start by looking at a metaphor that keeps improvisation in the musical arena – improvisation in Indian music.

In this setting, improvisation is, as in jazz, triggered exclusively by the will to create novelty which, in Indian music, does not mean to depart from a given score but to build new music with a wide set of prescribed instrumental routines. The goal of improvisational activity remains the demonstration of artistic accomplishment (Holroyde, 1972).

Regarding necessary conditions for improvisation to occur, Indian music shares much of what happens in jazz. What Weick (1999a) labels an 'aesthetic of

imperfection' must still be present and action / playing, instead of planning / composing, must be viewed as *the* way to create new music.

Indian music improvisation also relies on a minimal structure – although one that shares few traits with that of jazz. To be sure, Indian improvisers also come to the stage with a social structure and a task structure in the background. These structures however are qualitatively very different from those in jazz. Regarding the social element of this minimal structure, we can see that, in India, group improvisation is a competitive, not a collaborative (like it is in jazz), endeavor. Thus, while Jazz musicians' social structure is a set of rules for cooperation, that of Indians is essentially composed with rules of competition (Sharron, 1983). The difference in the task structure between these two genres of musical improvisation is also worthy of notice. In jazz, as we argued before, the task structure is mainly grounded in declarative memory – knowledge of a repertoire of songs and its major / wider known variations. In Indian music the task structure is somewhat different. It consists of the knowledge of *talas* and *ragas*, which are, respectively, formulas for melody and rhythm. Although these are also elements stored in memory, they are of a procedural nature, instead of a declarative one – upon which jazz relies. This means that instead of knowing a set of scores *to improvise upon*, the Indian musician knows a set of musical 'procedures' *to improvise with* (Gosvami, 1957).

Turning now to the factors affecting the degree and quality of improvisation in Indian music, it is possible, again, to find important differences from what happens in jazz environments.

Leadership, considered one of the cornerstones of jazz improvisation, is close to absent in its Indian counterpart. This is mainly explained by the fact that the latter is a competitive, and not a cooperative performance, and thus coordination

mechanisms above those conveyed by the minimal structure we presented above, are seldom needed.

The individual characteristics of musicians' performing either style of musical improvisation are also similar. Instruments are hard to play, so skill is as important as it is in jazz settings. Creativity is also important as a way to create novelty with highly prescribed musical procedures embodied by ragas and talas. Dealing with stress is also important, not only because of exposure, transient relationships and simultaneity of planning and execution – that are also present in jazz settings – but also because of the competitiveness embedded in Indian music improvisation – an important source of stress that jazz musicians are exempted from.

Communication among group members is as important in Indian music as in jazz. The only difference here is the purpose of communication. In jazz it is aimed at achieving a high degree of cooperation and in Indian music it is targeted at achieving proficient levels of competition. Memory is also an important factor in this type of music, but the relative weights of procedural and declarative knowledge are shifted: the task structure in Indian improvisation is much more procedural than in jazz (Sharron, 1983).

Finally, as in jazz, Indian improvisation works better with small groups.

Regarding outcomes, Indian music is also very similar to jazz. It is only worth noticing that 'trainwreck' happens in this setting, not because of cooperation but because of competition.

To end our presentation of improvisation in Indian music, let us look at some other characteristics of this musical genre that are relevant to the organizational arena.

Firstly, an Indian music group is coordinated through mechanic solidarity (Durkheim, 1933). This means that this kind of group has a crude division of labor

(almost non-existent), something which is clearly visible in the 'musical duels' that characterize their performances (Gosvami, 1957). In fact, when improvising, Indian musicians play very similar roles that are maintained throughout the whole performance and, more often than not, over the musician's later career (Sharron, 1983). Coordination is thus simpler, not only because of this, but also because this genre is much more competitive than collective thus needing lower levels of integration. Integration in Indian musical groups relies on the prescribed harmony and melodic formulas – rhythm is thus the major object of improvisation (Holroyde, 1972). In Indian music space (the area where one can move about melodically and harmonically) is given and known by players – they function as the constraining device that allows improvisation to cohere around a central theme. Contrarily to jazz, time frees and space restricts.

Another important point is that Indian music, because of its basis of improvisation, cannot be written down on a score – unlike what happens in jazz. It is as if improvised music represented some kind of tacit knowledge that can only be acted, but not translated to printed media (Sharron, 1983). This same characteristic of Indian music renders inoperative the concept of a 'degree of improvisation' such as that of jazz music (Weick, 1998), just because there is no *a priori* score to compare the performance with. Two other important differences from jazz are the relationship between players and audience and the immediacy of improvisation.

Indian improvisers have a much closer relationship to their audience than do jazz musicians; in fact, "the Indian listener becomes an integral part in the process of creation" (Sharron, 1983: 230) thus having a higher level of input into the performance than those listening to a jazz performance.

A final characteristic of Indian improvisation that strongly differs from that of jazz is the fact that players in Indian music can jump instantaneously to improvisation (Gosvami, 1957), without the need to follow the 'centering strategy' that Bastien and Hostager (1988) found that jazz musicians adopted. This means that an Indian group can be performing 'full fledged improvisation' sooner than a jazz band can – something that is mainly explained because of the underlying minimal task and social structures (songs vs. talas and ragas / cooperation vs. competition) that both groups rely upon.

Therapy as improvisation

Therapy based on musical improvisation is another area where improvisation is an important research topic and from where important insights have been emerging.

Regarding antecedents, therapy shares with the two musical genres we looked upon in that it is a deliberate decision. Nonetheless, therapy has no explicit ground upon which to improvise, so it cannot be considered a departure or a variation because it does not have anything to depart from or to vary upon (Southworth, 1983). The objective of improvisation in therapy is also different from that of the previous two instances of this phenomenon. It has the purpose of healing a patient either directly or indirectly, by building the patient / doctor relationship.

As far as conditions for improvisation go, there are some similarities with what happens in music. Again, a culture that encourages mistakes / errors as a source of aesthetic and learning (Crossan & Sorrenti, 1997; Weick, 1999a) is needed, together with the belief that action is an important way to gain insight into the patient's behavior and to foster healing.

A minimal structure is again an important element of improvisation in this field, although one that share few if any of the traits of that of music. In therapy, the task minimal structure is composed of a 'theme' set by the therapist that he then builds upon through performance, leading patients into improvisation by example (Southworth, 1983). The social structure is mainly imported from external (tacit) social rules that can be embellished by minimal agreements prior to performance – a demanding task with mental patients (Forinash, 1992).

Regarding factors influencing improvisation qualitatively, therapy seems to need a very different kind of leadership. Southworth (1983) claims that using musical improvisation in therapy calls for a dual leadership. One of the leaders would provide the theme and exemplify improvisation, while the other would encourage members to follow suit and join the improvisational activity.

One of the most important deviations between the use of musical improvisation in therapy, and its 'stand-alone' versions (both jazz and Indian music) refers to the issue of improvisers' characteristics. In fact, in this type of therapy musical improvisation requires *no special skill at all*. This is because this type of performance happens recurring to *simple instruments*, instead of the *complex ones* used in jazz and Indian music (Towse & Flower, 1993). Another curious point is that in therapy, there is no need for the affective skills so important in the musical arena (Eisenberg, 1990). In fact, a supportive and 'emotionally safe' environment seems to be a prerequisite for improvisation to occur. Memory has also several atypical traits. Improvisers do not share any kind of memory (procedural and declarative) and no practice is required for improvisation to have good results.

As in jazz, fluid and open communication can greatly enhance the quality of the 'performance' and group size must also be small. Nonetheless, Soutworth (1983) argues that these groups should not be as small as to hamper effective interaction.

As far as outcomes are concerned, therapy grounded on improvisational music can result in (and aims at) improving the patients mental condition, either by surfacing the underlying mental dynamics or by building the doctor / patient relationship (Forinash, 1992). However, improvisation in these settings can have just the opposite effect by fostering isolation through solipsism.

Regarding other important characteristics of therapy based on musical improvisation, this practice shares with Indian music the fact that it has no discrete degrees and that it can happen instantaneously, without the need for growing group improvisational competence (Bastien & Hostager, 1988). Two other relevant traits of this type of therapy can be made explicit, and thus is close to jazz, but has no audience whatsoever, something that may account, in a partial manner, for its low levels of anxiety.

Improvisation in role theory

Improvisation is an important issue in role theory, inasmuch as human social behavior can result from following prescribed or imposed or from improvising that behavior on the spot. In this sense, role improvisation results from an unintended deviation from a structure of prescribed roles (Banton, 1965).

To present a role theory perspective on improvisation, we will draw on the work of Powers (1981), that presented a theory of this phenomenon grounded on several principles and axioms.

There are several fundamental conditions for role improvisation to occur.

Firstly, continuity of membership in a group allows for imposed roles to be relaxed. This can be explained by drawing on Bastien and Hostager's (1991) research on group improvisation that shows that people only improvise after they have had time to build trust upon each other and 'embellish' the minimal social structure that binds them together. Only then will the group be able to make significant departures from prescribed performance / roles.

Low exposure seems to be another important factor determining the incidence of improvisation. The rationale behind this statement is that low exposure to outsiders relaxes the perception of 'panoptical surveillance' that tends to normalize behavior and submit it to prescribed roles (Sewell, 1998). Moreover, if the roles of those outsiders are tied to the roles of the improviser, a lower level of exposure means that a role improvisation will be less perceived by outsiders, lowering their perceived need to adjust their own roles, and thus lowering resistance to change (Bott, 1957).

Building on the first condition, we can further argue that a higher degree of personal disclosure will foster role improvisation. This is justified by the high levels of similarity-based trust that personal disclosure seems to foster (Jarvenpaa & Shaw, 1998), which will encourage role-holders to adapt to the circumstances of their relationships with each other – a very difficult task in the absence of trust. It is nonetheless important to point out that similarity-based trust is not the only form of trust available. In this sense there may be other forms of trust favoring the triggering of improvisation.

High interdependence among team members, together with a low perceived dependence on the environment (both the organizational and the external) also fosters role improvisation. In truth, if people perceive that their well-being depends on the context / organization, they tend to adopt those roles that are issued by it (Powers,

1991). Conversely, if they perceive that their fate depends mostly on their joint action, they will probably forego those imposed roles, and improvise the ones that are needed for sustaining or attaining a state free from problematic concerns (Gouldner, 1960).

In what refers to that set of factors that has an impact upon the degree of role improvisation, leadership appears as an important element. For role improvisation to occur, leadership has to be balanced and unstable.

If no one has a strong power advantage (leadership is balanced), then there is no authority to impose roles, and thus the degree of role improvisation is likely to be higher than in situations where that power exists (Weick, 1993b). If this balance of power results is not static but dynamic, meaning that leadership rotates among group members, then individuals will be encouraged to vary the way they act because they will be called, at a given point in time, to perform a role with which they are not familiar.

Trying relationships, those that entail a high level of affective stress are also responsible for higher degrees of improvisation. This is because, in the social milieu, people aim to develop their roles in a fashion that reduces concerns and augments benefits (Turner, 1980). Thus, when performing imposed roles leads to very trying relationships, people will tend to relax these in favor of improvised ones that reduce their emotional costs.

Sharing an external threat can also lead group members to improvise upon prescribed roles, in order to maintain a problem-ridden state. This is allowed by the building of similarity-based trust, grounded on the perception of joint fate, and it is demanded by the need to secure a problem-ridden state, as argued above. It is relevant to say that this role improvisation carries the danger of crystallizing around a group pathology, such as dependence, flight / fight and others (Bion, 1959).

Routine has also an impact on the degree of role improvisation. In fact, if a routine is performed effectively, then the organization will pay little attention to its related role holders and thus their opportunity to improvise is higher as long as they do it outside the routinized activity (Powers, 1991).

A final factor influencing the extent of improvisation is the distance between two actors in the broader social system. The wider that distance, the less knowledge each of the actors has about the role of the other, and thus the lower the probability that each will invoke the other imposed role in a relationship – a phenomenon especially frequent in large organizations (Crozier, 1964).

Regarding outcomes, role improvisation allows flexibility and learning, when improvisation is routinized. Nonetheless this same routinization can result in freezing ineffective interactions, that may go unnoticed while harming the organization.

Three additional characteristics of role improvisation are relevant to the study of organizational improvisation.

Firstly, theory on this phenomenon does not mention the existence of discrete degrees of improvisation. Furthermore, people seem to be able to improvise immediately, without the need for a 'centering strategy' (Bastien & Hostager, 1988) to build confidence upon each other. Finally, role improvisation happens without audience of any kind.

Reality check

After having presented the core characteristics of the jazz metaphor together with those of a set of alternative metaphors, we now turn to research that approaches organizational improvisation directly, either through empirical research or through 'pure' theoretical development. We go through these articles in order to assess the

relative usefulness of each competing metaphor and its absolute usefulness as a means of theory building.

Antecedents are the one of the major divergence points between improvisation in organizational settings and that occurring in any of the metaphors presented above. In jazz, Indian music and therapy, improvisation occurs because of a *deliberate* attempt to deviate from 'routine', which is perceived as 'standard' practice. This means that, in these settings, improvising is engaged in *as a matter of routine*. In role theory, although there is no deliberate will to improvise, this happens because of social factors that can hardly be classified under the headings of 'problems' or 'opportunities' – they are simply conditions / states of the broader social environment. In organizations, improvisation is all but routine. Improvisation is mostly triggered because of the perception of a problem that has to be tackled hastily. This shows two important deviations from the metaphors we are considering: organizations only improvise (1) in face of *problems* that need (2) speedy action. In fact, the few instances of quantitative empirical studies on organizational improvisation show that this mostly happens in face of hostile circumstances (Ciborra, 1991) that can arise from environmental turbulence (Moorman & Miner, 1998b), from problems uncovered by the adoption of new technologies (Johnson & Rice, 1984, 1987), from process breakdowns (Klein & Dellarocas, 1998; Hutchins, 1991) and from undocumented product malfunctions (Brown & Duguid, 1991).

Regarding speed, there are two important items to take in consideration. Firstly, organizations tend to prefer planning and routinization to improvisation / emergent behavior (Mintzberg & McHugh, 1985; Stacey, 1996). This is, to Weick (1998), a major discrepancy between jazz and organizational improvisation. This author contends that "the intention of the jazz musician is to produce something that

comes out *differently* than it did before, whereas organizations typically pride themselves on the opposite, namely, reliable performance that produces something that is standardized and that comes out the same way it did before. It is hard to imagine the typical manager feeling 'guilty' when he or she plays things worked out before [whereas the typical jazz musician would]" (Weick, 1998: 552, emphasis in the original). This means that they will only improvise when they do not have time to plan – thus, the problem to be tackled must demand fast action in order to trigger improvisational behavior. The second important issue to mention in relation to speed, is that this is a very different concept in jazz and organizations. In jazz, where performances only range across a few minutes, fast action is likely to be measured in seconds and, at the most, minutes. In organizations, velocity is a matter of days, weeks and sometimes months (Brown & Eisenhardt, 1997). In this light, jazz musicians are much more likely to rely on previously learned routines when pressured by time (e.g. when playing at a very fast tempo) than organizations (Weick, 1998).

Organizational theorists widen the span of those characteristics of improvisation that are to be considered necessary conditions for its occurrence, including in this category items that were deemed, by the metaphors presented above, as limiting their influence to the degree / quality of improvisation.

This departure from the above metaphors is explained because jazz, Indian music, therapy and, most often than not, role issues occur outside organizations. Nonetheless, organizations are an important source of added behavioral and cognitive constraints (Handy, 1976; Senge, 1990). Thus, improvisation is very likely to differ from organizational to extra-organizational settings.

The key word for organizational improvisation is alignment (Orlikowski & Hoffman, 1997). Because improvisation is not a standard activity in these settings, if

any element of the organization's system forfeits attempts to plan while acting, then the whole system is incapable of such an endeavor (Johnson & Rice, 1987; Orlikowski, 1996). We can liken this characteristic of improvisation with a multiplication and contrast it with a sum – if any of the conditions is not present ('is zero') then improvisation will not happen (it will also 'be zero').

As in all the former metaphors, organizations need a 'bias for action' (to use the infamous title of a chapter of *In Search of Excellence* [Peters & Waterman, 1982]). This means that the belief that 'to solve a problem requires acting on it instead of thinking on it' should be espoused and used by the majority of the organization's members (Eisenhardt & Tabrizi, 1995; Brown & Duguid, 1991), a precept that is entirely coincident to those of the metaphors outlined above.

This trait needs an organization that encourages experimentation. According to Johnson and Rice (1987), praise from superiors for improvising and the opportunity to talk to peers about it go a long way in achieving *de facto* from canonical practice.

In organizational settings what the jazz literature has been labeling a minimal structure (Eisenberg, 1990; Bastien & Hostager, 1988) is also needed. However, this minimal structure is of a very different nature than that of jazz. In the case of organizations, the 'minimal' in 'minimal structure' means (1) general purpose and (2) minimality.

To improvise, individuals must possess general purpose plans, plans that are more like a map, that one can use to choose a route from one point to the other, and less like a prescribed itinerary, where one will get lost by missing a single turn. The tools that organizations have to produce this type of 'planning' are strategic intent (Hamel & Prahalad, 1994) and shared vision (Senge, 1990) – mechanisms that integrate individual actions by maintaining focus but that allow (and foster) diversity

of action and thought. General purpose tools and technology are also necessary for real-time planning (Orlikowski, 1996). If one decides to change the nature of outputs instantaneously, then one's technology must be flexible enough to withstand that change. The concept of 'radically tailorable tools' (Malone, Lai & Fry, 1992) thus emerges as one of growing importance for improvising organizations. Finally, improvisational ability rests on having a multiple purpose structure (Ciborra, 1991), one that goes far in integrating but only timidly constrains. This structure is composed by an explicit and clear set of responsibilities and priorities (Hutchins, 1991); frequent milestones, to instill a sense of urgency (Eisenhardt & Tabrizi, 1995) and to provide the frequent feedback that fuels improvisers (Gardner & Rogoff, 1990); and choreographed transitions that purposefully introduce 'problems' (Brown & Eisenhardt, 1997, 1998).

This 'generality' of organizational minimal structures allows us to make an important point regarding improvisation. It is an almost dogmatic tenet of jazz that improvisers must possess a high level of knowledge in order to be able to conceive quality music in real-time and a high level of adroitery in order to materialize that composition (Weick, 1999a). Nonetheless, it is at least arguable that if both music theory underlying composition and instruments were simpler, then knowledge and adroitery would be a *system's* responsibility instead of an *individual* one. This is precisely what musical improvisation-based therapy does: it provides simple instruments and simple task and social structures to allow even the mentally challenged to compose in real-time musical pieces of some quality (Southworth, 1983). Research shows that organizational improvisation may be, in this instance, closer to this type of therapy than it is to jazz, because of its efforts in building systems that allow effective and efficient performances in the foreground of external

and internal conditions that turn the most knowledgeable person into an aspiring neophyte.

The 'minimality' side of minimal structures is a threefold set of conditions favorable to improvisation. First comes minimal agreement, meaning that some dissention of worldviews among members allows for a sharper scanning and thus to earlier and more abundant detection of 'problems' that require fast action (Perry, 1991). This argues for taking some distance from the jazz metaphor, which blinds us to this characteristic because of the centrality that cooperation and mutuality have in it (Bastien & Hostager, 1995). The competitive cooperation among Indian Music group members seems, in this light, a fitter image to organizational reality. A less prone condition to metaphor grounded theory building is minimal affluence, which is also an important trigger of improvisation because the company's money is one of the most popular targets of managerial attention. Low levels of this indicator are likely to produce action – although a minimal level has to be assured because of the slack / redundance that any innovative activity needs (Dougherty, 1996; Hedberg et al., 1976). Finally, minimal rationality is also important in order to keep action focused on ends, avoiding reification of means and concentrating on finding the questions the organization needs to ask to avoid the trap of pride for giving good answers even in the face of the wrong questions (Hedberg et al., 1976; Cohen, March & Olsen, 1972). Minimal rationality also aims at keeping organizations from rationalizing all activity into procedures, thereby destroying adaptivity to both internal and external circumstances (Johnson & Rice, 1984).

Empirical research shows that there are three elements necessary to support a minimal structure. Firstly, and contrarily to what happens in jazz but closely to improvisation-based therapy, strong leadership is needed to compensate for the lack

of structure in integrating member's activities and to obtain the resources needed for improvisational activity to take place (Brown & Eisenhardt, 1997). Secondly, this type of structure can only be transmitted tacitly (through action) instead of explicitly (through language) (Nonaka, 1991; Bastien & Hostager, 1995), pointing at a closer similarity between organizational improvisers and space-coordinated groups, such as those of Indian Music (Holroyde, 1972), than with time coordinated ones, such as those in jazz.

The fact that this structure is mostly tacit also means that newcomers must be permitted legitimate peripheral participation in organizational activity in order to allow them to learn without risking organizational outcomes. In this sense, the organization should aim at teaching its members how to become practitioners instead of teaching them about practice (Brown & Duguid, 1991). This, in turn, demands for the spatial co-presence of the various members, which again points to a space biased culture, instead of a time-biased one (Sharron, 1983).

In this light, when studying minimal structures, a metaphor other than jazz (Indian music improvisation) appears to have somewhat more explanatory power regarding improvisation in organizational settings, than jazz does.

Another important condition for improvisation is freedom of action. Individual members must perceive that they have some latitude for initiative in order to deviate from routine and standard practice (Johnson & Rice, 1987). Nonetheless, this freedom does not imply that the organization provides a safety net for risk taking, as it is the case in jazz music (Weick, 1999a). Improvisation can happen in organizations even if failures are frowned upon by peers and superiors alike (Orr, 1990). To be clearer, the point here is, to paraphrase Peters (1987), to lower the organizational waterline thus

allowing more space for employees to carve holes, but this does not mean that holes under the waterline are taken kindly.

The last set of conditions of organizational improvisation is related to memory. Firstly, procedural memory (or 'how to' memory) has to be low (Moorman & Miner, 1998a). This is because, in organizations, novel action comes not from abandoning a single routine because it is inadequate, but from exhausting all the other remaining routines to tackle the problem at hand (Hedberg et al., 1976). Thus the lower the procedural memory, the tighter the search space available for alternative routines. Improvisation also needs an attitude of unlearning, meaning that members must be willing and able to 'drop their tools' (Weick, 1993b) in favor of new practices, something that requires not only skill and training but also a detachment between their self and their work / technology / tools (Hutchins, 1991).

Apart from these conditions that determine the extent to which organizational activity may be improvisational, there is a set of factors that influences improvisation qualitatively.

The first category of such factors is leadership. Apart from a certain degree of directivity, necessary for improvisation to happen (discussed when we presented the constituents of the organizational minimal structure), leaders must be proficient (and perceived as such by those they lead) in performing the work of his subordinates (Johnson & Rice, 1987). It seems thus that, the wider the extent to which the leadership base is related to expert power, the greater the degree of improvisation. Organizational members also tend to pursue wider departures from canonical practice if they are allowed to have an active voice in how several decisions are made (Brown & Duguid, 1991). In their research on word processing adoption in large organizations, Johnson and Rice (1984) discovered that reinvention (another label for

improvisation) is fostered by greater employee participation in issues related to unit productivity, work procedures and training programs. However, participating in meetings on resource / technology acquisition and performance criteria (which are two of the most important elements of minimal structures [Perrow, 1986; Sewell, 1998]) had no effect on the degree and quality of improvisational activity. This points out that participation should not be pursued in a general fashion but in a selective one instead, that would only encompass those areas in which it is more likely to have a visible effect on the organization's improvisational ability.

Several individual characteristics also influence the nature of improvisation in organizational settings. A first of such characteristics is the individual degree of innovativeness. Hypothetically, the higher it is, the greater the degree of improvisation (Perry, 1991; Ciborra, 1991). The extent to which the individual understands the change / organization / technology as aligned within itself and with improvisational activity is also determinant to its quality (Orlikowski, 1996; Orlikowski & Hoffman, 1997). This characteristic can be amplified by the degree of identification individual members have with the organization and its ends. The higher this identification, the higher the willingness to perform major departures from standard practice to ensure that the company's goals are met (Johnson & Rice, 1987). In spite of the importance of this identification, employees pursue wider (and arguably better) improvisations if they experience what Hedberg et al. (1976) labeled a state of minimal contentment. The rationale for this statement is that, although some level of contentment / satisfaction is needed for individuals to be willing to take the risks commonly associated with improvisation (Hutchins, 1991; Brown & Duguid, 1991), a partial level of discontentment increases people's willingness to further depart from organization-prescribed practices. Again, jazz seems to fall short as a

model for organizational improvisation for, in spite of prescribing some level of 'permanent discontentment' with one's performance in a never-ending quest for musical virtuosity, it does describe an environment that can, from the organizational theory point of view, be described as conveying a high degree of satisfaction (if we filter it through a model such as that proposed by Herzberg [1968]).

Dealing with both task and social stress can also enhance the degree and quality of any improvisational activity. Task related stress can make individuals rely, as much as possible, on previously acquired behavior patterns (e.g. Weick, 1993b) thus seriously limiting the quality (and outcomes) of improvisational action. The ability to handle task related stress is then an important trait for organizational improvisers (Hutchins, 1991; Brown & Eisenhardt, 1997). Social stress is also an important topic in organizations, although one to which jazz-based theory pays but little attention (Weick, 1998). Nonetheless, this type of stress is frequent of such explicit social systems (Hedberg et al., 1976) and can dangerously hamper attempts to improvise (e.g. Meyer, 1998). In this vein, it can be useful, apart from performing empirical research, to look to improvisation-based therapy for insights, because of the degree of exposure that it demands from participants, especially from patients.

Turning now to communication, we can see that jazz prescribes a single type of information exchange among members: that of a frequent and informal nature (e.g. Bastien & Hostager, 1991; Berliner, 1994). Nonetheless, if we build a two entry matrix classifying the various types of communication according to formality and frequency, the jazz-based type theory addresses just one of four quadrants. Infrequent and formal communication, as the work of Sobek et al. (1999) on new product development shows, can serve as a powerful minimal structure building mechanism in which successive 'scores' are created and embellished with every improvised or

planned iteration. These 'scores' are then used as inputs for impersonal coordination of the development process, greatly enhancing improvisation (Hedberg et al., 1976). When interaction is frequent, communication can still be formal, pushing the quality and the degree of improvisation by building on previously acquired formal (and, more often than not, explicit) minimal coordination structure to enable individual freedom of action. The use of *talas* and *ragas* as coordination mechanisms in Indian music is an example of this in non-organizational settings (Sharron, 1983) and a persuasive reason to prefer into this metaphor to jazz when looking for insights.

Infrequent and informal communication, well accounted for in jazz-based theories of organizational improvisation, relies on coordination by social structures acquired *a priori*, thus relieving communication of that responsibility. In this setting, information exchange occurs as action unfolds and aims at socially constructing the challenges at hand together with generating the course of action required to address them, in real time – allowing high degrees of improvisation and enriching it by integrating different perspectives (Follett, 1940). This type of interchange can assume one of two shapes: either it relies on speaking directly about the issue under consideration (Johnson and Rice, 1987) or on telling stories that align individual perception and will (Brown & Duguid, 1991).

Finally, communication can also be infrequent and informal. This represents cases where improvisation is more of an individual phenomenon performed within the context of a group than a 'pure' grupal endeavor (e.g. Meyer, 1998). Two more points should be made about communication. Firstly, empirical research has shown that improvisational quality is higher if, aside from peers, organizational members talk with both customers and supervisors (Johnson & Rice, 1987). Because jazz musicians have little – if at all – communication with their audience and have no supervisors

(Berliner, 1994), this hasn't received as much attention in later studies on this topic as it would if authors drew their insights from Indian musical improvisation where this relationship is more important. The other issue worthy of notice is that Moorman and Miner's empirical research on organizational memory and improvisation (Moorman & Miner, 1998b) has shown that real time communication has little impact on improvisational quality, thus questioning the real value of that factor to study this phenomenon.

Memory has also emerged as an important factor in the degree of improvisation witnessed in organizational settings. High levels of declarative memory are prone to affect the quality of improvisation positively. Nonetheless, one must be wary that these high levels build a very wide search space for alternative courses of action thus ending up slowing the process, something that can be overcome by combining it with high levels of 'search-related' procedural memory (Moorman & Miner, 1998a). Training and explicit encouragement of learning by top managers have also been demonstrated to be good ways to build procedural and declarative memories more inclined to favor wider departs from prescribed practice and should thus be considered privileged means to build these two types of memory (Johnson & Rice, 1984).

Regarding group size –another factor qualitatively influencing improvisation – empirical research has yet to converge on an agreed set of findings, something that leads us to argue that a contingent theory development is in order, at least as far as this item is concerned. Studies argue for both large (e.g. Brown & Eisenhardt, 1987; Ciborra, 1991) and small groups (Hutchins, 1991; Brown & Duguid, 1991), a decision that seems to depend on the specific format of both the supporting minimal structure and the pattern of communication among members. In what refers to group

composition it is difficult, again, to find common ground. Some studies support the jazz metaphor saying that groups should be 'mono-functional' (e.g. Hutchins, 1991; Orlikowski, 1996), while others overtly depart from it~, arguing for 'multi-functional' teams to produce the requisite variety that enables the attainment of higher levels of improvisation (Hedberg et al., 1976; Johnson & Rice, 1984).

Cooperation seems to be the dominant tone of all major empirical research on improvisation (e.g. Miner, Moorman & Bassoff, 1996; Perry, 1991) although some competitiveness may be possible when the organization, for example, bets on competitive designs (Eisenhardt & Tabrizi, 1995; Sobek et al., 1999).

The degree to which the minimal structure is the result of emergent activity, *vis-à-vis* of deliberate design, also benefits the quality and the degree of improvisation – something that jazz-based theory either contradicts (Weick, 1999a) or leaves unaddressed (Bastien & Hostager, 1988).

As far as consequences of improvisation are concerned, jazz settings share little with organizational ones. To be sure, the flexibility often ascribed to jazz musicians (Eisenberg, 1990; Gioia, 1997) is also very important for organizations. One of improvisation's major benefits for them is the ability to respond to unexpected occurrences, either internally (Pearson et al., 1997) or externally (Ciborra, 1991; Miner & Moorman, 1995). Organizations are also prone to succumb to 'opportunity traps' ('trainwrecks' in jazz lingo) spreading themselves too thing along a wide series of unexpected opportunities and problems – being proficient at exploring the environment, but incompetent of exploiting it. Improvisation in Indian music, with its emphasis on competition rather than cooperation can be a source of powerful insights on how to avoid such a 'trap'.

Ultimately, the main appeal of improvisation to organizations is not only flexibility, but *real-time* flexibility (Eisenhardt & Tabrizi, 1995; Perry, 1991). In this vein, speed is, at the very least, as relevant an outcome as flexibility is – a departure from jazz since the aesthetic of imperfection that Weick (1999a) argues for, has little to do with playing music faster.

Learning brings improvisation closer to the jazz metaphor. When they perform improvisational activities, organizational members can learn (i.e. formalize) their outcomes or even a process created in real-time (Crossan & Sorrenti, 1997). They can even gain proficiency (i.e. learn) at improvising (Brown & Duguid, 1991). However, unlike what is common in jazz, the formalized outcomes and processes may not be the most efficient / effective ones and may quickly become organizational *panda thumbs* (Gould, 1980). What is more, in the face of astounding positive results, the organization may look at improvisation as 'the one best way', dangerously foregoing planning – a not very glamorous but still important organizational activity (Stacey, 1996).

Finally, the kind of incremental change brought about by improvisation can, in time, lead to organizational transformation (Brown & Eisenhardt, 1997). In fact, it has been argued (e.g. Van de Ven & Poole, 1995) that even the more discontinuous type of change, punctuated equilibrium, is little more than a particular instance of incremental transformation, thus making improvisation a powerful vehicle for full-scale organizational change.

There are still some important issues we need to approach to complete our comparison between organizational improvisation and that occurring in other settings. Firstly, there's the relationship with outsiders. Organizations have a relationship with their audiences very different from that of jazz bands (and much like that in Indian

music) because of its closeness. Clients, shareholders and stakeholders watch organizations closely and there are several famous cases in which organizations had to take them into account – especially in the case of full-blown crisis (Pearson et al., 1997) – when conceiving strategies in real time. Moreover these individuals and institutions do not share an 'aesthetic of imperfection' – errors are very expensive either (and, in worst cases, in both) lawsuit costs and loss of goodwill.

Another question left unanswered by research in organizational settings is if here improvisation is time biased or space biased. At first sight, it appears that in that context, improvisation is time biased, meaning that group activity is coordinated by a shared perception of time (Sharron, 1983). Brown and Eisenhardt's (1998) description of choreographed transitions among developed products is a clear instance of this claim. Nonetheless, if we look at a context broader than new product development, organizational improvisation clearly falls into a space-biased culture. This is due to two characteristics of this phenomenon in those settings. On the one hand, it relies on a broad base of mainly tacit knowledge (Johnson & Rice, 1987) which is more prone to be transmitted through action and orally than through written rules and manuals (Nonaka, 1991; Weick, 1993a). On the other hand, organizational action is grounded on a semi-permanent culture where myths, rituals, technology and other cultural artifacts are shared symbols with a common meaning to all members of the group / organization (Schein, 1985; Sewell, 1998; Hoftede, 1980; Senge, 1990). These two characteristics are, in turn, closer to space biased cultures than to time biased ones, where cultural artifacts have very different meanings for group members and where most of what is done is based on explicit / written structures, norms and behaviors whose results can be entirely put down in writing. In this light, organizational

improvisation is a space-biased phenomenon, happening in a broader time-biased social system.

Together, the argument in support of space-biases in organizational coordination mechanisms together with the proximity between organizations and their stakeholders appeal again, in a very explicit manner to favor Indian music over jazz as a metaphor for studying organizational improvisation.

As in jazz, organizational improvisation is essentially a retrospective endeavor, meaning that it can only be made sensible after it has happened (Weick, 1993a) in a fashion close to the emergent component of strategy (Mintzberg & McHugh, 1985). Nonetheless, it has to be mentioned that the usefulness of improvisation in organizations is to augment the deliberation of this part of strategy; this phenomenon thus, in this setting is more of a 'planned retrospective'.

An important difference from jazz is that, in organizations, the ability to improvise results from a 'centering' evolution (Perry, 1991), such as that witnessed in improvisational therapy sessions (Southworth, 1983), meaning that the set of conditions for it to arise must be grown instead of implemented. In jazz, these conditions are instantaneously created (Weick, 1999a; Eisenberg, 1990) and most often than not preexist the performance, even when it is nominally labelled 'centering' and growing (e.g. Bastien & Hostager, 1988).

Still another point is how much of organizational is explicable. As far as outcomes go, changes in product and processes can be written down, nonetheless issues related with organizational transformation, flexibility and learning are harder to quantify and render explicit (Weick, 1998). In what concerns the process and coordination mechanisms underlying an improvisation, the amount of tacit knowledge is somewhat high and is thus very difficult to put down in writing (Nonaka, 1991;

Hedberg et al., 1976) – improvising in organizations seems again more akin to Indian music than to jazz.

A final important issue is the usefulness, either theoretical or practical, of dividing improvisation in degrees. There are no instances of such a splitting coming out from empirical research, even in articles based on grounded theory methodology (e.g. Brown & Eisenhardt, 1997) where such categories are more likely to come up. In this light, it is difficult to include this topic in an agenda for research on improvisation in organizational settings, unless we accept as legitimate a rational that everything that happens in jazz *must* have an organizational counterpart.

Research challenges in organizational improvisation

When we say that a person is like a lion, we are probably referring to his or her courage but we are, by no means referring to that person's choice of food nor to his or her facial hair. Metaphor is a powerful mechanism to bring insights into emergent scientific phenomena – it is undoubtedly, a way of seeing but it is also a way of not seeing (Morgan, 1997).

Jazz improvisation, as a metaphor for that happening in organizational settings has helped researchers uncover important insights and avenues of inquiry. Nonetheless organizations are no jazz combos, like people are no lions. Therefore, there are several important differences between improvisation occurring in these two settings (see table A3 in appendix A) – differences that a single metaphor-based theory development tends to hide (Weick, 1998).

As table A3 (see appendix A) shows, using other metaphors to gain further insights into jazz improvisation is helpful. The three additional metaphors that we presented allowed us to see and understand important issues to the study of this

phenomenon in organizational settings that jazz blinded us to. The organization-stakeholder relationship, leadership style and the elements of minimal structures are but a few topics where these alternative metaphors are most illuminating.

However, a closer look at table A3 (see appendix A) uncovers a set of characteristics that are unique to improvisation in organizational settings. Speed, one of the most important aspects of improvisation for organizations, is absent from every metaphor presented here.

This clearly points out that we, both researchers and practitioners, face at this stage of development of the organizational improvisation construct, an important challenge.

Those who are wedded to a 'strong constructivist' paradigm (McCourt, 1997) – believing that metaphors are the only sound base for theory development (Morgan, 1997) – are summoned to see these gaps between improvisation happening in organizations and that happening in other settings (especially in jazz) as a call for finding / creating new metaphors that bring new insights into this phenomenon (while taking care to bear in mind that a new way of seeing is accompanied by 'new ways of not seeing').

To those who are wedded to a 'weak constructivist' paradigm – believing that metaphors are a useful tool, but not the only sound base for theory development (McCourt, 1997) – are called to engage in empirical research that can shed light upon the theoretical dilemmas that the theory of organizational improvisation currently faces.

A rationale for 'weak' constructivism

Here we will choose to adopt a 'weak constructivist' paradigm. Although these choice pertains to epistemological and ontological stances and is thus more akin "an act of faith" (Symon & Cassel, 1998: 3) than to educated choice, we will present two sets of arguments supporting this option. The first one pertains to reasons for choosing 'weak constructivist' paradigm and the second to those for not choosing the 'strong constructivist' one.

'Positive' arguments

The first argument favoring the choice of a 'weak constructivist' paradigm is an ontological one, which states that although the phenomena studied by organization science is socially constructed (second order reality), that construction is grounded on 'objective' or first order stimuli, which exists independently of the observer (Stubbart & Smircich, 1985). This means that empirically grounded research, if done adopting a qualitative epistemology, can provide insights on organizational phenomena that cannot be obtained through metaphor (Williams, Rice & Rogers, 1988; Symon & Cassell, 1998).

The second argument favoring our choice is related to the marginal contribution of insights from a new metaphor. As the former section attempted to demonstrate, the use of metaphors is quite abundant as far as improvisation is concerned. In this light, the marginal gains in knowledge from applying a new metaphor in the study of this phenomenon is, in our belief, potentially lower than attempting the first grounded theory study on this topic. At the very least, a research project of this kind will uncover some areas that are still not explained by current metaphor-based theories. This would be even beneficial for those espousing a 'strong

constructivist approach because it would suggest possible gaps in today's metaphors, and thus helping in defining the characteristics of those of tomorrow.

The final argument favoring the adoption of an empirical grounding for theory development on the topic of organizational improvisation is closer to the heart of 'strong constructivists'. An empirically grounded research provides a new lens upon this phenomenon, it represents a new way to view reality. In this sense it plays a role very close to that of the metaphor.

Negative arguments

We now turn to the reasons for not choosing a 'strong constructivist' paradigm, thus forfeiting the option of searching for more metaphors to shed light on organizational improvisation.

The first of such reasons is related to personal limitations: advancing knowledge of a phenomenon through a new metaphor, commands a high level of intimacy from the researcher with the metaphor – a level that, although I espouse having interests beyond organizational science, I cannot claim to possess in relation to any field of human endeavor apart from organizational inquiry.

The second reason in this category relates to one of the problems of metaphor-based theory building addressed above: not everyone ascribes the same meaning to a word or a concept: the same signifier can have different meanings for different people – increasing equivocality around the phenomenon under study. Perhaps the most widely shared 'metaphor' for those studying and acting in organizations is organizations themselves.

Finally, the option for not joining the quest for new metaphors for organizational improvisation comes from the perception that metaphor is so pervasive

in this topic of organizational inquiry that it is actually becoming what Weick (1980) calls a 'blinding spot' – a practice that helped theory development in the past but that seems to be hampering it now.

Towards a research question

Choosing to lay our study of organizational improvisation atop of empirically grounded foundations leaves us with a further decision to make: the type of research design.

There are three major research designs: exploratory, descriptive and explanatory (Williams et al., 1988) Explanatory designs assess the degree of fitness between a theory and a phenomenon, descriptive designs help us adjust and test a known theory, and exploratory designs helps us build a theory, in the first place (Symon & Cassell, 1998).

In our view, the study of organizational improvisation allows for little more than exploratory research. In fact, it is hard to speak of a theory of this phenomenon, when those studying it do not even agree on the general lines around which to build a definition of it (see Weick, 1998). A look at table A4 (see appendix A) makes this point clearer. Underlying the difference in wording, one can find several perceptions (and definitions) of the organizational improvisation construct, sometimes at odds with one another. The most striking of this incongruence is the inclusion, by some authors, of bricolage and real-time planning under one construct (e.g. Weick, 1998; Hatch, 1997), while others argue for their separation (e.g. Moorman and Miner, 1998a; Crossan and Sorrenti, 1997).

Finally, our use of an exploratory grounded theory study addresses Daft's and Lewin's (1993) call of for using this type of 'knowledge building' methodology and

forfeiting more 'knowledge testing' by asking "scholars to resist the urge, to break with the tradition of 'deriving' and testing normal science research hypotheses [resulting in] small knowledge yield" (Daft & Lewin, 1993: iii), when attempting to advance organizational theory in a time of change.

Taking all of this into account, the goal of this research on organizational improvisation is to answer the following research problem:

What are the regularities among improvisational actions in organizational contexts?

Research design

The research design is a three-source grounded theory.

Grounded theory: Some considerations

There are some issues concerning grounded theory worthy of notice, prior to describing the actual research design.

Our choice of grounded theory was based essentially on three of its properties: (1) it is a qualitative research method; (2) based on multiple case studies; (3) aiming at generating theory.

We chose grounded theory because it's a qualitative research method. Qualitative research methods allow a higher degree of detail, thus addressing the accusations of exaggerated reductionism that science often faces, because of its overreliance on quantitative methods (Symon & Cassell, 1998). Additionally, qualitative studies allow easier longitudinal research and provide richer detail, allowing to observe not only the outputs of social construction but also its process, which are tasks that quantitative methods tackle with more difficulty (Yin, 1984). Moreover, qualitative methods are also often accused to give only descriptive grounding to the propositions emerging from their use, limiting their cumulativeness (Strauss & Corbin, 1990).

All these benefits notwithstanding, qualitative studies do have some disadvantages. The sheer amount of data in a qualitative study can be so overwhelming to a researcher that some events may go unrecorded because of human cognitive limitations (Tversky & Kahneman, 1974; Eisenhardt, 1989b). Moreover,

human biases may threaten the external validity of this type of research (Symon & Cassell, 1998).

Another reason we chose grounded theory for was its reliance on multiple case studies.

Multiple case studies are potent sources of novel theory and allow researchers to draw on ongoing events (Currall, Hammer, Baggett & Doniger, 1999). Additionally, they allow for theoretical sampling, meaning choosing cases based on their ability to advance knowledge in the researcher's area of interest, often resulting in testable constructs and / or hypotheses (Strauss & Corbin, 1990). The fact that case studies allow us to draw on multiple sources of evidence is also an important strength for those seeking to build theory (Yin, 1984).

Case studies are no panacea, though. The amount and complexity of data may jeopardize one of science's most important tenets: parsimony. The researcher may be tempted to include too many constructs and relationships in the final theory because of the complexity that commonly underlies most organizational phenomena (Eisenhardt, 1989b; Stacey, 1996). Findings deriving from case studies are also sometimes accused of being too idiosyncratic (Symon & Cassell, 1998).

Turning now to grounded theory's potential for theory building, there are two issues that have to be addressed.

The first issue is that of generalization. In fact, theory building demands for a method with enough external validity for its findings to be able to encompass a wide variety of contexts and contingencies (Gower, 1997). If grounded theory relies on little more than a handful of cases, how can that generalization be possible? The key lies in the difference between replication-based and sampling-based generalization.

In sampling-based generalization we are concerned with discovering characteristics shared by a certain population, and thus we must be able to study a large enough sample to be representative of the population for our inferences to be externally valid (Yin, 1984). One cannot detect a country's culture by speaking with one of its members alone.

In replication based generalization, we are concerned with discovering relationships among several phenomena, and thus we must be able to study rich enough cases for our inferences to be theoretically valid (Eisenhardt, 1989b). One can know that touching fire burns by experimenting it just once.

The second issue, which concerns degrees of freedom, is related to that of generalization. In truth, the ability to generalize a theory depends, up to some extent, on the degrees of freedom the researcher enjoyed during data analysis.

The common conception of degrees of freedom, which pertains to those of an empirical nature, relates to the number of different observations the researcher has made in order to test the same theory (Yin, 1984) – this is the ground for sampling-based generalization.

The external validity of grounded theory also depends on the number of degrees of freedom enjoyed by the researcher, although these are of a very different kind from those in sampling-based generalization. Instead of empirical degrees of freedom, replication based generalization is concerned with theoretical degrees of freedom – the number of different theories the researcher has used on looking at the same observation (case or set of cases) (Campbell, 1975).

Data sources

Having dealt with the issues related to the choice of grounded theory for our research design, we now turn to look at the role of each of the three data sources for this study.

The first, and core source of empirical grounding is an embedded-cases / multiple case study on the development process of an organizational innovation (Project Prometheus). Here we look, at the macro level, at an organizational innovation development as a whole, together with an in-depth, micro level, study of its more important events, which constitute the embedded cases.

The second source of empirical grounding aims at contributing to the isolation of 'pure organizational factors' in improvisation. To accomplish this, we studied an event sharing the characteristics of an improvisational jazz performance happening in an organizational context (Company Valhalla's BigShow). This is a single case, single level case study.

The final empirical element that contributed to this grounded theory effort was a set of interviews aimed at acquiring theoretical sensitivity and interpretation variety. To do this, we interviewed nine subjects, two of each one of the following classes: 'pure' academicians; 'practicing' academicians (people with a PhD who both teach / research and work as managers); and consultants.

Sample

Selection

As far as cases are concerned, two major concerns guided our site selection: (1) the likeliness of improvisational activity and (2) generalization issues.

Regarding the likeliness of improvisation, we selected cases based on four criteria developed out of theoretical sensibility exercises (Strauss & Corbin, 1990): (a) unpredictability of events, a need for speedy action (two major triggers of improvisation), the presence of some form of dialectic (which we believe is central to improvisation), and the theoretical probability of improvisation itself.

Generalization issues are idiosyncratic to each case.

[Note: the names of organizations and individuals were changed for confidentiality reasons].

Project Prometheus

Project Prometheus refers to the partial conception and adoption of an administrative innovation based on advanced communication technologies (ACTs).

ACTs, according to adaptive structuration theory (DeSanctis & Poole, 1994) are inherently unpredictable and prone to triggering unexpected events, meeting the first criteria we set.

The 'need for speedy action' in this project arose from commitments among project parties and from a strong leader, who took every opportunity (mostly e-mail, but also memos, speeches, meetings) to inculcate a sense of urgency to project team members.

Dialectics are inherent to ACT's (Yates & Orlikowski, 1993) – the tension between formality and informality which leads to communication forms that appear to be a synthesis of both, together with the need for structure and creativity (Orlikowski, 1996) are but two of many possible examples.

Finally, research on ACT based organizational innovation has shown that this is a phenomenon very prone to improvisational activity, which tends to be more than just the exception (Johnson & Rice, 1984).

As far as generalization is concerned, this set of embedded cases could be accused of idiosyncrasy because of the central role of technology – findings could be infirmed in non-ACT mediated settings. Nonetheless, research on ACT mediated communication has shown that there are no changes in behavior resulting from it (Ambrosini, Bernardi & Benini, 1999).

Honesty demands a clarification at this point: I came to do research on Prometheus out of pure serendipity, although my initial case choice was in Prometheus industry. I wanted to study improvisation in new product development. This meets all the criteria set above. Unpredictability is high (Cunha, 1998; Craig & Hart, 1992); speed is a pressing demand (Cooper, 1979); there is a clear dialectic between exploitation and exploration (Miner, Moorman & Bassoff, 1996) and improvisation is a very likely phenomenon (Brown & Eisenhardt, 1997). Finally, and as far as generalization goes, Lester, Piore and Malek (1998) have argued for the closing similarity between general management and NPD management.

Like organizational members, scholars seem to have trouble turning their intended strategies into realized ones, and must improvise to tackle impromptu opportunities (and problems) that come their way.

Valhalla's BigShow

Valhalla is an ACTs (software) manufacturer that holds a closed-attendance event as a part of its marketing policy. The BigShow we draw upon pertains to a live demonstration of a new Valhalla's ACT product. In this light, the probability of unexpected events is also explained by adaptive structuration theory (DeSanctis &

Poole, 1994). Speed comes from the tight deadline Brunhilda, Thor and Frei (team members) were given by Odin (their boss) to accomplish the BigShow (one week). Dialectics comes from the need to structure BigShow and the need to be spontaneous if something goes wrong. Improvisation is, again, inherent to the use of ACTs (Johnson & Rice, 1984).

Due to the special role that Valhalla's BigShow has in this research – to be compared with jazz improvisation to look for organizational characteristics –its interest to generalization comes from its similarity to this phenomenon (except for happening in the context of an organization, of course).

This was a limited time live performance in front of an audience close to four thousand people, most of them customers and colleagues. It can be easily argued that it had the same time constraints, fast tempo, irreversibility, public exposure and technical limitations that characterize jazz improvisation (Weick, 1999a). The fact that memory is an enemy for jazz musicians, however, does not appear to hold in this context – if everything went according to the 'song' (BigShow plan) no one would complain. Although conceding that in fact no *voluntary* improvisation will happen, technology characteristics are for sure to cause some havoc resulting in some kind of unexpected problem that has to be solved as action unfolds, and in this instance memory *will* be an enemy (Orlikowki, 1996; Moorman & Miner, 1998b).

Interviews

Concerning the third source of insights: the interviews on organizational improvisation. The selection criterion was twofold. Interviewees could have no prior knowledge of the theory of organizational improvisation and had fit into one of the three categories: academics, academic practitioners or consultants. Academics and

academic practitioners had to posses a Ph. D. or an extensive industry experience (in order to allow for richer interviews). Academics were selected on a convenience basis. Academic practitioners were selected (on a convenience basis) among teachers from the MSc classes at ISPA (the academic context of this research) and consultants were selected on a convenience basis too. Since these interviews are only aimed at increasing theoretical sensitivity the non-randomness of interviewee selection and the small number of interviewees does not hinder the quality of the overall research effort (Currall et al., 1999).

Case synopsis

Prometheus

Prometheus is a project conceived by the Chief Executive Officer (CEO) of the leading company (BigPlayer) in one of Portugal's most important industries.

This CEO presides to an industry specific research and development center (TheCenter) funded and founded by all of it's major players.

The CEO put TheCenter's Chief Operating Officer (COO) in charge of developing the project, whose purpose is to conceive and implement a working methodology to allow people from companies scattered throughout the globe to work 24 hours a day on a shared task, by using, to their advantage, the time differences among countries. The idea is, for example, to have a person working on a CAD drawing from 9 AM to 5 PM, in Portugal. That person would then send his /her work to another in a country in the American continent, who would work on his / her 9 to 5 schedule and who would in turn send it to another person in Asia, who would again work 9 to 5 and would send it back to Portugal at the end of his or her shift, and so on.

Project members (in the conception phase) come from five different entities: TheCenter, BigPlayer, AM Player and two R&D centers in Asia. All team members come from an engineering background. CEO is perceived to be the team leader.

At the onset of the project, the CEO conceived a full-fledged plan to achieve its goals. In the first stage of the project, there would be a small number of tests that would provide the necessary, empirically grounded, knowledge, for a full-fledged working methodology (task and communication norms) to be designed, and later implemented in BigPlayer's operations and in those of those industry players who wished to buy it from TheCenter.

However, this plan was not realized. Instead, a series of unexpected problems and opportunities – both demanding quick responses allowed for a course of action to emerge that, until the end of data collection, hadn't yet allowed for a complete methodology to be formalized. In spite of this, several large and small-scale improvisations that occurred at critical moments of the project allowed new goals to emerge and did produce some elements of the aimed methodology.

Valhalla's BigShow

In this case, Odin, Valhalla's Portugal CEO, asked three of its sales team members (Frei, Thor and Brunhilda) to prepare a live demo for a large marketing event aimed at promoting the company. The time team members had to prepare the event was very short (one week), and during preparation several unexpected problems and opportunities emerged, leading to on-line changes on the script.

Even at the BigShow itself, an unexpected event occurred forcing team members to conceive a solution as action unfolded, which they accomplished successfully.

Data Collection

Prometheus

Prometheus data was collected over five months during eight field visits, one out-of-the-field interview, totaling forty one observation hours, and several Internet research sessions. At the onset of the investigation, team members expected me to play a participant role, which I refused in order to make my observations as objectively as possible.

Data on this case came from a multiplicity of sources.

For the macro-level case, sources were more of an archival nature. These archival data, which ran to 164 pages, included e-mail messages, company memos, chat sessions transcripts, and five official reports. Three 45 minutes (on average) semi-structured interviews, together with four 2 hours (on average) meetings were also important in obtaining data from the macro-level case.

As far as the micro-level embedded cases go, data was based mostly on team members' work observation, at TheCenter (where most of the project activity occurred), except for the last field visit which took place at BigPlayer. These observations were all translated into field notes, which I took as action unfolded since subjects would not trust a tape recorder. In fact, the only recorded event I was able to obtain was the first international project test, which was later transcribed for analysis. I was also able to take two photographs depicting the work area, an important element to assess the degree of bricolage, one of the concepts that constitute the organizational improvisation construct. Additionally, in my last field visit, I applied a small survey on team member's attitudes towards improvisation to 4 subjects. These surveys were

intended to contribute to the theory building process and not to make any kind of sampling-based generalization.

The unit of analysis selected was the improvisation, which was defined as an action which was conceived in real time (as it unfolded). This leaves out the 'bricolage' dimension of improvisation – dangerous from the theoretical point of view but irrelevant to identify the latter's occurrence (Moorman & Miner, 1998b). Using this indicator, I obtained for the macro-level case N=6 instances of improvisation and N=77 instances of it for the embedded micro level cases.

Valhalla's BigShow

Data collection at Valhalla occurred during a relative short period of time, because of the short duration of the case. Moreover, I only had access to one of the team members, a contingency that limited the quantity of data collected.

Again, multiple data sources were used.

The team member cooperating in the research kept a free-form diary of her actions for the course of the whole case. I had the opportunity to observe the BigShow and, additionally, the subject agreed to two 45 minutes (approximately) interviews before the BigShow (one unstructured and another structured) and to another interview (semi-structured), the day after it happened. Additionally, the subject was interviewed a week later by a fellow researcher who provided me, with the subject's agreement, the transcript from that interview. The main reason for incorporating this interview into this study was its availability not its necessity.

Interviews

The 'theoretical sensitivity enhancement' interviews were fully structured, although at times impromptu questions were asked to delve deeper into the subject's responses. All interviews were taped and transcribed, and each interview lasted for about 45 minutes.

Data Analysis

This research stretched along fourteen months, across five distinct phases.

Phase one aimed at building theoretical sensitivity and resulted in a broad literature review effort whose outcome was an article on organizational improvisation's antecedents, process and outcome.

It is important to note that building theoretical sensitivity through literature based research, as long as the researcher is able to view it skeptically, does not threaten the overall study's internal validity, in fact it enhances that validity (Eisenhardt, 1989b; Campbell, 1975).

In phase two, grounded on additional literature review, I held some conversations a few researchers about this phenomenon, aimed at building theoretical variety, benefiting from the presence of a few renowned scholars at the institution where the degree that serves as the background for this investigation is based.

The research design emerged in the third phase, together with the case selection criteria.

Phase four, which spawned across several months, pertains to the data collection and analysis *strictu sensu*, which are not separable in grounded theory research (Strauss & Corbin, 1990), occurring in somewhat parallel for each of the three sources I used.

Prometheus

This phase of data collection and analysis at Prometheus was divided in two distinct stages. On stage one (January – March, 1999) visits to the field were very frequent (with no more than two weeks apart, and sometimes with only a couple of days of interval). Apart from the procedures described in data collection, after each visit some cursory analysis was done in the form of basic open / axial coding (Strauss & Corbin, 1990), generating specific questions to ask and specific phenomena to be attentive to in the following visits. At the end of this stage, a somewhat more detailed analysis was performed, which included some selective coding (Strauss & Corbin, 1990), leading to an interview script and a survey to be applied in the next stage.

The second stage of observation at Prometheus, in which these surveys and interviews were performed coincided with further cursory analysis of these data, in order to prepare for the core theory building effort.

Valhalla's BigShow

Data from Valhalla's BigShow case was analyzed at two points in time. Some cursory analysis was made after the event, thus encompassing the two *a priori* interviews and the event observation. After the two final interviews were collected, some more cursory analysis was performed again aiming at preparing the core theory building effort.

Interviews

Interviews were analyzed using attributional coding, in order to allow for concepts, categories and relationships to emerge, which were then used as an input for the core theory building effort.

The fifth phase of this research corresponded to the final theory sensitivity and theory variety building efforts. A broader and more rigorous and critical literature review was performed which resulted in two different papers (figure B5, in appendix B, contrasts the two models I arrived at while acquiring theoretical sensitivity with the final grounded model that resulted from this research). One presented an integrative framework of organizational improvisation, the other presented some criticisms to the current approach organization scientists are using in researching this phenomenon, questioning the external validity of this area's findings, thus building theoretical degrees of freedom into this research (Campbell, 1975).

The sixth phase of analysis aimed at producing the actual grounded theory. Phenomena, from the macro-level cases (Prometheus and Valhalla) and from Prometheus embedded micro-level ones, together with the results from the attributional coding analysis to the 'theory sensitivity building' interviews, were labeled and turned into N=91 concepts, from which 14 constructs. Each category was then characterized on the basis of its properties and dimensions.

For axial coding, meaning assembling categories along a pre-determined paradigm (Eisenhardt, 1989b), we used Strauss and Corbin's (1990) paradigm, which follows the following line: casual conditions; phenomenon; context; intervening conditions; action strategies; and consequences. I did not perform axial coding for every single improvisation, instead I selected 'unique' improvisations, forfeiting those

who were simple replications of the same pattern. N = 13 'axes' were coded for Prometheus. As Eisenhardt (1989b) suggests, we tabulated the most salient variations in these axes in order to allow for further patterns to emerge. From axial coding, new concepts and categories emerged and others were revised. Some initial relationships among categories started to emerge. Axial coding reduced the concept count to N=83 and the construct count to N=9.

Selective coding started with the writing of a 'research story' from which the core category of our study was to emerge. The core category I selected was organizational improvisation, because it is the focus of this research effort and because it was the most frequent category across data.

Next, I proceeded with selective coding by relating the remaining categories to the core category, first at a more abstract level and then descending to the dimensional level.

These relationships were validated against data, which prompted further adjustments. Concepts came down to N=64 concepts, grouped in 5 overarching constructs.

After this was completed, I proceeded to a final validation of these concepts, categories and relationships against data. Some changes ensued, together with a couple of deviant cases, which this theory could not account for.

A final story of the phenomenon under study was built at this point.

(Note: In the analysis section, each quote is tagged with four pieces of evidence, e.g. [P2: JS 12-13]. The first letter identifies the case as 'Prometheus', the first number '2' identifies the field visit / interview number (if preceded by I); the two following letters represent the person quoted (or FN for 'field note'), and the second

number (12-13) specifies the page or pages from which the quote was taken [note that these page numbers refer to appendixes C, D and E).

Descriptive analysis of constructs

We now turn to the descriptive analysis of the various constructs uncovered from grounded theory development. Every construct is decomposed in its major variable categories, which are confronted with current theory on organizational improvisation, defined, exemplified, and operationalized. Table A5 (see appendix A) below summarizes the various constructs.

First Construct: Motivation to improvise

The 'motivation to improvise' construct pertains to the extent to which an organization / team / individual perceives the need to take action on a given event, for which no prescribed course of action exists.

Event Readiness

Conceptual Issues. This variable is considered to be *the* trigger of organizational improvisation in the literature on this topic and has been given many names: environmental turbulence (Moorman & Miner, 1998a, 1998b); the unforseen and the unexpected (Weick, 1999a); and spontaneous events (Crossan, 1997). Our designation of this construct attempts to focus the degree of surprise of the event on the organization, instead of on the event itself. This is to say that, as unforeseeable as an event might be, an organization may be, nonetheless prepared to handle it – Shell's effective response to the oil crisis because of their prior scenario planning exercises is

an example of this (Wack, 1985). In this sense, we define 'event readiness' as the organization / team / individual preparedness to deal with a given event.

Examples. An example of a low level of event readiness occurred at Prometheus: "JS uses the chat window to ask PA (who is in another room) whether he has sound or not. PA says he doesn't. JS sighs in despair, 'it's all screwed up now.'" [P9: FN 67].

An example of a high level of event readiness, also from Prometheus is the following: " [According to plan] the control switches to another room at BigPlayer." [P9: FN 70].

Operationalization. Event readiness is a concept category, so it doesn't stand as a variable prone to operationalization on its own. The variables that comprise it are event expectability; event intentionality; and event familiarity.

Event expectability was operationalized as the extent to which an event was expected to happen by the individual / team / organization. "A message from ASIA2 (unexpected) appeared on the screen" [P3: FN 36] is an example of a low expectability event at Prometheus.

Event intentionality was operationalized as the extent to which an event was intended by the individual / team / organization. "[JS] attempts to connect via Netmeeting and succeeds." [P5: FN 44] is an example of a high level of this variable.

Event familiarity was operationalized as the number of times the individual / team / organization encountered the event in question in the past. An example of such familiarity occurred at Prometheus: "[As it had happened numerous times that day], but there's no sound [on Netmeeting]." [P3: FN 35].

Sense of urgency

Conceptual Issues. This variable is rarer on texts on organizational improvisation. Most of the authors, make a more or less vague reference to speed.

Weick (1999a) does address time constraints' importance to jazz improvisation, but then states that "people in organizations routinely seem to operate with more time" (1999a: 10). Moorman and Miner consider environmental turbulence to be one of the triggers of improvisation but then state that an organization in such an environment "can attempt to speed up its planning and execution cycles so that they remain distinct but happen more quickly, or it can move toward an improvisational approach [...]" (Moorman & Miner, 1998b: 5). This phrasing seems to put speed at odds with improvisation, by turning these strategies into an alternative of each other. An exception to this tendency in the literature is Crossan and Sorrenti's (1997) treatment of improvisation as something that occurs when "time is the scarce resource" (1997: 156). This statement, however, does not make clear if time is a trigger or an outcome of improvisation (or even both).

In all of the cases studied, improvisation was always preceded by a perception or sense of urgency, which I define as the perception of the need for immediate action.

Examples. At Prometheus, for example, the project leader emphasized the need for quick action at several occasions. In an e-mail distributed to all team members, he wrote "we have to start to show some results [...] Do not allow this to cool off [...] We have to act fast [...]" [P0: FN 72].

Operationalization. The sense of urgency concept was operationalized by assessing the presence of communications whose content conveyed the belief that tasks had to be accomplished as fast as possible

Meta-event Importance

Conceptual Issues. A meta-event is the context or background on which discrete events emerge.

No concept similar to that of the meta-event is evident in the literature on organizational improvisation, nor in that addressing this phenomenon in any other context. Nonetheless, individuals / teams / organizations tend to give up more frequently on low readiness events when the importance of the meta-event is lower than when this importance is higher [e.g. P6: FN 49-51; P9: FN 67-71]. The concept of meta-event importance seems thus to be relevant to build a theory of organizational improvisation.

Examples. The Minister's visit to TheCentre [P7: FN 58-63] and the Valhalla's BigShow [V2: BH 114-115] are both examples of an important meta-event.

Operationalization. Meta-event importance was operationalized by assessing the extent of planning that went into preparing that meta-event. The fact that Valhalla's BigShow members were allocated to this task for two working weeks [V3: BH 126] shows that this was an important occurrence for Valhalla. The fact that no planning whatsoever occurred prior to the first point-to-point test between TheCenter and BigPlayer, shows that this was a low importance one.

Event importance

Conceptual Issues. Event importance is similar to the meta-event importance concept. The only difference between them lies in the level of abstraction, meta-event occur at the macro level, events occur at the micro level. Again, this variable has not

been addressed in the literature. Nonetheless, it seems to affect the level of organizational improvisation [e.g. P6: FN 50-51; P9: FN 69-71].

Examples. An instance of an important event happened in Prometheus when "at a certain point ASIA2 states that there are two companies interested in joining the Prometheus project, people at TheCenter get excited with these news and start 'talking' / communicating only through the chat window" [P3: FN 37].

Operationalization. Event importance was operationalized by the presence of verbal and non-verbal cues of an individual perception that the event under consideration is be decisive to the outcome of a broader one (meta-event). In the example above, "people at TheCenter get excited with these news" is an example of a verbal cue and "communicat[e] only through the chat window" (in order to reduce language-based equivocality) is an example of a non-verbal one indicating the event importance of "ASIA2 stat[ing] that there are two companies interested in joining the Prometheus project".

Event Difficulty

Conceptual Issues. Event difficulty refers to an individual / team / organization perception of its ability to handle a given event. This variable has still to be mentioned in the literature on organizational improvisation, although it has been implicitly mentioned on research on improvisation in developmental psychology (Gardner & Rogoff, 1990).

Examples. An example of a difficult event at Prometheus occurred when neither JS nor PA were able to connect to find a way to connect to each other using a specific software, which led them to postpone that attempt to the future [P5: FN 47].

Operationalization. Event difficulty is a concept category, so it doesn't stand as a variable prone to operationalization on its own. The variables that comprise it are event understanding and the number of failed attempts at the event.

Event understanding was operationalized from verbal and nonverbal cues from the subjects. An example of a complex event occurred at Prometheus when "SS [made] some attempts to solve [a] problem but he failed [and ironically stated that] this was a new situation for him, not being able to work on such a simple surface" [P7: FN 61] – the ironical statement of puzzlement before the task at hand is a verbal cue of low event understanding.

The number of failed attempts at the event was operationalized by counting these attempts. "JS launches [an ACT application], but fails; JS tells PA over the phone that he failed; JS attempts to connect via Netmeeting and succeeds" [P5: FN 44] is an example of a low (x = 1) level of this variable.

Second construct: Potential to improvise

The 'potential to improvise' construct pertains to the extent to which an organization / team / individual is capable to take action on a given event, for which no prescribed course of action exists.

Dialectical Structure Level

Conceptual issues. The need for what researchers call a minimal structure for organizational improvisation is one of the most pacific tenets in the literature. Most authors on this phenomenon agree that, to improvise, coordination must be assured by unobtrusive mechanisms that allow high levels integration and high levels of differentiation (e.g. Brown and Eisenhardt, 1997; Eisenberg, 1990). Calling this

concept a minimal structure may be, however, a misnomer. This is because one is tempted to interpret the word minimal as pointing to structure minimization, whose extreme is the absence of any coordination device.

This is not what improvisation demands.

In fact, improvisation is a highly structured activity, but that structure's composition is qualitatively very different from that of traditional organizational forms (Eisenhardt & Tabrizi, 1995; Bastien & Hostager, 1988). In fact, Brown and Eisenhardt argue that improvisation does indeed call for a limited structure "to provide an overarching framework without which there are to much degrees of freedom" (1997: 16). Weick makes this point eloquently by stating that "either there is *too little* structure or the wrong kind of structure in organizations, and this is what makes it hard for them to innovate " (1990: 5; my emphasis).

To better convey the idea underlying this concept of 'minimal structures', I opted for labeling it as 'dialectical structures'. This label appears to convey a clearer meaning of this concept because it highlights the central dialectical property of these structures – allowing for the presence of high levels of antithetical phenomena like efficiency and effectiveness (Moorman, Miner and Bassoff, 1996); tight control and high creativity (Weick, 1999a); and plans and spontaneity (Eisenhardt, 1997), for example.

The dialectical structure level can thus be defined as the extent two which the organization structure (*latu sensu*) allows for the co-presence of apparently antithetical phenomena in its own action or in that of any of its teams or individual members.

Examples. The co-presence of a tight script and high spontaneity in the live Prometheus demonstration [P9: FN 67-71] and in Valhalla's BigShow [V1: BH 112] are two examples of high levels of a dialectical structure.

Operationalization. Dialectical structure level is a concept category, so it doesn't stand as a variable prone to operationalization on its own. The variables that comprise it are control obtrusiveness, goal clarity, power distance to leader and resource / technology deployability.

Control obtrusiveness was operationalized by coupling archival records and observation to assess the number of first and second order controls (Perrow, 1986) present in the organization. Prometheus' leader's absence of order giving [e.g. P3: FN 36; P0: FN 72] and reliance on deadlines (see Prometheus 'real' timeline in figure B2, appendix B), are examples of low control obtrusion.

Goal clarity was operationalized by assessing, through interviews and archival data, the extent to which individual team / organizational members share the same perception of project goals. Prometheu's team members sharing of the projects goal (to develop a methodology), visible across several interviews [P1: FN 31; PI1: JP 74; PI3; RA 80] is one of the most salient examples of a high level of this variable.

Power distance to leader can be defined as the difference between the perceived status of the self and the leader, as was measured from verbal cues from subjects. JS expression that "no mistakes are to be made now because the boss is watching" [P9: FN 70] is an example of one of such cues.

Resource / technology deployability is defined as the extent to which there is a number of resources that can be deployed in very different uses. Prometheus's member's use of a Web camera and a written piece of paper to communicate over the

Internet [P3: FN 35] is one of the best examples of this concept's importance in improvisation. This concept has two different dimensions.

The first dimension relates to the degree of generality of resources, which was measured by the number of uses a resource can have. In the paper-Web camera example above, the paper was a high generality resource because it can be put to various uses [P3: FN 35].

The second dimension of this concept relates to the availability of these resources. This was measured by their physical and cognitive proximity to the individual / team / organization, a task which I accomplished by mapping the work space of the team members to whom I had access. Exhibit 1 (in appendix G) shows Prometheus team's most frequent working space, at TheCenter.

This measure however, limits the measure to its physical dimension. The cognitive dimension would need a declarative memory map, which I didn't have the ability or the possibility to obtain. Noting the type of cognitive resources that individuals accessed, however, provided a basis for assessing the level of this dimension.

Real-time information level

Conceptual Issues. Real time information is defined as information received during or immediately prior to action (Moorman & Miner, 1998b).

Most authors on organizational improvisation agree that real-time information is crucial for improvisation to take place (e.g. Weick, 1999a; Bastien & Hostager, 1988; Eisenberg, 1990; Crossan et al., 1996; Moorman & Miner, 1995).

Examples. All of the micro-level improvisations I witnessed in Prometheus had some real time information flow present. At the macro-level this was more difficult to detect, because of lack of access to decision-makers.

Operationalization. The operationalization of this variable was achieved following the measure proposed by Moorman and Miner (1998): assessing whether the information was received by 'real-time' media (e-mail, phone, conversation, video-conference, system status control panels, etc...) or by 'non-real-time' media (letters, memos, etc..).

Procedural Memory Pervasiveness

Conceptual Issues. Procedural memory pervasiveness can be defined as the extent to which an individual / team / organization relies on his 'how to?' memory to handle events. Again, the importance of a low procedural memory pervasiveness for organizational improvisation is a pacific issue for most authors on this topic (e.g. Moorman & Miner, 1998; Hatch, 1999; Weick, 1993b).

Examples. In Prometheus, one of the most striking instances of high levels of procedural memory pervasiveness is the following: "JS attempts to connect, but he only gets one channel and hangs up; he tries [the same procedure] again *17 times* and he fails every one of them" [P7: FN 57].

Operationalization. As far as operationalization goes, procedural memory pervasiveness is a concept category, so it doesn't stand as a variable prone to operationalization on its own. The variables that comprise it are the procedural memory level and the velocity of foregoing procedural memory.

The level of procedural memory was measured by the number of different routines an individual / team used before recurring to improvisation or forfeiting to tackle a given challenge.

The velocity of foregoing procedural memory was measured by the number of attempts to use routine procedures when these are not effective.

The example above clearly shows a low level of procedural memory coupled with a low velocity of foregoing that memory.

Action Culture

Conceptual Issues. Literature on organizational improvisation sees an action culture as a *sine qua non* condition for improvisation to take place (Weick, 1998, 1999; Crossant et al., 1996; Moorman & Miner, 1995; Eisenhardt & Tabrizi, 1995; Brown & Eisenhardt, 1997). An action culture can be defined as a set of values and beliefs that posits action as the best way to handle any type of event (Weick, 1993a).

Examples. Prometheus team members tendency to welcome unexpected events with action instead of reflection, in spite of the many failures they made along the way, indicates the sharing of such a set of values and beliefs among project members [e.g. P6: FN 48-51].

Operationalization. As with the previous variable, 'action culture' is a concept category, and thus cannot be operationalized directly, but instead through its constituent variables: the bias for action level and the degree of error tolerance.

A bias for action was measured by calculating the proportion of unexpected events tackled by acting instead of thinking.

The relatively low number of 'planning / reflexion moments' across all Prometheus micro-level cases, even in the face of unexpected and urgent events, is an example of a strong bias for action [e.g. P9: FN 69-71]

The level of error tolerance can be measured by counting the number of reprehensions an employee gets from his direct supervisor for failing. Measuring the second is accomplished through evaluating the perception that individuals have of the team's / organization's attitude toward those mistakes.

The fact that TheCenter team members made an overwhelming amount of visible failures in the presence of their direct supervisor, without a single reprehension, warning or signal of surprise [P3: FN 34-36], exemplifies a culture with a high tolerance for errors.

Third construct: Organizational improvisation

The 'organizational improvisation' construct was the core category of this research whose proposed definition is *the conception of action as it unfolds, by an organization and / or its members, drawing on available material, cognitive, affective and social resources.*

Immediacy of planning

Conceptual Issues. The first constituting variable of the organizational improvisation construct, immediacy of planning, meaning the extent to which planning coincides with execution, is the dominant definition of organizational improvisation in the literature (e.g. Moorman & Miner, 1998a, 1998b; Crossan &

Sorrenti, 1997). It was also used as the main indicator of the incidence of organizational improvisation as far as this research is concerned.

Examples. Actions such as "not follow[ing] the prescribed dialogue" [P9: FN 70] and "creating on the spot a signal to sign if anything goes wrong" [P9: FN 69] are two instances where planning and execution coincide, as the Prometheus live demonstration unfolds.

Operationalization. To measure the level of immediacy of planning I used Moorman and Miner's (1998b) suggested three seven-point Likert scales, as far as the surveys are concerned, and the approximate time distance between conception and action while observing Prometheus and Valhalla's team members at work.

Sub-optimality of Resource Use

Conceptual issues. Our inclusion of sub-optimality of resource use (a more complicated wording for level of bricolage) – which I define as the extent to which an individual / team / organization has to 'make do' with available (instead of optimal) resources are – as the second constituting variable of the organizational improvisation construct, is a more contentious option. In fact, although some authors (e.g. Weick, 1998; Hatch, 1999) argue that equating improvisation with what we called immediacy of planning is a very limited stance, these authors state that bricolage should be treated as a phenomenon separated from improvisation. However, a look at what Weick (1998) considers a hard to improve definition of this concept – "reworking pre-composed, materials and designs in relation to unanticipated ideas conceived, shaped and transformed under the special conditions of performance" (1998: 544) is closer to a definition of bricolage than to one pertaining to the immediacy of planning. In fact, this definition focus on "reworking pre-composed materials and designs" is strikingly

similar to Levi-Strauss's definition of bricolage as "to make do with whatever is at hand, that is to say with a set of tools and materials which is always finite and also heterogeneous" (1966: 17). Interestingly enough, Levi-Strauss adds that, in its earlier use, the verb 'bricoler' (to bricolate) "was always used with reference to an extraneous [unplanned for] movement: [... like] a horse swerving from its direct course to avoid an obstacle" (1966:16), thus bricolage appears to be closely linked to the temporal dimension of improvisation as well (the immediacy of planning).

Examples. As far as empirical grounding for understanding improvisation as a composite construct constituted by planning immediacy and bricolage goes, one can cite the fact that every action which was planned in real time at Prometheus had some extent of sub-optimal or resource utilization (see the table 1 below).

Table 1 – Sub-optimality of resource use and immediacy of planning at Prometheus.

Immediacy of Planning Sub-optimality of resource use	Planned when the event was detected	Planned the same day the event was detected	Planned the same week the event was detected
Optimal use	-	-	-
Canonical use	68	-	-
Non-canonical use	9	-	-

Additionally, more than 11% of those instances relied on non-canonical resource utilization, a higher level of bricolage. Two examples follow:

- At Prometheus, during a video-conference breakdown, team members abandoned voice communication, resorting to the chat window, which didn't work either, they ended up settling for e-mail, [P3: FN 35] which is clearly a sub-optimal device for verbatim communication.

- In another instance of voice communication breakdown, Prometheus team members experimented writing on the Whiteboard [P3: FN 35], which is a tool for sharing images, thus using it in a non-canonical fashion.

Operationalization. Since observation was my main data collection strategy, I created three levels of sub-optimality of resource use: the lower level (0) represented that the resources used equaled the optimal ones; the middle level (1) represented that the resources were sub-optimal but they were being used for the task categories they were intended (using e-mail to communicate); the higher level (2) represented that the resources were sub-optimal and that they were being used for task categories they were not intended for (using the Whiteboard to 'talk').

We now turn to the four dimensions of organizational improvisation

Novelty of improvisation

Conceptual Issues. The issue of the degree of novelty of improvisation – defined as the extent to which an improvisational action departs from organizational canonical practice – has already been addressed in jazz theory but remains relatively unaddressed in the literature on this phenomenon in organizational settings, with the exception of a superficial reference made by Weick (1998).

Examples. I was able to detect at least two distinct levels of improvisation at Prometheus: low-level improvisation and high-level improvisation. An instance of low-level improvisation consisted in ASIA1 recurring BigPlayer's website to find its IP number, when it was unable to connect via standard protocol [P9: FN 68]. High-level improvisation happened when team members used a military action-movie cliché to enhance their communication quality during meetings [P8: FN 64].

Operationalization. To measure the level of novelty of improvisation I relied on the level of sub-optimality of resource use, positing that high-level improvisation derived from non-canonical resource use and that low-level improvisation resulted from sub-optimality resource use *strictu sensu*.

Veracity of improvisation

Conceptual Issues. Literature on improvisation grounded on the jazz metaphor distinguishes two types of improvisation: real and fake (e.g. Hatch, 1999). Real improvisation happens when people actually improvise in order to tackle a given challenge, whereas fake improvisation happens when people improvise to give the illusion that they are indeed tackling that challenge, but in fact are not.

Examples. Prometheus provided one instance of 'fake' improvisation, which was (surprinsingly!) explicitly recognized in one of the projects reports: "In the BigPlayer – TheCenter connection we had planned to share Mastercam software but because of an unknown reason NetMeeting didn't allow us to use this functionality at that moment; however we opened this software locally, only *simulating* the sharing" [P0: FN 72].

Operationalization. To assess the presence of fake improvisation, I looked for signs indicating that the challenge that spurred the improvisation was not being addressed by it.

Improvisation Authority

Conceptual Issues. Improvisation authority pertains to source (author) of improvisational action.

Theory on organizational improvisation answers this question by exulting the role of the group in achieving improvisational activity (e.g. Bastien & Hostager, 1988). However one cannot help but wander if, in organizations, improvisation cannot happen individually. If this is in fact possible, then a further issue arises: how does the transition from individual improvisation to group improvisation occur, if at all?

Examples. At Prometheus, three distinct levels of authority were observed.

At the first level, which I labeled individual improvisation, this phenomenon results from a person's actions without any kind of exchange with others. An example of this kind of improvisation are JS efforts to connect with PA, at BigPlayer via a point-to-point connection: in this instance JS is alone and has no one to talk / act with [P5: FN 42-42].

At the second level, which I labeled instructional improvisation, one person instructs another on how to act. In this instance the leader conceives those instructions as the follower acts. An example of this kind of improvisation, are PA efforts to have JS succeed in enhancing the quality of his video feed [P6: FN 53-54].

At the third level, which I labeled group improvisation, a group of people act and communicate in real-time, as events unfolds, in order to be able, as a team, to tackle a given challenge. An example of this kind of improvisation, is the TheCenter and BigPlayer members conversation with AMPlayer (BigPLayer's American continent subsidiary) to get a compromise on who will finish a given part [P8: FN 65-66].

Operationalization. I categorized my observations in the first level (individual) when (1) no group was available for information exchange (or that availability was ignored) and (2) one individual was predominant in action taking; I categorized them in the second (instructional) when (1) a group was available for

information exchange but (2) one individual was predominant in information passing (in the form of orders) and action taking; and finally I categorized them in the third level (group) when (1) a group was available for information exchange and (2) no individual was predominant in action taking or information passing.

Extent of Pre-Action Conversation

Conceptual Issues. Extent of pre-action conversation is the degree to which individuals / teams / organizations engage in dialogue in order to conceive action as it unfolds. Research on non-canonical practice has shown that this variable may play an important role in improvisational activity quality (Brown & Duguid, 1991).

Examples. At Prometheus there were several instances of this phenomenon. In fact, it was not very infrequent to observe that when an improvisation failed, team members would normally discuss the situation, generating several ideas to address the issue under consideration, to which a new action-intensive phase would follow [e.g. P5: FN 45-46; P6: FN 53-54; P7: FN 58].

Operationalization. This type of dynamic was unearthed and measured during axial coding (Strauss & Corbin, 1990), one of the stages of data analysis, by means of process diagrams which show the process of handling a given challenge, from its appearance until it is resolved or abandoned.

Improvisation Outcome Intentionality

Conceptual Issues. Improvisation outcome intention can be defined as the extent to which a certain outcome was intended by an individual / team / organization (Mintzberg & McHugh, 1985). In instances of organizational improvisation, outcomes can thus be classified along a continuum between these two extremes.

Examples. The haphazard discovery of the efficiency of NetMeeting's whiteboard to transmit images by two of the Prometheus team members is an instance of a successful but emergent (unintended) outcome [P7: FN 54].

Operationalization. Outcome intentionality was thus measured by an individual / team / organization expectation of that outcome.

Improvisation cost

Conceptual Issues. Because of being touted as a mechanism for dealing with unforseen events and change, organizational improvisation has been little studied as far as efficiency is concerned, with the notable exception of Moorman and Miner's (1998b) research on this topic. Nonetheless, efficiency considerations are an important concern to for-profit organizations and thus worthy of inclusion in studies on organizational phenomena.

In this light, improvisation cost was defined as the monetary and non-monetary resources expended in a given action.

Examples. The use of a piece of paper to bypass communication difficulties among Prometheus member's, already mentioned above, is an example of a low cost improvisation [P3: FN 35].

Operationalization. Measuring improvisation cost was accomplished by a subjective evaluation of the resources used in a given improvisation.

Fourth Construct: *Influencing factors of improvisation*

The 'influencing factors of improvisation' construct differs from the 'motivation to improvise' and the 'potential to improvise' because these affect the quantity of improvisation, while the former affects its quality. By quality we are not

referring exclusively to the valence of improvisation (whether its 'good' or 'bad'), but also to its characteristics. In this sense, changes in one of the variables comprising this construct thus leads to changes in the type of improvisation (e.g. wheter it is performed by a single individual or by a group of people).

Degree of Procedure Rehearsal

Conceptual Issues. Some authors on organizational improvisation address the issue of holding rehearsals in order to increase individuals' ability to improvise (Crossan et al., 1996; Barrett, 1998). Companies, however, value routine much higher than they do improvisation and, consequently, rehearse not to enhance their member's ability to produce variety, but instead in order to ensure that a given plan will be followed (Weick, 1998).

In this light, in organizational settings, degree of procedure rehearsal can be defined as the extent to which an organization / team / individual attempts to ensure the closest possible match between its intended and realized action, through the performing of a given set of procedures in an environment separated from the actual performance context.

Examples. At Prometheus, there were several instances of rehearsal, and a script was even created (and rehearsed) for one of the meta-events [P9: FN 67-71].

Operationalization. Measuring the degree of procedure rehearsal was accomplished by counting the number of times a set of procedures is performed prior to the meta-event where those procedures have actually to take place.

Experience of Improvisation

Conceptual Issues. Literature on organizational improvisation states that previous experience with improvisation has important effects on the nature of improvisation, by allowing individuals / teams / organizations to build a procedural memory of how to improvise.

Taking this into account, the experience of improvisation is defined as the extent to which the individual / team / organization has been exposed to improvisational activity.

Examples. The sheer amount of experience with events where a high sense of urgency combined with a low event readiness that Prometheus team members had allowed them to attain a high level of experience with improvisation (see the table 2 below and Prometheus 'real' timeline in Appendix B).

Table 2 – Experience of success and failure in improvisation at Prometheus.

Field notes #	Successful improvisations	Failed / Aborted improvisations	Total
3	8 (40%)	12 (60%)	20
4	3 (100%)	0 (0%)	3
5	3 (37,5%)	5 (62,5%)	8
6	3 (23%)	10 (77%)	13
7	5 (23%)	17 (77%)	22
8	2 (100%)	0 (0%)	2
9	6 (66%)	3 (33%)	9
Total	30	47	77

Operationalization. The measurement of this variable was obtained directly by simply counting the number of improvisations in which the individuals / team participated.

Level of real time information use

Conceptual Issues. Literature on organizational improvisation seems to deem the level of available real time information as important but, with the notable exception of Moorman's and Miner's earlier work on this phenomenon (Moorman & Miner, 1995), to be little concerned with its use. However, the nature of a given improvisation can be greatly affected by the level of the use improvisers make of real-time information, as Weick's landmark research on firefighting tragedies eloquently shows (e.g. Weick, 1993b).

I define the level of real time information use as the extent to which an individual / team / organization incorporates real-time information as a resource for improvisation. In this light, low levels of real time information use occur when this information is limited to signal the need to improvise. High levels of this variable are visible when that information is used as a basis for the conception of the improvisational action itself.

Examples. At Prometheus there were several instances were real-time information was only used as a source of improvisational pressure, without being included in the improvisational attempt, as this example clearly shows: "JS tries to talk with PA but gets no answer; JS says he doesn't know what is happening but that he can read from [a real time information providing software] that his computer is sending almost no data; he opens [another source of real time information and then another]" [P7: FN 52]. As we can see, there seems to be need for improvisation (this event happened in the context of an important meta-event and required fast action). Let's look at the improvisation that did, in fact, ensue to see how this information was put to use: "PA tells JS to attempt to reduce the size of his CAD program window; JS says he already did it; PA asks JS to lower his resolution; JS says that he already did it

[then PA goes on trying solutions crafted as action is unfolding until the problem is solved]" [P7: FN 53-55]. Notice how none of the real-time info available (network problem) was used during improvisational activity, which was focusing around specific application issues until the problem gets solved by itself, much later.

Operationalization. Measuring the level of real time information was accomplished by assessing, through field note analysis, what kind of information gets discarded and what kind gets used as an input in the improvisational process.

Communication Quality

Conceptual Issues. Those looking at organizational instances of improvisation through the lenses of jazz and improvisational theater have alerted to the importance of communication in shaping the nature of this phenomenon (e.g. Eisenberg, 1990; Crossan et al., 1996). These authors have essentially focused on a limited perception of this concept, pertaining to communication fluidity, meaning the pace of information exchange among members which, as Moorman and Miner (1998b) pointed out, is but a particular case of real time information flows.

My interaction with computer mediated communication among people from different cultures, through my observations of Prometheus, alerted me to the need to encompass a wider set of factors when conceptualizing the quality of members' exchanges. Consequently, I suggest the use of the 'communication quality concept' to account for this type of setting that, although being seldom studied in organizational improvisation, has been growingly pervasive in the organizational landscape (Bettis & Hitt, 1995; Jarvenpaa & Shaw, 1998).

In this light, communication quality is defined as the extent to which meaning can be communicated at a fast tempo without sacrifices in its content. According to

this definition, a high communication quality would indicate a context where information is exchanged at a high pace and where there is a high degree of matching between the meaning intended by the emitter and that perceived by the receptor.

Examples. Due to of our choice of cases, it is easier to present an evidence of low communication quality because of the presence, in the Prometheus team, of such diverse cultures and the relative awkwardness of the communication media, as the following example clearly shows: "[SS tries] to change the color of the model [but] fails; SS tells people at BigPlayer what is happening; SS gets no response; after a few seconds people from BigPlayer respond only to say that they can hear SS but without addressing [his] concern" [P7: FN 60-61].

Operationalization. As communication quality is a concept category, it cannot be measured directly. Its operationalization is grounded on that of its two constituting variables: communication fluidity and communication clarity.

Communication fluidity was measured by the pace of information exchange among members. In the following instance of a Prometheus team communication we are able to witness a low level of this variable: "JS writes a message on the chat window; the Asians behave as if they haven't read the chat window; [...] JS starts writing on NetMeeting's Whiteboard; the Asians still appear not to [see] it" [P3: FN 35].

Communication clarity was measured by the difference between the meaning intended by the emitter and that perceived by the receptor. Here is an instance of a low level of this variable: "JS explains to the Asians that they have to press a certain button; the Asians point their camera at their keyboard and ask what keys they have to press; JS tells them it's not a key but a button on the computer screen" [P3: FN 35].

Communication Humor Content

Conceptual Issues. Humor, which has been defined as a circuit involving the destruction and restablishment of the figure-ground relationship (Bateson, 1972), has yet to be addressed by researchers on organizational improvisation. The only approximation to this task was performed by Weick and Westley (1996) by linking, in an implicit manner, both concepts through each one's standing in relationship with organizational learning (improvisation was labeled as a learning place and humor as a learning moment).

The importance of this relationship deserves however a more explicit consideration, because of humor's role in helping improvisers deal with affectivity. In fact, as table 3 below shows, at every important meta-event of Prometheus, humor was abundant, suggesting the relevance of this relationship for the nature of organizational improvisation.

Table 3 – Use of humor in important and unimportant meta-events

	Important meta-events	Unimportant meta-events
Instances of humor	14	2

One instance of the use of humor at Prometheus was the following exchange between JS and PA: "PA tells JS [they need] better lighting; JS agrees; PA asks if JS has candles (they both laugh)" [P7: FN 59]

Operationalization. As far as operationalizing humor goes, this research relied on counting the number of jokes told on the course of each meta-event. This does not constitute a scientifically rigorous measure of this phenomenon, but was a nonetheless useful one.

Declarative Memory Availability

Conceptual Issues. Moorman and Miner's research on the linkages between organizational improvisation and organizational memory has shown that declarative memory – the memory that stores mental models –plays an important role in the quality of improvisation (Moorman & Miner, 1995). In our research, this relationship was confirmed but, as these same authors have recently argued, a high level of declarative memory alone is not enough for improvisation: if accessing this memory takes too long, then the opportunity to improvise will have passed before a course of action is crafted – (Moorman & Miner 1998a).

The concept of declarative memory availability appears to encompass these two complementary arguments. I define this concept as the extent to which an individual / team / organization is able to access a broad set of mental models relevant to the conception of action while events unfolded.

Examples. In Prometheus, a visible instance of this concept was a conversation in which PA and JS improvised their way out of a CAD program problem by producing, at a very fast pace, a set of improvised solutions with only thin cognitive connections to one another [P7: FN 52-54].

Operationalization. Because declarative memory availability pertains to a concept category, its level can only be assessed by its constituent variables: the declarative memory level and the efficiency of access to declarative memory.

The declarative memory level of the Prometheus team members was assessed through a subjective ranking of each individual's knowledge based on my observations of the variety of action alternatives he / she was able to improvise. JS's attempts to solve a communication problem at a Prometheus meta-event by adjusting

settings only very thinly related with communication properties is an example of a high declarative memory level [P6: FN 49].

The efficiency of access to declarative memory was assessed by the pace at which individuals produce these different improvisations. The rate at which JS conceived the aforementioned solutions [P6: FN 49] is an example of a high level of this variable.

Degree of Affectivity

Conceptual Issues. Authors drawing on the jazz metaphor to study organizational improvisation argue that this practice entails a certain degree of affectivity which can be defined as the perception of an emotional tension (e.g. Eisenberg, 1990; Hatch, 1999). These authors, however, have a somewhat unclear perception of affectivity's role in this phenomenon. Weick (1999a) posits affectivity both as a characteristic of improvisational contexts and as an outcome of improvisational activity.

Examples. Independently of the nature of its role, affectivity was in fact present at several instances at Prometheus, sometimes even explicitly: "JS [tells] ASIA1 he is getting nervous; ASIA1 says they are pretty nervous too; [...] JS sighs in despair" [P9: FN 67], is one of such instances.

Operationalization. Because stress emerged as a concept category, measuring it was accomplished indirectly through its two constituent variables: the degree of stress and the degree of exposure.

I operationalized the degree of stress by measuring the number of verbal cues of anxiety. The example above provides three of such cues.

The degree of exposure was measured by the perceived importance that the audience had for the individual / team / organization. On of Prometheus member's expression that "the Prime Minister is gone, we can 'half-screw-up' now" is an example of the lowering of this degree [P9: FN 68].

Member Similarity

Conceptual Issues. Member similarity, meaning the extent to which individual members perceive each other as sharing a same set of characteristics / experiences, is only partially addressed in the literature. This is to say that, literature on organizational improvisation only addresses a limited set of dimensions of this concept, namely the knowledge gap (Brown & Eisenhardt, 1997); the specialization gap (Weick, 1999a); and the status gap (Bastien & Hostager, 1988).

Examples. In this research effort other very important gaps among members emerged. When asked about the 'industry' culture similarity between BigPlayer and its AMPlayer, one of BigPlayer's members commented "At the beginning [AMPlayer] didn't make any contribution whatsoever to the project because they had a [different culture]" [PI1: JP 77].

Operationalization. In this light, operationalizing member similarity is done through each one of its dimensions.

The language gap was assessed by member's understanding of each other's language. The poor English level of Prometheus members is an example of a high level of this variable [P3: FN 34].

The cultural gap was measured by the number of assumptions, values and beliefs shared by members: TheCenter COO's comment that "we can't change anything when working with Asians; when we were visiting them, we wanted to

change the time for a dinner appointment and it was a real problem" [P2: FN 33] is an example of such a gap.

The knowledge gap was operationalized by the difference of the declarative memory content between individuals / teams / organizations. At Prometheus, an instance where "JS c[ould]n't get ASIA2 to hang up, they don't have anyone with computer skills there" [P3: FN 36] is an example of such a gap.

The status gap was measured through the level of formality used in conversation. TheCenter's COO addressing one of the Asians partners by his first name and another by Mister Professor [last name] [P3: FN84, FN90] shows a low and a high status gap, respectively.

Experience of interaction was measured as the number of previous interactions held by two parties. In the live Prometheus demonstration, TheCenter had a larger experience of interaction with ASIA1 than with DKM (see Prometheus 'real' timeline in figure B2, appendix B).

Finally, the affective level of interaction experience was measured by verbal and action cues of emotion displayed during previous interactions among parties. Looking again at Prometheus, one can see that TheCenter had a higher affective level of interaction experience with BigPlayer than with ASIA1 (see Prometheus 'real' timeline in figure B2, appendix B).

Approval of improvisation

Conceptual Issues. As Weick (1998) noted, executing plans is organizational member's preferred action, not improvisation. In fact, people and organizations vary in their level of approval of improvisation, which we define as the extent to which individuals / teams / organizations view improvisation as positive.

Examples. One of our interviewees stated that improvisation should not be used in important matters, only in small impact ones [I1: TT 131], thus exemplifying a low approval of improvisation.

Operationalization. Measuring the approval of improvisation was accomplished, in our research in two ways. On one hand, the survey we distributed at the end of Prometheus live event and our interview with Brunhilda addressed this question directly. On the other hand, archival analysis of e-mails and memos allowed us to infer the level of this variable through the adjectives used to classify improvisational activity.

Fifth Construct: Outcomes of improvisation

The 'outcomes of improvisation' construct pertains to the nature of the consequences, either intended or not, of organizational improvisation.

Improvisation success

Conceptual Issues. Most authors on organizational improvisation do not view it as a panacea. Improvisation does not necessarily address successfully all the challenges it is used to tackle (Weick, 1993b; Moorman & Miner, 1998b). In this light, outcome success is defined as the extent to which an improvisation is effective in dealing with an event for which the organization / team / individual has a low level of readiness, and perceives it as urgent, important and not too difficult.

Examples. At Prometheus, the following was an example of a successful improvisation: "TheCenter's COO tries something completely different; he writes on a piece of paper the following 'GO TO CHAT' (see exhibit 2, in appendix H); the Asians seem to understand and communicate via the chat window" [P3: FN 35].

Operationalization. In this research, outcome success was measured simply by noting the number of such instances that improvisational action 'solved'.

Action Speed

Conceptual Issues. Action speed is one of the most touted advantages of improvisation (Perry, 1991; Eisenhardt, 1997; Brown & Eisenhardt, 1997), and it can be defined as extent to which an individual / team / organization is able to respond quickly to unexpected change.

Examples. Valhalla's BigShow team members ability to prepare it in less than two weeks is an instance of high action speed [V3: BH 124-127].

Operationalization. Action speed, in this research was measured using the time gap between the need for action was perceived and action was taken (higher gaps leading to lower action speed).

Positivity of Feelings Toward Self

Conceptual Issues. Authors drawing on the jazz metaphor (e.g. Eisenberg, 1990) argue that improvisation conveys what they call a feeling of transcendence. Although this concept did not emerge in this research, that of 'positivity of feelings towards self', which was defined as the extent to which an individual / team / organization has a positive self image.

Examples. Prometheus provided some examples of high levels of this concept. At the end of the live demonstration of this project "[TheCenter's COO said enthusiastically that everything went well, that they have to keep the [Prometheus] project alive and *that all of them will have a brighter future*" [P9: FN 71].

Operationalization. In this research, positivity of feelings towards self was measured through subjects' verbal and non-verbal cues of a positive self image (the italics in the Prometheus example above illustrate an instance of such cues).

Member Trust

Conceptual Issues. The literature on organizational improvisation views member trust – which can be defined as the willingness of a party to be vulnerable to the actions of another, based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to control that party (Mayer, Davis & Schoorman, 1995) – as an important factor for this phenomenon's effectiveness in those settings (Crossan et al., 1996; Weick, 1993b; Bastien & Hostager, 1988).

Examples. The fact that TheCenter's and BigPlayer's team members forfeited a planned rehearsal with ASIA1, and ASIA1's acceptance, just before the live Prometheus demonstration is a clear example of their trust in each other.

Operationalization. The level of trust was measured by assessing the importance of the meta-event (see *operationalization* in the 'meta-event importance' concept), in which individuals were willing to be vulnerable to the actions of other team members. In the event above, the meta-event was very important and thus the level of trust was relatively high.

Level of Routinization of Improvisational Action

Conceptual Issues. Those authors that look at improvisation from a learning perspective have argued that improvisations may be 'learned' by the individual / team / organization and become routine practice (e.g. Miner et al., 1996; Crossan and

Sorrenti, 1997). In this light, I define the level of routinization of organizational action as the extent to which an individual / team / organization introduces improvisational action in its procedural memory.

Examples. The repeated use of the 'OK CAMBIO' improvisation in Prometheus team communications, and its formalization in an official project document [P8: FN 64-66] are examples of a high level of routinization of this improvisational action.

Operationalization. The measure used to assess the level of this variable was twofold. On the one hand, I assessed the formalization of improvisational action by looking for their standardization as working norms in the cases' archival evidence. On the other hand, I counted the number of times it was used by project members.

Action Cost

Conceptual Issues. Several authors on improvisation have touted it as a way to reduce overall action cost (e.g. Eisenhardt & Tabrizi, 1995; Moorman & Miner, 1998b), which I defined as the monetary and non-monetary expenditures needed to accomplish a given action.

Examples. At Prometheus, two different ways were used to check the status of an ISDN line: (1) checking real-time software indicators (cost close to 0 PTE); (2) dialing the ISDN via cellular phone (cost of approximately 95 PTE).

Operationalization. Action cost was measured either through the costs of the resources or by analyzing financial archival data.

Level of Declarative Learning

Conceptual Issues. The literature on improvisation and learning has argued that improvisation may not only result in the acquisition of new routines (increasing procedural memory) but also in the acquisition of new facts (incresing declarative memory) (Moorman & Miner, 1998a, 1998b; Crossan & Sorrenti, 1997; Barrett, 1998). In light of this, the level of declarative learning is defined as the extent to which an individual / team / organization acquires knowledge of new facts.

Examples. At the Prometheus' demonstration for the Minister of Science, SS and his interlocutor at BigPlayer encountered a problem they were able to sort out by taking turns at improvising, after a few attempts they succeed and SS stated that he had learned something new about the program (software).

Operationalization. The level of declarative memory learning was measured by counting the instances of new facts acquired by individuals. These instances were detected mostly by relying on subjects verbal cues.

A grounded theory of organizational improvisation

Out of these five constructs emerged a grounded model of organizational improvisation (see figure B4 in appendix B). This model will be presented in two stages. Firstly, at a more abstract level, the relationships among the constructs will be presented. Secondly, at a less abstract level, relationships among the variables will be presented by establishing propositions and presenting supporting evidence.

Relationships among constructs

This model presents the factors that influence the quantity of improvisation, the nature of improvisation and its major outcomes.

The quantity of improvisation is proposed to be determined by two factors that stand in a multiplicative relationship: the motivation to improvise and the potential to improvise. That is to say that no matter how much the motivation to improvise might be, if there is no potential in the organization / team / individual to do so, then improvisation will not happen, and vice versa.

The quality of improvisation, meaning the position of a given improvisational action across the general dimensions of this phenomenon, is influenced by a few variables comprising the 'potential to improvise' construct, by some comprising the 'motivation to improvise' one, and by those constituting another I labeled the 'influencing factors of improvisation'. A few variables in the latter construct are in their turn influenced by a few of those comprising that of the 'motivation to improvise'. Finally, the 'outcomes of improvisation' construct is influenced by a number of factors comprised in the 'influencing factors of improvisation' construct, and by other comprised in the 'organizational improvisation' one.

Relationships among variables

A – Variables influencing the 'motivation to improvise construct'

Figure B6 (in appendix B) summarizes the main relationships among variables comprising the motivation to improvise construct.

Proposition A1: The higher the level of event expectability, the higher the level of event readiness.

The rationale behind this proposition is, basically, that if an entity expects an event to occur, then it will be readier to meet it than one that does not.

At Prometheus meta-events, several events were expected and sometimes even planned to happen. In the live demonstration meta-event, for example, the sequence of 'work shifts' was previously planned and was posted in front of every team member. Additionally, that plan included which tasks the individual had to accomplish. This way, when an individual was given the 'command of the session', he / she expected this to happen and was ready to perform the actions that were planned for him / her [P9: FN 70-71].

Proposition A2: The higher the level of event intentionality, the higher the level of event readiness.

The rationale underlying this proposition is that if an entity deliberately creates an event, then it will be ready to handle that event.

At Valhalla's BigShow, team members crafted a script for their performance *a priori* to its occurrence; consequently most of the events at the BigShow were intended by the team and thus, its members were ready to respond to them in the manner they had planned for. [V2: BH 112]

Proposition A3: The higher the level of event familiarity, the higher the level of event readiness.

The logic behind this proposition is that if an entity has previous experience of a given event, then it will be ready to tackle it when it appears anew.

At Prometheus' first video-conference, an unexpected sound failure occurred. However, because team members were used to meet this type of failure, they readily switched to the 'chat window' for communication [P3: FN 37].

Proposition A4: The higher the level of event readiness, the lower the level of the motivation to improvise.

This proposition is grounded on the assertion that motivation to improvise comes from events for which the improvising entity does not possess any routine course of action. If an organization expects / is ready for an event, which it has met in the past, then it won't need to resort to improvisation to handle it.

In Prometheus first video-conference, team members were not prepared / ready for loosing every mean of interaction except for video. Because of this, they had to create a solution in real-time that consisted in writing on a piece of paper and putting it in front of the camera [P3: FN 35].

Proposition A5: The more important a meta-event is, the higher the motivation to improvise.

An unexpected finding of this research pertains the importance of what I called a meta-event (the larger event where action unfolds) to determine the quantity of improvisation. When the meta-event framing action is perceived as important, people tend to go to far reaches in attempting that no event gets unaddressed; in lower important meta-events, some events are dropped out of the team's attention.

In the two higher importance meta-events of Prometheus, the live demonstration and the Minister of Science demonstration, almost every event for which the team was not ready for was improvised upon [P7: FN 58-63; P9: FN 67-71]. In lower importance meta-events, the number of 'unready-for' events team members gave up on was significantly higher [P5: FN 42-47; P6: FN 48-51].

Proposition A6: The more important an event is, the higher the motivation to improvise.

This proposition constitutes again an unexpected finding. The apparent rationality that underlies it is that individuals / teams / organizations make some kind of motivational computation to assess the costs of dropping the event altogether and those of attempting to tackle it. If an event is low in importance, for example, then probably the latter will be higher than the former, and thus no attempt will be made to depart from procedural memory.

The type of 'unready-for' events that Prometheus team members gave up on more frequently were those which they consider to be less important. In one of this projects sessions, PA and JS attempted to put CUSeeMe to work as their video-conference software. They failed in a few attempts at doing so, and ended dropping the idea of using the software completely [P5: FN 46-47].

Proposition A7: The higher the sense of urgency, the higher the motivation to improvise.

The logic upon which this proposition is grounded is that, without no time pressures, then an 'unready-for' event will more likely lead to reflection than to action. Under a perception of urgency there is no time to act according to a plan; thus conception will be forced upon action.

When the opportunity to perform a live demonstration was given to Prometheus' team, it had close to one month in advance to prepare. In this instance, they had a low sense of urgency and thus recurred to planning (see Prometheus 'real' timeline in figure B2 in appendix B). When the communication broke down during

the live demonstration, team members had no time to plan a solution and improvised one instead [P9: FN 70].

Proposition A8: The lower the level of event understanding, the more difficult the event appears.

The rationale behind this proposition is that when an individual / team / organization fails to understand a given event, he / she / it will possess a lower level of information about it and thus a lower level of input to choose a routine to address it or to improvise around it, thus augmenting the perception of that event's difficulty.

PA and JS inability to find the causes of their failed attempt to put CUSeeMe to work, which translated in a low understanding of what the problem was, led them to deem the task as too difficult and abandon it.

Proposition A9: The higher the number of failed attempts at an event, the higher the perception of event difficulty.

This proposition is logically grounded on the assertion that a high number of failed attempts will likely exhaust procedural memory and create a perception of impotence in the individual, thus lowering his / her perceived ability of handling it.

Just before Prometheus demonstration for the Minister of Science, SS was performing some operations in MasterCam in collaboration with people from BigPlayer. At one time, a problem arises in working with the model and SS makes a number of different attempts to solve it, failing every time, until SS actually voices that he is not able to solve the problem. [P7: FN 60-61].

history shows that milestones (see Prometheus 'real' timeline in figure B2, appendix B) – a low obtrusiveness control mechanism (Brown & Eisenhardt, 1997) – were present all along, acting as powerful coordination device, while being 'invisible' (as a control mechanism) to team members, thus permitting the variations in action and creativity than one can observe during the course of this project [e.g. P3: FN 34-39; P9: FN 67-71].

Proposition B2: The clearer the goals, the higher the dialectical structure level.

Clear goals act as an alternative to deliberate unobtrusive controls, functioning in a way close to that of coordination by 'output standardization' (Mintzberg, 1995). This allows for the co-presence of a high level of autonomy (of means) and a high level of compliance (of goals).

The shared perception of 'creating a methodology' as the overall goal for Prometheus led, for example, PA and JS to jointly establish meetings to build the technological ground for this methodology [P1: FN 31; P5: FN 42-47; P6: FN 48-51].

Proposition B3: The higher the power distance to the leader, the higher the dialectical structure level.

The logical grounding comes from the assertion that a strong leadership need not be obtrusive. A manager's informational roles, for example, allow him / her to shape his / her followers perception of reality (Mintzberg, 1975) thus building a form of unobtrusive control. An unexpected finding in our case adds to this control arsenal the sheer presence of an authority figure. Apparently, this presence works in a way similar to the meta-event importance. In fact, one could even argue that the presence

of the leader points out to his / her subordinates that the meta-event in question is in fact important.

Prometheus leader enjoyed of some power distance but did not usually issue orders. Instead he seemed to control others in two ways, which allowed for high levels of participation. The first was shaping their perception of events, which he mainly did using through e-mail [P0: FN 72]. The second was by just being there. JS's stating that "No mistakes are to be made now, the boss is watching", is an example of this approach. Curiously enough, this event in Prometheus case data points that the latter form of control does not limit itself to the leader but to any figure of authority whatsoever. In fact, the presence of Portugal's Prime Minister seemed to have the same effect, even for the Asians team members! [P9: FN 69] (dialectics: high power distance and high participation).

Proposition B4: The higher the resource deployability, the higher the dialectical structure level.

Highly deployable resources, meaning heterogeneous resources that can be used for a multiplicity of purposes allow handling 'unready-for' events quickly, while maintaining a tight grip on efficiency.

The 'GO TO CHAT paper' improvisation, already mentioned above, is an example of a high effectiveness but low cost (high efficiency) improvisation [P3: FN 35] (dialectics: efficiency and effectiveness).

Proposition B5: The higher the dialectical structure level, the higher the potential to improvise.

It was the absence of visible controls coupled with a high level of structure, together with the absence of optimal resources coupled with the availability of general purpose ones, that allowed Prometheus project members to be 'creative on the spur of the moment'.

In fact, the team member responsible for organizational methodology told me that at the beginning the initial (small) set of rules helped people work together, but that as more rules were being introduced, people felt that the process was becoming very awkward for them to accomplish such a creative task [PI3: RA 81].

Proposition B6: The higher the level of real time information, the higher the potential to improvise.

In agreement to Moorman's and Miner's (1998b) findings, there were several instances at Prometheus where the lack of real-time information forfeited any improvisational activity.

JS's and PA's ending of a work session because they didn't have any real-time information pertaining a communication problem and thus didn't believe they could solve it [P5: FN 45-47], and JS's installation of a software that provided that information in the session where this problem was solved exemplifies this relationship.

Proposition B7: The higher the level of procedural memory, the higher the pervasiveness of procedural memory.

The logic behind this proposition is quite simple: since individuals must 'use up' they procedural memory before attempting to improvise, the higher the level of this memory, the higher the number of routines the individual has to use before improvisation occurs, and thus the higher the likeliness that one of those routines will handle the challenge at hand.

In our case, there are some instances when procedural memory is so high, that improvisation does not occur, even after several attempts at the problem. In one of such instances, SS attempted to solve a problem and only succeeded at his fourteenth attempt, but he was still using procedural memory [P7: FN 58-63].

Proposition B8: The lower the velocity of foregoing procedural memory, the higher the pervasiveness of procedural memory.

The logical argument underlying this proposition is that since velocity equals distance divided by time, low velocity comes from either low time or low distance. In this statement, distance pertains to the extent of procedural memory and, as the proposition above argues, if this is low, then the overall pervasiveness of this memory is low. Conversely, if low velocity comes from low time, then the pervasiveness of this type of memory is lowered because it gets 'used up' more quickly.

Prometheus provided striking instances of low levels of this velocity. At one point, JS attempted the same procedure 17 times (!) [P7: FN 57], which shows that, even in the presence of very low levels of procedural memory, low 'foregoing velocity' can sustain high levels of its pervasiveness.

Proposition B9: The higher the level of procedural memory pervasiveness, the lower the ability to improvise.

The rationale behind this proposition is that if individuals / teams / organizations have a pre-made solution to a given challenge, then they will attempt to use that solution before improvising.

When sound broke down at the first Prometheus video-conference, JS attempted to use the chat window. Next he attempted to communicate via the Whiteboard and only then did he and TheCenter's COO improvise the 'GO TO CHAT paper' solution [P3: FN 35].

Proposition B10: The higher the error tolerance, the stronger the action culture.

A culture is said to be strong when it is shared by most members of the organization (Schein, 1985). I define an action culture as one who believes that action is better than reflection, when handling a given task. In this light, the rationale underlying the above proposition is that novel action often leads to mistakes (Sitkin, 1992) and thus that an action culture depends on a high level of error tolerance to subsist.

Prometheus team members exhibited a high level or error tolerance, visible in the number of failures per session, and had indeed an action culture, visible in the fact that most 'unready-for' events were met with action [e.g. P5: FN 42-47; P6: FN 48-51].

Proposition B11: The higher the bias for action, the stronger the action culture.

This proposition is close to a statement of the obvious. Its rationale is grounded on Schein's assertion that a culture can be assessed by its members' behaviors. In this instance, an action culture can be assessed by the frequency with its members meet challenges with action.

At Prometheus this type of bias was visible in the fact that most of the times, team members met 'unready-for' events with action and only reflected when several action failed to deal with the problem. Additionally, this reflection was strongly action-oriented. In fact, at Prometheus, reflection was accomplished through conversation and testing, not by thinking and planning [e.g. P6: FN 56-57].

Proposition B12: The stronger the action culture, the higher the potential to improvise.

The rationale behind this proposition is that if individuals / teams / organizations believe that action is *the* way to handle any challenge, then when confronting with any 'unready-for' event they are likely to act by whether relying on procedural memory or by conceiving their actions while these unfold (i.e. to improvise).

The high number of improvisations (77 across 7 events) detected at Prometheus, together with the fact that all 'unready for' events were met with action indicate the existence of such a relationship between an action culture and the level of improvisation.

C – Variables pertaining to the 'motivation to improvise' construct influencing variables from the 'influencing factors of improvisation' construct

Figure B8 (in appendix B) summarizes the main relationships among variables comprising the 'motivation to improvise' construct and those comprising the 'influencing factors of improvisation' construct.

Proposition C1: The higher the level of meta-event importance, the higher the level of exposure.

Meta-event importance affects the level of exposure because its importance tends to be shared by entities (e.g. people from higher levels of the organization, external stakeholders, media, etc...) other than those acting directly on it, thus building an audience for the latter.

In fact, Valhalla's BigShow was witnessed by its major customers, external partners, and members from top management of the region where the Portuguese subsidiary belongs [V1: BH 111]. At Prometheus live demonstration, apart from a full conference room visible from the TV screen present in one of the rooms at BigPlayer, there were several members of the Portuguese government and members of the press [P9: FN 68-69].

Proposition C2: The higher the level of meta-event importance, the higher the level of rehearsal.

Due to the fact that organizations and its members do not look kindly on improvisation (Weick, 1998) [I4: CM 137-138], important meta-events tend to be rehearsed to the exhaustion in an attempt to reduce the number of surprises to zero.

As table 4 below shows, the number of rehearsals Prometheus members underwent when important meta-events were going to take place was significant, whereas no such rehearsals took place for less important ones.

Table 4 – Rehearsal for important and unimportant meta-events

	Important meta-event	Unimportant meta-event
# of rehearsals	7	0

D – Relationships among the variables comprising the 'influencing factors of improvisation' construct.

Figure B9 summarizes the main relationships among variables comprising the 'influencing factors of improvisation' construct

Proposition D1: Given a high exposure, the higher the use of humor, the lower the level of stress.

In important meta-events, where exposure is high and, consequently, stress is potentially high (Eisenberg, 1990), the use of humor can be used as a coping strategy to reduce anxiety (Coser, 1959; Daniels & Daniels, 1964).

At Valhalla's BigShow, team members used the time period prior to their performance not to rehearse, but instead to make jokes about possible foul ups [V2: BH 114].

At Prometheus live demonstration, members continually recurred to humor before their performance, joking while improvising on a real problem that was still unsolved and that could jeopardize the entire performance [P9: FN 69].

Proposition D2: The higher the level of stress, the higher the level of affectivity.

The rationale behind this statement is that high levels of stress push the affective climate of the team, by introducing a higher degree of emotional tension. As soon as the stressful situation ends, relief ensues and the level of affectivity is reduced.

At Prometheus demonstration for the minister of science, for example, when the minister left (end of stressful situation) "everybody sigh[ed] of relief" [P7: FN 63]. Additionally, at this project's live demonstration, there were visible signs of stress, like "people shout[ing] orders from one place to the other" [P9: FN 67] and the level of affectivity is high, as JS despair epitomized in his "It's all screwed up!" comment clearly shows [P9: FN 67]. At the end of this session, the affectivity lowers as "everyone expresses relief" [P9: FN 71].

Proposition D3: The higher the level of exposure, the lower the level of affectivity.

Although this proposition seems counterintuitive at first, a closer look reveals that it is not so. In fact, a high level of exposure, where that team / individual action is witnessed by others he / she perceives to be important, limits individual's ability to build affectivity among them.

In fact, no affectivity whatsoever is present during Valhalla's BigShow, since team members are performing on a stage [V3: BH 124] whereas at Prometheus live demonstration (in which the audience could see little more than the faces of those people working at the terminals) there were several demonstrations of affectivity as

people were "shouting from one room to the other (off-air) and waiving and making gestures (on-air) [P9: FN 71].

Proposition D4: The higher level of rehearsal, the higher level of experience of interaction.

This is another proposition close to a statement of the obvious, but nonetheless relevant for establishing this model of organizational improvisation. Essentially, since a rehearsal is a form of interaction, the more people rehearse together, the more they interact. BigPlayer and TheCenter, because of being the only members of the Prometheus team that participated in both the live demonstration [P9: FN 67] and the Minister of Science demonstration [P7: FN 58], were those who shared a higher level of interaction intensity.

Proposition D5: The higher the experience of interaction, the higher the level of member similarity.

As noted by Mayer et al. (1995), more experience of interaction creates shared experiences that individuals use as a basis of similarity. In this sense, people feel similar because they have a set of common experiences to which they can refer.

Table 5 below shows that, from this point of view, the closest members of the Prometheus team were TheCenter and AMPlayer. Their high perception of similarity is patent on the fact that their interaction was the more informal one at the live demonstration meta-event [P9: FN 69].

Table 5 – Number of interactions among Prometheus partners

	BigPlayer	TheCentre	AMPlayer	ASIA1	ASIA2	OLHO
BigPlayer	-	-	-	-	-	-
TheCentre	4	-	-	-	-	-
AMPlayer	1	8	-	-	-	-
ASIA1	1	2	1	-	-	-
ASIA2	0	1	0	1	-	-
OLHO	1	1	1	1	0	-

Proposition D6: The higher level of affectivity, the higher the member similarity.

Drawing on McAllister (1995), one can contend that affectivity, in a way, replaces frequency as far as interaction is concerned. This means that the perception of similarity can be formed over very few interactions, as long as those are very rich on affective content.

At Prometheus, for example, the level of perceived similarity that TheCenter's' COO had in relation to one of the Asians was high because they were together when the COO visited Asia, which was an affectivity-ladden experience for him.

Proposition D7: The lower the knowledge gap among members, the higher the member similarity.

If members differ as far as their knowledge goes, then their perspective of a given event will also be different leading, to a perception of overall dissimilarity (Morgan, 1997).

At Prometheus, for example, the fact that both JS and PA are computer specialists, makes them handle problems in the same way, thus contributing to a high perception of similarity, visible in the friendly relationship among them [P7: FN 59].

Proposition D8: The lower the cultural gap among members, the higher the member similarity.

According to Schein (1985), people with different cultures have different ways of perceiving reality. People from different cultures may be looking at the same phenomenon and see two different, even opposite, realities. In this light, if members do not share the same culture, the perception of difference is inevitable, and cooperation is more likely.

At Prometheus, a possible example of this relationship is that JS never followed up the agreement with the Asians to test software, after he failed in the first attempt, and did so with PA (from BigPlayer).

Proposition D9: The lower the language gap among members, the higher the member similarity.

This proposition replicates the argument above, because language is one of culture's manifestations (Schein, 1985).

The fact that BigPlayer preferred to have Prometheus start with a project between TheCenter and AMPlayer (where people speak Spanish), instead of between the former and the Asians (who speak a very poor English) [PI3: RA 80] is an evidence of this proposition.

Proposition D10: The lower the status gap among members, the higher the member similarity.

The grounding for this proposition is almost commonsensical. Difference in status, apart from promoting a more formal relationship, entails, in organizations, different worldviews and, consequently, different event perceptions because of

differences of information access (Mintzberg, 1975). The difference in treatment used with one of the Asians, considered of higher status (calling him Mr. Professor [name]) and with others of lower status (calling them by their first names) is an example of this proposition.

Proposition D11: The higher the level of communication clarity, the higher the level of communication quality.

An unexpected finding in this research was that communication quality cannot be equated with communication fluidity, as current texts on organizational improvisation appear to do (e.g. Moorman & Miner, 1998a), with the notable exception of Weick (1993b). This probably happens because the observation context for these studies does not offer serious threats to communication clarity: a jazz or a theater group, or even an innovation team do not operate in contexts where they have difficulty in hearing each other. Weick's study of firefighting and this study of organizational improvisation focus on a different kind of context. In fact, Weick (1993b) alludes to firefighters inability to listen to each other because of the noise flames produced. In this study, the communication distortion that comes from having significant amounts of data (video and sound) travelling across inter-continental phone lines also hinders members' ability to have a perceptible conversation at times.

A look at a section of the transcript of Prometheus first video-conference clearly shows this phenomenon: ('@' signal video conference communication in English; 'L' signals local communication in Portuguese)

@: ASIA1 - Are you seeing now?

@: COO – Yes, I am seeing you!

@: ASIA1 – Yes we can see you clearly. We are going to send you a product plan very soon.

[Using chat window]

L: COO – Don't put that on, put [inaudible].

@: RT – Hello, hello! Are you there?!

L: PG – Hey guys! Just a moment ago you lowered the sound right there!

[pause]

@: RT – Are you there?

@: ASIA1 [inaudible 'robot' voice]

@: JS – Can you repeat {that ?

@:RT - {can you repeat that?

[pause]

Proposition D12: The higher the level of communication fluidity, the higher the level of communication quality.

Communication fluidity is often used in the literature on jazz improvisation as the equivalent of communication quality (e.g. Crossan et al., 1996; Hatch, 1999), although, as we stated in the above proposition, the level this latter construct also depends on the communication quality, which is strongly influenced by the media that is used as the channel for communication.

An example of a high level of communication fluidity was JS's and PA's second point-to-point connection where, in spite of having their interaction mediated by a video-conference software, they were able to maintain, at least, an adequate pace of communication while having a low level of equivocality [P6: FN 48-51].

Proposition D13: The higher the level of declarative memory, the higher the level of declarative memory availability.

One of the Asian organizations which was a member of the Prometheus team, did not employ a computer expert, consequently their declarative memory to improvise on computer related matters was very low and, most often than not, they had to take directions from JS [P3: FN 37].

Proposition D14: The higher the efficiency of access to declarative memory, the higher the level of declarative memory availability.

As noted by Moorman and Miner (1998a), a high level of declarative memory is not enough for it to be available during improvisation – it is crucial for individuals / teams / organizations to be efficient at accessing it, so it is readily available.

Brunhilda, one of Valhalla's BigShow team member, told me that she is used to being asked impromptu questions, and that that had grown in her the ability to quickly search her [declarative] memory for an answer [V2: BH 113-114].

<u>E – Variables pertaining to the 'influencing factors of improvisation' construct influencing variables from the 'organizational improvisation' construct</u>

Figure B10 (in appendix B) summarizes the main relationships among variables comprising the 'influencing factors of improvisation' construct and those comprising the 'organizational improvisation' construct.

Proposition E1: The higher the level of communication quality, the lower the level of improvisation authority.

An unexpected finding in this research is that the 'sharing' of improvisational activity depends on the quality of the communication among members. Weick had already pointed to this relationship when studying firefighters but both Ambrosini et al. (1999) and Jarvenpaa and Shaw's (1998) work on computer mediated communication didn't came across such findings. This might be explained by the fact that both these studies are based on asynchronous computer mediated communication, whereas our research setting comprises mostly synchronous computer mediation communication. Additionally, Ambrosini's et al. (1999) population is mostly mono-cultural.

At Prometheus, because of the communication problems TheCenter had with Asians, when they were communicating with one another and the need for improvisation emerged, this was either accomplished by JS on his own or, at the most, the Asians executed the instructions he issued [P3: FN 35-36].

Proposition E2: The higher the level of member similarity, the lower the level of improvisational authority.

Similar team members, who share the same language, the same culture and whose history of joint interaction affords each of them some ability of prediction of their fellow members actions, are able to communicate with more fluidity and are thus more prone to improvise as a group.

However, status gap and knowledge gap tend to have a disproportionate effect on the extent to which improvisation is performed alone or in a group.

When the status gap is high, the individual with higher status either commands or hinders improvisational activity.

At Prometheus, the fact that SS's interaction with a person from BigPlayer was limited to orders and 'soloing' (to use a common jazz expression) was due to his higher standing as 'expert' [P7: FN 61]. Conversely, the higher status that people from TheCenter conferred to the leader of one of the Asian organizations led them to prefer lowering the interaction with him than to ask him to improvise [P3: FN 36; T1: FN 85].

When the knowledge gap is high, improvisation takes the form of soloing or instructing.

The Asians low computer expertise led JS to instruct them [e.g. P9: FN 68] or to attempt to improvise himself [e.g. P3: FN 36] on most occasions.

PA's and JS's similar degree of knowledge made their improvisations truly groupal activities [e.g P6: FN 49-51].

Proposition E3: The higher the level of declarative memory availability, the lower the level of improvisation novelty.

The relationship between memory and improvisation novelty has only been addressed explicitly in the literature in respect to procedural memory (Moorman and Miner, 1995; Weick, 1998). However, one can argue that a higher level of declarative memory availability provides a higher level of resource availability for the bricolage dimension of improvisation to act upon and thus a potentially lower departure from canonical utilization of resources.

The low level of departure from canonical practices that characterized most 'computer-based' improvisations accomplished by Prometheus team members from

TheCentre and BigPlayer seems to be derived from the high declarative memory that these members possess as far as computer science goes [e.g. P6: FN 49].

Proposition E4: The higher the level of declarative memory availability, the lower the level of sub-optimality of resource use.

The rationale behind this proposition is as follows: a higher level of declarative memory availability means that more (cognitive) resources are available and thus the likeliness that an optimal resource is found is higher.

The fact that one group of Asians used resources at a more sub-optimal level, like showing a business card on the web-camera instead to send an e-mail address to TheCenter instead of using the 'chat window' or even e-mail [P3: FN 38], was likely the result of a lower level of declarative memory (they had no one formally trained in computer science).

F – Variables pertaining to the 'motivation to improvise' construct influencing variables from the 'organizational improvisation' construct

Figure B11 (in appendix B) summarizes the main relationships among variables comprising the 'motivation to improvise' construct and those comprising the 'organizational improvisation' construct.

Proposition F1: Given a high level of exposure, the higher the level of event difficulty, the lower the veracity of improvisation.

This was a very unexpected finding, although one that in retrospective does make sense. Indeed, as proposition A6 states, important meta-events encourage individuals / teams / organizations to act on a given event and, conversely, discourage

them to forfeit that action (i.e. 'give up'), through of the level of exposure which they lend them. This way, when task difficulty is high, a dilemma emerges: one is compelled to act but is unable to conceive a course of action. To tackle it, individuals / teams / organizations do improvise but in the only way they can: 'faking' (to borrow a term from jazz), i. e. improvising a course of action that appears to have dealt with the event while only really hiding its symptoms.

The most invisible instance of 'faking' occurred at Prometheus live demo, when team members had to simulate sharing a program, when NetMeeting forbade them to do so – an event that was even recognized by the team members in an official report [P9: FN 70].

Proposition F2: The higher the sense of urgency, the higher the immediacy of planning.

This was an expected finding. As Brown and Eisenhardt (1997) state, urgency has very different meanings for different industries: a two year development time for a car instills a sense of urgency; the same period of time for a computer instills one of idleness. Therefore, the measure of a sense of urgency is different from industry to industry, and in fact develops when the time an individual / team / organization has to perform a task is perceived as much lower than the standard. When this measure is high, then the perception of the availability of sufficient time to separate planning from execution is lower and thus the 'immediacy of planning' side of improvisation tends to be higher.

At Valhalla's BigShow, for example, the one week period team members had to prepare for the meta-event instilled a sense of urgency because this would be the time that each one would need if making a solo performance but, on top of it, they had

to coordinate their individual performances and were not exempted from their 'normal' workload; consequently the script for the event was conceived as members performing it (in rehearsal) and some details were left open, only to be filled during the performance itself [V3: 117-120].

Proposition F3: The higher the number of failed attempts at the event, the higher the level of pre-action conversation.

An unexpected but recurrent pattern in this research was that, when confronted with an 'unready for' event, individuals immediately acted on it; however if their actions failed successively, then they engaged in conversation (see table 6 below), either to discuss the causes of the event at hand or to discuss possible solutions, before attempting to act on it again.

Table 6 – Extent of pre-action conversation in the presence and absence of failure.

	Previous attempt was failed	No previous attempt	Total
Action	20 (42%)	28 (58%)	48 (100%)
Conversation / action	27 (93%)	2 (7%)	29 (100%)
Total	30	47	77

At Prometheus, JS's and PA's configuration standardization sessions were a proficous source of such observations [P5: FN 42-47; P6: FN 48-51; P7: FN 52-59].

G – Variables pertaining to the 'potential to improvise' construct influencing variables from the 'organizational improvisation' construct

Figure B12 (in appendix B) summarizes the main relationships among variables comprising the 'potential to improvise' construct and those comprising the 'organizational improvisation' construct.

Proposition G1: The higher the degree of resource / technology deployability, the higher the sub-optimality of resource use.

The logic behind this proposition is a simple one: if available resources have a plethora of potential uses, then the need to search for more optimal solutions lowers and thus the temptation to recur to bricolage is higher.

In fact, the improvisation of using a cellular phone to check the status of an ISDN line [P6: FN 51] could have been replaced by a look at the network status control panel. However, since the cellular phone was more available (deployable) than that control panel, it was JS's solution of choice although being a sub-optimal one.

H – Variables pertaining to the 'organizational improvisation' construct influencing variables from the 'outcomes of improvisation' construct

Figure B13 (in appendix B) summarizes the main relationships among variables comprising the 'potential to improvise' construct and those comprising the 'outcomes of improvisation' construct. Some relationships among variables from the 'outcomes of improvisation' construct are also shown.

Proposition H1: Given high event difficulty, the higher the novelty of improvisation the higher the level of declarative learning.

Authors on organizational improvisation (e.g. Crossan & Sorrenti, 1997) have been arguing that learning, in improvisation, is not confined to procedural memory – it may also pertain to declarative or 'fact' memory. This study's results support this argument, although in a different fashion from literature's expectations. In fact, I found that declarative learning only occurred in instances of high event difficulty (a most unexpected finding) and that the element of the 'organizational improvisation' construct that fosters that learning is the novelty of improvisation.

At Prometheus, SS's interaction with people from BigPlayer during the demonstration for the Minister of Science, where SS verbally acknowledges having increased his factual memory about the MasterCam software, because of their joint improvisation, which resulted in a novel solution, is an example of this proposition.

Proposition H2: The higher the novelty of improvisation, the higher the level of improvisation success.

This was a puzzling and unexpected finding, because no theoretical reason for it exists in the literature. Nonetheless, all of the seven instances of high novelty improvisation at Prometheus addressed the events they were meant to tackle in a successful manner [e.g. P3: FN 35, FN 36].

Proposition H3: The lower the level of improvisation authority, the higher the level of member trust.

According to Mayer et al. (1995), trust revolves around the presence of four elements: ability, benevolence, integrity (on the part of the trustee) and propensity to

trust (on the part of the trustor). Propensity to trust, being a disposition, is not likely to be changed by interaction. As far as ability goes, if improvisation is performed in group, then members have an opportunity to assess each one's level of this characteristic. Moreover, if improvisation is truly groupal, meaning that it is an outcome of the group as a whole, then that assessment is likely to be positive. As far as benevolence goes, if repeated interaction does cause cooperation / interpersonal care (Baker, 1994), the low levels of improvisational authority (group improvisation) do provide the opportunity for higher levels of benevolence. Finally, as far as integrity is concerned, group improvisation allows each member to build a mental model of the others' work habits thus increasing this factor, too.

At Prometheus, PA's an JS's succession of group improvisations build trust among both, visible in the demonstration for the Minister of Science, where each one relied upon the other in being able to set up the conditions for a successful performance from his 'side of the (ISDN) line [P7: FN 53-57].

Proposition H4: Given a high level of improvisation success and a high level of approval of improvisation, the higher the improvisation outcome intentionality, the higher the level of routinization of improvisational action.

It is not enough that a given organizational action is successful (i.e. brings positive outcomes) for it to be stored on the organization's procedural memory. Firstly, the improviser has to know what he / she did. This is to say that the more an outcome is emergent, the lower the improviser's knowledge on how to produce that outcome and thus the less material available for storage on procedural memory. Moreover the individual / team / organizational culture might have a hostile attitude towards improvisation that will probably lead to the triggering of strong enough

defensive routines (Argyris, 1974) for whatever process led to a successful improvisation to be forgotten.

The routinization of the 'OK CAMBIO' improvisation by Prometheus team members is an example of a routinization of a successful intended improvisation [P8: FN 64-66].

Proposition H5: The higher the improvisation success, the higher the action speed.

When an improvisation is successful then, by definition, the overall action where it fits will happen faster (Eisenhardt & Tabrizi, 1995), because, of the time gained by superimposing planning and execution. However, an unsuccessful improvisation may either lead to further attempts to improvise, to plan or even to forfeit tackling the event at hand. In any of these situations, time will be lost and thus action speed will be lower.

At Prometheus' demonstration for the Minister of Science, SS successful failed attempts at handling an unexpected problem, for example, delayed the overall action speed [P7: FN 60-63].

Proposition H6: Given a high level of exposure, the higher the level of the improvisation success, the higher the positivity of feelings towards self.

Improvisation in public exposure is a daunting task (Eisenberg, 1990): improvisers have the perception that failures are very likely together with that that their action is being scrutinized. The higher degree of tension a context of this kind fosters a more positive self image when the improvisers' efforts are met with success than when this is accomplished in a 'safe' environment. This is in part due to the

perception of overcoming two challenges: that of improvisation and that of public scrutiny, whereas in the latter environments this final challenge is absent.

The emphatic verbal cues of a positive self image at the two high exposure meta-events, especially the "claps and joy" [P9: FN 71] and the "telling [...] they will all have a brighter future" [P9: FN 71] are eloquent instances of this proposition.

Proposition H7: The lower the improvisation cost, the lower the action cost.

Although this proposition appears commonsensical, its statement is important in that it allows to establish a connection between improvisation level variables and organization level ones. In fact, through bricolage, improvisation can help to offset organizational costs in two ways. Firstly, bricolage may provide a less costlier way of accomplishing a given task. Secondly, bricolage, by using more intensely the available resources, allows for a dilution of the organization's fixed costs (as far as these resources are not variable, of course).

In the case of the 'GO TO CHAT paper' improvisation, the overall Prometheus costs were lower because this improvisation required one relatively costless variable resource (piece of paper) and a relatively expensive, but fixed one (Web camera).

I – Variables pertaining to the 'influencing factors of improvisation' construct influencing variables from the 'outcomes of improvisation' construct

Figure B14 (in appendix B) summarizes the main relationships among variables comprising the 'influencing factors of improvisation' construct and those comprising the 'outcomes of improvisation' construct.

Proposition I1: The higher the level of affectivity (during an improvisation), the higher the member trust (as an outcome).

Mimicking the rationale on proposition D6, this proposition argument is grounded on that affectivity, in a way, replaces frequency as far as interaction is concerned. Consequently, the increase in levels of benevolence, integrity and in a way, ability, may be accomplished either through a significant number of interactions (close to proposition H3) or through a smaller number of them but with high affective content.

The fact that BigPlayer and TheCenter interacted in the Minister of Science demonstration [P7: FN 52-63], allowed a higher level of mutual trust as far as the live demonstration was concerned [P9: FN 67-71].

Proposition I2: The higher the level of real-time information use, the higher the improvisation success.

The rationale behind this statement is that using more real-time information allows a clearer perception of the event at hand, and thus a more informed grounding upon which to improvise (Moorman & Miner, 1998b).

In fact, the presence of a real-time network status control panel on JS's computer allowed for PP to know that he was not sharing Mastercam because of a network failure, thus choosing to 'fake' the sharing [P9: FN 70]; had PP ignored the source of the problem, he could have attempted another improvisation whose failure would be disastrous giving the level of exposure.

Voices on a grounded theory of organizational improvisation

As mentioned in 'Research Method' section, a set of interviews was conducted aiming at enhancing theoretical sensitivity towards improvisation in organizational settings. Although the results of such an exercise are most often presented in an appendix and left out of the main report of a research effort such as this, the particular outcomes of that performed in this study of organizational improvisation are worthy of being included in the section discussing its results. This is due two to main reasons.

Firstly, from the interviews conducted, a series of variables emerged that have not yet been addressed by the literature and some do not even emerge in the final grounded model because they could not be found in the data (although they were not denied by them).

Secondly and, one might argue, most importantly, a set of alternative views of improvisation are also to be found in interviewee's perception of this phenomenon.

As far as variables are concerned, table 7 below groups those that came out from the analysis of the interviews into those that have already been addressed in the literature and those that have not.

Table 7 - Variables emerging from interviews with scholars, scholar-practitioners and consultants.

Addressed in the literature	Not addressed in the literature
Antecedents - Urgency - Bias for action - Openess - 'Flat' organizations - Working in teams - Managers as coaches - High level of skill - Safety net that allows risk taking Outcomes - Greater speed - Solving the problem - Addiction to improvisation	Antecedents - Direct participation - Paradigm - Language as minimal structure - Interaction technology - Non-visionary / servant leadership - Importance of overarching event - Little contact with sources of routines Outcomes - Greater risk Other issues - Need for reflection after improvisation

Although it is interesting to witness a number of coincidences between what people that never heard about organizational improvisation but that have some tacit experience of it think and what has been published on this topic, there is no point in discussing those items further since that has already been done both in the introductory section of this text and in a previous literature review (Cunha, Cunha & Kamoche, 1999). In the same vein, some variables that were uncovered in the interviews, although absent from the literature also emerged during the actual research in both the Valhalla's Big Show and the Prometheus cases and were thus fully discussed in the two previous sections.

Four variables, which were not detected in this study, seem interesting enough to be discussed in more detail.

The first of these pertains the 'closeness' allowed by the communication technology used. One of our interviewees pointed out that e-mail, although not allowing for anonymity, does shield from the feeling of continuous observation and scrutiny that a face-to-face conversation conveys and thus allows for more creative / improvisational behavior because the fear of peer / superior evaluation is partially

cloaked [I5: PM 139-140]. This goes very much in line with Yates's and Orlikowski's (1999) work on the paradoxical – one is tempted to say, dialectical – nature of advanced communication technologies: they bring together the advantages of formal and informal communication, in this case they allow for an informal dialogue to be established with the protection of self allowed by more formal communications. In what concerns the present research, this means that the choice of communication technology the organization / team chooses to adopt may hinder or foster improvisation by influencing the extent to which individuals are willing to depart from routine practice and thought.

One of the scholar-practitioners interviewed provided an interesting account of the impact that visionary leadership can have on an organizations ability and will to improvise. This interviewee drew on Bion's (1959) research on groups to contend that a visionary leader hinders his / her subordinate's will to improvise by assuming the responsibility of solving important and urgent issues (those that trigger improvisation). He further argued that after the leader is gone, organizational members will dedicate themselves to 'write' –either explicitly or implicitly – the 'Bible' of the leader, meaning that they will attempt to map the routines and heuristics they believe the leader used to tackle the challenges that came about as he / she acted. By doing so, they enrich the organization's procedural memory and thus lower the occurrence of improvisation (Moorman and Miner, 1998a). This is an important argument to take into account in what concerns the results of this research, where a leadership akin to a visionary one was found to be an important component of a minimal structure. However, in the case studied, the leader had a non-intrusive style and had a low level of expertise in most of the tasks that constituted the main improvisation-triggering events, this dictated that problems were always handled by

subordinates which, in a few instances even directed the leader's action [e.g. P3: FN 36-38].

An additional interesting statement that came out in one of the interviews relates to the way improvisation is formalized. Both the current literature and this research state that formalization depends on the company's attitude towards improvisation and the actual valence of its outcome for those performing it, this interviewee argued that in addition to those two factors, the kind of post-action (in this case post-improvisation) reflection process a company has can also influence the extent to which this type of action is formalized [I4: CM 138]. This is a very relevant statement because of the possibility of type I and type II errors that can happen in the aftermath of an improvisation. In fact, an organization can fail to formalize a successful improvisation. A thorough analysis of the way the company improvised in response to an important but unexpected and urgent event, free from the pressure of action, can help it to articulate the improvisation process and decide whether it can be replicated successfully to provide the same positive results it did. The exact same exercise can be done to avoid the formalization of inefficient improvisations and, most importantly, to deliberately maintain the organization out of the many 'opportunity traps' that the very practice of improvisation lays by itself (Miner, Moorman and Bassoff, 1996).

A final insight that came out of these theoretical sensitivity-building interviews was that improvisation can occur in the presence of a high level of procedural memory in the organization to handle the event that triggered this phenomenon in the first place. One of our interviewees pointed out that it is not sufficient for that memory to be present, it has to be accessible. He recalled a project he was assigned to that forced him to physically relocate to a place where his

organization's procedural memory – stored in senior members' heads and in procedure manuals – was virtually inaccessible. This forced him to improvise a series of solutions to problems that he was aware that had a prescribed solution in manuals or that had already been tackle by the more senior members of the company. Due to the fact that the procedural memory of the organizations studied in this research was readily available to their members, this variable did not come out in the final model.

Apart from uncovering a set of variables that would otherwise go unnoticed, the interviews also allowed for three alternative views of improvisation to emerge.

The first and probably more interesting view of improvisation is what we can call a contingencial approach to this phenomenon. Most interviewees argued that improvisation is not a panacea and is not applicable in all situations [e.g. I1: TT 130-131; I2: CP 133; I3: JM 136; I6: FG 142]. Some of the factors that came out as determining the applicability of improvisation are the industry where the company is located [I1: TT 131], the risk of improvising [I4: CM 138], the 'routinizability' of a task (meaning the extent to which it should be routinized) [I3: JM 136] and the level of the task (operational vs. strategic) [I1: TT 131]. Most of the interviewees agreed that in high risk, strategic situations, the dangers associated with improvisation were far to great for companies to rely on it. One of them even advocated that it was preferable to loose some competitive edge than to improvise, in such a situation.

As far as the second view on improvisation goes, some of the Portuguese persons interviewed argued that it was important to distinguish this phenomenon from another they labeled 'desenrascar' [I6: FG 141]. 'Desenrascar' is a Portuguese word meaning 'removing or getting rid of difficulties' (Ferreira, 1979) which can be translated in English by 'disentangling' (New Michaelis illustrated dictionary, 1972). According to the interviewees these terms can be confused because they both mean

taking action to handle an urgent issue. However they are distinct in that by 'desenrascar' organizations just get rid of the problem without needing actually to solve it, whereas improvisation aims to handle an urgent problem in a way that some action is actually taken in order to find a solution for it. The relevance of this distinction to research on organizational improvisation is to fine tune the scope of this phenomenon by moving it away from actions that only aim at hiding a problem or 'quick-fixing' it without a real concern to tackle it thoroughly.

Finally, one of the scholars interviewed pointed out that one can look at an improvising organization as a totalitarian system. From this point of view, improvisation contributes to the further expansion of the centrality of organizational life to shape the individual's self-concept by making the individual accountable for handling the various unexpected occurrences his organization faces via improvisation, which is a presential activity (a person has to be there to improvise), instead of relying on impersonal systems for doing so [I1: TT 130]. In this vein, improvisation may create or reinforce a 'success to the successful archetype' (Senge, 1990) where personal life is more and more devalued in favor of organizational life. This is relevant for this research as it draws attention to the need to incorporate some 'rules' in the minimal structure to attempt to hold this effect at a minimum.

Research Hypotheses

Although a grounded theory study does no possess *a priori* research hypotheses, I did in fact posited three broad hypotheses (contributions) about improvisation as a phenomenon of dialectics and change, which can now be discussed.

First contribution: The punctuated incrementalism change synthesis

In the introduction to this research, improvisation was offered as a potential synthesis between the punctuated and the incremental change models –something we termed by punctuated incrementalism. We argued that punctuated incrementalism was a type of change which occurred both incrementally (meaning that it comes from small and local adaptations) and punctuated (meaning that it comes from discrete 'bursts' of change).

Prometheus provides empirical grounding for this argument. In fact, there were two instances of meta-events (to use the language of the grounded model) which were not predictable at the outset, but that commanded important changes.

The first of those events, the Minister of Science's visit to TheCentre, demanded a ready-to-use methodology [P7: FN 58-63]. This was a punctuated change in that, at one point in time (namely at the meta-event itself) the first methodology appeared, i. e., it materialized during action.

This methodology was not the result of some incremental growth. In fact, all of the process sessions prior to this one were performed in the absence of those people that took the lead role in this meta-event. The few minutes that they interacted before

the Minister's visit was the first time SS worked via collaborative technology. He had no script and those few minutes were his rehearsal. However, the methodology used at that moment was a punctuated change event because it drew on the findings that JS and PA made in the two sessions they had together prior to this event.

In this vein, if we are to label the type of change which brought about this methodology we would name it punctuated incrementalism – punctuated because it created, at a discrete point in time, something that did not exist in any form before (the methodology), and incremental because that creation wouldn't have been possible without the prior efforts to build a knowledge base upon which that methodology could be created, one step at a time.

The second event where punctuated incrementalism was visible was at the live Prometheus demonstration [P9: FN 67-71]. Again, a full-fledged methodology was needed – a task that was now complicated by the larger number of participants (close to thrice those of the Minister's demonstration) and the cultural and knowledge difference. In this instance, some rehearsals were made, mostly between TheCenter and the Asians, prior to the demonstration. Nonetheless, none of those rehearsals were made using the actual video-conference technology, a relevant difference because different technologies create different problems – as those that ensued during the actual meta-event clearly showed [P9: FN 67-71]. Additionally, no multi-party collaborative work had been attempted before by none of the members, so there was no grounding for the methodology that had to be created. In fact, even the methodology that emerged from the Minister of Science's visit was not an adequate grounding for this event because of the significant technological differences [P0: FN 72]. Finally, although there was a final rehearsal planned for the day of the meta-event, team members decided to abort it – once again the methodology was created as

it was being used (to such an extent that even the dialogues prepared *a priori* with the Asians were not followed [P9: FN 70]) and a punctuated change ensued.

This discontinuity notwithstanding, one can find some elements, which were incrementally developed and which served as inputs for this new methodology. In truth, in addition to PA's and JS's experimenting sessions [P5: FN 42-47; P6: FN 48-51], Prometheus team members relied on their experience at the first project video-conference [P3: FN 34-38] and on the TheCenter / AMPlayer joint project. The incremental knowledge obtained through these experiences was closer to being a patch of procedural and declarative knowledge than a consistent methodology. In fact, the most recent report on Prometheus admitted that the team had yet to arrive at the technical specifications for collaborative work, let alone a task methodology [P0: FN 72].

Again, the nature of change appears to be punctuated incrementalism.

Second contribution: The deliberate emergence change synthesis

The second contribution I asserted that improvisation could make to organizational change was providing a synthesis between deliberate and emergent change. There were three processes undergoing at Prometheus that appear to provide empirical instances of such a synthesis, which we will label as deliberate emergence.

The first process, which had JS, PA and RA as protagonists, had the explicit goal of producing the technical side of the methodology the project aimed for [PI1: JP 74-75] – this was achieved by deliberately provoking technological emergence in order to formalize a technological methodology. In fact, even the most cursory look at PA and JS's sessions shows that they were experimenting together various programs and options in order to learn enough to build this methodology. The ILS, which was

deemed as one of the most important elements for the live project demonstration [P0: FN 72] was a serendipitous discovery that came out of an improvisation aiming at discovery [P6: FN 49].

The second process, mostly the responsibility of RA, aimed at looking at emergent activity in search of procedures to formalize as the methodology's norms. In essence, RA introduced, at TheCenters / AMPlayer a set of norms [PI3: RA 80-81], similar to those previously used among BigPlayer and AMPlayer and waited to see what happened. As the team members interacted, some of the rules emerged as fit for their task and some did not, RA decided which ones to keep and which ones to drop [PI3: RA 80-81].

The final deliberate emergence process going on at Prometheus concerned obtaining notoriety for the project so as to obtain funds and to get some bargaining power. This process, mostly the responsibility of BigPlayer's CEO, used the emergent opportunities for visibility, namely the Minister of Science's visit and the live demonstration to deliberately pursue these ends [P7: FN 63; P0: FN 72].

Third contribution: Discovering a new change model

The final and maybe the boldest assertion stated on the introduction was that organizational improvisation was able to fill one of the two theoretical slots Van de Ven and Poole (1995) left vacant in their attempt to produce an overarching framework for change – that of a change mode driven by a teleological, dialectic and evolutionary model. The following paragraphs attempt at putting some empirical flesh on the rather theoretical skeleton presented in the introduction. This is accomplished by drawing on data from Prometheus. However, for the following arguments to substantiate this statement, we first have to prove that Prometheus was, at the macro-

level, an improvisational project. To do this, we have to assess if it fits under our proposed definition of improvisation, which was *the conception of action as it unfolds, by an organization and / or its members, drawing on available material, cognitive, affective and social resources.*

On the one hand, thus, it has to be shown that, at Prometheus, action was conceived as it unfolded. In fact, it was. A look at the original BigPlayer's plan for the project and the *de facto* unfolding of the project shows a pronounced difference (compare the project's 'real' and 'planned' timelines in figures B2 and B3, in appendix B). Furthermore, data show that the emerging meta-events were met with action, not with planning. The opportunity to develop a product with AMPlayer, for example, was reaped immediately (see Prometheus' 'real' timeline in figure B2 on appendix B). The first video-conference was scheduled, but not planned. In fact, one of the most important participants, ASIA2, appeared completely unexpected [P3: FN 36]. The planning for the Minister's demonstration was little more than scheduling a point-to-point link between BigPlayer and TheCentre, as the spontaneity of actions clearly shows [P7: FN 52-58]. The confusion about who would finish the jointly developed product between TheCentre and AMPlayer clearly shows that there was little planning put into this meta-event too [P8: FN 65-66]. Planning was in fact performed in action.

On the other hand, and turning to the 'bricolage' element of improvisation, there is evidence that TheCenter has severe financial and technical constraints as far as this project is concerned [e.g. P4: FN 41], and data from our observations show several instances of bricolage. The only moment in which optimal resources seem to be in place is at the live demonstration, however even in this instance, project members complain that this was not the case [P0: FN 72].

Taking all this into account, one can say that Prometheus was, in fact, a mostly improvisational endeavor

Evidence of the presence of a teleological motor

Firstly, let us assess the presence of a teleological motor. This type of change has three characteristics: it has to possess a process of reflexive monitoring, it has to have explicit or implicit goals enacted through some visible mechanism, and there has to have some time constraints (Van de Ven & Poole, 1995). Prometheus provides evidence of each of these characteristics.

As far as its reflexive monitoring is concerned, Prometheus relies on positive feedback to reach its goals (constructing a methodology) because its prescribed norm (the methodology used between BigPlayer and AMPlayer) exerts centripetal instead of centrifugal force [e.g. PI1: JP 74-75]. That is to say that the old methodology is not used as a reference to which the new one must be fashioned but instead as a departure point, from which the new one is to be built (a very close role to that of the song in jazz improvisation [Weick, 1999a]). In this light, the decision-making component of the reflexive monitoring mechanism, meaning the way people know they reached their goal comes from assessing the marginal gains from changes in the methodology. When these are low enough, then the goal has been reached [e.g. PI3: RA 81].

In what relates to goals and to their process of enactment, BigPlayer's CEO was the one who explicitly defined the project's goal as that of formalizing a methodology and although the actual process of this goal's enactment was invisible to us, both the CEO's and TheCenter's COO comments on Prometheus led me to think that this was the result of a deliberate strategy [P1: FN 31; P2: FN 32-33].

As far as the constraints go, they are of a twofold nature. Firstly, there are financial constraints, which are somewhat pressing for TheCenter and thus force it to run this project on a low budget [P1: FN 31: P2: FN 32-33]. Secondly, there are time constraints coming from the emergence of meta-events with clear deadlines (see Prometheus 'real' timeline in figure B2, in appendix B).

Evidence of the presence of a dialectical motor

Now, we turn to assess the presence of a dialectical motor. This type of change has three characteristics: two antithetic entities must be present, there has to be an actual conflict between these entities, and from that conflict a third different entity must emerge (Van de Ven & Poole, 1995).

There are at least three dialectics present at Prometheus.

The first dialectics is composed the opposites 'thinking' and 'action'. Indeed, the major goal of this project seems to call for careful reflection. Building a work methodology is a task that requires study, analysis and planning (Hammer & Champy, 1993), in addition to the careful consideration needed by the process of rolling out the implementation. In spite of this, there's a pull for action across all of this project because of the number of unexpected events that keep appearing (see Prometheus 'real' timeline in figure B2, appendix B), reinforced by the leader's call for urgent action.

Effectiveness and efficiency make up the second dialectics present at Prometheus. In fact, the goal of formalizing a methodology does have to get accomplished. Additionally, the joint product development between TheCentre and AMPlayer did need everything to work properly, since the 'window of communication' between the two entities was rather small [PI3: RA 81; P8: FN 65-

67] and thus there was little time available for long attempts to get technology to function adequately. Moreover, the high level of exposure that some of the meta-events forced onto the team provided little room for mistakes and lack of effectiveness. All of this notwithstanding, efficiency had to be maintained: TheCentre has limited financial resources and thus has to deploy them as efficiently as it can and each one of the other partners has its limitations as well.

The final conflict arises between control and freedom. In fact, there are goals to be achieved and deadlines to be met. Consequently, people's activity has to be controlled in order that each one of them individually and, most importantly, all of them as a team, play indeed their role in keeping with these objectives. Nonetheless, Prometheus team was composed with people from different organizations and from different countries. No one could claim to have power beyond a small number of elements, who were not enough to keep the project going on.

These three dialectics confronted each other in every single Prometheus meta-event. In the first video-conference, for instance, no member could claim control over all other participants, so they chose conversation partners as they please. However, there was a common goal to achieve: that of forging an action plan and commitments to the project [P3: FN 34-38]. Additionally, the means available for this video-conference were limited: connections were not point-to-point but internet based; no real time data about the actions of other participants was available; and the communication broke up easily [P3: FN 35-37]. The pressure for effectiveness was high. An opportunity to have most of the project members on-line was rare, as the failed attempt to test some software with the Asians shown [P4: FN 39], thus the pressure to get an initial commitment to the project from all partners was high. Moreover, the unexpected announcement from ASIA2 stating that there were two

partners available for collaborative work pushed that pressure even higher [P3: FN 37]. Finally, such a complex interaction (because of the complexity of technology and the language / culture differences) cried out for a communication methodology to be implemented, but none was ready and no time to plan was available, thinking and action had to be merged.

From the confrontation between the two extremes of these dialectics, a synthesis emerged.

The thinking needed to conceive a work methodology was done as action unfolded. The 'OK CAMBIO' improvisation, which came about during one of Prometheus interactions [P8: FN 64] was quickly formalized into a rule [e.g. P8: FN 65] becoming part of the emergent methodology. Additionally, the team, especially those in charge with the technological side of the working methodology, pursued an efficient effectiveness developing expertise in bricolage with limited but heterogeneous resources, as the 'GO TO CHAT paper' improvisation clearly exemplifies [P3: FN 35]. Finally, leadership was essentially accomplished through goals and milestones, giving individual members the perception that they were free to act as they wished as long as the goals / milestones were met [P0: FN 72].

Evidence of the presence of an evolutionary motor

The final element of the change mode we identify improvisation with is an evolutionary motor. This type of change motor has essentially three characteristics: 1) a population of entities which compete for limited resources which each one needs for survival; identifiable mechanisms for variation, selection and retention of entities in the population; and the parameters for these mechanisms are set at the macro-population level (Van de Ven & Poole, 1995).

As far as the first characteristic is concerned, the entities that comprise the population constituting the evolutionary motor are procedural routines, which may be improvised or not. The limited resource, in this case, is procedural memory, which each one of the routines needs for survival. Indeed, if a routine gets dropped from memory it will figuratively die since it won't ever be used again or at least until it is discovered anew.

Turning now to variation, selection and retention mechanisms, one can say that, at Prometheus, the meta-event and project goals, together with the sense of urgency pushed by the projects leader [P0: FN 72] act as a potent source of variation by generating a centripetal force that pushes for more and more variation. In fact, at any of the meta-events observed, an extremely high number of ideas gets generated and tested [e.g. P3: FN 34-38].

This generation process can take one of two possible shapes: action or conversation. When materialized in action, the generation process comes from individual and team attempts at either responding to a given 'unready for' event or looking for novel ways to accomplish current tasks [e.g. P6: FN 49]. When materialized in conversation, the generation process comes from an attempt to create procedures or routines for later action [e.g. P5: FN 43].

The selection process that acts upon these variations is deceptively simple but powerful: if an improvisation works it gets selected, meaning that it can be used again in the future (and 'lives') if an improvisation fails it will be forgotten until it is enacted again. The 'GO TO CHAT paper' improvisation is an example of a successful improvisation that got selected [e.g. P3: FN 35; P4: FN 39].

The retention process happens through the use of a given routine. The more times it gets used, the higher its salience on procedural memory and thus the higher

the probability that it will be used again. The 'OK CAMBIO' routine is an example of an improvisation that got retained in procedural memory because of the frequency of its use (after each completed sentence). The level of retention was such that this procedure was even put down in writing [P0: FN 72].

Improvisation at Prometheus also complies with the need for variation, selection and retention criteria to be determined at the macro-population level.

At Prometheus, variation was found to be determined by the level of declarative memory together with the joint action of both the 'motivation to improvise' and the 'potential to improvise' constructs. In other words, variation happened when the need to improvise was high and the level of declarative memory to improvise upon was also high – two macro level factors (Van de Ven & Poole, 1995). A clear instance of this occurred during the first video-conference when, due to a communication failure, the need for improvisation arose and JS improvised a number of attempts to solve that problem (high variation). People on the other end, the Asians, didn't make any effort to handle the problem (low variation) because their team didn't comprise anyone with substantial declarative knowledge on computer science [P3: FN 36-37].

As far as selection and retention are concerned, these depended essentially on the desirability of the action / routine outcome, its level of deliberateness and its salience. The improvisation of using a cellular phone to check a ISDN line status was an instance of selection and retention due to these factors, which are again macro-populational.

Evidence for the presence of a life-cycle motor

Now let us assess the presence of a life-cycle motor. This motor of change has three main characteristics: a singular discrete entity undergoes change, yet it maintains its identity throughout the process; the entity passes through distinguishable stages; a program exists in nature, social institutions or logic that determines the stages of development and their progression (Van de Ven & Poole, 1995).

Procedural routines do not fit the first category, however the Prometheus' goal – the methodology – can be considered a discrete entity undergoing a process of change, while maintaining its identity. Evidence from the various meta-events proves as much [e.g. P3: FN 34-38; P7: FN 52-63; P9: FN 67-71]. Nonetheless, as we saw when discussing the incremental / punctuated dialectic, the development of this methodology doesn't fit a model with distinguishable stages. In truth, it doesn't seem to develop cumulatively at all [e.g. P3: FN 36; P9: FN 69]. Consequently, it is also hard to find a development program underlying its evolution.

In the end, Prometheus, when regarded as an improvisational process, is not subjected to a life-cycle motor.

Drawing on the arguments above, Prometheus is an improvisational process and, as the argument put forth in the introduction led to expect, as a change process, it is driven by a teleological, a dialectical and an evolutionary change motor, thus substantiating the statement that improvisational processes fit one of the empty slots of Van de Ven's and Poole's (1995) framework and thus constitutes a newly discovered change theory.

Improvisation in jazz and in organizations

An additional, although somewhat implicit hypothesis in the introduction was that improvisation in organizations had relevant differences from that in jazz. The assessment of the tenability of this hypothesis – which is important because it allows those doing research in improvisation in organizational settings to evaluate the soundness of further pursuing the much-traveled road of using jazz as a source of insights for these settings – was accomplished by using Valhalla's Big Show as an infirmatory case. This means that a case that fulfilled all the traits that Weick (1999) defines as idiosyncratic to the context of jazz improvisation (see table 8 below) differing only in the fact that team members come from an (the same) organization was used to collect evidence that organizational settings have particular characteristics that account for relevant differences between organizational and jazz improvisation.

Table 8 – Valhalla's Big Show shares the characteristics of jazz improvisation.

	Jazz improvisation	Organizational improvisation
Short time boundaries	Yes	Yes
Fast tempo	Yes	Yes
Irreversibility of action	Yes	Yes
Physical and technological limitations	Yes	Yes
Memory of routines as enemy	Yes	Yes

In this light, and to use data from the case, one can see that the short time boundaries are present in the short time that Valhalla's team has to perform their Big Show together with the time constraints imposed on each member by the presentation script [V1: BH 112]. Fast tempo was provided by this script itself and by the somewhat high number of tasks that each member had to perform [V3: BH 117,120].

Irreversibility of action was caused by factors resembling those that cause it in jazz settings. The fact that there is an audience present and that each team member's

work was preceded by another's made it impracticable, if not impossible to 'go back' and reverse a mistake. In fact, even when Brunhilda went a few screens back to correct a mistake [V2: BH 114], this was not an act of reversibility because the perception of a mistake could not be erased from the audiences (and from her) memory. In this sense, to say that her going back shows the possibility of reversibility is the organizational equivalent of using the argument that jazz musicians can stop their performance and start over from the first head to contend that their performance is reversible.

Physical and technological limitations were also present in Valhalla's members' performance. The technological limitations are, in this case the most important ones. In fact, the ACT software they were using had some important limitations [V3: BH 120-124], was new to them and could crash or behave unpredictably when pushed above some limits [e.g. V1: BH 111]. The Prometheus case provides even clearer examples of organizational improvisations under significant technological constraints [e.g P3: FN 35].

Taking all of this into consideration, it can be said that Valhalla's Big Show shared indeed the major characteristics of the context of a jazz performance, the question now if equally shares the characteristics of its process.

Even the most cursory analysis of the case interviews answers with a resounding 'no'. In truth, the negative connotation that performing unplanned action and facing unplanned events pervades both interviews. In fact, Brunhilda even states that if it hadn't been for Odin's (her boss) pressing the need to do a live performance, all of the Big Show team members would have done a previously taped presentation [V1: BH 112]. Brunhilda's negative feelings towards the unexpected further support this assertion. In the end, the major difference between jazz and organizational

improvisation is that in the latter the hallmark is to perform as composed while that of the former is to compose as performed or, in other words, organizational performance must follow a plan while jazz performance builds its plan (while playing) (Eisenberg, 1990; Bastien and Hostager, 1988). This creates important differences in jazz and organizational improvisational performance.

Firstly, in organizations rehearsals are viewed as a way to enhance compliance with plans, whereas in jazz they are viewed as a way to build improvisational capacity (the ability to deviate from plans). The way that Brunhilda perceives her team's rehearsals as a way to correct mistakes and make a plan for their presentation [V1: BH 110] is an example of this.

Secondly, in Valhalla's Big Show, alternative plans were created so team members had a plan to follow when and if their core one failed [V1: BH 112]. In jazz because of the role of 'action enabler' (*vis-à-vis* 'action constrainer') played by the musical score (the plan) no redundant plans are ever conceived (Barrett, 1998).

Thirdly, and most importantly, in organizations the need to improvise is forced upon individuals, whereas in jazz improvisation is actively practiced and sought by players (Hatch, 1999). In Valhalla's BigShow, improvisations only occurred when technology failed, when there was no time to plan [e.g. V2: BH 113-114] and when novel demands were place upon the team by their boss [e.g. V1: BH 111]. The team members preference for a taped presentation [V1: BH 112] further supports this argument.

The case also shows that improvisation can happen at the individual level, as when Brunhilda serendipitously discovered a solution for an apparently unsolvable problem on her own [V3: BH 122-123].

Another important difference between organizational and jazz improvisation is visible in the 'Go to chat' improvisation at Prometheus [P3: FN 35]. This instance shows that simple tools (pen and paper) can replace high knowledge (instrumental virtuosity) in fostering high levels of improvisational competence, in a line of reasoning close to the one used by improvisational *gestalt* therapists when advocating the use of simple instruments (e.g. baby rattles, drums, bells) to work with their patients (Southworth, 1983).

Finally, another difference between jazz and organizational improvisation is related to the audience's attitude towards performers, as Brunhilda eloquently noted "in a jazz concert, the audience is friendly because it is mostly composed by fans of the band or one of its players, in an organization the audience is more hostile" [V2: BH 115].

Table 9 below outlines the major differences between improvisation in jazz and organizational settings.

Table 9 - Major differences between improvisation in jazz and organizational settings.

	Jazz improvisation	Organizational improvisation
Use of rehearsals	Enhance improvisational ability.	Reduce the need to improvise.
Use of back-up plans	No	Yes
Attitude towards improvisation / novelty	Positive. Improvisation is sought.	Negative. Improvisation is avoided.
Source of improvisational capacity	High knowledge.	Simple instruments.
Groupality of improvisation	Group phenomenon.	Individual and group pohenomenon.
Attitude of the audience	Friendly.	Hostile.

All these differences seem to point out that jazz and organizations are qualitatively different settings for improvisation. Even when the context features that habitually characterize jazz settings occur in organizational ones, organizational and jazz processes of improvisation differ significatively. This calls (and allows) for the

isolation of organizational specific factors related to this phenomena, an instance of which are those shown in the table above, which is completed by the grounded model that resulted from this research, which was presented earlier.

Furthermore, this supports the claim made in the introduction for outgrowing jazz as a metaphor for studying organizational improvisation and either find a new metaphor or use empirically-grounded research to advance theory on this topic.

External and Internal Validity of the Results

External validity

Although the external validity of this research was already discussed in the 'METHOD' section, it will be now reviewed in light of the results.

In essence, there are two major possible challenges to the external validity of this research.

The first one pertains to the generalization of results based on a grounded theory methodology.

There are two arguments to address this criticism.

On the one hand, this research is driven by a logic of replication, not by a logic of sampling. In fact, a sampling logic is concerned with discovering characteristics shared by a certain population for which the number of cases I used is clearly insufficient. However a replication logic is concerned with discovering relationships among several phenomena. Thus this type of research only needs a small number of theoretically representative cases (Strauss & Corbin, 1990).

On the other hand, and related to this being a replication logic research, our lack of empirical degrees of freedom is replaced by a considerable number of theoretical degrees of freedom. This means that instead of using a large number of different observations the researcher has made in order to test the same theory, this logic relies on using a number of different theories to look at the same observation (case or set of cases) (Campbell, 1975; Yin, 1984). In truth, it is possible to argue that this research in particular enjoyed at least 12 theoretical degrees of freedom (six from the interviews plus four from the different metaphors laid out on the introduction plus

two from my efforts in increasing theoretical sensitivity which resulted in two different models of improvisation grounded in the literature).

Additionally, the sampling criteria upon which cases were chosen provides high variability among cases, as shown by table 10 below.

Table 10 – Differences across cases

Field note #	# of people	# of different organizations	# of different countries	Special characteristics
P3	6	4	3	Video conference with most project partners aiming at establishing commitments.
P4	1	1	1	Testing technology (safe environment)
P5	2	2	1	Testing technology (safe environment)
P6	2	2	1	Testing technology (safe environment)
P7	4	2	1	Live performance before Portuguese Minister of Science.
P8	4	3	2	Joint product development
P9	10	5	4	Live performance before Portuguese Prime Minister, the media, and top superior.
V1,V2,V3	3	1	1	Live performance before clients, partners, colleagues and superiors

The second possible challenge to this research is related to the fact that group instances of improvisation were computer mediated and thus this research's results are not generalizable to non-computer mediated settings. There are two arguments to address this criticism.

On the one hand, research from Ambrosini et al. (1999) has shown that, at the group level, the effect of computer mediation on member's interaction is negligible.

On the other hand, there are many instances of improvisation at both Prometheus and Valhalla that are not computer mediated [e.g. P8: FN 66; P9: FN 69].

Internal validity

Internal validity is always an issue present in qualitative methodologies.

Two issues are of particular significance to this research.

The first one pertains to another researcher's ability to reach the same results if following the same process. The strict discipline imposed by Strauss's and Corbin's (1990) method for grounded theory building (which I followed) seems to answer this issue affirmatively. Nonetheless, the biggest threat to internal validity may not be in the process of building theory itself but instead in the biases that the researcher brings with him / her. In this research, several efforts were made to reduce this bias.

Firstly, one of the data sources used were the six interviews made to academicians, consultants and academicians / practitioners, which resulted in the same number of models of organizational improvisation.

Secondly, there was the integrative literature review on improvisation in four major areas: jazz, therapy, role theory and organizations.

Thirdly, and finally, I was given the task of preparing, at different points in time, two integrative frameworks of the literature on organizational improvisation, which resulted in two more models of this phenomenon.

Ultimately, the test of a grounded theory's internal validity comes from the number of unexpected findings, be they new concepts or new relationships (Strauss &

Corbin, 1990). In fact, there were several unexpected instances of both, emerging in this research: the three most important instances of each are shown below.

Three unexpected concepts

The three unexpected concepts I deem more important are: humor, event characteristics and meta-event importance. None of the different approaches to improvisation ever mentioned any of these concepts.

Humor was found to have a very important role in member's active managing of their level of affectivity, which was in turn found to influence the outcomes of improvisation.

Event characteristics allow for a fine-tuning of the 'turbulence' and 'spontaneous' triggers of improvisation. Additionally, the 'event importance' concept has been totally ignored by the literature, which seemed to believe that the occurrence of an unexpected event in conditions of speed was enough for improvisation to be triggered. The number of instances in which Prometheus members gave up on unexpected and urgent but otherwise non-important events, infirms that belief.

Finally, and most importantly, the concept of the meta-event proved one of the most surprising findings in our research – not only no mention whatsoever had ever been made to this concept but it also appeared to be the decisive variable as far as people's attitude to unexpected and urgent events were concerned. In fact, in unimportant meta-events, even important, unexpected and urgent events were forfeited, whereas none was so at important ones.

Three unexpected relationships

A first unexpected relationship was that between several concepts and the level of groupality of improvisation (which I termed 'improvisation authority'). In fact, literature on improvisation has still to address the issue of the transition between individual and group improvisation, to which the relationships that emerged from this research can give a contribution.

A second unexpected relationship related to the dynamics between action based (Berry & Irvine, 1986; Scribner, 1986) and conversation-based improvisation (Orr, 1990; Brown & Duguid, 1991). Until now, the literature has been treating these phenomena separately. My findings, however, suggest that they are both part of a temporal alternating dynamic.

Finally, this research uncovered a puzzling relationship between improvisation novelty and improvisation success. Both at Prometheus and Valhalla, every single instance of very novel improvisation (wide departure from canonical practice) was successful – a strange finding because several authors affirm that the more an action / product is novel, the more prone it is to fail (Craig & Hart, 1992; Porter, 1982; Peters, 1987).

Explaining disagreeing results

When using a grounded theory methodology, the cases that do not fit the model are more of a puzzling nature than of a disagreeing one. There were two types of phenomena that appeared occasionally that I found hard to comprehend.

The first of these phenomena concerns the pervasiveness of procedural memory. Appart from the 'explained' routine/fail/improvise, improvise/fail/improvise and improvise/fail/conversation/improvise patterns, I found two others that I could not

make sense of, in the light of the model that emerged from the data. One was the improvisation/fail/routine pattern, the other was the routine/fail (repeated 'n' times, and 'n' went from 2 to 17!). A possible explanation for the first one was that there was a very powerful bias for improvisation working in the people performing it and as soon as they realized the improvisation did not work, they relied on procedural memory. A possible explanation for the second pattern was that the person enacting it had a very powerful procedural memory or a very slow velocity of abandoning it. Both these instances are explained by my grounded model. What the model cannot explain is that these patterns happen with the same person, with a very short time interval and with equal or comparable events! The literature on organizational improvisation and organizational memory provided no clues as how this pattern might come into existence.

The second type of phenomena addresses the issue of national culture and improvisation. The puzzling nature of the data came from the following:

a. Prometheus' members from Asia were able to improvise and even to produce high-novelty improvisations.
b. Prometheus' members from Asia were those with a higher degree of routinization of improvisation [e.g. P3: FN 38].
c. Prometheus' members from Asia, when answering the survey asked me the following: "in our opinion the actions we took during the video conference followed the plan. So must we answer the question about UNPLANNED actions / decisions?" (see appendix F). However, in that meta-event (the live demonstration), the Asians did improvise [P9: FN 70] and avowed as much [P9: FN 71].

d. In the survey, Prometheus' members from Asia said that they completely figured out actions as they went along, that they strictly followed a plan in taking these actions (!), and that these actions were mostly spontaneous.

How can all of this be integrated? One alternative is arguing that Prometheus' members from Asia have in fact a culture that permits improvisation but a need to 'save face' keeps them from avowing it, even though they knew that I was present at when it occurred.

An alternative explanation: Complexity, creativity and garbage cans

I found three possible alternatives to explain the phenomena observed in the cases used in this research: complexity theory, creativity theory and garbage-can models of decision-making. Because none of these models is the underlying theoretical framework guiding this research, I will only make a cursory illustration on how data from Prometheus fits these theories and argue why improvisation is fitter to explain it.

Complexity theory

Complexity theory can also be used explain the phenomena we found at both Prometheus and Valhalla.

In fact, Prometheus can be seen as a complex adaptive system that can survive and thrive amidst the entire emergence that surrounded it.

A complex adaptive system is composed by an explicit structure and a shadow structure (Stacey, 1996).

At Prometheus, the roles of the shadow and the explicit structures, are the opposite from their normal use. In truth, because this project is carried out by a team

with mostly informal ties linking its members, its explicit structure is one that generates variation. The shadow structure of Prometheus, composed by goals, milestones and a few working rules has the role of bounding the variation, acting as a "strange attractor" around which the team's spontaneity gravitates (Lane & Maxfield, 1996).

In sum, complexity is a valid lens to understand the events that unfolded at Prometheus both at the macro and the micro level. There is one reason however that makes organizational improvisation a fitter approach to study them: the fact that improvisation possesses a teleological model and complexity theory does not, and thus allows for an explanation of the final result of this project (or more visibly of Valhalla's BigShow) closer to the observations this research draws on, than complexity theory does.

Creativity Theory

According to Amabile (1998) creativity comes from the interplay of three major elements: motivation, creative skills and knowledge.

Creative skills are quite visible at Prometheus in the fact that some of the group's outputs constitute clear deviations from the canonical use of resources [e.g. P3: FN 35].

Knowledge, in the form of both declarative and procedural memory is also present in a high degree, at least as far as JS, PA (both in computer science) and SS (in CAD design) are concerned. The breadth of solutions they find for the problems that keep coming up, are a clear indicator of a high procedural and declarative memory [e.g. P5: FN 42-47; P6: FN 48-51].

Intrinsic motivation is also high, as a look at Prometheus' team and its context through the lenses of Amabile's (1998) model shows.

In effect, individuals perceive this project as challenging, because of the state-of-the-art technology involved. An indication of this is JS initiative throughout the whole project, especially visible in the sessions where he and PA experiment with some technology [e.g. P6: FN 49-51].

As far as resources are concerned, these are available but are somewhat limited and heterogeneous, thus pushing team members to bricolate, which is an important instance of creativity (Berry & Irvine, 1986; Scribner, 1986; Thayer, 1988) [e.g. P3: FN 34-37].

Work groups have more than the necessary diversity for creativity to arise: Prometheus team members come from four different countries and seven different companies; hence the fact that most of them share an engineering background seems to be the only similarity they share.

As far as supervisory encouragement goes, TheCenter's COO participates actively in all Prometheus video-conferences and TheCenter's / BigPlayer's CEO sent several messages of encouragement to team members [P0: FN 72].

Finally, organizational support is signaled by the direct access that every team member has to the TheCenter's / BigPlayer's CEO and by the allowance of ilimited time to work on the project.

Prometheus appears thus to be, in essence, a creative endeavor. However, creativity obfuscates the structure upon which the project relies to coordinate members in order to achieve the organization's common goals. In short, using a term from complexity theory, creativity does not take into account the 'shadow' restraining structure that ensures coordination among members.

Garbage-can models of decision-making

Prometheus also fits a garbage-can model of decision-making (Cohen, March & Olsen, 1972).

There are three conditions that Prometheus must meet in order to be an adequate setting for a garbage can model to emerge.

Firstly, its members have to have problematic preferences, meaning that their preferences are discovered through action. JS enthusiasm with CUSeeMe as a video-conferencing software and later preference for NetMeeting [P5: FN 42-47; P9: FN 67-71] and his touting of VRML as the only possible way to share CAD files and his later choice of MasterCam [P7: FN 52-63] are clear instances of this type of preferences.

Secondly, the technology must be unclear. At Prometheus, changes in technology from one meta-event to the other are a clear instance of this characteristic [P0: FN 72].

The third and final characteristic is fluid member participation. Again, Prometheus fits this characteristic perfectly: each meta-event relied on a different mix of partners, which never repeated on the course of the project – only JS and TheCenter seemed to be present in all events, but then that was probably because they were my basis of observation and thus any event that did not include them was beyond my awareness.

Because of filling all of these characteristics, Prometheus can be labeled an organized anarchy and is thus a fertile ground for garbage-can processes (Cohen et al., 1972).

To assess if Prometheus was in fact a materialization of a garbage-can process let us see if it fits this type of process' major characteristics.

The first characteristic of such a process is the resolution of problems by flight. This is indeed observable at Prometheus via the number of problem that gets dropped. The faking of a solution at the live demonstration meta-event [P9: FN 70] is the most striking evidence of this characteristic's presence.

The second characteristic is that during high workload times, problems do not get solved. In fact, the only three attempts at 'solving' the core project problem (finding a methodology) happened during low workload times. As soon as the major project meta-events appeared, no more attempts were made at it (see Prometheus 'real' timeline in figure B2, appendix B).

The third characteristic is that people keep working on the same problem, being occasionally met with choice opportunities, to which they apply their partial solutions, but without ever solving the problem. In truth, this is exactly what happened as far as JS work was concerned: he kept testing software and hardware in a quest for the final choice of technology, being occasionally met by meta-events to which he applied part of his current solutions, but without ever getting to a final choice of technology (see Prometheus 'real' timeline in figure B2, appendix B).

The fourth characteristic of garbage can processes is interactivity, i. e., the quick solution of problems as soon as they emerge. This was exactly the focus of our study and a recurrent characteristic at Prometheus.

The fifth characteristic is that important problems are more likely to be solved than less important ones – one of this research's findings (Propositions A5 and A6).

The sixth characteristic of a garbage can process is that important choices (meta-events) are less likely to contribute to problem solution than less important ones. This is again visible at Prometheus, where most of technological methodology

came from JS's and PA's interactions, and not from important meta-events (see Prometheus 'real' timeline in figure B2, appendix B).

Finally, choice failures are more likely to happen at high –importance or low importance events. This characteristic is shared by Prometheus in the sense that its major choice failures (unsolved problems) were the first video-conference (which was considered a highly important event) where nothing got accomplished at all [P3: FN 34-38] and some interactions with AMPLayer, in which one side of the team was not present [PI2: JS 78].

As the last paragraphs show, Prometheus fits in a garbage-can model. However, this model fails to account for the dialectical nature of the process: the confrontation between effectiveness and efficiency present in bricolage, the co-existence of control and autonomy and the tension between planning and acting.

Limitations of the present research

This research effort has some limitations, which can be divided in two major groups: (a) data collection related limitations and (b) data analysis related limitations.

Data collection related limitations

The most important limitations as far as data collection is concerned are the five following: (a) cognitive limitations; (b) social desirability of respondents; (c) restriction of cases to computer-mediated contexts; (d) small sample for interviews; (e) poor field notes due to the absence of taping.

Cognitive limitations in grounded theory relate to a researcher's inability to be everywhere at the same time, which can lead to important phenomena to remain

unobserved and thus unknown. In this research effort, this was a particularly accute issue.

At Prometheus, my experience with video-conferencing taught me that improvisation most often than not happened beyond the range of a web-camera and thus my observations mostly pertain TheCentre's improvisations because that was where I was based. Additionally, after the Minister of Science visit, some reason (unknown, at least to myself) led to a reduction in cooperation from its staff, especially JS who had the role of notifying me when any occurrence was to happen. This led to my absence from all but the final video-conference of the joint TheCentre / AMPlayer product development and probably from some other events I'm not even aware of. In spite of this, I was able to complement my absence with interviews and a look at the project's final report shows that any event I missed was not part of any important meta-event.

At Valhalla, my observation was much more limited. I only had access to one of the team members, but my observation's were limited to three interviews, a free-form (and somewhat incomplete) diary and from an observation of the actual BigShow. However, in virtue of this being a secondary case and due to the fact that it was the actual event that most interested me, the results were not seriously affected by these limitations.

There is still another issue indirectly related to cognitive limitations that I must mention. Due to the fact that it is not possible to pry a human brain open and look at the workings inside (from a cognitive point of view, that is), I was unable to observe how the process of improvisation really happened at the micro-behavioral level and thus some concepts and relationships are likely to be missing from the grounded model presented above. Again not a very problematic issue, because this

research was not aimed at such a level. A more serious cognitive limitation comes from the fact that a typical researcher does not hold enough knowledge of computer science to detect subtler improvisations performed with this type of technology. Fortunately, computing is one of my personal interests and I am familiar with most internet applications, some programming languages and, because of the pervasiveness of piracy as far as personal productivity software is concerned, I am used to have to understand the major workings of a program without the help of a manual.

The second limitation related to data collection pertains to the subjects' tendency to give the answers they think the researcher wants to hear (social desirability) and may additionally have rationalized the events they are being questioned about.

At Prometheus this is not much of an instance. Interviews were scarce, as observation was chosen to be the major data collection mechanism, and mostly about specific characteristics of the projects, which I later checked on the final report.

Valhalla's BigShow case was much more permeable to this kind of issues because it was mostly based on interviews, and the subject was informed of the topic of the researcher's inquiry. In spite of this, the fact that this case was used for assessing the differences between organizational and jazz settings and the existence of data from Prometheus to cross-check helps diluting the influence from this factor.

Interviews on improvisation were also potentially affected by this issue. Nonetheless, the fact that these interviews were used only for theoretical sensitivity and not to build the model directly offsets the potential effects of social desirability's pervasiveness.

A third data collection related limitation is the fact that both Prometheus and Valhalla are, each one in its own way, instances of computer mediated

communication. Valhalla's BigShow was in fact a demonstration of software integration and Prometheus is all about computer-mediated interaction. In our understanding, this is not a limitation due to, at least, three major reasons: (a) this research uses a replication, not a sampling logic (see 'external validity' above) and thus is not seeking a representative sample; (b) a number of improvisations, both at Valhalla and Prometheus happened outside a computer mediated context; (c) as stated above, research on computer mediated interaction shows that as far as group processes are concerned, computer mediation is not relevant (Ambrosini et al., 1999).

A fourth possible criticism to this research is that, the samples are too small for any inference to be made. Again, this is not a true limitation because we are using not a sampling logic but a replication one. Consequently, only theoretical and not statistical significance is to be tended.

Finally, the last major limitation that could be pointed at this research is that the absence of taping at Prometheus can have led to poor field notes. Indeed, taping conversations and video-conferences would provide a richer data set. However, in my first visit, I realized that, due to the fact that I was introduced to TheCenter's members by the CEO, I was being perceived as a 'spy' of some kind and thus I decided to let go of my tape recorder in order to build trust with the subjects. I believe that my losses in terms of information because of distrust would far exceed the ones I endured because of not taping the events at Prometheus.

Data analysis related limitations

The most important limitations as far as data analysis is concerned are the five that follow: (a) lack of quantification of the relative influence of each variable; (b) using a different model from Strauss and Corbin's (1990) paradigm; (c) improvisation

may not be the 'real' core category; (d) biased literature sample; (e) influence by preconceptions.

In what concerns the first limitation, a lack of quantification of the relative influence of each variable, I admit in fact that its knowledge would provide a much more accurate model of improvisation. In fact, there are variables whose influence may be marginal and even the constructs can turn out to be different after some kind of statistical analysis. However, those were not the issues that this research was set out to answer. The point here was to allow these variables, constructs and relationships to emerge from the data. There were no propositions – not even variables – to test when this study began: only a pile of theoretical articles which seldom mentioned any type of testable relationship and with very little agreement with each other, even when the same author is concerned (e.g. Weick, 1999a, 1993a, 1998; Moorman & Miner, 1995, 1998a, 1998b). Additionally, testing these relationships after this model was completed would be a Herculean task – although, I must confess, a tempting one.

Regarding the fact that I did not use Strauss and Corbin's (1990) paradigm model, this is only true at first sight. The fact is that, as the figure B5 (in appendix B) shows, I had to reframe the causal linkages these authors propose because of two reasons: (a) the phenomenon I studied was an action strategy, so both these elements coincide; and (b) the context was both an intervening condition and part of the causes.

Related to the above statement is the possibility that a further limitation of this research was the choice of improvisation as a core category. In fact, although this was the most salient category in the data, other choices were available. Learning was one of those choices. In fact Prometheus is a process about learning a new methodology. Nonetheless, data from Valhalla supported 'organizational

improvisation' as a core category but not 'learning'. The same happened with the interviews we made. Improvisation is a phenomenon broader than learning, as learning can also be broader than improvisation (Crossan & Sorrenti, 1997). I chose improvisation.

The fourth limitation that can be pointed out in this study, concerning data analysis, is the possibility that the literature sample chosen to develop theoretical sensitivity was limited and biased. It seems hard to prove so. The most cursory of looks at the introduction shows that at least four major areas of improvisation related literature were reviewed with some depth. In addition, a look at the references of this study shows that other areas were taken into consideration, like teaching, anthropology and children developmental psychology.

Finally, the last major limitation involves the presence of preconceived notions about relationships and concepts. The breadth of the literature review, together with that of the 'theoretical' interviews should be enough to quiet this limitation. Nonetheless, to be honest this limitation constitutes more than a danger than I would like to admit. In fact, although I am not wedded to any particular model of improvisation, as my previous work on this topic shows (Cunha, Cunha & Kamoche, 1999), there is one hypothesis that I believe in that I brought to this research: the fact that 'immediacy of planning' and 'bricolage' are part of a single construct. This is in fact the theory-in-use by most authors, although their espoused theory differs, as I have argued before (Weick [1998] is the most striking example). However there have been some discussions among me and my colleagues which might have led me to reinforce my belief through defensive routines (Argyris, 1974; Argyris & Schon, 1992). The reader is thus advised to look upon this finding (yes, this

association did come up in the data) warily and check the data provided in the appendixes, with the knowledge of this predisposition of mine.

Suggestions for further research

To address the suggestions for further research that arise from this study, I'll step back from my choice of paradigm and address implications for those wedded to positivism, to weak-constructivism and to strong / radical constructivism (McCourt, 1997).

Positivism

Positivism is the paradigm that benefits the most from this study. With 54 suggested propositions, 64 variables and 5 major constructs, this study gives positivists plenty to work from.

Two major issues seem to be worthy of priority: to find if there are cultural differences to improvisation, perhaps by applying a hypotheses-testing questionnaire to different cultures, and to perform the same exercise with computer-mediated vs. non computer-mediated teams, to see if Ambrosini et al.'s (1999) argument stands as far as improvisation goes.

Finally, a research aimed at understanding the sequencing of action choices (on of the puzzling phenomena found in our data) seems to be worthy of inquiry.

Weak constructivism

Those wedded to this paradigm can find two research challenges coming from this study.

The first is to study improvisation at the micro level to answer the question of what are the psychological mechanisms that trigger and influence improvisation, and what are its outcomes at the individual level?

The second is to study improvisation at a very macro level, maybe through a comparative management framework, in order to assess the impact of national culture on it.

There are still other challenges, like that of understanding the role of humor in change management and that of building a grounded theory of the functioning of dialectic structures.

Again, a finer understanding of the sequencing of action choices (one of the puzzling phenomena found in our data) can also be achieved through weak constructivist methods, such as grounded theory.

Strong constructivism

Finally, those wedded to this paradigm have also some important challenges. Finding a metaphor for improvisation at the individual level is maybe the most salient one. However there are other concepts that came out of this research that appear to be worth of being studied through metaphor, namely the fact that unimportant events or important ones in unimportant meta-events get discarded from attention. Dialectical structures are also a topic that seems to be a fertile ground for metaphor based inquiry.

CONCLUSION

This research set out what to find the regularities among improvisational actions in organizational contexts. Through multiple-case grounded theory analysis I found that there is indeed such a thing as improvisational organization, which was a most pervasive characteristic among the organizations studied here.

The regularities among all of the improvisations observed in the data allowed the building of a grounded model of organizational improvisation, which brought five contributions to theory on organizational improvisation and to organization theory in general.

Firstly, it provides an organizational grounding for all of the theoretical issues and debates, which gravitate mostly about jazz in particular, and metaphors in general.

Secondly, it provides a grounded definition of organizational improvisation by arguing, drawing on empirical data, for the aglutination of bricolage and immediate planning under one construct – that of organizational improvisation.

Thirdly, it provides a set of variables and relationships that aim to serve not as a final theory of organizational improvisation, but to be an input in the building of that theory, be it through positivist 'hypothesis-testing', through grounded theory building around the interrogations that emerged from the data, or through building metaphors to shed new light on these interrogations.

Fourthly, it suggests an alternative, a synthetical perspective, on answering two important debates in change theory – the deliberate vs. emergent change and the incremental vs. punctuated change – by showing that there is such a thing as deliberate emergence and punctuated incrementalism.

Finally, it provides empirical evidence to build a new model of change – driven by teleological, dialectical and evolutionary motors – to fill one of the two empty slots in the theoretical framework for organizational change of Van de Ven and Poole.

Researchers doing a master's or a doctorate thesis often feel that their thesis must change the World and make a contribution to their field at least as important as that of Isaac Newton or Albert Einstein to Physics.

If one thing came out as a personal lesson from this research is that all of us that reach the final lines of the conclusion and see no Law of Gravity nor $E = MC^2$ in the pages behind us may perhaps have given a contribution to Science as important as these are – we may have altered organization science forever because organizational improvisation shows that small incremental steps can lead to punctuated, radical changes.

I can only hope that that is the case with my contribution for a grounded theory of organizational improvisation.

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