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**INNOVATIVENESS AND PREJUDICE:  
DESIGNING A LANDSCAPE OF DIVERSITY FOR  
KNOWLEDGE CREATION**

Tese de Doutorado apresentada ao Programa de Pós-Graduação em Engenharia e Gestão do Conhecimento da Universidade Federal de Santa Catarina como requisito parcial para obtenção do grau de Doutor em Engenharia e Gestão do Conhecimento.

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KNOWLEDGE CREATION**

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Florianópolis, 05 de Março de 2015.

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Este trabalho é dedicado ao meu filho,  
à minha esposa, ao meu irmão, à minha  
irmã, à minha mãe e ao meu pai.  
Pessoas únicas.



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This is a research as ‘true fiction.’<sup>1</sup>

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<sup>1</sup> (ALVESSON; SKÖLDBERG, 2009, p. 310)



## ABSTRACT

The contemporary organizational interest about innovation has led to several attempts to tame it through broad calls for creativity and design practices. Most of the times, these calls evade the confrontation between the process of continuous renewal of the ephemeral on one side; and the tradition and prejudice on the other. The purpose of this study is to make sense of a discourse that augment the potential of groups to create knowledge so to act into the future, towards better performance and longevity. Based on the concept of Need for Closure, from a hermeneutic perspective and inspired by a reflexive methodological approach, the present study sheds light on the impacts of prejudice on innovative efforts of groups. The presented data and results answer positively the research question of this thesis by indicating that there is a relation between the motivated cognitive tendency of an individual in a group (NFC Mean) and the potential of that group to create products perceived as innovative (OUP Mean). These results enable to describe NFC Mean as a positive and significant predictor of OUP Mean. Supported by an empirical study and quantitative data analysis, it proposes a Prejudice Related Innovativeness Determinants Heuristic (PRIDHe) to enable groups to effectively augment their innovative potential. The heuristic suggests forms of assigning people to and defines a governance policy for groups, in order to provide a creative environment where prejudice does not so much confine actions as suggest new opportunities to act into the future. The main theoretical contribution of this work lies in the reflections about the positive impacts of prejudice in innovative efforts. The discourse proposed by this text can be summarized as: *organizations that are aware about their prejudices and the impacts of these are more likely to perform better.*

**Keywords:** Groups. Need for Closure. Innovation. Knowledge. Design. Sensemaking. Prejudice. Hermeneutic.





## RESUMO

O interesse organizacional contemporâneo a respeito da inovação levou a várias tentativas de domá-la por meio de amplas chamadas para as práticas de criatividade e design. Na maioria das vezes, essas chamadas fogem do confronto entre o processo de renovação contínua do efêmero de um lado; e a tradição e o preconceito, por outro. O objetivo deste estudo é fazer sentido de um discurso para aumentar o potencial de criação de conhecimento de grupos, de modo a atuarem na direção do futuro, para um melhor desempenho e longevidade. Baseado no conceito de Necessidade de Enquadramento (Need for Closure), a partir de uma perspectiva hermenêutica e inspirado por uma abordagem metodológica reflexiva, o presente estudo lança luz sobre os impactos do preconceito nos esforços inovadores de grupos. Os dados e resultados apresentados respondem positivamente à pergunta de pesquisa da tese, indicando que existe uma relação entre a tendência de motivação cognitiva de indivíduos em um grupo (NFC Mean) e o potencial desse grupo de criar produtos percebidos como inovativos (OUP Mean). Esses resultados habilitam a descrever o NFC Mean como uma variável preditora (ou explicativa) positiva e significativa do OUP Mean. Apoiado por um estudo empírico e análise quantitativa de dados. Assim, este estudo propõe uma heurística baseada em determinantes de inovatividade relacionados a preconceito (denominada Prejudice Related Innovativeness Determinants Heuristic – PRIDHe), para aumentar efetivamente o potencial inovativo de grupos sociais. A heurística sugere formas de alocar pessoas em e define uma política de governança para grupos, a fim de proporcionar um ambiente criativo onde o preconceito não somente limita as ações como sugere novas oportunidades de atuar em direção ao futuro. A principal contribuição teórica deste trabalho reside nas reflexões sobre os impactos positivos do preconceito nos esforços inovativos. Em seu núcleo, o discurso proposto neste texto pode ser resumido como: *organizações cientes de seus preconceitos possuem maior probabilidade de apresentar um melhor desempenho.*

**Palavras-Chave:** Grupos. Necessidade de Enquadramento. Inovação. Conhecimento. Design. Sensemaking. Preconceito. Hermenêutica.



## The Landscape Map

At the next page there is a figure of a map to support the reading of the following texts. The structure of this document was thought as a *consequence* (DEWEY, 2013, p. 02) of texts. Depending on which specific cognitive interests is chosen, this document does not need to be read in its entirety. The Landscape Map indicates on which path to follow in order to fulfill one's main cognitive interest.

The structure of this document is divided into three sections and four parts: an introduction with approximately 40 pages, four divergent parts discussing the research through four different voices, with some 45 to 70 pages each; and a converging discussion with roughly 30 pages.

The present text offers three paths towards fulfilling different human cognitive interests, which were based on Habermas suggestion that reality is apprehended through three categories of possible knowledge (HABERMAS, 1971, p. 313):

information that expands our power of technical control; interpretations that make possible the orientation of action within common traditions; and analysis that free consciousness from its dependence on hypostatized powers.

Based on those assumptions, there are three different cognitive paths to guide the readings of this document:

1. Technical: by reading the Mineral (55 pp), Stone (45 pp) and Converging Discussion (30 pp) it should be possible to apprehend in some 130 pages the construction of data and its causal explanation, towards providing information that expands the power of technical control;
2. Historical-Hermeneutic: by reading the Introduction (40 pp), Stone (45 pp), Mountain (50 pp) and Converging Discussion (30 pp) it should be possible to apprehend in approximately 165 pages the understanding of meanings based on the history of this research, towards constructing interpretations that make possible the orientation of action within common traditions, enabling to act and to reflect;
3. Emancipatory: by reading the Introduction (40 pp), Mountain (50 pp) and Landscape (70 pp) it should be possible, in 160

pages, to enable reflections towards freeing consciousness from its dependence on hypostatized<sup>2</sup> powers.

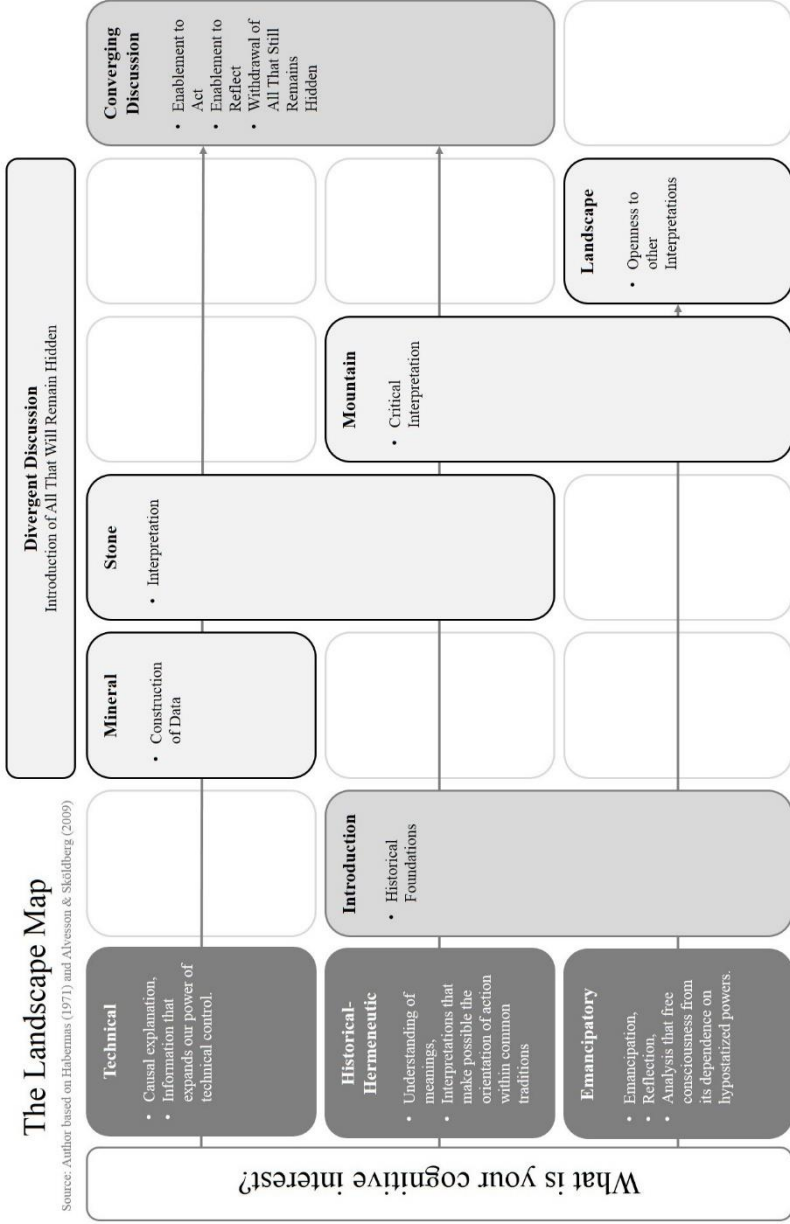
Although presented as separate, “there is a close relationship between the three varieties of cognitive interest” (ALVESSON; SKÖLDBERG, 2009, p. 156). After all, emancipation is dependent upon the empirical-analytical knowledge to be able to understand the difference between what is given by nature and what is socially constructed.

---

<sup>2</sup> Hypostasize: treat or represent (something abstract) as a concrete reality.  
<http://www.oxforddictionaries.com/us/definition/english/hypostasize>

# The Landscape Map

Source: Author based on Habermas (1971) and Alvesson & Skoldberg (2009)





## INDEX OF FIGURES

Figure 1 – From Service Innovation to Prejudice .....	63
Figure 2 – The hermeneutic circle: basic version .....	67
Figure 3 – Possible Research results: quadrants .....	78
Figure 4 – Cognitive Interests, Knowledge and Research .....	92
Figure 5 – The Proposed Structure for the Present Document .....	93
Figure 6 – The Landscape Map .....	98
Figure 7 – The Structure for the Studies .....	121
Figure 8 – OUP Mean and NFC CoV relation .....	146
Figure 9 – OUP Mean and NFC Mean relation .....	146
Figure 10 – Horizons of Innovation and other elements .....	260
Figure 11 – Narrowness of Horizon and other elements .....	261
Figure 12 – High diversity of Horizon and other elements .....	261
Figure 13 – Fusion of Horizons and other elements .....	262
Figure 14 – Proposed positioning between NFC and Prejudices .....	263
Figure 15 – OUP/NFC Inverted U Relation at UNI.1.02 .....	277
Figure 16 – Innovativeness Sweet Spot .....	278
Figure 17 – The Explanation of the Business Cycle .....	282
Figure 18 – Cognitive Interests, Knowledge and Research .....	291
Figure 19 – Cognitive Interests and Levels of Predictability .....	293
Figure 20 – The strange symmetry of Innovativeness .....	306
Figure 21 – Model of the Triple P.....	316
Figure 22 – Expanded Model of the Triple P.....	323
Figure 23 – Determinants of PRIDHe.....	334
Figure 24 – Circles of PRIDHe.....	347
Figure 25 – Orbits of PRIDHe .....	354





## INDEX OF TABLES

Table 1 – Search results for the attractor <i>Closure</i> .....	111
Table 2 – Search results for the attractor <i>Prejudice</i> .....	111
Table 3 – Search results for the attractor <i>Mindedness</i> .....	112
Table 4 – Search results for the attractor <i>Sensemaking</i> .....	112
Table 5 – Search results for the attractor <i>Innovation</i> .....	113
Table 6 – Search results for the attractor <i>Innovative</i> .....	114
Table 7 – Search results for the attractor <i>Innovativeness</i> .....	114
Table 8 – Search results for the attractor <i>Group</i> .....	115
Table 9 – Search results for the attractor <i>Intergroup</i> .....	116
Table 10 – Illustrative Matrix of the Research Gap.....	117
Table 11 – Legends of the Figure 3.....	123
Table 12 – NFCS 41 items Questionnaire.....	128
Table 13 – OUP Questionnaire.....	130
Table 14 – Participants’ NFC levels from the Study WKS.2.01.....	132
Table 15 – NFC levels analysis from the Study WKS.2.01.....	132
Table 16 – Participants’ NFC levels from the Study GSJ.1.01.....	133
Table 17 – NFC levels analysis from the Study GSJ.1.01.....	133
Table 18 – Participants’ NFC levels from the Study KSD.1.01.....	134
Table 19 – NFC levels analysis from the Study KSD.1.01.....	134
Table 20 – Participants’ NFC levels from the Study UNI.1.01.....	135
Table 21 – NFC levels analysis from the Study UNI.1.01.....	135
Table 22 – WKS.2.01’s judges.....	136
Table 23 – WKS.2.01’s OUP Ratings by Judges.....	137
Table 24 – OUP mean levels from the Study WKS.2.01.....	138
Table 25 – GSJ.1.01’s Judges.....	138
Table 26 – GSJ.1.01’s OUP Ratings by Judges.....	139
Table 27 – OUP mean levels from the Study GSJ.1.01.....	139
Table 28 – KSD.1.01’s Judges.....	139
Table 29 – KSD.1.01’s OUP Ratings by Judges.....	140
Table 30 – OUP mean levels from the Study KSD.01.....	140
Table 31 – UNI.1.01’s judges.....	141
Table 32 – UNI.1.01’s OUP Ratings by Judges.....	142
Table 33 – UNI.1.01 Cronbach’s alpha coefficient.....	143
Table 34 – OUP mean levels from the Study UNI.1.01.....	143
Table 35 – Groups’ NFC and OUP characteristics – 18 groups.....	147
Table 36 – Groups’ correlations NFC/OUP – 18 groups.....	148
Table 37 – Groups’ ranking based on OUP – 18 groups.....	149
Table 38 – Groups’ OUP – 13 groups (without UNI.1.01).....	150
Table 39 – Groups’ correlations NFC/OUP – 13 groups (without UNI.1.01) .....	151
Table 40 – Data results from linear regressions analysis.....	152
Table 41 – A typology of epistemic motivations.....	168
Table 42 – Groups’ NFC and OUP characteristics – 18 groups.....	185

Table 43 – Average composition per tiers of groups .....	186
Table 44 – Groups' OUP – 12 groups .....	186
Table 45 – Groups' ranking based on OUP – 6 groups .....	187
Table 46 – Data results from regressions of NFC Mean and W/M .....	189
Table 47 – Findings as indexes of reference for groups .....	190
Table 48 – IPJ01 and OUP correlations .....	191
Table 49 – IPJ02 and OUP02 correlations .....	192
Table 50 – IPJ03 and OUP03 correlations .....	192
Table 51 – POJ01 and OUP04 correlations.....	193
Table 52 – IPJOUP and OUP correlations .....	194
Table 53 – Findings as indexes of reference for judges .....	195
Table 54 – KISD variations of NFC Mean and NFC CoV .....	222
Table 55 – Different types of NFC based groups.....	223
Table 56 – KISD initial NFC Mean and NFC CoV .....	223
Table 57 – KISD intermediate NFC Mean and NFC CoV .....	224
Table 58 – KISD final NFC Mean and NFC CoV .....	225
Table 59 – Findings as indexes of reference for groups.....	226
Table 60 – KISD Groups OUP ratings.....	236
Table 61 – KISD Judges OUP ratings.....	237
Table 62 – UNI.1.01's Individual NFC, NFC Mean and NFC CoV .....	241
Table 63 – OUP mean levels from the Study UNI.1.01 .....	244
Table 64 – UNI.1.01's OUP Ratings by Judges .....	244
Table 65 – Data results from regressions analysis from all variables .....	246
Table 66 – UNI.1.02's Individual NFC, NFC Mean and NFC CoV .....	276
Table 67 – OUP mean levels from the Study UNI.1.02.....	277
Table 68 – Women and Men averages per Tiers .....	303
Table 69 – Findings as indexes of reference for groups.....	341
Table 70 – Findings as indexes of reference for judges .....	341

## INDEX

PREFÁCIO – in Portuguese.....	35
INTRODUCTION AND HISTORICAL FOUNDATIONS.....	59
Translation and Tradition.....	61
Breakdowns and Mysteries.....	62
Boundaries of a Landscape.....	64
Innovativeness.....	64
Prejudice.....	65
Preoccupation with Effectiveness.....	68
Reflexive Methodology.....	71
A stone in the middle of the road.....	74
Research Quadrants.....	76
Study context: from organizations to groups.....	78
Moving to Cologne.....	80
Purpose of the thesis.....	81
Designing Research Questions.....	85
Research Question.....	88
General Objective.....	88
Specific Objectives.....	88
Questioning the Structure.....	88
Structure of this document.....	89
The Landscape Map.....	98
<b>2 DIVERGENT DISCUSSION: INTRODUCTION OF ALL THAT WILL REMAIN HIDDEN.....</b>	<b>101</b>
<b>2.1 MINERAL: CONSTRUCTION OF DATA.....</b>	<b>109</b>
Literature Review.....	109
Defining the Gap.....	117
Study.....	118
First Part of the Study.....	121
Second Part of the Study.....	124
Procedures of the Study.....	126
Variables.....	126
Instruments.....	127
Data.....	130
Results.....	152
<b>2.2 STONE: INTERPRETATION.....</b>	<b>159</b>
Closed Mindedness.....	161
Intergroup Contact.....	162
Need for Closure – NFC.....	165
High NFC.....	168
Low NFC.....	169
NFC and Groups.....	170

NFC Measurement .....	171
Innovativeness Measurement .....	172
Studies Description .....	180
Measurements .....	182
<b>Innovativeness Production Groups</b> .....	184
NFC Coefficient of Variation .....	186
Interpretation about Production Groups.....	189
<b>Innovativeness Perception Judges</b> .....	191
Interpretation about Perception Judges.....	195
<b>Considerations to Reflect</b> .....	196
<b>Considerations to Act</b> .....	196
<b>2.3 MOUNTAIN: CRITICAL INTERPRETATION</b> .....	205
Breaking down .....	206
Organizational mechanics.....	207
Innovativeness and Social Groups.....	210
The Triple Challenge of Innovativeness .....	212
Need For Closure and its role .....	214
NFC's Continuum .....	217
Impacts of Intergroup Contact .....	220
Study: KISD 6 WEEKS MID-TERM-PROJECT .....	221
Independent Panel of Judges – IPJ03 .....	236
Making Sense of this Study – KSD.1.01 .....	237
Study: UNIVALI – BRANDING – MBA .....	240
Panel of Judges – POJ01.....	243
Making Sense of this Study – UNI.1.01 .....	245
Considering all variables .....	246
<b>2.4 LANDSCAPE: OPENNESS TO OTHER INTERPRETATIONS</b> .....	255
2.4.1. Efficiency as an Ideology for the Reduction of Diversity .....	256
2.4.2. Three Types of Academic Research .....	258
2.4.3. Horizons of Innovation .....	258
2.4.4. Gadamer, Allport and Kruglanski.....	262
2.4.5. Design Thoughts about Method.....	263
2.4.6. Creativity and Prejudice.....	266
2.4.7. Collaborative creativity.....	268
2.4.8. Creative People.....	270
2.4.9. Creativity as Thinking.....	271
2.4.10. Etymology of Innovation.....	274
2.4.11. Innovation's Sweet Spot.....	274
2.4.12. Innovation as Interdisciplinarity .....	278
2.4.13. Interdisciplinarity as Innovation .....	283
2.4.14. Innovation as a WE-Action .....	286
2.4.15. Design and Prejudice .....	294

2.4.16. Design and Innovation.....	296
2.4.17. Design and Knowledge.....	299
2.4.18. NFC, Innovativeness and Gender.....	302
2.4.19. NFC and Leadership.....	307
2.4.20. The Impacts of Prejudice on Originality.....	307
2.4.21. Interdisciplinary Discourse.....	308
2.4.22. Further interpretations.....	309
2.4.23. Productivity as an antithetical process.....	310
<b>3 CONVERGING DISCUSSION: WITHDRAWAL OF ALL THAT STILL REMAIN HIDDEN.....</b>	<b>327</b>
Reflexive questioning.....	328
Research Question.....	329
General Objective.....	329
Specific Objectives.....	329
Designing Research Answers.....	329
Considerations to Act.....	330
Facing the Triple Challenge of Innovativeness.....	331
<b>Prejudice Related Innovativeness Determinants Heuristic.....</b>	<b>333</b>
<b>1. Longevity.....</b>	<b>335</b>
<b>2. Performance.....</b>	<b>335</b>
<b>3. Innovativeness.....</b>	<b>336</b>
<b>4. Bildung.....</b>	<b>337</b>
<b>5. Diversity.....</b>	<b>338</b>
<b>6. Prejudice.....</b>	<b>339</b>
<b>7. Evidence.....</b>	<b>339</b>
<b>8. Commitment.....</b>	<b>342</b>
<b>9. Enablement.....</b>	<b>343</b>
<b>10. Knowledge.....</b>	<b>343</b>
<b>11. Confidence.....</b>	<b>344</b>
<b>12. Longevity.....</b>	<b>346</b>
<b>ENABLEMENT TO ACT.....</b>	<b>347</b>
Act into the Future: Innovativeness.....	348
Apprehend Reality: Evidence.....	348
Building Bridges: Confidence.....	349
The Triple Challenge of Innovativeness.....	350
Innovativeness Potential Check.....	352
<b>ENABLEMENT TO REFLECT.....</b>	<b>353</b>
<b>FINAL REFLECTIONS.....</b>	<b>355</b>
REFERENCES.....	359
APPENDICES.....	379
APPENDIX I.....	381
APPENDIX II.....	391
APPENDIX III.....	398



In the beginning was the Word,  
and the Word was with God,  
and the Word was God.

John 1:1





**355. The Origin of our Concept of “Knowledge”.** – I take this explanation from the street. I heard one of the common people say, “he knew me right away”. Then I asked myself: What is it that the common people take for knowledge? What do they want when they want “knowledge”? Nothing more than this: Something strange is to be reduced to something *familiar*. And we philosophers – have we really meant *more* than this when we have spoken of knowledge? What is familiar means what we are used to so that we no longer marvel at it, our everyday, some rule to which we are stuck, anything at all in which we feel at home. Look, isn’t our need for knowledge precisely this need for the familiar, the will to uncover under everything strange, unusual, and questionable something that no longer disturbs us? It is not the *instinct of fear* that bid us to know? And is the jubilation of those who attain knowledge not the jubilation over the restoration of a sense of security? Here is a philosopher who fancied that the world was “known” when he had reduced it to the “idea.” Was it not because the “idea” was so familiar to him and he was so well used to it – because he hardly was afraid of the “idea” anymore?

How easily these men of knowledge are satisfied! Just have a look at their principles and their solutions of the world riddle with this in mind! When they find something in things – under them, or behind them – that is unfortunately quite familiar to us, such as our multiplication tables or our logic, or our willing and desiring – how happy they are right away! For “what is familiar is known”: on this they are agreed. Even the most cautious among them suppose that what is familiar is at least *more easily knowable* than what is strange, and that, for example, sound method demands that we start from the “inner world,” from the “facts of consciousness,” because this world is *more familiar to us*. Error of errors! What is familiar is what we are used to; and what we are used to is most difficult to “know” – that is, to see as a problem; that is, to see as strange, as distant, as “outside us.”

The great certainty of the natural sciences in comparison with psychology and the critique of the elements of consciousness – one might say, with the *unnatural* sciences – is due precisely to the fact that they choose for their object what is *strange*, while it is almost contradictory and absurd to even *try* to choose for an object what is not strange.

**Friedrich Nietzsche,**

The Gay Science. Die fröhliche Wissenschaft. First published in 1882.



## **PREFÁCIO – in Portuguese.**

Este texto resume a pesquisa interdisciplinar realizada, entre Junho de 2011 e Março de 2015, para a obtenção de grau de doutor em Engenharia e Gestão do Conhecimento. Como um prefácio, este texto está alijado de descritivos pormenorizados, uma vez que eles constam dos textos em inglês.

## **INTRODUÇÃO E FUNDAMENTOS HISTÓRICOS**

- *Mauricio, você terá que encontrar uma paisagem. E, nessa paisagem, você escolherá uma montanha particular. Depois, nessa montanha, você encontrará uma pedra. É sobre essa pedra que você terá que escrever.*

Pelo o que eu me lembro, isto foi o que a Professora Ulla Johansson Sköldeberg me disse no início de uma tarde brasileira. A data era o dia 15 de Junho de 2011. Eu estava em Florianópolis, no Brasil. Ela estava em Gotemburgo, Suécia. Apesar de nos encontrarmos em hemisférios distintos, eu me lembro de que ambos estávamos vivendo um belo dia ensolarado.

Após essa videoconferência, eu só conseguia pensar em “paisagens.” Tal metáfora geográfica/geológica me guiou desde o referido dia. Apesar de parecer uma abordagem linear, indo de um todo (paisagem) a uma parte (pedra), a tecelagem dessa experiência ocorreu também na base de pedras determinando paisagens. Numa iteração contínua entre as minhas pré-compreensões e compreensões dos contextos pelos quais vaguei.

Para iniciar esta jornada através dessa paisagem de “ficção real” (ALVESSON; SKÖLDBERG, 2009, p. 310), eu gostaria de apresentar o seguinte texto:

Os julgamentos sobre a beleza de uma paisagem, sem dúvida, dependem do gosto artístico de cada época. Basta pensar na paisagem alpina sendo descrita como feia, algo que eu ainda encontro no século XVIII – resultado, por quanto eu saiba, do

espírito da simetria artificial que dominou o século do absolutismo (GADAMER, 2004, p. 51).<sup>3</sup>

Nas páginas seguintes, eu apresento o meu esforço para criar uma paisagem na qual o espírito da simetria artificial se amalgama aos gostos pós-modernos da minha contemporaneidade. Afinal, alcançar a compreensão reflexiva de nós mesmos exige o entendimento de que o velho está, de alguma forma, preservado em toda suposta transformação. E o velho precisa ser combinado com o novo para criar novos valores (GADAMER, 2004, p. 282–283). Esta combinação, este passeio por essa paisagem particular, foi feita em três passos.

O primeiro passo é um descortinar das fundações históricas deste estudo. Por causa de sua estrutura interdisciplinar, como na descoberta<sup>4</sup> da incomensurabilidade de paradigmas feitas por Kuhn (KUHN, 1970, p. vii), eu me refugiei na história e na hermenêutica. A premissa básica de qualquer estudo interdisciplinar é o fato de que as disciplinas são “pré-condições necessárias e fundamentais para a interdisciplinaridade” (REPKO, 2012, p. 21). Portanto, eu optei por adotar uma narrativa histórica de modo a preservar os “significados” de cada uma das disciplinas que apoiam este estudo. Ou, pelo menos, para tentar reduzir as inescapáveis distorções de significados (POLANYI, 2014, p. 251) geradas pelos desafios inerentes à interdisciplinaridade. Por estar consciente de que “Nous sommes toujours situés dans l’histoire”<sup>5</sup> (Gadamer apud RICOEUR, 1986, p. 98), eu reconheço que “estar situado dentro de uma tradição não limita a liberdade para conhecer, mas torna isso possível”<sup>6</sup> (GADAMER, 2004, p. 354). Em outras palavras, eu só consigo imaginar um esforço verdadeiramente interdisciplinar à medida em que esse feito é realizado através de narrativas históricas.

O segundo passo toma a forma de uma discussão divergente. Discussão essa que, dividida em quatro diferentes retóricas (ALVESSON; SKÖLDBERG, 2009), tem suas partes denominadas de

<sup>3</sup> Na versão original: “For judgments on the beauty of landscape undoubtedly depend on the artistic taste of the time. One has only to think of the Alpine landscape being described as ugly, which I still find in the eighteenth century – the effect, as I know, of the spirit of artificial symmetry that dominates the century of absolutism.”

<sup>4</sup> Um breve texto explicando “Kuhn’s route to incommensurability” pode ser encontrado em: <http://plato.stanford.edu/entries/incommensurability/#KuhRouInc> (accessed on the 05/11/2014).

<sup>5</sup> Tradução livre: “Nós estamos sempre situados na história” (Gadamer apud RICOEUR, 2007, p. 72).

<sup>6</sup> Na versão original: “to be situated in within a tradition does not limit the freedom of knowledge but makes it possible” (GADAMER, 2004, p. 354).

acordo com a paisagem metafórica oferecida pela Professora Ulla. Tais partes são: Mineral (construção dos dados), Pedra (Interpretação), Montanha (Interpretação crítica), e Paisagem (Abertura para outras interpretações) (ALVESSON; SKÖLDBERG, 2009, p. 277). A intenção, embutida com o *ethos* interdisciplinar, é a de apresentar ao menos quatro perspectivas diferentes sobre os objetivos de pesquisa propostos. Isto é o que se pode denominar de quadri-hermenêutica (ALVESSON; SKÖLDBERG, 2009). Essa pode ser definida como uma metateoria<sup>7</sup> ou metaprincípios que permitem gerar “uma certa garantia contra posições epistemológicas específicas que podem atuar em detrimento a outros posicionamentos”<sup>8</sup> (ALVESSON; SKÖLDBERG, 2009, p. 308). Tal esforço contra a fixação em alguma posição epistemológica específica, embora desafiadora, me parece inevitável devido às características interdisciplinares do presente texto.

O terceiro e último passo nessa caminhada interdisciplinar é caracterizado por uma discussão convergente que, movida pelo propósito de habilitar a agir do *sensemaking* (COOPEY; KEEGAN; EMLER, 1997; WEICK; SUTCLIFFE; OBSTFELD, 2005; WEICK, 1995), tenta oferecer alguns *insights* e apresenta algumas sugestões de atuação no sentido de cumprir o interesse cognitivo emancipatório subjacente (HABERMAS, 1971) desta pesquisa e do respectivo pesquisador.

### Dissonâncias e Mistérios

A designação de uma paisagem, e a “descoberta” de uma montanha da qual uma pedra deveria ser encontrada e sobre a qual uma pesquisa seria feita, começou a partir de uma dissonância específica percebida por mim e evoluiu para algo que pode ser definido como a busca da solução de um mistério<sup>9</sup>. Um mistério científico.

De qualquer forma, a solução de um mistério não pode ser igualada à descoberta da verdade. Ou seja, eu não clamo, de forma alguma, que este estudo produzirá qualquer versão simplificada e objetiva de verdade (SMYTHE et al., 2008).

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<sup>7</sup> “A metatheory is about a comprehensive frame of reference for inspiring and structuring reflection.” (ALVESSON; SKÖLDBERG, 2009, p. 271).

<sup>8</sup> Na versão original: “can generate a certain guarantee against specific epistemological positions which detract from other positions” (ALVESSON; SKÖLDBERG, 2009, p. 308).

<sup>9</sup> “A mystery is a specific kind of breakdown that cannot be understood simply by asking more questions, hanging around and walking to the library to read more books” (ALVESSON; KARREMAN, 2007).

Desta feita, retrospectivamente, toda a discussão do que poderia ser o tema de minha pesquisa de doutorado, ganhou contornos formais a partir de Outubro de 2010, germinando de um interesse meu em particular: a inovação em serviços. Esta é definida aqui como “recombinação colaborativa ou evolução combinatória” (VARGO et al., 2015, p. 64) que conduz a adoção por um contexto social de nova(s) forma(s) de “aplicação de recursos operantes (conhecimentos e habilidades)” (VARGO; LUSCH, 2008, p. 7). Vale a pena notar que eu acredito que a prestação de serviço é a base de toda troca econômica. Ou seja, ao falar em serviço postulo abranger uma vasta gama de atuações de seres humanos em grupos.

Portanto, esta é a minha paisagem inicial: inovação em serviços. A partir da qual eu escolhi as montanhas do Design de Serviço e da Gestão do Conhecimento. Nessas montanhas, eu encontrei as pedras do Design, do Processo de Criação de Conhecimento, do Serviço e da Lógica Serviço-Dominante. Estas duas últimas podem ser consideradas como pedras firmemente coladas uma a outra. O mineral, o qual considero como um elemento presente em todas as pedras encontradas, é representado pela ideia de Preconceito (detalhamento apresentado a seguir).

A partir dessa paisagem inicial, que foi também objeto da minha dissertação de mestrado (MANHÃES, 2010), emergiu uma percepção específica: a resistência de organizações<sup>10</sup> para colaborativamente criarem e adotarem novas proposições de prestação de serviço. Tal percepção surgiu da minha experiência de trabalho, com início em 1995, junto a organizações localizadas em uma região geográfica em particular: o litoral do estado de Santa Catarina, Brasil.

### Limites de uma Paisagem

As organizações, pressionadas pelas dinâmicas da inovação, apelam para os mitos da criatividade e diversidade sem levar em consideração os conflitos ignitores e decorrentes dos processos de mudança. Na maioria das vezes, tais apelos evitam confrontar de forma clara os desafios impostos pela tradição e pelo preconceito.

Com base nos trabalhos do filósofo alemão Hans-Georg Gadamer, defino Preconceito como o ponto de vista histórico, a partir do

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<sup>10</sup> Eu trabalho com a definição de que “organizações” são “Collectivities whose participants share a common interest in the survival of the system and who engage in collective activities, informally structured, to secure this end” (SCOTT, 1987, p. 23).

qual a finita capacidade de entendimento do ser humano está situada, e que pode resultar em julgamentos que são processados antes que uma quantidade suficiente de elementos tenham sido examinados a respeito de determinada questão. Tais julgamentos não podem ser considerados necessariamente negativos ou positivos.

O que pretendo discutir neste texto é justamente o impacto do preconceito nos processos de inovação. A discussão ocorre a partir da criação e execução de uma série de estudos empíricos através dos quais busquei investigar a existência de relações entre as características de grupos compostos por pessoas com diferentes níveis de motivação cognitiva (como um tipo específico de diversidade sócio-cultural) e o potencial desses grupos de criar produtos (bens ou serviços) que são percebidos como inovativos.

Nesse processo iterativo para a designação de uma paisagem de pesquisa – da mesma forma que o foram as montanhas e pedras, no dia 11 de Abril de 2014, após uma demorada reunião com os Professores Gregório Varvakis, Tarcísio Vanzin, Francisco Fialho, Paulo Maurício Selig, Roberto Pacheco e Marina Nakayama, a Pergunta de Pesquisa, o Objetivo Geral e os Objetivos Específicos foram assim definidos:

#### Pergunta de Pesquisa

*Qual, se alguma, é a relação entre a tendência de motivação cognitiva de indivíduos em um grupo e o potencial desse grupo em criar produtos percebidos como inovativos?*

#### Objetivo Geral

*Estudar a relação entre a tendência de motivação cognitiva de indivíduos em um grupo e o potencial desse grupo em criar produtos percebidos como inovativos.*

#### Objetivos Específicos

- i. Identificar um instrumento capaz de avaliar a tendência de motivação cognitiva de indivíduos em um grupo;*
- ii. Identificar um instrumento capaz de avaliar a percepção de inovatividade de um produto;*
- iii. Desenvolver um estudo capaz de capturar possíveis relações entre os dois instrumentos listados a cima.*

Apontada por uma busca sistemática de literatura, a identificação da motivação cognitiva dos participantes foi realizada através do conceito de Need for Closure (NFC), algo como Necessidade de Enquadramento. O NFC é medido através de um questionário com 41 itens (KRUGLANSKI; FRIEDMAN; ZEEVI, 1970; KRUGLANSKI; WEBSTER, 1996; KRUGLANSKI, 2004; WEBSTER; KRUGLANSKI, 1994). Importante notar que o NFC não é uma característica biológica de um indivíduo, não tem nenhuma relação com algum tipo de déficit orgânico. É uma tendência de motivação para agir tão rapidamente quanto possível, dado o que determinadas pressão de tempo e falta de informação e outros recursos podem impor a um indivíduo. Para alguns indivíduos, essa tendência é alta. Para outros, é baixa. Embora possa ser considerada um traço de personalidade estável de uma pessoa, é também circunstancialmente maleável. Assim, pode variar ao longo de um *continuum*, devido ao contexto social no qual o sujeito se encontra.

A inovatividade, por sua vez, foi medida através da utilização da técnica de avaliação consensual (AMABILE, 1982), baseada na constituição de painéis de juízes. Estes avaliam a inovatividade de cada produto com base em três fatores: Originalidade, Valor para o Usuário e Producibilidade (MAGNUSSON, 2003). A média dos valores obtidos por cada um dos produtos é identificada pelo acrônimo OUP.

O estudo empírico criado para testar a relação entre as médias do NFC e do OUP é dividido em duas partes.

Na Parte 1 são realizadas oficinas de criatividade (WKS-E1 a WKS-En, ver Figura 7) nas quais os participantes (H1 a Hn) respondem ao questionário NFC; com base na tabulação dos dados do questionário (NFC-G1E1 a NFC-GnEn), os participantes são divididos em grupos (G1 a Gn) e cada grupo deve gerar uma proposição inovativa de produto (bens ou serviços, P1 a Pn) ao final da oficina. Para todos os grupos criados são calculados os níveis médios de NFC, a partir dos quais é composta uma lista de classificação dos grupos (NFC-RE1 a NFC-REn).

Na Parte 2 do experimento são constituídos painéis de juízes (IPJ-E1 a IPJ-En) para a avaliação de cada produto gerado pelos grupos. As avaliações dos juízes geram duas listas de classificação dos produtos: uma individual, para cada juiz (OUP-J1RE1 a OUP-JnREn), e uma lista consolidada (OUP-RE1 a OUP-REn). Os juízes também respondem ao questionário de NFC (NFC-J1 a NFC-Jn), o que gera uma lista de classificação de todos os juízes em cada experimento (NFC-JE1 a NFC-JEn).

A partir desses conjuntos de dados, foram investigadas duas correlações:



- a) C1: obtida entre a lista de classificação do nível médio de NFC de cada grupo (NFC-G1E1 a NFC-GnEn) e a lista de classificação das notas finais atribuídas pelos painéis de juízes a cada produto (OUP-RE1 a OUP-REn);
- b) C2: resultante da relação entre as listas de classificação dos produtos geradas individualmente pelos juízes (OUP-J1RE1 a OUP-JnREn) e a lista de classificação das notas finais atribuídas pelos painéis de juízes a cada produto (OUP-RE1 a OUP-REn).

Das oficinas realizadas durante o processo de pesquisa, foram considerados os dados resultantes de 4 delas, com 18 grupos, 4 painéis de juízes, totalizando 99 participantes, divididos da seguinte forma:

- a) 84 participantes das oficinas oriundos da Alemanha, Brasil, Canada, China, Índia, Itália e Polônia;
- b) 36 juízes divididos em 4 painéis de juízes originários do Brasil, Colômbia, Croácia, Alemanha, Itália, Suécia e Reino Unido.

Desta feita, nesses 4 experimentos foi possível obter todos os dados, de todos os participantes, de todos os produtos, da forma correta, na temporalidade exigida.

Com a utilização do programa IBM SPSS Statistics version 21 foi possível determinar, através de correlações e regressões lineares, que as maiores percepções, quanto à inovatividade dos produtos, foram obtidas por grupos com o nível médio de NFC ao redor de 56,16 (ver Tabela 37, Intergroup NFC Mean). As menores notas quanto às percepções de inovatividade foram obtidas por grupos com o NFC médio ao redor de 49,29.

A correlação resultante entre a lista de nível médio de NFC dos grupos e a lista das notas obtidas pelos produtos criados, aplicando a análise de correlação bivariada de Spearman (*rho*) bi-caudal, ficou acima de 0,6, e a probabilidade (*p-value*) ficou a baixo dos níveis de significância (0,01), ver Tabela 36.

### Grupos Produtores de Inovatividade

Com base nos dados colhidos nestes estudos é possível afirmar abduktivamente que existem faixas de níveis médios de NFC nas quais o potencial de agir para obter propostas inovativas é maior. Estas faixas estão apresentadas na seguinte tabela.

<b>Índices</b>	<b>Referências</b>
NFC Mean	52 to 59
NFC Coefficient of Variation	0,14 to 0,24

### Grupos Avaliadores de Inovatividade

No que interessa à definição de perfis ideais para a avaliação de níveis de inovatividade de propostas para novos produtos, os juízes que geraram listas classificatórias individuais mais próximas das listas geradas pelos painéis foram os que apresentaram níveis de NFC ao redor de 47 (ver Tabela 52). O NFC dos referidos juízes estão apresentados na faixa de referência descrita a seguir.

<b>Índices</b>	<b>Referências</b>
NFC	40 to 51

### Construção de Sentido

Com base nos estudos realizados, eu proponho uma heurística composta por doze determinantes. Ao mesmo tempo, tal proposta busca evitar tanto (i) as restrições de um “método” para a inovação, quanto (ii) propor “tirânicas da falta de estruturas” (ALVESSON; SKÖLDBERG, 2009, p. 160). Este “caminho do meio” leva em conta a experiência hermenêutica e convida as pessoas envolvidas a tomarem consciência dos preconceitos em jogo num determinado contexto. E, como um discurso para a construção de sentido, esse jogo é precisamente o que pode ser entendido a respeito do jogo da inovação: não é possível prever que ela “não funcione, que funcione ou que funcione novamente, e isto é a atração de todo jogo”<sup>11</sup> (GADAMER, 2004, p. 106).

Embora apresentados como elementos distintos, os doze determinantes da heurística são fundamentalmente interligados. Afinal de contas, o interesse cognitivo emancipatório depende do conhecimento empírico-analítico para ser capaz de entender a diferença entre o que é dado pela natureza e o que é socialmente construído.

Em resumo, ao invés de propor um método linear ou um único perfil ideal a ser aplicado aos membros de um grupo, a pesquisa aponta na direção oposta: sugere a composição do grupo formado por diferentes

<sup>11</sup> Na versão original: “will not ‘work,’ ‘succeed,’ or ‘succeed again,’ which is the attraction of the game” (GADAMER, 2004, p. 106).

perfis de pessoas e regido por uma governança inclusiva. Desta forma, não apenas a pesquisa oferece uma perspectiva de aumento da produtividade das organizações, mas pretende fazê-lo através da comprovação:

- a) que o respeito às diferenças individuais gera ganhos de produtividade;
- b) de que é possível habilitar grupos sociais a agir de forma a gerar propostas inovativas sem a necessidade de métodos lineares.

Ou seja, ao invés de propor um método linear e de redução de diversidades para a geração de propostas inovadoras por grupos sociais, esta pesquisa sugere que a diversidade de motivações cognitivas é um fator determinante para a referida criação. Tal sugestão é feita através da análise de correlação bivariada de Spearman ( $\rho$ ) bi-caudal entre o nível médio de motivação cognitiva de determinados grupos (NFC Mean) e o nível de inovatividade percebida a respeito de produtos criados por esses mesmos grupos (OUP Mean).

Desta feita, com base nos dados gerados pelo presente estudo, como insumos para um discurso de construção de sentido (*sensemaking*) a respeito da designação de grupos de trabalho de tal forma a propiciar um ambiente para a criação ou julgamento de propostas inovadoras, a partir dos resultados desta pesquisa pode ser interpretado que:

- Grupos com níveis de NFC médios localizados próximos e a cima da metade da escala apresentam maior probabilidade de terem seus produtos percebidos como mais inovativos;
- Grupos com níveis de NFC médios localizados próximos e a baixo da metade da escala apresentam maior probabilidade de serem mais assertivos no julgamento da inovatividade de novas proposições de produtos.

Os resultados deste estudo confirmam que o nível médio de NFC de grupos (níveis esses, gerados a partir do ponto de vista histórico de seus membros) impactam os resultados dos esforços inovativos desses mesmos grupos. E, também, que é possível a designação de grupos que “são muito mais inovativos do que os outros,” parafraseando Jensen et al.

(2007, p. 685). Em outras palavras, me parece possível designar grupos propensos a apresentarem características de *Bildung*<sup>12</sup>.

Tal como a construção de um novo ponto de vista, a partir do qual eu e outros poderão observar futuras paisagens, este texto procura estabelecer um discurso que aumente o potencial de agir de certos contextos sociais (acadêmicos e corporativos). Esse particular aumento do potencial de agir (conhecimento) é desejado por mim para atuar na direção de:

- a) habilitar grupos a trabalharem na criação de proposições inovativas;
- b) comprometer grupos a agirem para apoiar a diversidade socio-cultural.

A criação deste potencial de agir (conhecimento) é focado em propor uma heurística para a (i) designação de indivíduos em grupos e (ii) a governança dos grupos sociais, a fim de aumentar o seu potencial de geração de propostas inovadoras de produtos (bens ou serviços). Assim, o destino de toda pesquisa acadêmica no contexto organizacional – que é o de propor formas de aumentar a produtividade das organizações – é alcançado. Alcance esse que deve ser norteado pelos resultados desta pesquisa.

Esta abordagem interdisciplinar a respeito dos esforços inovativos realizados por grupos pode contribuir para dar sentido a um desafio importante para uma miríade de organizações: fazer sentido dos esforços inovativos. Ao mesmo tempo em que mantém o potencial de inovação das equipes – sem depender de processos de controle, esta abordagem permite que as organizações atuem fornecendo um discurso academicamente suportado na forma de uma heurística.

Em outras palavras, o interesse desta pesquisa é o de propor uma heurística para designar o melhor conjunto de participantes, dado um conjunto definido de possíveis candidatos, de forma a obter o maior potencial inovativo para um produto gerado por um grupo de pessoas. Isto é, a partir de um conjunto específico de participantes. Ou, como selecionar participantes para formarem um grupo, de modo a obter a

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<sup>12</sup> Em Português, *Bildung* corresponde a “formação” e pode ser entendida como o esforço de “manter-se aberto para o que é outro – para outros e mais universais pontos de vista” (GADAMER, 2004, p. 15), o que pode ser considerado uma condição fundamental para os esforços de co-criação, especialmente para a obtenção de propostas inovadoras.

melhor composição, para produzir o produto de mais elevado potencial de inovação, dado o conjunto disponível de candidatos.

A operacionalização da heurística proposta é dividida em etapas simples, tais como:

1. Avaliar o nível de NFC dos potenciais indivíduos a serem envolvidos no esforço inovativo;
2. Designar grupos com base em conjuntos específicos de diversos níveis individuais de NFC, seja para a realização de esforços inovativos ou para a avaliação desses esforços;
3. Adotar políticas de governança para esses grupos nas quais estejam embutidas as quatro condições-chave determinadas por Allport;
4. Definir um prazo determinado e os recursos disponíveis;
5. Prover autonomia organizacional para esses grupos.

Os passos sugeridos acima devem permitir que as organizações criem grupos propensos ao *Bildung*, nos quais a produtividade imaginativa é mais rica, porque não é “apenas” livre. Os horizontes específicos que esses grupos irão observar, “como nas circunvoluções do arabesco,” devem proporcionar “um campo de atuação, onde o desejo de entendimento de unidade não tanto confina, como sugere incitamentos para atuar”<sup>13</sup> (GADAMER, 2004, p. 41).

### Designando Respostas de Pesquisa

A presente pesquisa produziu correlações iguais ou superiores a 0.6 ponto entre as tendências de motivações cognitivas de indivíduos em um grupo (NFC Mean) e o potencial desse grupo para criar produtos que são percebidos como inovativos (OUP Mean).

Quando a OUP Mean é considerada como uma variável dependente e as W/M Ratio (razão Mulher/Homen), NFC CoV e NFC Mean como variáveis independentes (Preditoras), a regressão linear múltipla permite verificar que o modelo resultante gera os seguintes dados: R com valor de 0.668, R quadrado de 0.446, R quadrado ajustado de 0.328 e o índice Durbin-Watson de 1.294, com uma Significância de 0.036. Esses valores indicam que o  $F(3;14) = 3,762$  é estatisticamente significativo para o modelo proposto (acima do valor crítico de 3,34).

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<sup>13</sup> Na versão original: “a field of play where the understanding’s desire of unity does not so much confine it as suggest incitements to play” (GADAMER, 2004, p. 41).

As variáveis predictoras (ou explicativas, ou independentes) indicam que o modelo pode explicar 32,8% da classificação obtida através do OUP Mean para cada grupo. Assim, os dados e resultados apresentados respondem positivamente à pergunta de pesquisa desta tese, indicando que existe uma relação entre a tendência de motivação cognitiva de indivíduos em um grupo (NFC Mean) e o potencial desse grupo de criar produtos percebidos como inovativos (OUP Mean). Esses resultados habilitam a descrever o NFC Mean como uma variável preditora (ou explicativa) positiva e significativa do OUP Mean.

Portanto, a solução da dissonância e mistério iniciais é apresentada como uma proposta de uma heurística focada em habilitar a ação para a (i) designação de indivíduos em grupos e (ii) a adoção de uma política de governança para os grupos sociais, a fim de aumentar o potencial deles para gerar propostas inovativas de produtos (bens ou serviços).

### **Determinantes de Inovatividade Relacionados a Preconceito**

Com base nos estudos e dados gerados por esta pesquisa, é possível sustentar, por argumentos quantitativos, um discurso qualitativo que relaciona as noções de preconceito e inovatividade.

O discurso que suporta esta heurística, nomeada Prejudice Related Innovativeness Determinants Heuristic – PRIDHe (MANHÃES; MAGER; VARVAKIS, 2013) ou heurística baseada em Determinantes de Inovatividade Relacionados a Preconceito, pode ser resumido como: *organizações cientes de seus preconceitos e dos impactos que eles geram possuem maior probabilidade de apresentar um melhor desempenho*. Desta forma, por consequência, é possível dizer que quando as pessoas de determinado contexto social precisam fazer sentido do “novo,” elas farão isso com base nas estruturas prévias de entendimento que possuem. Sendo assim, se elas estiverem cientes de seus preconceitos, aumenta a probabilidade de apresentarem um desempenho melhor no trato do “novo.”

O discurso que suporta a heurística proposta é estruturado da seguinte forma, baseado em doze determinantes:

1. Quando as pessoas se sentem confiantes em um grupo, elas querem que ele seja **longevo**;
2. Para ser longo, um grupo precisa ter um bom **desempenho**;
3. Para ter um bom desempenho, um grupo precisa **innovar**;
4. Para inovar, um grupo tem que passar por um processo de **Bildung**;

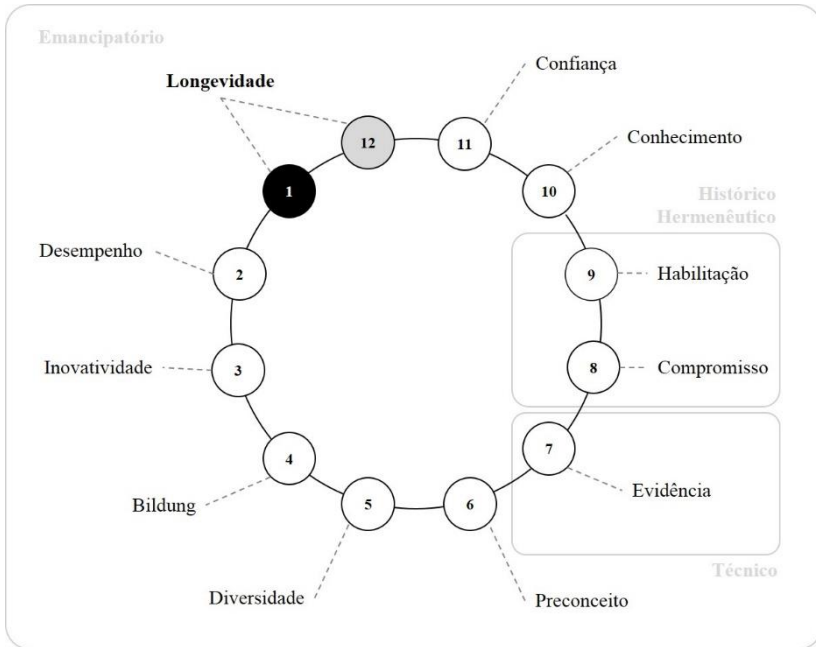
5. Para passar por um processo de *Bildung*, um grupo precisa dos benefícios da **diversidade** sócio-cultural;
6. Para obter os benefícios da diversidade sócio-cultural, um grupo tem que estar ciente dos **preconceitos** de seus membros;
7. Para estar ciente dos preconceitos de seus membros, um grupo precisa obter **evidências**;
8. Para obter evidências, um grupo precisa estar **comprometido** a agir;
9. Para se comprometer a agir, um grupo tem que ser **habilitado** para agir;
10. Para estar habilitado a agir, um grupo tem que criar novos **conhecimentos**;
11. Para criar novos conhecimentos, os membros do grupo precisam se sentir **confiantes**;
12. Ao se sentirem confiantes em um grupo, seus membros vão querer que ele seja **longevo**.

Ao passo que o determinante 1 é uma atuação em direção ao futuro, o determinante 12 é um fazer sentido retrospectivamente do passado. Afinal de contas, o interesse na longevidade de um grupo surge em retrospecto, devido a explicações plausíveis sobre o que ocorreu ou está ocorrendo com as pessoas dentro de um grupo ou organização particular.

A heurística proposta, com base no processo de *sensemaking* (WEICK, 1995, p. 55), funciona de forma a comprometer às pessoas a agir para gerar evidências tangíveis em algum contexto social. A geração de evidências ajuda a fazer sentido em retrospecto do que ocorreu, as razões pelas quais está ocorrendo (plausibilidade), e o que deve ser feito na sequência para melhorar a sua identidade como uma organização inovadora. A figura a seguir apresenta a heurística proposta.

A relação crítica entre preconceito e capacidade de inovação, como uma perspectiva sobre o desempenho de grupos, permite compreender a capacidade das organizações para criar novos produtos, tendo em conta a combinação entre totalidade (as características de um grupo) e subjetividade (as características de um indivíduo).

Os detalhes de cada um dos doze determinantes são apresentados no corpo da tese. Na sequência, com o intuito de habilitar a agir, é descrita uma versão simplificada da heurística.



**Figura – Determinantes da PRIDHe**

### **Habilitação para Atuar**

A toda pesquisa científica podem ser atribuídos dois objetivos principais: o de habilitar a atuar e o de habilitar a refletir.

Sendo assim, um dos objetivos desta pesquisa é o de habilitar as pessoas a agir, a atuar. O que, afinal, é o principal objetivo de qualquer heurística. Com isso em mente, com base na pesquisa que eu fiz, o círculo da heurística pode ser iniciado por qualquer um dos doze determinantes. No entanto, eu prescrevo três entradas principais para a heurística proposta. Estas três entradas principais representam uma versão simplificada da PRIDHe. Logo, é possível concentrar os esforços iniciais em três, ao invés dos doze determinantes. Isso foi feito a fim de facilitar o compromisso de agir, no sentido da adoção da heurística proposta. Seguindo em sentido único, essas três principais oportunidades de entrada são: Inovatividade, Evidência e Confiança.

Inspiradas nas três questões propostas por Kant, que responderiam a todos os interesses da razão: “O que eu posso saber?,” “O que eu devo fazer?” e “O que eu posso esperar?,” estas três oportunidades de entradas podem ser contextualizadas em três núcleos de ação nomeados como:



Atuar na direção do futuro ou *Act into the Future* (centrado na pergunta: O que eu posso esperar?), Aprender a Realidade ou *Apprehend Reality* (como resposta à: O que eu posso saber?) e Construir Pontes ou *Build Bridges* (como ação resultante de: O que eu devo fazer?).

Atuar na direção do futuro: Inovatividade

PRIDHe, na sua abordagem mais básica, serve para apoiar a execução de esforços de inovação *ad hoc*. Durante a fase de preparação para “atuar na direção do futuro,” que pode ser entendida como o desenvolvimento de um novo produto (bem ou serviço), as organizações podem usar os determinantes dessa heurística para apoiar a tomada de decisão em cada uma das etapas do projeto. Em certo sentido, os seus determinantes asseguram que os líderes do projeto permaneçam cientes das condições hermenêuticas necessárias para o processo de inovação. Hermenêuticas que são pré-condição para os processos de *sensemaking* e para as oportunidades que ele cria de compreender o “novo.”

A heurística proposta ajuda a avaliar se o desejado esforço de inovação, de “atuar na direção do futuro,” leva em efetiva consideração as determinantes da PRIDHe, tal como as outras duas entradas: (i) a geração de evidências *in concreto* sobre o esforço desejado e sobre a equipe responsável por ele (apreender a realidade) e (ii) se existe uma política de governança que impõe igualdade de condições entre seus membros (construir pontes).

Por exemplo, se a organização já decidiu de que forma vai “atuar na direção do futuro,” o melhor próximo passo é buscar evidências de que seus membros formam um grupo com alto potencial inovativo (apreender a realidade) e, em seguida, ela deve assegurar que este grupo adota uma política de governança adequada que irá promover o seu potencial inovativo (construir pontes).

Apreender a Realidade: Evidência

Principalmente para avaliar o potencial de inovatividade de um grupo ou de uma organização, a heurística PRIDHe habilita as pessoas a agirem ao fornecer uma ferramenta de avaliação verificada academicamente. Com base nos resultados desta pesquisa, é possível avaliar um grupo real de pessoas para verificar seu potencial de inovatividade e, se necessário, proceder à seleção de pessoal ou à realocação.

Dado os fatos apontados pela pesquisa, é possível entender que a capacidade de inovatividade dos grupos foi maior quando o NFC médio ficou entre 52 e 59 pontos, com NFC CoV entre 0,14 (para grupos compostos por membros com históricos diferentes) e 0,24 (para grupos compostos por membros com históricos semelhantes). Com base nesses dados, é possível fazer a designação de grupos através de um processo simples de avaliar possíveis candidatos e, a partir desses resultados, designar grupos com maior potencial de inovatividade.

Se a organização não tem uma ideia clara de como ela pretende “atuar na direção do futuro,” o melhor lugar para começar é buscar evidências de que seus membros formam um grupo com alto potencial inovativo (apreender a realidade) e, em seguida, ela deve assegurar que este grupo adote uma política de governança adequada que irá promover o seu potencial inovativo (construir pontes). No final deste ciclo curto, a organização pede para o grupo definido – e que possui a governança adequada, para definir maneiras de “atuar na direção do futuro.”

### Construir Pontes: Confiança

Esta pesquisa mostra que a adoção de práticas que aumentam a consciência dos preconceitos que atuam em determinado contexto social promove a confiança dos membros e das comunidades vizinhas para com grupos definidos. Portanto, a adoção de uma política de governança que apoia a consciência dos preconceitos em jogo pode ser considerada como uma estratégia de maximização da longevidade de um grupo. Para que uma política de governança promova a consciência dos preconceitos em jogo, uma das soluções é que ela seja baseada nas condições-chave de Allport. Ou seja, ela teria que ser (i) marcada por condições de igualdade de status de indivíduos dentro do grupo; (ii) necessariamente dirigir todas as ações em prol de objetivos comuns; (iii) e que só poderiam ser alcançados através de cooperação e interdependência obrigatórias; e (iv) sendo essas três primeiras condições apoiadas por mensagens e ações claras das autoridades.

Se a organização não tem uma ideia clara de como ela vai “atuar na direção do futuro,” nem sabe como ou onde é o melhor lugar para “apreender a realidade,” os seus gestores devem assegurar que o primeiro passo seja a adoção de uma política de governança adequada e que irá promover o potencial de inovação da organização. Governança essa que deve promover a construção de pontes para permitir a organização se conectar com os outros, os externos, os diferentes. Como segundo passo, a organização deve definir um “atuar na direção do futuro.” Ao atuar sob

uma certa governança, ou seja, atuar de acordo com o que ela deve fazer, a organização será capaz de entender melhor o que pode esperar do futuro. Ao compreender o que esperar, a organização estará em uma posição histórica melhor para reunir evidências sobre o que ela poderá saber. Com isso, ela estará apta a responder às três perguntas propostas por Immanuel Kant.

### O Triplo Desafio da Inovatividade

Grosso modo, esta pesquisa aponta para o fato de que, para aumentar seus potenciais de gerar produtos considerados mais inovativos, os grupos sociais precisam vencer um desafio triplo. Esse triplo desafio exige que os grupos consigam: (i) entender os preconceitos de seus membros, (ii) entender o contexto social e histórico no qual esses grupos estão inseridos e, por fim, (iii) criar propostas inovativas que aumentem o repertório do possível.

Para enfrentar tais desafios, para facilitar o compromisso de agir no sentido de enfrentar o triplo desafio, esta abordagem interdisciplinar a respeito dos esforços de inovação de grupos propõe também uma versão simplificada do PRIDHe. Eu acredito que, ao mesmo tempo que esta proposição mantém o potencial de inovação das equipes – sem depender de processos de controle, permite que as organizações possam agir, fornecendo um discurso fundamentado academicamente sob a forma de uma heurística.

A operacionalização da heurística proposta para enfrentar o triplo desafio descrito é dividida em simples etapas, tais como:

1. Avaliação dos tipos de mentalidades (mente aberta e fechada): Com base nos resultados da literatura e da pesquisa mencionadas, é possível avaliar participantes de um grupo existente para verificar os níveis de mente-fechada de cada indivíduo e, se necessário, proceder à seleção de pessoal ou realocação. Essa avaliação é obtida através da escala NFC, que é um instrumento academicamente validado para medir diferentes tipos de mentalidade dos indivíduos. A escala NFC foi desenvolvida pelo Professor Arie W. Kruglanski (2004) e é composta por 41 perguntas. A partir de 15 dessas perguntas (questões 3, 4, 6, 8, 9, 11, 12, 13, 15, 25, 30, 32, 33, 39 e 40) são obtidos os níveis de NFC de cada indivíduo. Outras informações sobre a forma como avaliar os tipos de mentalidades (mente aberta e fechada)

utilizando a escala de NFC estão disponíveis no corpo deste documento;

2. **Design de Grupos Inovativos:** Criação de grupos com base em uma combinação de indivíduos com diversos níveis de NFC. Trata-se de um processo simples para avaliar possíveis candidatos com a escala de NFC e conceber grupos com potenciais inovativos maiores com base nos níveis médios agregados de NFC. De acordo com a pesquisa apresentada neste documento, a capacidade de inovação dos grupos foi maior quando eles eram caracterizados por níveis médios de NFC entre 52 e 59 (quando consideradas as respostas para as 15 questões colocadas acima) e quando possuíam um Coeficiente de Variação entre 0,14 e 0,24. As diferenças entre os grupos que estão nessa faixa de NFC e aqueles que não estão sugere que aqueles obtêm uma avaliação quase 50% superior quanto ao nível percepção de inovatividade dos seus produtos;
3. **Políticas de Governança:** Adoção de políticas de governança que impõem o contato intergrupar não-hierárquico. Por exemplo, se a organização já avaliou seus membros para formar um grupo com alto potencial inovativo; em seguida, ela deve assegurar que este grupo obedece a uma política de governança adequada que irá reforçar o seu potencial inovativo. Portanto, a adoção de uma política de governança que promove a consciência dos preconceitos que atuam em determinado contexto pode ser considerada como uma estratégia de reforço da capacidade inovativa de um grupo. A política de governança sugerida deve ser baseada nas condições-chave de contato intergrupar, sendo elas: (i) criar condições de igualdade de status entre indivíduos ou grupos; (ii) necessariamente dirigir todas as ações individuais em prol de objetivos comuns; (iii) objetivos que só podem ser atingidos através da cooperação e interdependência obrigatórias; e (iv) as condições anteriores devem ser apoiadas por mensagens e ações claras das autoridades quanto à obediência a essas mesmas condições;
4. **Autonomia:** Proporcionar autonomia organizacional para os grupos formados. A organização não necessita obrigatoriamente ter uma ideia clara de como ela vai “atuar no futuro.” Portanto, o melhor lugar para começar a agir no futuro é procurar evidências de que os seus membros formam um grupo de alto potencial inovativo e, em seguida, assegurar que esse grupo obedece a uma política de governança adequada e que irá favorecer o seu

potencial inovativo. Por fim, a organização deve fornecer autonomia para o grupo inovativo e pedir aos membros desse grupo que eles próprios definam maneiras de “atuar na direção do futuro,” criando autonomamente cursos de ação, metas, objetivos e resultados;

5. Recursos: Definição de prazos e recursos disponíveis, acompanhar a aplicação desses recursos e verificar continuamente se o grupo obedece à governança adotada e está comprometido com o processo de inovatividade, com as suas metas e resultados, tanto para o próprio grupo quanto para a organização como um todo.

Os passos sugeridos acima devem permitir que as organizações possam criar grupos propensos ao processo de *Bildung* onde a imaginação produtiva é mais rica, porque não vai ser apenas livre. Esta pesquisa mostra que a adoção de práticas que aumentam a consciência dos preconceitos em atuação dentro de determinado contexto promove a confiança para com os grupos por seus membros e pelas comunidades vizinhas. Se a organização não tem uma idéia clara de como ela pretende “atuar na direção do futuro,” nem sabe como/onde é o melhor lugar para “compreender a realidade,” seus administradores devem assegurar que o primeiro passo se dê com a adoção de uma política de governança adequada e que irá promover a sua inovatividade potencial. Governança que deve promover a construção de pontes para permitir a organização se conectar com Outros, com diferentes discursos e realidades.

### Verificação do Potencial Inovativo

A partir da heurística proposta, é possível sugerir uma Verificação do Potencial Inovativo para as organizações. Esta análise foi criada para ser usada por gestores organizacionais, a fim de verificar se a respectiva organização tem o potencial necessário para enfrentar o triplo desafio de inovatividade.

O processo de análise proposto é baseado em cinco perguntas, para as quais os gestores precisam responder “Sim” ou “Não.” As perguntas são:

1. Os membros da organização, como um todo, representam diversos tipos de mentalidades (mente aberta e fechada)?

2. O grupo diretamente responsável pelo esforço inovativo é composto por uma mescla ideal de indivíduos com diferentes mentalidades (mente aberta e fechada)?
3. Esse grupo obedece a uma política de governança que impõe condições de contato entre indivíduos e grupos, nas quais: existe *status* de igualdade dentro de toda situação; metas únicas e interdependência profunda?
4. O referido grupo tem total autonomia para definir cursos de ação, metas, objetivos e resultados?
5. O grupo responsável direto pelo esforço inovativo foi claramente informado sobre os recursos (orçamento e prazo) que será obrigado a cumprir?

Estas questões estão diretamente relacionadas com os cinco itens descritos na heurística simplificada acima. Para aumentar a probabilidade de enfrentar com sucesso o triplo desafio da inovatividade, com base no raciocínio que apoia a presente heurística, os gestores das organizações têm de responder positivamente (Sim) para todas as questões apresentadas acima. Cada resposta negativa solicita aos gestores implementar as diretrizes sugeridas pelo item correspondente, a partir dos cinco descritos a cima.

### **Habilitação para Refletir**

Embora os estudos realizados tenham se concentrado em estruturas específicas de design e dinâmicas de criatividade em grupos fictícios (por exemplo, não foram investigados grupos longevos), o objetivo desta pesquisa de doutorado é o de apoiar um discurso que permita que os grupos sociais se comprometam a agir no sentido de promover oportunidades inovativas. E, especificamente, promover oportunidades inovativas apoiadas pela diversidade social.

Os dados quantitativos gerados por esta pesquisa apoiam a adoção de políticas de governança organizacionais que promovam a conscientização sobre os impactos de preconceitos nos esforços inovativos, como um tipo de perspectiva particular sobre o desempenho das organizações. Provavelmente, tal como defendido por estes resultados da investigação, a institucionalização das condições-chave de Allport, ou seja, a incorporação delas em políticas de governança, pode permitir que as organizações sejam mais inovativas.

Portanto, as considerações finais são direcionadas a afirmar que os preconceitos são realmente necessários para alcançar a inovação, que são

fundamentais para os esforços inovativos. Este trabalho mostra que os esforços inovativos precisam ter algumas âncoras, algumas pessoas profundamente enraizadas na contemporaneidade, da mesma forma que precisam de pessoas capazes de criar novas raízes. A diferença está no fato de que todos os envolvidos estarão cientes de seus preconceitos e seus impactos positivos e negativos.

As avaliações de NFC dos membros de uma organização pode ajudar a estruturar equipes de inovação mais eficazes, no sentido de que elas ajudam a identificar não só as pessoas de mente aberta, mas também a identificar e acrescentar aquelas de mente fechada para o esforço inovativo. Os resultados desta pesquisa podem ser considerados tal qual um “palpite educado” ao concluir que os grupos com determinados níveis de NFC médio poderiam melhorar as chances de criar mais e melhores proposições percebidas como inovativas. Níveis ideais que, contra intuitivamente, não estão localizados em direção à parte da escala onde estão localizadas as mentes mais abertas, mas sim em direção aos espíritos mais fechados. Esta “descoberta” ecoa a afirmação de Gadamer de que os seres humanos não podem escapar à história, para compreender reflexivamente a nós mesmos, é necessário lidar com o fato de que o velho está de alguma forma preservado em qualquer suposta transformação. E aquele tem que ser combinado com o novo para criar, de fato, um novo valor. Afinal, como Gadamer escreve, “preservação é tanto uma ação livremente escolhida como são a revolução e a renovação.”

Em seu núcleo, o discurso proposto neste texto pode ser resumido como: para um melhor desempenho, as organizações têm de estar conscientes de seus preconceitos. Ou, dito de outra forma: as organizações que são conscientes de seus preconceitos e dos impactos destes são, provavelmente, mais propensas a um melhor desempenho.

## **Reflexões Finais**

Eu não tinha nenhuma ilusão, desde o início, que esta pesquisa produziria conceitos simplificados, objetivos, científicos de verdade. No entanto, eu acredito que é uma boa pesquisa interdisciplinar e que convida corretamente os outros a pensarem junto e a sentirem-se habilitados a agir. Eu também acredito que os principais objetivos desta pesquisa foram atingidos. As dissonâncias percebidas no início desta jornada foram estudadas e outras investigações são mais do que justificadas e necessárias. Mais e diversas percepções podem ser desenvolvidas através de outros textos e por pesquisas futuras.

Numa pesquisa interdisciplinar como essa, há sempre o perigo de se partir da disciplina, se mover em direção à interdisciplina e, dela, adentrar a indisciplina. Eu assumi o risco. Como Nietzsche sugere ao escrever sobre o conhecimento como o resultado de quando algo estranho é reduzido a algo familiar, optei por trabalhar com métodos estranhos. Nietzsche também afirma que a certeza das ciências naturais reside precisamente no fato de que elas escolhem para seu objeto o que é estranho. E, em seguida, elas usam métodos sólidos para encontrar coisas familiares dentro, sob ou por trás desse objeto. Mas, o que é familiar, “o que estamos acostumados, é mais difícil de conhecer,” diz ele. Embora possa parecer contraditório e absurdo, eu acredito que a única abordagem válida para tentar conhecer um objeto tão familiar e quase transparente, tal como preconceito, é através de uma estranha metodologia reflexiva.

Acima de tudo, o que eu estou mais entusiasmado com esta pesquisa é a própria estrutura resultante deste documento. Ela me parece ideal para servir como estrutura de suporte a uma pesquisa interdisciplinar. No entanto, acredito firmemente que esta é uma corrida de revezamento no tempo. Estes são os meus passos.

Agora, o desafio é dos que vão bater à frente deste texto e, talvez, passá-lo para os próximos caminhantes de paisagens futuras.



**Section I**



## INTRODUCTION AND HISTORICAL FOUNDATIONS

- *Mauricio, you will have to find a landscape. And, in that landscape, you will have to choose a particular mountain. Then, in that mountain, you will have to pick a particular stone. It is about this stone that you will have to write.*

As far as I can remember, this was what Professor Ulla Johansson-Sköldberg told me on the beginning of a Brazilian afternoon. The date was the 15<sup>th</sup> of June 2011. I was in Florianopolis, Brazil. She was in Gothenburg, Sweden. Although we were on different hemispheres, I remember that we praised the fact that we both were enjoying a beautiful sunny day.

After that particular videoconference, I could only think about “landscapes.” This geographical/geological metaphor has guided me since then. Although it might seem a linear approach, going from the whole (landscape) to the part (stone), the weaving of this experience also happened on the basis of stones defining landscapes. In an interplay of my pre-understandings and understandings of the contexts through which I have wandered.

To start this journey through this ‘true fiction’ (ALVESSON; SKÖLDBERG, 2009, p. 310) landscape, I would like to present the following text:

For judgments on the beauty of landscape undoubtedly depend on the artistic taste of the time. One has only to think of the Alpine landscape being described as ugly, which I still find in the eighteenth century – the effect, as I know, of the spirit of artificial symmetry that dominates the century of absolutism (GADAMER, 2004, p. 51).

In the following pages I present my attempt to create a landscape in which the spirit of artificial symmetry fits into the postmodern taste of my time. After all, to reflexively understand ourselves is to cope with the fact that the old is somehow preserved in any supposed transformation. And it has to be combined with the new to create a new value (GADAMER, 2004, p. 282–283). This combination, this walk through a particular landscape is done in three steps.

The first one is an unveiling of the historical foundations of this research. Because of its interdisciplinary structure, as in Kuhn's discovery<sup>14</sup> of incommensurability of paradigms (KUHN, 1970, p. vii), I will take refuge in hermeneutic history. A premise of any interdisciplinary study is that the disciplines themselves are “necessary preconditions for and foundations of interdisciplinarity” (REPKO, 2012, p. 21). Therefore, I opted for a historical narrative in order to preserve ‘meanings’ from each one of the disciplines that support the present study. Or, at least, to reduce the inescapable distortions of meanings (POLANYI, 2014, p. 251) due to the interdisciplinary inherent challenges. By being aware that “Nous sommes toujours situés dans l’histoire”<sup>15</sup> (Gadamer apud RICOEUR, 1986, p. 98), I am recognizing that “to be situated in within a tradition does not limit the freedom of knowledge but makes it possible” (GADAMER, 2004, p. 354). That is to say, I can only envision an interdisciplinary effort by making it through history.

The second step takes the form of a divergent discussion, which goes through four tropes (ALVESSON; SKÖLDBERG, 2009) named after the metaphors offered by Professor Ulla, as: Mineral (construction of data), Stone (interpretation), Mountain (critical interpretation), and Landscape (openness to other interpretations) (ALVESSON; SKÖLDBERG, 2009, p. 277). The intention, imbued by the interdisciplinary ethos, is to present at least 4 different perspectives on the proposed research objectives. This is what is called quadri-hermeneutics (ALVESSON; SKÖLDBERG, 2009). It can be defined as a metatheory<sup>16</sup> or metaprinciples that “can generate a certain guarantee against specific epistemological positions which detract from other positions” (ALVESSON; SKÖLDBERG, 2009, p. 308). Such effort against the cling to any specific epistemological position, although daunting, seems to me unavoidable due to the interdisciplinary characteristics of the present text.

The third and last step is characterized by a convergent discussion that, moved by the sensemaking purpose of enabling people to act (COOPEY; KEEGAN; EMLER, 1997; WEICK; SUTCLIFFE;

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<sup>14</sup> “A fortunate involvement with an experimental college course treating physical science for the non-scientist provided my first exposure to the history of science. To my complete surprise, that exposure to out-of-date scientific theory and practice radically undermined some of my basic conceptions about the nature of science and the reasons for its special success.” (KUHN, 1970, p. vii). A brief text explaining “Kuhn's route to incommensurability” can be found at: <http://plato.stanford.edu/entries/incommensurability/#KuhRouInc> (accessed on the 05/11/2014).

<sup>15</sup> “We are always situated in history” (Gadamer apud RICOEUR, 2007, p. 72).

<sup>16</sup> “A metatheory is about a comprehensive frame of reference for inspiring and structuring reflection.” (ALVESSON; SKÖLDBERG, 2009, p. 271).

OBSTFELD, 2005; WEICK, 1995), will try to offer some actionable insights towards fulfilling the underlying emancipatory interest (HABERMAS, 1971) of this research and researcher.

### Translation and Tradition

One final remark before starting this journey. I am a Portuguese native speaker. My second language is French. My third, in a corresponding qualitative ranking, is English. At this moment, my knowledge of the German language is effectively small. Due to the traditions of ‘academy’, this thesis is written in English. Hence, besides English, the reader will find passages of texts in the other three languages. Paraphrasing Gadamer (2004, p. 404), as an interpreter I know that I am bringing myself and my own concepts into the interpretation. And having to rely on translation is tantamount to abusing of my authority as author. Gadamer goes on and, unmercifully, states that

Where a translation is necessary, the gap between the spirit of the original words and that of their reproduction must be taken into account. It is a gap that can never be closed. (GADAMER, 2004, p. 386)

Based on that reasoning, whenever possible I will use the original version of texts, without relying on further interpretations of mine. After all, “our confidence in the meaning of words is an act of social allegiance” (POLANYI, 2014, p. 250–251). In an interdisciplinary text, each word “seems to face us with an immensely ramified system of wholly indeterminate uncertainties which we have to accept blindly, if we are ever to speak at all” (POLANYI, 2014, p. 251). And, without adding a *comma*, I cite Polanyi (POLANYI, 2014, p. 251) to say that

I have also said before that we must accept the risk of semantic indeterminacy, since only words of indeterminate meaning can have a bearing on reality and that for meeting this hazard we must credit ourselves with the ability to perceive such bearing. [...] This decision would eliminate precision of meaning as an ideal, and raise the question in what sense (if any) we apply the term ‘precise’ or ‘imprecise’ to meaning of a descriptive term.

Beyond that, I will also always try to present an English translation of the original cited texts, if readily available. Nevertheless, I firmly believe that the “possibilities of our knowledge seem to be far more individual than the possibilities of expression offered by language” (GADAMER, 2004, p. 404). Thus, I invite the reader to interpret and understand by her/himself *le collage de textes* that constitute this thesis. Texts from several authors and languages presented in a way that set as low as possible bounds to understanding. So, I do that believing that “the verbal form in which this understanding is interpreted must contain within it an infinite dimension that transcends all bounds” (GADAMER, 2004, p. 402). And, yes, just a last reminder that this is a research as true fiction.

So. Once upon a time, there was a breakdown<sup>17</sup>...

### Breakdowns and Mysteries

The designing of that landscape, and the “finding” of a mountain from which to pick a specific stone to research upon, started from a particular breakdown and evolved as something that can be compared to solving a mystery<sup>18</sup>, a scientific mystery. As the following explanation states:

Solving the mystery means it becomes more understandable: it is less puzzling, less ambiguous, and we will have concepts, a line of reasoning, a metaphor, or other tools which will give sense of what to expect and how to intellectually understand the mystery.

(ALVESSON; KARREMAN, 2011, p. 111–112)

Nevertheless, solving a mystery does not equate to finding the truth, as I will not claim in any sense that this research will produce any objective truth (SMYTHE et al., 2008).

Retrospectively, the whole discussion of what could be the theme of my doctoral research gained formal contours in October 2010 and built up from a particular interest of mine: service innovation. Which is defined here as the “collaborative recombination or combinatorial evolution”

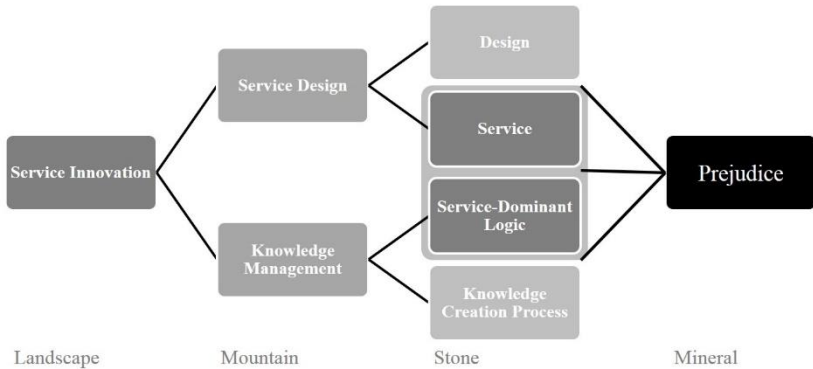
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<sup>17</sup> “A breakdown is a lack of fit between one’s encounter with a tradition and the schema-guided expectations by which one organizations experience” (Agar, 1986: 21 *apud* Alvesson & Karreman, 2007).

<sup>18</sup> “A mystery is a specific kind of breakdown that cannot be understood simply by asking more questions, hanging around and walking to the library to read more books” (ALVESSON; KARREMAN, 2007).

(VARGO et al., 2015, p. 64) and adoption by a social context of a new “application of operant resources (knowledge and skills)” (VARGO; LUSCH, 2008, p. 7). It worth noting that I believe that *service* is the basis for all economic exchange.

Thus, this is my initial landscape: Service Innovation. From which I choose the mountains of Service Design and Knowledge Management. On those mountains, I picked the stones: Design, Knowledge Creation Process, Service and Service Dominant-Logic. These last two could be considered two stones firmly held together. The Mineral, which I consider as a component of all the picked stones, is represented by the concept of Prejudice.



**Figure 1 – From Service Innovation to Prejudice**

From that initial landscape, which was also the theme of my master thesis (MANHÃES, 2010), emerged to me a particular perception: the reluctance from organizations<sup>19</sup> to collaboratively create and adopt new service propositions. That perception came from my work experience on Information & Technology projects, which started around 1995, with organizations from a particular geographical region: the coastal region of the state of Santa Catarina, Brazil. Which, for me, has a geography that can be inspirational for the creation of several ‘ships of land’; that can be thought of as wonderful landscapes.

<sup>19</sup> I work with the definition of “organizations” as “Collectivities whose participants share a common interest in the survival of the system and who engage in collective activities, informally structured, to secure this end” (SCOTT, 1987, p. 23).

## Boundaries of a Landscape

Before I go further into the proposed landscape, I have to start defining some boundaries around the two main concepts presented at the title of this thesis: Innovativeness and Prejudice.

### Innovativeness

I will briefly describe my perspective on innovativeness and how it relates to social groups. At first, it is necessary to state that the concept of “innovativeness can at the very least be defined as imprecise” (ROEHRICH, 2004, p. 671). It has been defined, at an individual level, as “the degree to which an individual is receptive to new ideas and makes innovation decisions independently” (MIDGLEY; DOWLING, 1978, p. 236).

For the purpose of this thesis, I define innovativeness as a measure of the degree of “newness” that is perceived by a social group about a specific product. Therefore, the degree of innovativeness is intrinsically related to “*whose* perspective this degree of newness is viewed” and *what* is considered new by those who are taking part at the assessment (GARCIA; CALANTONE, 2002). This is precisely the idea that justifies why “knowledge management is purported to increase innovativeness and responsiveness” of groups (ALAVI; LEIDNER, 2001, p. 113) by supporting and promoting knowledge creation processes.

And to differentiate innovativeness from innovation, I have to say that I understand this last one as a broad social phenomenon (MANHÃES, 2010) with two folds: (a) a social process of creating, proposing and designating new values in a socio-cultural context and (b) of generating opportunities for “coping with interruptions” (Weick, 1995) that will enable a social group to understand, adopt and enact these new propositions of value. A last and fundamental characteristic of innovation is the fact that its performance can only be judged over time “as it unfolds through decades or centuries” (SCHUMPETER, 1943). However predictable is the incessant revolution of the economic structure *from within* (i.e., the creative destruction phenomenon), there is no point in appraising its performance on a given point in time (SCHUMPETER, 1943). This is one of the reasons why this research is based on innovativeness measures and not on the overarching concept of *innovation*.



## Prejudice

To describe the concept of prejudice adopted by me for this thesis, first, I have to present the following arguments from Allport (1979, p. 281):

Prejudice (unless deeply rooted in the character structure of the individual) may be reduced by equal status contact between majority and minority groups in the pursuit of common goals. The effect is greatly enhanced if this contact is sanctioned by institutional supports (i.e., by law, custom or local atmosphere), and provided it is of a sort that leads to the perception of common interests and common humanity between members of the two groups.

The importance of that for the present research – that of working within the cited conditions, resides in the apparent conceptual support that those lend to the processes of creating bridges between different prejudices, bridges to enable meeting the Other.

Simply speaking, the Other (with a capital “O”) is much more than the *Not-I*, “which sounds like an opposition or a reduction against which one must struggle, or which one must overcome” (GADAMER, 2000, p. 282). Gadamer shows how the understanding of the Other possesses a fundamental significance, not just as a limiting factor for existence:

In the end, I thought, the very strengthening of the Other against myself would, for the first time, allow me to open up the real possibility of understanding. To allow the Other to be valid against oneself – and from there to let all my hermeneutic works slowly develop – is not only to recognize in principle the limitation of one’s own framework, but is also to allow one to go beyond one’s own possibilities, precisely in a dialogical, communicative, hermeneutic process.  
(GADAMER, 2000, p. 284)

Therefore, it is through the concept of prejudice that one goes “beyond one’s own possibilities” in a *Bildung*<sup>20</sup> hermeneutic process as

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<sup>20</sup> In English this word corresponds to ‘formation’ and can be described as “keeping oneself open to what is other – to other, more universal points of view” (GADAMER, 2004, p. 15) which

depicted at the next figure. Which prompted me to the suggestion that the design of *Bildung* prone groups should have to take into account the implementation of these Allport's key conditions. And one of the most pressing reasons for that is the fact that, although open-mindedness can be considered a virtue, "strictly speaking, it cannot occur" (Allport, 1979, p. 20):

A new experience *must* be redacted into old categories. We cannot handle each event freshly in its own right. If we did so, of what use would past experience be? Bertrand Russel, the philosopher, has summed up the matter in a phrase, "a mind perpetually open will be a mind perpetually vacant."

Again, Gadamer's prejudice notion comes handy into play. It seems that we cannot *escape* our history. From a hermeneutical perspective, nobody proceeds from a *tabula rasa*. So, to "understand presupposes preunderstanding." Alvesson and Sköldbberg (2009, p. 120) also explain that preunderstanding is an obstacle to understanding. And to prevent it from developing into a vicious circle they write that:

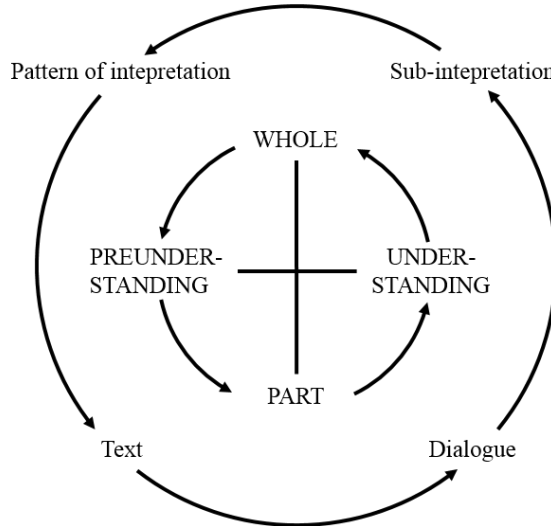
[...] the existential hermeneuticians advocate a constant alternation between merging into another world and linking back into our own reference system. By means of this movement back and forth, we can successively come to an understanding of the unfamiliar reference system, something which also leads to the gradual revising and/or enriching of our own: there is a 'fusion of horizons' [...].

From that statement, an understanding of a new part fosters a new understanding of a whole. This would happen individually, with each member of a group going through an interpretative process based on her/his own horizon of understanding. And, in an iterative process involving the other members of the group, the understanding process proceeds until it express "a nexus of personal meanings that are formed in a complex field of social and historical relationships" (THOMPSON, 1997, p. 439). In that sense, Gadamer's notion of prejudice is a *whole* concept that entails a socio-cultural context, an individual historical vantage point, which unveils a particular horizon. In sum, one more time

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can be considered a fundamental condition for co-creation efforts, especially towards obtaining innovative propositions.

emerges, by repeatedly knocking at the text (ALVESSON; SKÖLDBERG, 2009, p. 122), the hermeneutic *basic circle* as depicted by Alvesson and Sköldbberg at Figure 2 (ALVESSON; SKÖLDBERG, 2009, p. 104).



**Figure 2 – The hermeneutic circle: basic version**

Source: (ALVESSON; SKÖLDBERG, 2009, p. 104).

It is important to note that Allport's works presents a particular use of the word prejudice as "an antipathy based on faulty and inflexible generalization. It may be felt or expressed. It may be directed toward a group or an individual of that group" (ALLPORT, 1979, p. 10). For Kruglanski (2004), prejudice results from a tendency to rely on stereotypes which is supported by the notion that "need for closure leads to reliance on pre-existing knowledge structures to the relative neglect of case-specific information" (p. 84). From a Gadamer's perspective, both of these definitions would be related to prejudice's possible negative values and to the "discrediting of prejudice by the Enlightenment" (GADAMER, 2004), i.e. to the "prejudice against prejudice itself."

Based on the works of Arie W. Kruglanski (KRUGLANSKI, 2004; KRUGLANSKI et al., 2010), Gordon W. Allport (ALLPORT, 1979) and Hans-Georg Gadamer (GADAMER, 2004), I adopted the description of prejudice as *a historical vantage point where human finite understanding is situated, and which may result on judgments that are rendered before a fair amount of elements have been examined* (ALLPORT, 1979;

DOBROSAVLJEV, 2002; GADAMER, 2004; KRUGLANSKI, 2004; ROETS; VAN HIEL, 2011b). It is also important to note that there are not only negative connotations in this description of prejudice. It has at its core the phrase “human finite understanding,” which encompass both negative and positive notions as:

- Negative: one of its negative notions is the fact that it may describe “an antipathy based on faulty and inflexible generalization” towards the Other.
- Positive: one of its positive senses lies in the fact that it enables us “to understand history as well as ourselves” (DOBROSAVLJEV, 2002). It also “allows us to get on with our lives, rather than remain in an indefinite cognitive limbo” as explains Kruglanski (2004) about the positive effects of closed mindedness<sup>21</sup>.

So, I do not endorse the notion of *reducing prejudices*. Instead, I work with the conceptual development of a process for gaining awareness by a person or a group about their own prejudices and the impacts of the later on a specific socio-cultural context. On the previous and following citations, whenever the notion of *reducing prejudice* appears, my interpretation is as if it was written: *the augmentation of the awareness of the negative impacts of prejudice*.

### Preoccupation with Effectiveness

There was always, under or behind the concept of prejudice, an incident voice from Professor Ulla that kept reminding me that most of the thesis and research on organizational grounds were about

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<sup>21</sup> “The phenomena of closed and open mindedness are at the heart of the interface between cognitive and social processes. Every intelligible judgment, decision, or action rests on a subjective knowledge base held with at least a minimal degree of confidence. Formation of such knowledge requires that we shut off our minds to further relevant information that we could always strive and often manage to acquire. The relation of closed mindedness processes and social cognition and behavior is twofold. First, other people or groups of people often are the targets of our judgments, impressions, or stereotypes. Second, they are often our sources of information, and their opinions, judgments, and attitudes exert an important influence on our own. Thus, closed mindedness phenomena impact on what we think of others as well as how we think, in terms of the sources of information we take into account when forming our own opinions.” (KRUGLANSKI, 2004, p. 04)

“productivity”, i.e. increasing organizational performance<sup>22</sup>. This remark from her seemed to echo the excessive literature focus on the “preoccupation with growth” by organizational researchers, supported by the belief that “growth is synonymous with effectiveness” (WHETTEN, 1980), which is being denounced by academics since the early 1970.

What appeared to me as a potentially interesting breakdown to study about (ALVESSON; KARREMAN, 2007) was the fact that the majority of these organizations seemed to have a common characteristic. To me, they were *over-focused* on efficiency (KRISTENSSON UGGLA, 2010). As if *efficiency* was equated to *good performance*: better efficiency would lead to better performance. And innovation, particularly service innovation, was seen by these organizations as a highly inefficient process. Although efficiency can be considered as one of the elements of organizational performance (TANGEN, 2005), it cannot be considered its main component.

One factor that could be considered as a major contributor to organizational performance could be its capacity to play along with the *creative destruction* dynamics of capitalism, i.e. *innovation* (SCHUMPETER, 1943). Moreover, this last one cannot be considered as an efficient process in itself nor a direct result of an organizational focus on efficiency.

At some point I understood this particular *focus on efficiency* as a sensemaking<sup>23</sup> discourse that was enabling these organizations to act *towards* a better performance. As Professor Varvakis once verbally explained to me, the conditions in which *Taylorism* came to be:

*“To understand Taylor and all the focus on efficiency you have to be aware of the time and context in which this mindframe was created. The workers of that time did not have much educational background. The focus on efficiency was also a process of technology education. People could*

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<sup>22</sup> “Furthermore, performance can be described as an umbrella term for all concepts that considers the success of a company and its activities. Nevertheless, the types of performance that a particular company strives to fulfil are very case specific.” (TANGEN, 2005, p. 40)

<sup>23</sup> “Sensemaking involves the ongoing retrospective development of plausible images that rationalize what people are doing. Viewed as a significant process of organizing, sensemaking unfolds as a sequence in which people concerned with identity in the social context of other actors engage ongoing circumstances from which they extract cues and make plausible sense retrospectively, while enacting more or less order into those ongoing circumstances. Stated more compactly and more colorfully, “[S]ensemaking is a way station on the road to a consensually constructed, coordinated system of action.” (TAYLOR; VAN EVERY, 2000, p. 275).” (WEICK; SUTCLIFFE; OBSTFELD, 2005, p. 409)

*only handle a very small amount of instruction per time. They were moving from an agricultural paradigm, where time and conditions were unquestionable and given by nature to a context where these last factors were controlled by man. The knowledgebase had to be changed. And this can only be done on a parsimonious manner, controlling the chunks of information that they would have to handle. In that sense, Taylor can be seen even as an illuminist, rather than a reductionist!”*

As I could grasp, the prejudices and horizons of the workers at that time, the Efficiency Movement in the early 20<sup>th</sup> century – in which Frederick Winslow Taylor (1856-1915) is one of its main leaders, could be considered a knowledge creation effort. As the label “scientific management” entails, it can be understood as a scientific knowledge creation process. Although, as presented by Derber (1983), on one hand it can be said that the *efficiency movement* deprived “workers of a belief in their capacity to manage their own work” (p. 315), on the other it also enabled non-technical workers to become employed in industries. Thus, educating and enabling more people to act, i.e. to work in industries.

So, my perceived initial breakdown was this inconsistent relation between an organizational focus on efficiency and a sustained low level of efficiency of those same organizations. In other words, what seemed to be the breakdown was the fact that organizations that are seemingly focused on efficiency cannot proportionally improve their performance. At least, not to a point that raises their survival rates over the long run. My perception was that of a discrepancy existed between what was meant by “efficiency” and what people in those organizations did as for improving it. Therefore, my belief is that performance, understood as the umbrella term of excellence, which includes profitability and productivity is what many people who claim to be discussing efficiency are actually talking about (TANGEN, 2005).

The first explicit statement about this interest of mine was made by publishing a book chapter entitled<sup>24</sup> “A Produtividade como um Processo Antitético: uma proposta para a ilustração da relação entre estabilidade e criatividade nas organizações” (MANHÃES; VANZIN, 2010). This text is, with absolute certainty, the conceptual *locus* from which the landscape journey begun. Due to its seminal role for this

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<sup>24</sup> As translated by me, its title in English would be: Productivity as an antithetical process: a proposal for the illustration of the relationship between stability and creativity in organizations.

research, a revised, abridged and translated to English version of it is presented at the Landscape part of this document under the title of “Productivity as an antithetical process.” Although it was the start of everything, I will present it as the very last *part* of a *whole* Landscape.

It was due to the writing of this chapter, driven by that preoccupation with organizational growth, that I directed my attention to the concept of innovation, as one of the components of organizational performance. And after several discussions with Professors Gregório Varvakis and Ulla Johansson-Sköldberg, they oriented my attention to the concept of *prejudice*. Not any kind of “prejudice,” but a particular one described by a German philosopher named Hans Georg Gadamer (1900-2002).

So, the combination of these two concepts – prejudice and innovation – led me to design a mystery over a landscape depicting the impacts of prejudice on innovative efforts.

It was very interesting to find out later – in 2014 – that Nonaka et al. (2014, p. 139), amongst the most influential academics from the Knowledge Management grounds,

[...] believe that the most important aspect of economics and business studies from now on will be the focus on knowledge and the subjectivity of the humans, who create and utilize the knowledge. (NONAKA et al., 2014, p. 139)

This is what I believe<sup>25</sup> to be doing: trying to understand the subjectivity of humans (precisely in the plural) during the creation and use of knowledge and the impacts of those subjectivities on the business economic cycle of human organizations. And to be able to endure this research, I had to find a suitable method to do it in an interdisciplinary way.

## Reflexive Methodology

Being a student on an interdisciplinary doctoral program with a focus on *knowledge* required from me a parsimonious research on research methodology. Furthermore, a research about the possible impacts of prejudice on innovative efforts, or the relations between prejudice and performance in the organizational context would, have to

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<sup>25</sup> “To believe is to notice selectively” (WEICK, 1995, p. 133).

be supported by a methodology that could take into account the diversity of voices to be heard, i.e. an interdisciplinary perspective. Otherwise, a research that taps onto the concept of prejudice could not be in any sense fruitful.

At some point, I understood that only a methodology that could give rise to several voices would be suited to tackle the complex issues that would arise from the intended landscape. Again, the directions given by Professor Ulla were definitive towards a reflexive methodology approach. Precisely, due to its interdisciplinary underlying structure (specifically, quadri-hermeneutics), the reflexive approach could facilitate building bridges between different disciplines. Which means not to solve the contradictions and incongruences between them. But, to expand the possibilities of dialogue with the Other by building bridges between the different. Throughout this document I use interchangeably either the phrase *building bridges between the different* or *building bridges with the Other*. These phrases are based on the concept of *other* (GADAMER, 2000, p. 284) and on the generative metaphor<sup>26</sup> (SCHÖN, 1979) of a bridge as an *arc herméneutique* (RICOEUR, 1986, p. 158), and are inspired by the French Philosopher Paul Ricoeur and his insistence

on building bridges between concepts that are otherwise seemingly incompatible and between which there might be controversy. (JAHNKE, 2010, p. 106)

The interdisciplinary characteristics of the reflexive methodology – as it is supposed by me, helped me to find a way through the traditional institutions of science and education to experiment new combinations of structures for discourse. Combinations which have emerged and were discussed and tested during the whole period of this research.

Perceiving interdisciplinarity as a creative destruction process enabled me to understand it based on the same elements proposed by Schumpeter for innovation (SCHUMPETER, 1927). From this point of view, interdisciplinarity is a search for “new combinations” of approach to the disciplinary way of researching, teaching and practicing. In addition, as innovation in the business cycle, interdisciplinarity arises in moments of “crises” (scientific, environmental, energetic), demands a

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<sup>26</sup> “When the two things seen as similar are initially very different from one another, falling into what are usually considered different domains of experience, then *seeing-as* takes a form that I call “generative metaphor.” In this form, *seeing-as* may play a critical role in invention and design [...]” (SCHÖN, 1982, p. 183–184)



concerted effort of brain activities, then a series of experiments until it reaches a new equilibrium; i.e. new routines (SCHUMPETER, 1927).

And this opens space for Gadamer's consideration about "the convolutions of the arabesque," which should provide "a field of play where the understanding's desire of unity does not so much confine it as suggest incitements to play" (GADAMER, 2004, p. 41). Before Gadamer's writings about the *arabesque*, Foucault stated in 1971 that discipline "est un principe de contrôle de la production du discours"<sup>27</sup> (FOUCAULT, 2014, p. 37). And he adds, as echoes Repko (2012, p. 21), that to fully comprehend the "role positif et multiplicateur" of the disciplines, it is necessary to take into consideration their restrictive and binding functions. And this offers an interesting argument for the role of questioning disciplinary structures. Foucault ascertains that disciplines are composed by mistakes and truths alike. In his own words, he writes that disciplines

[...] sont faites d'erreurs comme de vérités, erreurs qui ne sont pas des résidus ou des corps étrangers, mais qui ont des fonctions positives, une efficacité historique, un rôle souvent indissociable de celui des vérités.<sup>28</sup> (FOUCAULT, 2014, p. 33)

Based on that, my interdisciplinary understanding of *disciplines*, as an intricate discourse about the relations between prejudices, errors, truths, restrictions and multiplications, demands a research approach that supports multiple discourses and tropes.

Although I put aside from the very outset "any claim that this research will produce objective, simplified, scientific concepts of truth" (SMYTHE et al., 2008, p. 1391), I also learned that a good research must be an "invitation to others to come and look and think along with us" (SMYTHE et al., 2008, p. 1393) and to feel enabled to act (WEICK, 1995). As stated somewhere else in this text, I am also concerned with understanding a particular landscape.

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<sup>27</sup> Disciplines constitute "a system of control in the production of discourse," as translated by me.

<sup>28</sup> [...] are made up of errors as well as truths, like any other discipline – errors which are not residues or foreign bodies but which have positive functions, a historical efficacy, and a role that is often indissociable from that of the truths. As translated by translated by Ian McLeod in R. Young (ed.). (1981). *Untying the Text: a Poststructuralist Reader*. Boston: Routledge and Kegan Paul, pp. 48-78.

Therefore, I am “concerned with establishing similarities, regularities and conformities to law which would make it possible to predict individual phenomena and processes” (GADAMER, 2004, p. 03), i.e. to *understand* a particular phenomenon. For me, to predict a phenomenon in human sciences, without caricaturizing it, calls for ‘an ability to reflect in “wide circles” informed by epistemological and ontological awareness (JAHNKE, 2013). An ability to understand how we think, to reflect. As stated by Dewey (DEWEY, 2013, p. 02):

Reflective thought is consecutive, not merely a sequence. [...] Reflection involves not simply a sequence of ideas, but a *consequence* – a consecutive ordering in such a way that each determines the next as its proper outcome, while each in turn leans back on its predecessors. The successive portions of the reflective thought grow out of one another and support one another; they do not come and go in a medley. Each phase is a step from something to something – technically speaking, it is a term of thought. Each term leaves a deposit which is utilized in the next term. The stream or flow becomes a train, chain, or thread. [...] Reflective thought aims, however, at belief.

It is precisely this reflection in wide circles, should I say in a widening “knowledge spiral” (KROGH et al., 2013), in a *consequence* of thoughts aiming at understanding a particular breakdown that draw me towards the reflexive methodology.

A stone in the middle of the road

No meio do caminho tinha uma pedra  
Tinha uma pedra no meio do caminho  
Tinha uma pedra  
No meio do caminho tinha uma pedra.<sup>29</sup>

Carlos Drummond de Andrade  
(1902-1987)

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<sup>29</sup> As translated by me: In the middle of the road there was a stone / There was a stone in the middle of the road / There was a stone / In the middle of the road there was a stone.

On the 15<sup>th</sup> of December 2011, Professor Ulla sent a message to me stating that she “have to take back the permission to come and stay” with her and the group at Business & Design Lab during the year of 2012. Due to serious health conditions that she was facing, she was not able to supervise my research anymore. Almost a year after having received her acceptance (received on the 21<sup>st</sup> of December 2010), I had to change plans. To check if there was any possibilities of maintaining Gothenburg on the landscape, I flew there on the 10<sup>th</sup> of January 2012, staying until the next 20<sup>th</sup>.

Fortunately, I had a previous understanding with Professor Birgit Mager, from the Service Design Research Center (SEDES) in Cologne, Germany. On the 24<sup>th</sup> of January 2012, Professor Mager officially accepted to be my supervisor at the Köln International School of Design.

Although there was some alternatives for staying at Gothenburg, none of them was better than a possibility to go to Germany. That stumbling stone, instead of being a setback, became a definite contribution towards a more empirical approach on my research.

During these ten days at Gothenburg, I had the opportunity to meet with my friends Katarina Wetter-Edman and Marcus Jahnke. After a “breakfast coffee” that I had with Marcus on the 20<sup>th</sup> of January 2012 in Gothenburg, where we discussed several issues relating to both of ours research, I definitively set myself the challenge of approaching the Reflexive Methodology (ALVESSON; SKÖLDBERG, 2009).

And almost one year and a half from that meeting, on the 31<sup>st</sup> of May 2013 (the day I finished my study and reading of the book *Reflexive Methodology – New Vistas for Qualitative Research*), I finally found myself sure enough to commit to the challenges of a reflexive methodology. Which does not mean that I was overly confident, just that I was sure *enough* that it was the right step to take given the landscape and mysteries ahead.

Through reading a few of the fundamental literature about reflexive methodology (which is cited on these first pages), I accepted that “Everything finite is an expression, a representation of the infinite” (GADAMER, 2004, p. 55) and that decoupling a part from a whole would impoverish my research journey. After all, “we are always set in a context, and this context is also of a *practical* nature” (ALVESSON; SKÖLDBERG, 2009, p. 119). Therefore, my ideal for a research method was one that would enables me to explore “*tension situations* between empirical support and the freedom to express something creatively” (ALVESSON; SKÖLDBERG, 2009, p. 306). And that this method

should permit empirical data to “function as a generatively springboard for interpretations” (ALVESSON; SKÖLDBERG, 2009, p. 305).

## Research Quadrants

At the lived moment when I was doing this research, the reflexive methodology, as described by Alvesson and Sköldbberg (2009), was the one that better resonated with how I learned how a research – about the impacts of prejudice on innovative efforts – should be. In particular, because of the quadri-hermeneutics approach. To me, it seems that it “can generate a certain guarantee against specific epistemological positions which by definition detract from other positions” (ALVESSON; SKÖLDBERG, 2009, p. 308). As I learned, it would help me to be aware of the prejudices at play and also to be aware of the “prejudice against prejudice itself” (GADAMER, 2004).

That methodology would stand still and be flexible enough to help me face the challenge of dealing with such an interesting context as the one I idealistically intended to endure. To have an interesting context approached through a good research framework should facilitate the inclusion of

[...] the potential for novel insights that will add significantly to – or against – previous understandings. It should thus include something unexpected and challenging; something that turns at least some elements of earlier knowledge on their head. Normally something interesting will also mean clear connections to what is (perceived to be) socially and practically relevant and recognizable, but also something having a broader theoretical relevance. For example, this may mean allowing for and encouraging abstraction, aiming for in-depth understanding, and now and then attempting to provide explanations for the phenomena of which the focal empirical case is one example. (ALVESSON; KARREMAN, 2011, p. 57–58)

The sensemaking discourse that I created for this study, and which enabled me to act towards continuing my research journey, can be summarized in the following figure. The research, once written down on the form of a document, would have the intended “potential for novel

insights that will add significantly to – or against – previous understandings” (ALVESSON; KARREMAN, 2011, p. 57–58) scattered into four different quadrants.

The quarters Reflection/Answers and Action/Questions point to the presentation of mysteries as the possible contributions of the research process. At the former, the answers presented as contributions lead to more reflections. At the later one, the questions presented force to take action. This perspective of understanding the research process as a way of enabling people to act or, at least, augmenting their potential to act, echoes the very definition of knowledge as proposed by (KROGH et al., 2013, p. 4):

Knowledge is also what enables people to act and should therefore be thought of as potential rather than actuality.

Based on my personal understanding of the literature review that I have done about reflexive research methodology (ALVESSON; KARREMAN, 2007, 2011; ALVESSON; SKÖLDBERG, 2009; DEWEY, 2013; GADAMER, 2004; WEICK, 1995), I will focus mainly on providing novel insights to both Action/Answers and to the Reflection/Questions quarters. The former would mean to propose some framework as to assess the innovative potential of groups. The later, would be an invitation to think along about the impacts of prejudice on innovative efforts, or the impacts of diversity in organizations’ performance. After all, I learned that knowledge has this “activist orientation” (MANNHEIM, 1954, p. 265) in many degrees, and that the main goal of a research process is to enable people to act, to augment their potential to act (KROGH et al., 2013, p. 4); i.e. to create knowledge.

The challenge to enable people to act and/or reflect as a result of an interdisciplinary research requires a hermeneutically trained consciousness, “to be aware of one’s own bias, so that the [research] can present itself in all its otherness and thus assert its own truth against one’s own fore-meanings” (GADAMER, 2004, p. 271–272). Nevertheless, it does not mean having some kind of “neutrality.” Since this research deals with the concept of *prejudice*, from my point of view, “instead of favoring any one methodological perspective or level” (JAHNKE, 2013), it is necessary to adopt metaprinciples, such as quadri-hermeneutics. As I cited above, I learned that the different voices that quadri-hermeneutics permits are a certain guarantee from different positions detracting one another (ALVESSON; SKÖLDBERG, 2009, p. 308). Thus, to foster a

*Bildung* by keeping the researcher open to what is different, “to what is other – to other more universal points of view” (GADAMER, 2004, p. 15).

Reflection	<ul style="list-style-type: none"> <li>• Present mystery as contribution</li> </ul>	<ul style="list-style-type: none"> <li>• Present mystery and solution as contribution</li> <li>• Enable to reflect</li> <li>• Propose questions</li> <li>• Fertilize preunderstandings</li> </ul>
Action	<ul style="list-style-type: none"> <li>• Present mystery and solution as contribution</li> <li>• Enable to act</li> <li>• Propose answers</li> <li>• Refer back to preunderstandings</li> </ul>	<ul style="list-style-type: none"> <li>• Present mystery as contribution</li> </ul>
	Answers	Questions

**Figure 3 – Possible Research results: quadrants**

Source: Based on (ALVESSON; KARREMAN, 2007, 2011; ALVESSON; SKÖLDBERG, 2009; WEICK, 1995)

Study context: from organizations to groups

An interdisciplinary and reflexive research about the possible relations between prejudice and performance in the organizational context calls for a specific “context” of study. A context that could help design both a particular landscape and a mountain. And within which I could “find” or designate a particular stone.

The “perfect” research context for study was found serendipitously by me in 2011. In the beginning of that year, two service design consultants – Markus Edgar Hormess and Adam StJohn Lawrence – initiated a worldwide call for the realization of simultaneous workshops under the banner of Global Service Jam (GSJ)<sup>30</sup>. As presented on its website, the GSJ is an open invitation for “experimentation, innovation, co-operation and friendly competition, teams [...] have less than 48 hours to develop and prototype completely new services inspired by a shared theme.” And an important aspect of this initiative, at least from an

<sup>30</sup> Further details about this event can be obtained at: <http://www.globalservicejam.org/>

academic perspective, is the fact that “[a]t the end of the [workshops], their collection of brand new services [are] published to the world.”

Whilst starting my doctorate research, I was invited to be a facilitator (i.e. a group’s process manager) at the Global Service Jam 2011 in São Paulo<sup>31</sup> (GSJSP), Brazil. The main structure of the event, as proposed by the initiators, received some important contributions from the hosts of the Brazilian edition, Juliana Proserpio and Ricardo Ruffo. Juliana and Ricardo had been strongly influenced by their recent, at that time, experience at the School of Design Thinking, at the Hasso Plattner Institut located in Potsdam-Babelsberg nearby Berlin, Germany.

The way that GSJSP actually occurred generated a conceptual structure that was perceived by me as having almost all the elements necessary to support what I considered to be an ideal study (HARRISON; LIST, 2004). In this study, besides having open access to the resulting data, it is possible “to observe a subject in a controlled setting but where the subject does not perceive any of the controls as being unnatural and there is no deception being practiced” (HARRISON; LIST, 2004). So, although my research would initially be focused on studying organizations<sup>32</sup>, I thought that “groups” would make the study about the impacts of prejudice on innovative efforts much easier. One aspect that helped me justify this change was the fact that the definition<sup>33</sup> of social groups as “a number of people that work together or share certain beliefs,” was closely related to the organizational definition by Scott (SCOTT, 1987, p. 23).

In the years that followed (from May 2011 until March 2015), based on the format proposed by GSJ+GSJSP, I had the opportunity to stage several workshops<sup>34</sup>. The first thirteen of them were held in Brazil, between May 2011 and June 2012, with the wonderful partnership of Maria Augusta Orofino. Partnership that had to be suspended in July 2012 as I started to prepare my relocation to Germany.

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<sup>31</sup> This particular event was held on the 11th of March 2011. A video about that event can be found at <http://www.spjam.com/portfolios/marco11/>.

<sup>32</sup> I work with the definition of “organisations” as “Collectivities whose participants share a common interest in the survival of the system and who engage in collective activities, informally structured, to secure this end” (SCOTT, 1987, p. 23).

<sup>33</sup> Definition obtained on 04/11/2014 from <http://www.oxforddictionaries.com/definition/english/group?q=group>

<sup>34</sup> Further details about these workshops can be obtained at: [www.innovaservice.com.br](http://www.innovaservice.com.br) (available only in portuguese).

## Moving to Cologne

I arrived at Cologne on the 13<sup>th</sup> of February 2012. Although I did not know the city, having the decisive support of Professor Birgit Mager made the whole process of fit-in a lot easier. Cologne also turned out to be the perfect place to be with my wife and son, who arrived on the following 25<sup>th</sup> of February. During the whole time that I lived in Cologne, I had the opportunity of traveling often to several European countries and, specifically, to Sweden.

During one of those trips, on the cold afternoon of 8<sup>th</sup> of May 2012, during a bus trip between Stockholm and Karlstad, I had an epiphany while reading a paper: *Allport's Prejudiced Personality Today: Need for Closure as the Motivated Cognitive Basis of Prejudice* (ROETS; VAN HIEL, 2011b). At that moment, I realized that the Need for Closure (NFC) (KRUGLANSKI; FRIEDMAN; ZEEVI, 1970; KRUGLANSKI; WEBSTER, 1996; KRUGLANSKI, 2004; WEBSTER; KRUGLANSKI, 1994) scale was one possible alternative to empirically approach the issue of functional-diversity (HONG; PAGE, 2004) along with relating it to the prejudice concepts of Allport and then expand it through the one of Gadamer.

On that same week, on the 09<sup>th</sup> of May, I met Peter Magnusson to discuss his PhD Thesis (MAGNUSSON, 2003). Specifically, I discussed an important issue on how to assess the perception of innovativeness of products.

This particular week can be said to represent a converging point from which the research started to diverge again. The moment when “a” stone was picked (from countless other possible ones) forcing the ship of land to be recreated. That was when my preunderstanding was one more time, although a decisive time, “fertilized by the new understanding” (ALVESSON; SKÖLDBERG, 2009, p. 104).

At this point, it became clear to me that an academic research is both a design and a knowledge creation process (MANHÃES; VARVAKIS; VANZIN, 2010). As a design process, an academic research seems to present a hermeneutic dynamic between a part and a whole, following divergent and convergent phases of understandings. It also relates to the knowledge creation process, with its socialization, externalization, combination and internalization phases (NONAKA; VON KROGH, 2009).

Then, after a couple of months exchanging e-mails, on a cold morning of the 16<sup>th</sup> of November 2012, I met Professor Dr Arne Roets at the Department of Developmental, Personality, and Social Psychology of



the Ghent University, Belgium. We had the opportunity to discuss my intended research, to which he asserted: “Your research plans look interesting and I definitely believe NFC is a major determinant of innovation and creativity.”

Following that visit to Professor Dr Roets, I got in contact with Professor Arie Kruglanski, to whom I also explained my interests and described the ongoing research. On the 02<sup>nd</sup> of January 2013 Professor Kruglanski sent me a message stating that “Yes, I am interested in your findings and would be interested in discussing them with you.” He also mentioned Professor Antonio Pierro, the leader of the group from the University of Rome that have done some works on the possible relations between NFC and creativity<sup>35</sup>, along with Antonello Chirumbolo and Stefano Livi.

In a sense, those people and places seemed to be the initial landscape that I would wander through.

### Purpose of the thesis

After having started to know that landscape, I could start to tackle the possible purposes of this thesis. At the beginning of this journey, the “purpose” was very much focused on how to design a study about the possible relations between prejudice and performance in the organizational context. After a while, further down the walk, the purpose started to shift towards a more broad approach on understanding how an interdisciplinary and reflexive research about the impacts of prejudices on innovative efforts could be done. Alternating divergent and convergent phases, either searching for a part or a whole, some elements of a landscape started to get crystallized.

One of them arose from reflections about my experience of having produced several creativity-driven workshops along the first year of this research, from May 2011 to June 2012. As I reflected about this experience, it was possible to recollect new breakdowns and mysteries that I considered interesting enough to deserve further investigation (ALVESSON; KARREMAN, 2007). These new breakdowns, as interpreted by me, may be summarized by the fact that the perception of innovativeness is not guaranteed simply by adopting design allegories<sup>36</sup>

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<sup>35</sup> “Creativity entails some variation-selection process (or set of such processes) that generates and winnows out numerous conceptual combinations.” (SIMONTON, 1997, p. 67)

<sup>36</sup> “For this sense an allegory is a form of metaphor developed so continuously as to make its surface meaning, the meaning associated with its source domain, independent, autonomous and

in the same way (although diametrically opposed) that efficiency was not obtained simply by adopting “efficiency allegories”.

These perceptions made me reflect on my understanding about the following aspects:

1. The role of design, and, more precisely, that design tools or design practices do not suffice for the creation of innovative opportunities. It follows that diversified socio-cultural perspectives seemed to me to be not only desirable, but obligatory in quests for innovation. That diversified socio-cultural perspectives and the building of bridges between these differences seem to me to be the two *sine qua non* conditions – although not sufficient ones – to enact what can be called a *design process*.
2. As I see it, innovation cannot rely on truisms; it has to have its own immanent logic. Therefore, it seemed to me that it is inherently impossible to have a linear approach or rule based method for innovation. The very moment when someone tries to “control” innovation, it is most likely that it flies from the context.
3. On the other side, it also seemed clear to me that a diversified socio-cultural context could hinder, even more, the already difficult organizational quest towards the preoccupation with effectiveness.

The research interests related to the design process (item 1 above) converge with Prof Ulla ‘s desires to

welcome studies of designers’ meaning creation in the practice of innovation from a designerly point of view.

(JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013)

From all those perceptions, it struck me that being able – with and through this research – to make the design of groups a bit more understandable, less puzzling, less ambiguous, giving a sense of what to

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so unobviously metaphorical. [...]. The modern sense of allegory defines it in effect as a form of extended metaphor whose extension is so radical that it is no longer obviously a metaphor.” (CRISP, 2001, p. 6–7)

expect and how to intellectually understand it (ALVESSON; KARREMAN, 2011, p. 111–112) was the way to go.

In other words, the research interest became to propose a heuristic<sup>37</sup> for designing the best set of participants, given a definite pool of possible candidates, as to obtain the highest innovative product's potential out of a group of people; i.e. a specific set of participants. Or, how to select participants to a group as to obtain the best composition to yield the highest innovative potential product from that same group.

Given that kind of purpose, this research fits into a crossroads of several lines of research between the fields of Management, Psychology, Design and Economics. As it was summarized by Nonaka et al. (NONAKA et al., 2014, p. 139), this research (and researcher) is concerned with *the impact of human subjectivity on the creation and use of knowledge as one of the most important aspects of business and economics studies*.

The interdisciplinary research path that I went through led me to use the theory of lay epistemics<sup>38</sup>, as it concerns the process of all kinds of knowledge formation and the motivated cognitive tendencies of the individuals (KRUGLANSKI et al., 2009, p. 148). Which lead me to study the need for closure effects as fundamental to the epistemic–social nexus, and its capability of emerging in artificial *ad hoc* groupings created in the experimental laboratory (KRUGLANSKI et al., 2006, p. 89). These milestones convinced me that lay epistemic should have “important implications for group training, team management, and personnel selection within organizational contexts” (CHIRUMBOLO et al., 2004, p. 275). Especially, I came to believe that it may help to

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<sup>37</sup> A heuristic can be defined as a mediation to a judgment “when the individual assesses a specified *target attribute* of a judgment object by substituting a related *heuristic attribute* that comes more readily to mind. This definition elaborates a theme of the early research, namely, that people who are confronted with a difficult question sometimes answer an easier one instead” (KAHNEMAN, 2003, p. 707). Or, more simply, “Heuristics can be mental shortcuts that ease the cognitive load of making a decision. Examples of this method include using a rule of thumb, an educated guess, an intuitive judgment, stereotyping, profiling, or common sense” (<http://en.wikipedia.org/wiki/Heuristic>, accessed on April 07<sup>th</sup>, 2015).

<sup>38</sup> “The theory of lay epistemics concerns the process of knowledge formation. It outlines a general framework designed to pertain to all kinds of knowledge, scientific and lay, including personal knowledge of people and the world, religious knowledge, political knowledge, etc.” (KRUGLANSKI et al., 2009, p. 148). Over the last decades, “research in the lay epistemic framework has taken place within three separate paradigms, centred respectively on (1) the need for cognitive closure, (2) the unimodel of social judgment, and (3) the concept of epistemic authority.” (KRUGLANSKI et al., 2009, p. 150).

illuminate why groups are more innovative, and in particular how groups manage implementation barriers, coordinate and work together to manage the innovation process. (BECHTOLDT et al., 2010, p. 87)

From this perspective, the academic literature on diversity, from a wide variety of scientific fields seems to have identified two main traditions in research about work-group diversity and performance (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009): the social categorization perspective and the information/decision-making perspective.

The social categorization perspective advocates that the more homogeneous the work group, the higher will be the overall group performance. The information/decision-making perspective holds that diverse groups should outperform homogeneous groups. The fact is that recent meta-analyses “failed to support the proposition that diversity type moderates the effects of diversity on performance” (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009):

These studies showed that neither diversity on readily observable attributes nor diversity on underlying job-related attributes could be reliably linked to group performance.

Nevertheless there are strong indicatives that the longevity of groups (SCHIPPERS et al., 2003, p. 784) and self-similarity or dissimilarity characteristics (KRUGLANSKI, 2004, p. 136) may help make sense of effects of diversity on performance.

It seems that the more promising line of research dealing with the relation between group performance and diversity is the one based on the motivated cognitive tendencies of the individuals in a group. As I could understand both from my personal and professional experience and the literature review that I have done so far, adding more diversity (any kind of) is not necessarily better. But I echo the belief that there may exist a “sweet spot, or at least a preferred region” for diversity and that it is worthy of further study (PAGE, 2014, p. Discussion):

And given the substantial functional contributions from cognitive diversity, questions of how much and what types of diversity would create a more robust, innovative, and fair society merit deeper thinking, and especially thinking by social psychologists.

Thus, as by this very moment in time, the purpose of this research is two folds. One is to develop a heuristic capable of augmenting the potential of a social group to generate products perceived as innovative. Two, to invite others to think along about the impacts of prejudice on innovative efforts. These efforts taken as a specific perspective on organizational performance.

### Designing Research Questions

We have already seen that, logically considered, the negativity of experience implies a question. In fact we have experiences when we are shocked by things that do not accord with our expectations. Thus questioning too is more a passion than an action. A question presses itself on us; we can no longer avoid it and persist in our accustomed opinion. (GADAMER, 2004, p. 360)

The somehow questionable necessity to have *a priori* a “research question” was addressed by me in a hermeneutic way. Firstly, unconsciously. But, after all the readings done on Gadamer’s works, it became clear to me that the research question cannot be given upfront. Not that it cannot be written upfront. The way I understand the hermeneutic process of understanding, even when the question is given upfront, its meaning will be constructed in an interplay between parts and wholes throughout the time lapse in which the research will evolve. And, in most cases, the research question will be written in its final form after some considerable amount of the research has already been done. And it will be presented in the text as if it was designed (i.e., written and understood) at the beginning of the research process.

The questioning and the questions give sense to the hermeneutic experience (FLEMING; GAIDYS; ROBB, 2003). The persistence of the questioning process, “of questioning ever further,” while being able to preserve the “orientation towards openness” is precisely what Gadamer calls “the art of thinking” (GADAMER, 2004, p. 360). Art of which is of utmost importance for an interdisciplinary doctoral research.

So, a question must put “into question” a particular understanding about a particular subject. A question mark does not turn a phrase into a question, at most it turns it into an “apparent question” (GADAMER, 2004).

I will try to register the design process of this research questions as a way of making it explicit. As a way to try reducing the inescapable distortions of its meanings (POLANYI, 2014, p. 251).

As presented somewhere else on this text, the theme of my doctoral research started to gain some formal contours in October 2010. What appeared to me as a potentially interesting breakdown to study (ALVESSON; KARREMAN, 2007) was the fact that the majority of organizations that I knew seemed to be over-focused on efficiency. As if efficiency was equated to performance: better efficiency would lead to better performance. Then, after March 2011, I started a study done through several creativity-driven workshops which made me question the role of design into the creation of innovative opportunities.

The research questions were started to be thought, searched and designed around the month of August 2012. Initially, the following question defined the perspective at that time:

*How could be designed a discourse to compromise organizations to act towards assessing prejudice among its members as a way to create knowledge to support innovative opportunities?*

This question could be divided into three, as follows:

*How are structured the discourses that compromise organizations to act?*

*How organizations act towards assessing prejudice among its members?*

*How organizations act towards creating innovative opportunities?*

To tackle these issues would require that other questions to be faced before. Questions like these ones:

*What are the academic works that relates prejudice to the creation or not of new value propositions?*

*What are the relation between “being committed to assessing prejudice” and the organization’s perception of innovative opportunities?*

*What would be the theoretical arguments to describe Design as a set of behaviors and tools that mitigates prejudices?*

*What would be the logic to describe Design as a dynamic that generates bridges between islands of personal prejudice?*

*What would be the impact of adopting the four key conditions of Allport into design practices and routines?*

*What would be the impact of adopting the four key conditions of Allport into the governance policies of organizations?*

On November 2013, more than a year after these first attempts to design research questions, they became the following ones:

*What are the relationships between the motivated cognitive tendencies of people in a group and the potential of that group to create products that are perceived as innovative?*

*If there are relationships, which ones are the more significant given the prejudice related aspects of this research?*

*If there is a significantly relationship, is it possible to understand and describe how does it works?*

*Understanding how this relationship works can habilitate people to act towards assessing the potential of a social group to generate products perceived as innovative?*

*If this relationship can habilitate people to act, how to assess the potential of a social group to generate products perceived as innovative based on that relationship?*

On an ongoing process of designing a research landscape – all along with its mountain and a particular stone, on the 11<sup>th</sup> of April 2014, after a special meeting with Professors Gregório Varvakis, Tarcísio Vanzin, Francisco Fialho, Paulo Maurício Selig, Roberto Pacheco and Marina Nakayama, the Research Question and the General and Specific Objectives were further defined as:

## Research Question

*What, if any, is the relation between the motivated cognitive tendencies of individuals in a group and the potential of that group to create products perceived as innovative?*

## General Objective

*To study the relation between the motivated cognitive tendencies of individuals in a group and the potential of that group to create products perceived as innovative.*

## Specific Objectives

- i. Identify an instrument capable to assess the motivated cognitive tendencies levels of individuals in a group;*
- ii. Identify an instrument capable to assess the perception of innovativeness of a product;*
- iii. Develop a study capable to depict the possible relations between the results of the two instruments listed above.*

## Questioning the Structure

After working and writing based on the landscape metaphor for more than two years, in April 2013 I was informed that Professor Ulla had to retire earlier than expected due to some health issues and was no longer taking doctoral students. All hopes of having an opportunity to meet her again to discuss about this research vanished away. At that moment I feared that the whole research landscape was in danger of vanishing.

As I returned to Brazil, on the 1st of August 2013, I started to discuss with Professors Varvakis and Vanzin the possibility of having to restructure the research based on new academic perspectives. These discussions culminated at the meeting of the 11<sup>th</sup> of April 2014, as cited above. During that meeting, all participants have mutually agreed that I should try to restructure the document adopting a rather traditional form. This new structure should be presented at the doctoral proposal defense, scheduled for the 08<sup>th</sup> of August 2014.

The structure defined during the April's meeting was a traditional one divided into the following sections: Introduction, 2. Design, 3.



Innovation, 4. Prejudice, 5. Methodological Procedures, 6. Results, 7. Discussion and 8. Concluding Contribution. All instruments and data should be presented as appendices, after the References section.

On that due day, the new structure of the document was presented and discussed. The Professors had twenty days to read this new version of the document. At the end of the doctoral proposal defense, which had as its members Professors Marina Nakayama, Francisco Fialho, Roberto Pacheco, Luiz Salomão Ribas Gomez, Tarcísio Vanzin and Gregório Varvakis, the proposal was accepted. The final conclusion was that the first structure should be brought back to the document, in order to preserve breadth and originality of the research and of the document itself.

### Structure of this document

Initially, the structure of this document started from a *standpoint* and followed the exact opposite of the original orientation suggested by Professor Ulla. As if, after finding the landscape, then the mountain and picking up the stone, I started to write the bread-crumbs “back” to a landscape that I did not know.

While starting the research in Germany, at the beginning of 2012, I still had hopes of working again with Professor Ulla after her recovery. So, I kept focusing on the sensemaking discourse that relates to the landscape research metaphor: “the four main rhetorical figures, or ‘master tropes’, which in a wider perspective express four principal thoughts styles, and thus constitute a kind of ‘poetic logic’” (ALVESSON; SKÖLDBERG, 2009, p. 317). And, as I was detached from the supervision of Professor Ulla due to her health conditions, I could wander the landscape any way I felt like to do.

By wandering, it seemed to me that an important element was missing. Before the *stone*, I thought that I had to add a *mineral* level, as to be able to focus on the presentation of the data, before heading to the interpretation of it. That, of course, would be an ironical presentation of the data, striped as much as possible of discourse or discourses. As a way to reflect about the difficulty – not to say, impossibility – to present data in a meaningful way without any support of a *qualitative* discourse. As if data could scape “l’ordre du discours” (FOUCAULT, 2014), to be seen as strange or “outside us” (NIETZSCHE, 1913). As if numbers could be detached from *l’histoire* (Gadamer apud RICOEUR, 1986, p. 98).

The initial metaphorical journey proposed by Professor Ulla had three levels (Landscape, Mountain and Stone) instead of the four suggested by Alvesson and Sköldberg. It is important to note that the

reflexive methodology does not oblige to adopt the four levels of tropes. As a matter of fact, Alvesson and Sköldbberg (2009, p. 271) explain that just the postmodernist variant can be considered quadri-hermeneutic. And that nothing precludes that the research final text may “generate more (or less)” than the four tropes initially suggested by them.

And there is also another tricky aspect on the words said by Professor Ulla. The way she suggested the landscape approach to me, I understood that the *whole* thesis should fit into a *stone*. As I remember, she said: “It is about that stone that you will have to write.” In a message that she sent to me on the 19<sup>th</sup> of July 2011, she referred to the fact that I would have to “add a stone” in a mountain: “*Think of all the knowledges in the world as one – or many – mountains. You should add a small stone to that mountain with your dissertation. Then you first have to argue about where the stone should be there and why it is important.*”

But the metaphorical journey from the landscape-to-the-stone resonated in such a way within me, that I just could not let it go. So, I decided that I should write not only about the *stone*, but also about all other components of that journey to accommodate the four tropes suggested by the reflexive methodology.

Accordingly, this research is based on the four tropes described by Alvesson & Sköldbberg (2009) and – as highlighted by Professor Michael Erlhoff on the 19<sup>th</sup> of June 2013 – also echoes the logic “from the abstract to the concrete” as advocated by Karl Marx (1993). But, instead of accommodating the four tropes as tiers, intertwined on a same body of text, I opted to exacerbate the metaphorical journey proposed by Professor Ulla. To do that I nested the four tropes on a middle section of a structure divided into three: (i) Introduction and Historical Foundations, (ii) Divergent Discussion and (iii) Convergent Discussion.

The Divergent Discussion section aims at escaping the “snares of positivism” (HABERMAS, 1971) by dividing itself into four nests. Each one accommodating one of the four tropes proposed by Alvesson & Sköldbberg (2009) and are named as: *Mineral*, *Stone*, *Mountain* and *Landscape*. They are explained in the following pages.

The Divergent Discussion tropes permit to embed three Jürgen Habermas views of knowledge in terms of what he calls cognitive interests (ALVESSON; SKÖLDBERG, 2009, p. 155): “a technical, a historical-hermeneutic, and an emancipatory interest” (see The Landscape Map at the beginning of this document). In Habermas terms (HABERMAS, 1971, p. 308)

There are three categories of processes of inquiry for which a specific connection between logical-methodological rules and knowledge-constitutive interests can be demonstrated. This demonstration is the task of a critical philosophy of science that escapes the snares of positivism. The approach of the empirical-analytic sciences incorporates a technical-cognitive interest; that of the historical-hermeneutic sciences incorporates a practical one; and the approach of critically oriented sciences incorporates the emancipatory cognitive interest that, as we saw, was at the root of traditional theories.

What he brings to the structure of this thesis are these perspectives directed towards fulfilling human cognitive interests. He goes on and explains that (HABERMAS, 1971, p. 313)

The specific viewpoint from which, with transcendental necessity, we apprehend reality ground three categories of possible knowledge: information that expands our power of technical control; interpretations that make possible the orientation of action within common traditions; and analysis that free consciousness from its dependence on hypostatized powers.

Although presented as separate, “there is a close relationship between the three varieties of cognitive interest” (ALVESSON; SKÖLDBERG, 2009, p. 156). After all,

[t]he emancipatory interest is dependent upon the empirical-analytical knowledge – not least in order to distinguish what is socially construct from what is given by the laws of nature, thus enabling emancipation from stultifying dependence relations.

These three different human cognitive interests will guide the tropes. Nevertheless, the last one – Landscape, is a postmodern text. So, it will discard any explicit attempt of fulfilling any specific human interests. Its purpose is to bring as many perspectives on the research subject as possible. Thus, it tries to bring into the “landscape” some of the

otherness that compose the subject under study. In a schematic view, the three domains of knowledge from Habermas can be presented as follows at the next figure.

<b>Cognitive Interest</b>	<i>Technical</i> (prediction)	<b>Historical-Hermeneutic</b> (interpretation and understanding)	<i>Emancipatory</i> (criticism and liberation)
<b>Kind of Knowledge</b>	<i>Instrumental</i> (causal explanation)	<i>Practical</i> (understanding of meaning)	<i>Emancipation</i> (reflection)
<b>Research Methods</b>	<i>Positivistic Sciences</i> (empirical-analytic methods)	<i>Historical Sciences</i> (hermeneutic methods)	<i>Critical Social Sciences</i> (critical theory methods)
<b>Viewpoint to apprehend reality</b>	<i>Information that expands our power of technical control</i>	<i>Interpretations that make possible the orientation of action within common traditions</i>	<i>Analysis that free consciousness from its dependence on hypostatized powers</i>

**Figure 4 – Cognitive Interests, Knowledge and Research**

Source: Based on (HABERMAS, 1971; TINNING, 1992)

As a way of paying homage to all that will remain “hidden, silent, unspoken” (SMYTHE et al., 2008), to all these unspoken historical influences that are an essential aspect of the cultural dialogue “which we are” (THOMPSON; POLLIO; LOCANDER, 1994), the *Divergent* and *Convergent Discussions* sections have a subtitle inspired by Smythe et al. (2008) as: *Introduction of all that will remain hidden* and *Withdrawal of all that will remain hidden*, respectively.

At this point it is interesting to remember that I adopted the description of “disciplines” as the methods to control “bodies of men” in order to submit them to a “*rapport de docilité-utilité*”<sup>39</sup> (FOUCAULT, 1975, p. 139). Therefore, interdisciplinarity, by the definition that I adopted, discards the use of clear and disciplined *postcards* in favor of textual portraits closer to the reality of the landscape observed, which is socially constructed. And, therefore, impossible to describe in any level of completeness in a postal card or any other type of framing.

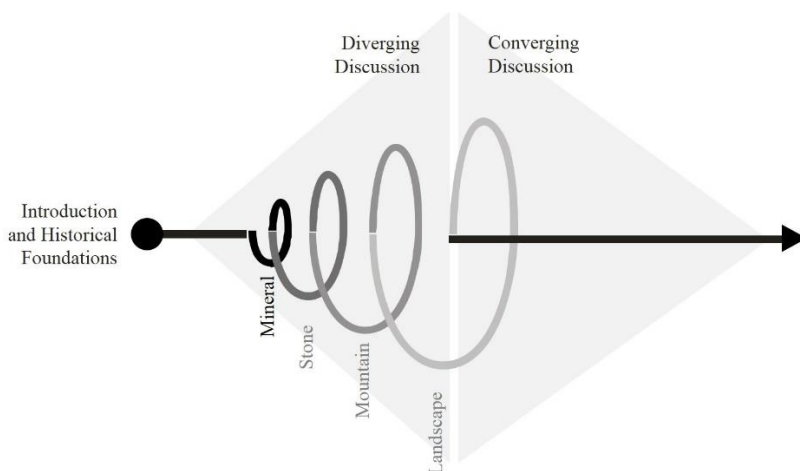
Which means that interdisciplinarity is not concerned in solving contradictions and incongruences between the different. But, specifically,

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<sup>39</sup> A “relation of docility-utility,” as translated by me.

to expand the possibilities of dialogue by building bridges as *arcs herméneutiques* (RICOEUR, 1986, p. 158).

Based on the understandings presented upstream, the reflexive methodology suggests that a qualitative research should be approached from different perspectives and other voices through reflexive cycles. As explained, the structure of the document should reflect that understanding, which entails a sort of spiral narrative to accommodate the recursive reflexive *consequence* of thoughts (DEWEY, 2013, p. 02). Therefore, the resulting sections of the intended spiralized structure are illustrated and detailed below:



**Figure 5 – The Proposed Structure for the Present Document**

### *1. Introduction and Historical Foundations*

This introducing discussion presents the main personal and historical reasons for this research. It is an attempt to textualise the following elements:

- a) the socio-cultural context of the researcher when the theme came to be;
- b) the methodology adopted and the reasons why it was chosen;
- c) the purpose of the research;
- d) the research questions;
- e) the resulting structure of the thesis document;
- f) the adoption of metaphors based on *quadri-hermeneutics*.

The underlying objective of this section of the document is a defense of the adoption of reflexive methodology as a fundamental allied on the excruciating challenges of the interdisciplinary research. Because of its interdisciplinary structure, as in Kuhn's discovery of incommensurability of paradigms (KUHN, 1970), I take a hermeneutic refuge in history. I opted to do that in order to preserve meanings or, at least, reduce the inescapable distortions of meanings (POLANYI, 2014, p. 251) due to the interdisciplinary inherent challenges.

## 2. *Divergent Discussion: Introduction of all that will remain hidden*

The textualisation of the four tropes are addressed by this section of the document, besides revealing them, it elicits everything that are not. The landscape built by this document, from the very first to the last word, is perceived as a limited interdisciplinary composition. The divergent discussion, which goes through four tropes (ALVESSON; SKÖLDBERG, 2009), are named after the metaphors offered by Professor Ulla, as: Mineral (construction of data), Stone (interpretation), Mountain (critical interpretation), and Landscape (openness to other interpretations) (ALVESSON; SKÖLDBERG, 2009, p. 277). The intention, imbued by the interdisciplinary ethos, is to present at least 4 different perspectives on the proposed research objectives. This is what I understand as quadri-hermeneutics (ALVESSON; SKÖLDBERG, 2009). It can be defined as a metatheory<sup>40</sup> or metaprinciples that “can generate a certain guarantee against specific epistemological positions which detract from other positions” (ALVESSON; SKÖLDBERG, 2009, p. 308).

The reflexive methodology suggests that the approach has to be made from different perspectives and voices through the reflexive cycles described below:

### 2.1. *Mineral: Construction of Data (empirical / metaphor)*

With this trope I intend to describe the empirical-analytic methods of the research, studies and processes that were executed for data collection. This is the *ceteris paribus* interpretation, from my point of view. I explain that these processes are based on the following instruments:

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<sup>40</sup> “A metatheory is about a comprehensive frame of reference for inspiring and structuring reflection.” (ALVESSON; SKÖLDBERG, 2009, p. 271).

- a) Systematic search of academic literature;
- b) The sub set of 15 items from the original 41 items revised Need for Closure (NFC) questionnaire to identify the motivated cognitive basis of the participants;
- c) Creativity workshops designed to be isotropic, non-teleological, and observing the four Allport's key condition to reduce intergroup contact's attrition;
- d) Independent Panels of Judges and Consensual Assessment Technique used to assess the products on Originality, User-Value and Producibility (OUP).

The focus here lies entirely on the empirical material and the “atomistically” construction of data. This construction is done seeing everything as isolated from everything else, according to scientifically validated methods. With a very much data-oriented approach and an emphasis on isolated empirical data, the *whole* (landscape) is absorbed by a *part* (mineral), or vice-versa (metaphor). Working as a metaphor, the data (part) is intended to promote an understanding about the impacts of prejudice on innovative efforts (whole).

Represented by the image of a *mineral*, this part of the text depicts and is concerned mainly “with information that expands our power of technical control” (HABERMAS, 1971, p. 313), and with what can be collected, analyzed and described objectively.

What is left hidden, what *disappears*, gives a hint of what cannot be grasped by the researcher and the research through the mineral metaphor. And, as a whole, the mineral part itself serves as a springboard, as a starting point for further *consequence* of reflexive discourses.

## 2.2. *Stone*: Interpretation (hermeneutic / metonymy)

At this part, hermeneutics guide the discourse to formulate “interpretations that make possible the orientation of action within common traditions” (HABERMAS, 1971, p. 313). This is a text about the experience of belonging, related to what Ricoeur assigns to Gadamer as “l’herméneutique des traditions” (RICOEUR, 1986, p. 335).

The studies described at the Mineral part serve as springboard for a “first” cycle of interpretation. Hence, aiming at

creating a “consecutive ordering in such a way that each determines the next as its proper outcome, while each in turn leans back on its predecessors” (DEWEY, 2013, p. 02).

Represented by the *stone*, this text expands the interpretation of the *mineral*, giving to it an application/interpretation to which it is not obligatorily connected. The *part* is the *whole* (metonymy). There are no discrepancies between these two entities. This part of the text describes, interprets and gives meaning to the collected data from one particular perspective that is aligned with the present research and researcher’s interests and context. A specific perspective on data is favored to support a single academically valid discourse;

### 2.3. *Mountain*: Critical Interpretation (ideology-critical / synecdoche)

This part of the text concentrates the discourse about the impacts of this research on the lifeworld<sup>41</sup> of people at organizational settings. A critical theory perspective will guide the text as it deals with the “emancipatory interest in knowledge” (ALVESSON; SKÖLDBERG, 2009, p. 144).

I will consider the ethical implications of applying the “instrumental/technical rationality” (KINCHELOE; MCLAREN, 2011, p. 289) described at the Mineral and Stone tropes. The “powerful inertia inherent in the dominant discourses” that support the research is recognized, described and criticized (ALVESSON; SKÖLDBERG, 2009, p. 196).

Represented by the *mountain*, this text aims at revealing when a part is made to represent the whole or vice versa (synecdoche), and unveils where particular interests are masked as universal. The contextual and specific interests of the research and of the researcher are criticized and revealed in order to better locate the mineral/stone on a bigger picture of a mountain (this one

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<sup>41</sup> “The lifeworld, a concept taken from phenomenology [...], stands for those contexts of meaning, that cultural horizon through which people seek to interpret and understand their situation and their environment. The lifeworld indicates the sphere of (always interpreted) concrete experiences, all that is close to human existence.” (ALVESSON; SKÖLDBERG, 2009, p. 149).



representing a particular collection of knowledge, as explained by Professor Ulla<sup>42</sup>);

#### 2.4. *Landscape*: Openness to Other Interpretations (postmodern / irony)

All three sections and four parts of this document are permeated by an ironical style. But this part is the most ironical one, presenting several voices about the research. The interplay between design, innovation and knowledge management metaphors is worked at it, trying to reconstruct a landscape from prejudices of the researcher. “Inconsistencies, fragmentation, irony, self-reflection and pluralism must pervade” here (ALVESSON; SKÖLDBERG, 2009, p. 201). As “a palate of imageric possibilities” (ALVESSON; SKÖLDBERG, 2009, p. 203; TAUSSIG, 1984) this research serves as a springboard to pluralistic interpretations. In a sense, this part extrapolates the emancipatory interest of the Mountain, by offering further analysis aiming at “free consciousness from its dependence on hypostatized powers” (HABERMAS, 1971, p. 313).

Represented by the figure of the *landscape*, this text composes a complex *ship of land*, giving voice not just to criticism, but to other and different perspectives on the mineral/stone/mountain metaphors. The ironic tone allows to uncover other meanings to the words and actions described from the horizon, prejudices and traditions of the researcher.

### 3. *Converging Discussion: Withdrawal of all that still remains hidden*

The third and last step is characterized by a convergent discussion that, moved by the sensemaking purpose of enabling people to act (COOPEY; KEEGAN; EMLER, 1997; WEICK; SUTCLIFFE; OBSTFELD, 2005; WEICK, 1995), will try to offer some actionable insights towards fulfilling the underlying emancipatory interest (HABERMAS, 1971) of this research and researcher.

Like constructing a new vantage point to create and enjoy future landscapes, this last section of the text aims to establish a discourse that

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<sup>42</sup> See the e-mail sent to me by Prof Ulla Johansson Sköldbberg on the Tuesday, July 19<sup>th</sup>, 2011 7:49:44 AM with the subject “Fw: Blind Variation and Selective Retention.”

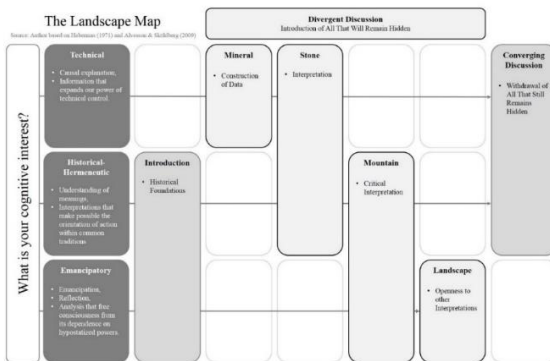
increases the potential to act of certain social contexts (academic and corporative) towards:

- a) enabling its members to work on the creation of innovative proposals;
- b) committing its members to act in support of socio-cultural diversity.

The creation of this potential to act (knowledge) is focused on proposing a heuristic to make less puzzling, less ambiguous, that will give sense of what to expect and how to intellectually understand: (i) the assignment of individuals to groups and (ii) the governance of social groups. All aiming at to increase the potential of these same groups to generate innovative propositions of products (goods or services). Thus is fulfilled the destiny of all organizational context research that is to propose ways to increase the performance of organizations.

### The Landscape Map

Figure 6, also presented at the beginning of this document (a larger version), depicts a map to support the reading of the texts of this thesis. Although its structure was thought as a *consequence* (DEWEY, 2013, p. 02) of texts, depending on which specific cognitive interests is chosen, this document does not need to be read in its entirety. The Landscape Map indicates on which path to follow in order to fulfill one’s main cognitive interest.



**Figure 6 – The Landscape Map**

Source: Author based on (ALVESSON; SKÖLDBERG, 2009; HABERMAS, 1971)

## Section II



**2 DIVERGENT DISCUSSION: INTRODUCTION OF ALL THAT  
WILL REMAIN HIDDEN**









**Mineral:** *noun* 1 a solid, naturally occurring inorganic substance: *it identifies the mineral or compound present* – a substance obtained by mining: *the economy has long been dependent on exports of minerals, especially gold* – an inorganic substance needed by the human body for good health: *a wide range of necessary vitamins and minerals* 2 (minerals) *British* fizzy soft drinks. Adjective of or denoting a mineral: *mineral ingredients such as zinc oxide*. Origin: late Middle English: from medieval Latin *minerale*, neuter (used as a noun) of *mineralis*, from *minera* 'ore'.<sup>43</sup>

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<sup>43</sup> <http://www.oxforddictionaries.com/definition/english/mineral?q=mineral>



**Metonymy:** [mass noun] the substitution of the name of an attribute or adjunct for that of the thing meant, for example *suit* for *business executive*, or *the turf* for *horse racing*. Origin: mid 16th century: via Latin from Greek *metōnumia*, literally 'change of name'.<sup>44</sup>

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<sup>44</sup> <http://oxforddictionaries.com/definition/english/metonymy?q=Metonymy>



## 2.1 MINERAL: CONSTRUCTION OF DATA.

218. *The Machine as Teacher.* – Machinery teaches in itself the dovetailed working of masses of men, in activities where each has but one thing to do. It is the model of party organisations and of warfare. On the other hand, it does not teach individual self-glorification, for it makes of the many a machine, and of each individual a tool for one purpose. Its most general effect is to teach the advantage of centralisation.

(NIETZSCHE, 1913)

This first section presents, from a instrumental perspective (HABERMAS, 1971), the description of a research and the construction of data as generated by four specific studies. These studies were designed to capture the possible relations, if any, between levels of closed mindedness of specific groups of individuals and the levels of perceived innovativeness of the products created by these groups. Moreover, paraphrasing Habermas, this part intention is to provide information that expands the potential of technical control.

### Literature Review

The logic that supported this research and study was defined through an academic literature review. The review can be considered integrative (CARLINER, 2011; TORRACO, 2005; YORKS, 2008) and resulting from a systematic literature search done at Scopus.com.

In order to precisely identify a research gap, the systematic search focused on specific concepts<sup>45</sup> that were subdivided into constructs<sup>46</sup>. Which, by their turn, were used as keywords for the literature database search. The concepts were explored by single or multiple words combination search. Which were done using the following conditions as available at Scopus.com:

- a) Document Search: Article Title, Abstract, Keywords;
- b) Limit to: Date Range (inclusive): All years to Present;
- c) Document Type: All;

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<sup>45</sup> “Concept” is a form of mental construct, such as laws or theories (ICHIJO; NONAKA, 2006).

<sup>46</sup> A “construct” is the ideal result of a mental process. It is a “purely mental construction, created from the simplest elements to be part of a theory.” Translated from the (HOUAISS) Portuguese language dictionary.

- d) Subject Areas: Life Sciences (> 4,300 titles.), Health Sciences (> 6,800 titles. 100% Medline coverage), Physical Sciences (> 7,200 titles.), Social Sciences & Humanities (> 5,300 titles.).

The systematic search for literature, for each one of the concepts, resulted in the data presented at the tables below, which relate every attempted combination of search terms with the number of units of literature that was found. The goal was two folds: (i) to map the academic literature production for each of the words combination and (ii) to find sets of words combination that returned null results.

To highlight the difference between the resulting amounts of documents that the systematic search returned, the lines of the tables were colored as follow: dark grey for results hat are above nineteen documents (results > 19); light grey for results below twenty and above zero documents (20 > results > 0); and not colored (white) for null results (-).

Although the systematic searches were done at several attempts between years 2011 and 2014, they were repeated on the 18<sup>th</sup> of August 2014. The concepts and constructs that were clustered into three sets:

- a) Closed Mindedness;
- b) Innovativeness;
- c) Groups.

According to the analysis conducted, each of these three sets work as as cognitive domain<sup>47</sup>, which act as a conceptual attractor<sup>48</sup> of various sub-themes, as presented in the following pages.

#### a. Closed Mindedness

The search for the concept of *Closed Mindedness* used the following words alone or combined: *closure*, *mindedness*, *prejudice*, *sensemaking*. Several of the resulting combinations of these previous words were used for search with the instruction “AND” along with the following words alone or in combination.

A search at Scopus.com (on the 18<sup>th</sup> of August 2014) for the word *Closure* alone returned 170.142 documents and 255 documents for the

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<sup>47</sup>A cognitive domain can be understood as a scientific research field characterized by the overlapping of various disciplines (CAUTELA; RIZZO; ZURLO, 2009).

<sup>48</sup> An attractor links a system to a behavior pattern. It can be an attraction to a stable point, to a regular cycle or to more complex forms of behavior (AXELROD; COHEN, 2001).

phrase “*Need for Closure*.” For *Prejudice* alone, it returned 32.750. And for *Sensemaking* and *Mindedness* alone, 1.566 and 1.402 documents respectively.

**Table 1 – Search results for the attractor *Closure***

TITLE-ABS-KEY (18/08/2014)	Results
(closure)	170.142
(closure AND performance)	6.887
(closure AND knowledge)	3.366
(closure AND innovation)	563
("need for closure")	255
("need for closure" AND group)	77
("need for closure" AND cognition)	76
("need for closure" AND scale)	60
("need for closure" AND motivation)	55
("need for closure" AND motivated)	42
("need for closure" AND epistemic)	23
("need for closure" AND performance)	18
("need for closure" AND prejudice)	16
("need for closure" AND “closed mindedness”)	8
("need for closure" AND creativity)	4
("need for closure" AND innovation)	0
("need for closure" AND innovativeness)	0
(closure AND innovativeness AND mindedness)	0
(closure AND innovation AND mindedness)	0
(closure AND mindedness AND prejudice AND sensemaking)	0

A search for (closure AND mindedness AND prejudice AND sensemaking) got a null result at that chosen database.

**Table 2 – Search results for the attractor *Prejudice***

TITLE-ABS-KEY (18/08/2014)	Results
(prejudice)	32.750
(prejudice AND knowledge)	2.769
(prejudice AND performance)	860
(prejudice AND motivation)	857
(prejudice AND cognitive)	803
(prejudice AND motivated)	257
(prejudice AND innovation)	187
(prejudice AND innovative)	142
(prejudice AND epistemic)	37
(prejudice AND closed AND mindedness)	3

*Table continues*

<b>TITLE-ABS-KEY (18/08/2014)</b> <i>- continued</i>	<b>Results</b>
(prejudice AND closure AND mindedness)	2
(prejudice AND innovativeness)	0
(prejudice AND closure AND mindedness AND innovativeness )	0
(prejudice AND closure AND mindedness AND innovation )	0

Also, when gravitating around the concept of *Closure*, the search yield no results for the combinations ("need for closure" AND innovation) and ("need for closure" AND innovativeness). The same can be said to have happened to the search ("closed mindedness" AND innovation) and ("closed mindedness" AND innovativeness). It was also the case for searching for the combination of (prejudice AND innovativeness).

**Table 3 – Search results for the attractor *Mindedness***

<b>TITLE-ABS-KEY (18/08/2014)</b>	<b>Results</b>
(mindedness)	1.402
(mindedness AND performance)	83
(closed AND mindedness)	75
("closed mindedness")	64
(mindedness AND innovation)	44
(mindedness AND innovative)	23
(closed AND mind* AND innovation)	8
("closed mindedness" AND motivation)	6
("closed mindedness" AND motivated)	6
("closed mindedness" AND epistemic)	4
(mindedness AND innovativeness)	3
("closed mindedness" AND performance)	2
("closed mindedness" AND prejudice)	2
(closed AND mind* AND innovativeness)	0
(closed AND innovation AND mindedness)	0
(closed AND innovativeness AND mindedness)	0
("closed mindedness" AND innovation)	0
("closed mindedness" AND innovativeness)	0

**Table 4 – Search results for the attractor *Sensemaking***

<b>TITLE-ABS-KEY (18/08/2014)</b>	<b>Results</b>
(sense AND making)	19.814
(sense AND making AND knowledge)	2.658
(sense AND making AND performance)	1.719
(sensemaking)	1.566
( sense AND making AND innovation)	486
(sensemaking and knowledge)	356
( sense AND making AND innovative)	291

*Table continues*



<b>TITLE-ABS-KEY (18/08/2014)</b> <i>- continued</i>	<b>Results</b>
(sensemaking and performance)	135
(sensemaking and innovation)	113
(sense AND making AND epistemic)	86
(sense AND making AND prejudice)	75
(sense AND making AND closure)	66
(sensemaking AND innovative)	40
(sensemaking and epistemic)	9
(sense AND making AND mindedness)	7
(sense AND making AND innovativeness)	4
(sensemaking and mindedness)	2
(sensemaking and prejudice)	2
(sensemaking and innovativeness)	2
(sensemaking and closure)	1
(sensemaking AND "need for closure")	0
(sensemaking AND "intergroup contact theory")	0
(sensemaking AND "closed mindedness")	0

## b. Innovativeness

The search for the concept of *Innovativeness* used the following words alone or combined: *innovativeness*, *innovative* and *innovation*. Several of the resulting combinations of these previous words were used for search with the instruction “AND” along with the following words alone or in combination, as can be seen on the tables below.

A search at Scopus.com (18<sup>th</sup> of August 2014) returned 225.810 documents for the word Innovation alone. For Innovative, 185.601. And for Innovativeness alone, it returned 2.974. A search combining the two words (innovation and innovativeness) returned 1.940 documents. Therefore, the amount of academic documents that relates to the word Innovativeness equals to 1,3% of the documents related to Innovation, at that same database.

**Table 5 – Search results for the attractor *Innovation***

<b>TITLE-ABS-KEY (18/08/2014)</b>	<b>Results</b>
(innovation)	225.810
(innovation AND knowledge)	27.385
(innovation AND performance)	25.872
(innovation AND group)	22.658
(innovation AND productivity)	6.308

*Table continues*

<b>TITLE-ABS-KEY (18/08/2014)</b> <i>- continued</i>	<b>Results</b>
(innovation AND creativity)	4.654
(innovation AND group AND knowledge)	3.961
(innovation AND cognitive)	2.726
(innovation AND group AND individual)	2.620
(innovation AND innovativeness)	1.480
(innovation AND group AND creativity)	794
(innovation AND group AND productivity)	607
(innovation AND closure)	563
(innovation AND innovative AND innovativeness)	525
(innovation AND group AND cognitive)	473
(innovation AND group AND individual AND creativity)	192
(innovation AND prejudice)	187
(innovation AND epistemic)	158
(innovation AND mindedness)	42
(innovation AND group AND epistemic)	38
(innovation AND motivated AND cognition)	19
(innovation AND group AND mindedness)	11
(innovation AND epistemic AND motivation)	6
(innovation AND group AND epistemic AND creativity)	4
(innovation AND group AND epistemic AND motivations)	4
(innovation AND "need for closure")	0
(innovation AND "closed mindedness")	0
(innovation AND mindedness AND closure)	0

**Table 6 – Search results for the attractor *Innovative***

<b>TITLE-ABS-KEY (18/08/2014)</b>	<b>Results</b>
(innovative)	185.601
(innovative AND performance)	27.268
(innovative AND innovation)	25.648
(innovative AND closure)	766
(innovative AND mindedness)	23
(innovative AND “closed mindedness”)	0

**Table 7 – Search results for the attractor *Innovativeness***

<b>TITLE-ABS-KEY (18/08/2014)</b>	<b>Results</b>
(innovativeness)	2.974
(innovativeness AND innovation)	1.480
(innovativeness AND performance)	704
(innovativeness AND knowledge)	593
(innovativeness AND group AND individual)	107

*Table continues*

<b>TITLE-ABS-KEY (18/08/2014)</b> - <i>continued</i>	<b>Results</b>
(innovativeness AND closure)	23
(innovativeness AND "need for closure")	0
(innovativeness AND "closed mindedness")	0
(innovativeness AND "intergroup contact theory")	0
(innovativeness AND epistemic AND motivation)	0
(innovativeness AND mindedness AND closure)	0
(innovativeness AND motivated AND cognition)	0
(innovativeness AND prejudice)	0
(innovativeness AND group AND prejudice )	0

When gravitating around the concept of *Innovativeness*, the search yield no results for the combinations (innovativeness AND "need for closure") and (innovativeness AND "closed mindedness"). The same can be said to have happened to the search (innovation AND "need for closure") and (innovation AND "closed mindedness").

### c. Group

The search for the concept of *Group* used the following words alone or combined: *group*, *intergroup*. Several of the resulting combinations of these previous words were used for search with the instruction "AND" along with the following words alone or in combination, as can be seen on the tables below.

When searching around the concept of *Group*, the search yield no results for combinations (group AND innovativeness AND "closed mindedness") and (group AND innovation AND "closed mindedness"). The same can be said to have happened to the search ("intergroup contact theory" AND innovativeness).

**Table 8 – Search results for the attractor *Group***

<b>TITLE-ABS-KEY (18/08/2014)</b>	<b>Results</b>
(group)	4.942.891
(group AND performance)	311.804
(group AND knowledge)	159.604
(group AND innovation)	22.658
(group AND innovative)	19.802
(group AND productivity)	19.353
(group AND prejudice)	9.478
(group AND creativity)	5.122

*Table continues*

**TITLE-ABS-KEY (18/08/2014)****Results***- continued*

(group AND innovation AND knowledge)	3.961
(group AND innovation AND individual)	2.620
(group AND innovation AND creativity)	794
(group AND innovation AND productivity)	607
(group AND innovativeness)	583
(group AND innovation AND cognitive)	473
(group AND innovation AND individual AND creativity)	192
(group AND innovativeness AND individual)	107
(group AND "need for closure")	76
(group AND innovativeness AND creativity)	39
(group AND innovation AND epistemic)	38
(group AND closed AND mindedness)	17
(group AND "closed mindedness")	16
(group AND innovation AND mindedness)	11
(group AND epistemic AND motivations AND creativity)	5
(group AND innovation AND epistemic AND creativity)	4
(group AND innovation AND epistemic AND motivations)	4
(group AND innovativeness AND mindedness)	1
(group AND innovativeness AND "closed mindedness")	0
(group AND innovation AND "closed mindedness")	0
(group AND closed AND mindedness AND innovativeness)	0

**Table 9 – Search results for the attractor *Intergroup*****TITLE-ABS-KEY (18/08/2014)****Results**

(intergroup)	10.637
(intergroup AND prejudice)	987
(intergroup AND performance)	651
(intergroup AND knowledge)	267
("intergroup contact theory")	70
(intergroup AND innovation)	37
("intergroup contact theory" and prejudice)	27
(intergroup AND epistemic)	6
("intergroup contact theory" AND knowledge)	5
("intergroup contact theory" AND performance)	4
(intergroup AND mindedness)	3
(intergroup AND innovativeness)	1
("intergroup contact theory" AND motivation)	1
("intergroup contact theory" AND cognition )	1
("intergroup contact theory" AND innovation)	1
("intergroup contact theory" AND innovativeness)	0

*Table continues*

**TITLE-ABS-KEY (18/08/2014)****Results**- *continued*

("intergroup contact theory" AND motivated)	0
("intergroup contact theory" AND "need for closure")	0
(intergroup AND "closed mindedness")	0
(intergroup AND innovative)	0

**Defining the Gap**

The research gap was defined by the searches that did not yield any documents on the Scopus database. These searches were done using a combination of the following words: *closed*, *closure*, *cognition*, *epistemic*, *group*, *innovation*, *innovativeness*, *mindedness*, *motivated*, *motivation*, *prejudice*. Several of the resulting combinations of these previous words were used for search with the instruction “AND” along with the following words in combination: *closed mindedness*, *intergroup contact theory*, *need for closure*.

The systematic literature search indicates that there are several possible research gaps represented by Boolean operations between the word *Innovativeness* and the other listed ones. One possible array of boolean search that returns null results is related to the combination of words “closed mindedness” and one of the followings: *innovativeness*, *innovative*, *innovation* or *sensemaking*. The same holds true for the combination *need for closure*. The combination *intergroup contact theory* presents the same results, except for the words *prejudice* and *innovation*.

The results of the systematic search of literature are presented in the following table, which presents an illustrative matrix of the research gap.

**Table 10 – Illustrative Matrix of the Research Gap**

	Closed Mindedness				Innovativeness			Groups
	1	2	3	4	5	6	7	
1. "closed mindedness"								
2. "need for closure"	8							
3. prejudice	3	16						
4. sensemaking	0	0	2					
5. innovation	0	0	187	113				
6. innovative	0	0	142	40	25648			
7. innovativeness	0	0	0	2	1480	?		
8. "intergroup contact theory"	0	0	27	0	1	0	0	

These voids of publications justify the design of a study to capture the possible relations, if any, between levels of **closed mindedness** of specific **groups** of individuals and the levels of perceived **innovativeness** of the products created by these groups.

## Study

To do the design of a study, the review of literature pointed to the notion of Need for Closure (NFC) as a validated instrument to measure the level of closed mindedness of individuals. NFC is a one-dimensional construct, indicated by five facets and developed from around 1980 by Professor Arie W. Kruglanski. And, since the first decade of the 21<sup>st</sup> century,

the NFC construct has captured the interest of many researchers and hundreds of studies indexed in Web of Science have used the (revised) NFC scale in a wide variety of domains within psychology, as well as in business and management literature. (ROETS; VAN HIEL, 2011a, p. 91)

Basically, NFC “refers to individual’s desire for a firm answer to a question and an aversion towards ambiguity”(KRUGLANSKI; WEBSTER, 1996, p. 264). In a simple way, it is the level of closed mindedness of a person. I also relate it to the sensemaking processes “of making do with whatever resources are at hand” (WEICK; SUTCLIFFE; OBSTFELD, 2005, p. 145).

As stated above, the NFC is a one-dimensional construct with five major aspects or facets that are assumed to broadly represent it (ROETS, 2007, p. 5–6):

1. Preference for order: “people with a high level of dispositional NFC prefer order and structure in their lives, abhorring unconstrained chaos and disorder” (DHONT; ROETS; VAN HIEL, 2011, p. 515), assessed by questions 1, 6, 10, 20, 23, 27, 32, 33, 35 and 41 (see Appendix III);
2. Preference for predictability: “which is reflected in a desire for secure and stable knowledge that is reliable across circumstances and unchallenged by exceptions” (DHONT; ROETS; VAN HIEL, 2011, p. 515), assessed by questions 5, 7, 11, 18, 19, 25, 26 and 40 (see Annex III);

3. Decisiveness: “People high in NFC also experience an urgent desire to reach closure in judgments, reflected in their need for decisiveness” (DHONT; ROETS; VAN HIEL, 2011, p. 515), assessed by questions 12, 13, 15, 16, 17 and 22 (Annex III);
4. Discomfort with ambiguity: “They feel discomfort with ambiguity; experiences without closure are viewed as aversive” (DHONT; ROETS; VAN HIEL, 2011, p. 515), assessed by questions 3, 8, 14, 21, 29, 30, 31, 36 and 38 (see Annex III);
5. Closed-mindedness: “they are closed-minded, reflected in an unwillingness to have their knowledge challenged by alternative opinions or inconsistent evidence” (DHONT; ROETS; VAN HIEL, 2011, p. 515), assessed by questions 2, 4, 9, 24, 28, 34, 37 and 39 (see Annex III).

### Individual to Group

The individual-to-group transposition is justified by a line of theory and research. These are based on the understanding that the desire for definite, nonambiguous solutions (closed mindedness) among individuals produces effects at the group level (KERR; TINDALE, 2004, p. 631). The opposite also generate the same effects, as groups under stress should also increase the referred desire at the individual level (KRUGLANSKI; WEBSTER; KLEM, 1993).

The groups’ levels of closed mindedness were obtained by calculating the average NFC individual levels of all members from each group. The individual closed mindedness level was assessed with the Need For Closure (NFC) scale, computing a 15 items selection of its original 41 items (KRUGLANSKI, 2004; ROETS; VAN HIEL, 2011a). The products perceived innovativeness levels were assessed by panels of judges through the Consensual Assessment Technique (AMABILE, 1982). The relations between the two types of levels were established through bivariate two-tailed Spearman rank correlation, using the IBM SPSS Statistics version 21 (IBM CORP., 2012).

### The Design of a Study

The designed study (MANHÃES; MAGER; VARVAKIS, 2013) is divided into two parts as illustrated in Figure 7 and detailed below (see Table 11 for legends).

One is a workshop where participants individually respond to a questionnaire (KRUGLANSKI, 2004; ROETS; VAN HIEL, 2011a) and, divided into groups, are invited to create a proposition for a new product (goods or service). This part of the study is supposed to satisfy the following assumptions:

- (i) Agents are intelligent: given any starting point, an agent finds a weakly better solution, and the set of local optima can be enumerated. (ii) The problem is difficult: no agent can always find the optimal solution. (iii) Agents are diverse: for any potential solution that is not the optimum, there exists at least one agent who can find an improvement. (iv) The best agent is unique. (HONG; PAGE, 2004, p. 16387)

The second part is the consensual assessment technique (AMABILE, 1982), which is based on independent panels of judges that rate each proposed product on three factors: Originality, User-Value and Producibility<sup>49</sup> (MAGNUSSON, 2003). To better clarify what is meant by these three words, an extract of the judges' instruction (that are supposed to have an intuitive understanding of what these dimensions are) is presented below:

*Originality: For the dimension of Originality your starting point should, however, be how unusual, unique and "new wave" you consider the relevant service idea to be. At this juncture, you are not to think about whether the idea is realizable or not, this will be evaluated in another dimension (the ability to commercialize).*

*User-Benefit: We believe you have an intuitive feeling for what user benefit is. It can be, for instance, saving time, saving cost, an experience or something else that provides the user with added*

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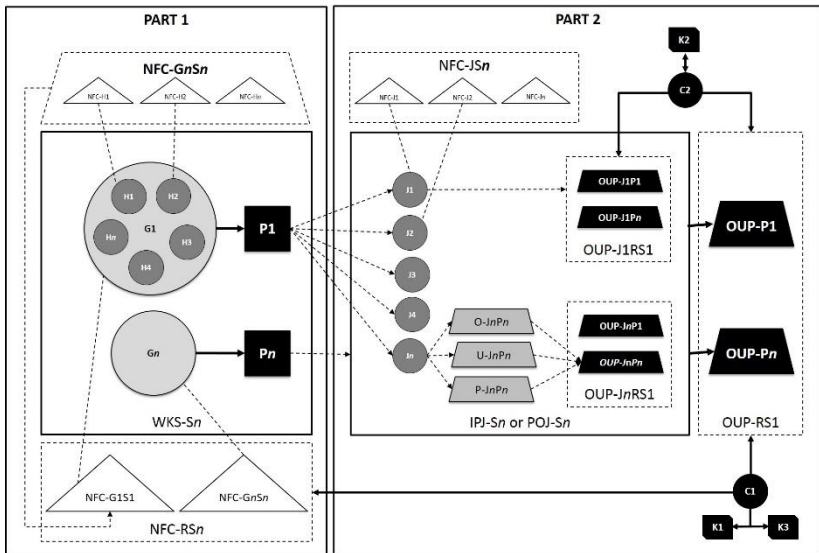
<sup>49</sup> "Originality is a concept that enfolds the innovative dimension. One reason for involving users in the development process is to co-opt their preferences, desires and needs. *User-value* takes the user's perspective; what value lies in using the service, is it likely that the target group will use the service? The third dimension *producibility*, i.e. the ability and ease by which the service can be produced, takes the producers' (the mobile operators') perspective. A concept can be excellent from a user's perspective, and also extraordinarily innovative, but if it cannot be produced (i.e. having a very low level of *producibility*), it will have no short-term business value for the company. However, the idea can have a long-term business value. For example, the level of *producibility* can be very low because current technologies cannot implement the idea. However, it might be possible with forthcoming technologies. If protected by a patent, the idea could hence be valuable in the future." (MAGNUSSON, 2003, p. 62)



value. In order to evaluate the benefit of a product or service, it is important, for instance, that it meets the user requirements of the relevant target group and that this target group can really be expected to want to use the service.

*Producibility:* When you are doing the Producibility evaluation, it does not need to be realizable directly, but still within a 'reasonable time'. Producibility concerns questions such as whether it is technically and administratively feasible to implement the service, can the use of the service be measured, etc.

On the following pages these two parts of the study are detailed.



**Figure 7 – The Structure for the Studies**

### First Part of the Study

The Part 1 of the studies (S1 to Sn) are staged during creativity workshops (WKS-S1 to WKS-Sn) where participants (H1 to Hn) are divided into groups (G1 to Gn) and each group have to create an innovative proposition (P1 to Pn) at the end of the event. The NFC levels of the participants are collected (NFC-H1 to NFC-Hn) and the resulting

presentations of the innovative propositions (goods and/or services) are digitally recorded (video and slides presentations).

### *The Workshops*

*Task.* The first part of the study can be done in any workshop-like event where the participants are split into groups and are asked to create and present a new product proposition at the end. Before or at the end of the related event/workshop each participant has to respond to a specific 41 items questionnaire (ROETS; VAN HIEL, 2011a) (see Appendix I). Each completed questionnaire is linked to a particular participant, group and product proposition.

*Design.* The actual workshop can have many formats and goals. The only conditions imposed by the study are: (a) to form groups of 2 to 6 persons at the beginning of the workshop; (b) have the groups kept unchanged during the whole duration of the workshop; (c) until the end of the workshop each group have to create a proposition for a new product (goods or service); (d) each participant have to respond to the NFC's questionnaire (ROETS; VAN HIEL, 2011a); (e) each group have to present its innovative proposition at the end of the event; and (f) make a video recording of the groups' presentation. Excepting these conditions, the participants are free to work the way it better fits the workshops characteristics and goals.

*Materials.* At the end, the study has to produce (a) the NFC's questionnaire responses for each participant, (b) personal information about each one of the participants (at least: first name, last name, date of birth, place of birth, e-mail address and sex), (c) a list relating each participant to one group from a specific event, (d) a 10 minutes (maximum) video recording of each group's product presentation.

*Participants.* As the study can be embedded into several types of event/workshops and can be run remotely, the participants are defined by external factors not controlled by the study. For the four different and independently held events being depicted, 84 workshop participants from Germany, Brazil, India, Italy, Mexico and Poland were divided into 18 different groups;

*Procedure.* After informed consent was obtained, the workshops participants are shown instructions on how to respond to the NFC's

questionnaire. The data collections can be done by printed forms or on line with digital tools.

**Table 11 – Legends of the Figure 3**

Part	Item	Description
1	NFC- $H_n$	NFC level of the individual participant
	NFC- $G_nE_n$	NFC Mean level of one group
	$H_n$	The workshop participant.
	$P_n$	The resulting product of a group
	WKS- $S_n$	The workshops identification
	NFC- $RS_n$	The groups NFC ranking from a specific study run
Correlations	C1	Correlation between NFC- $RS_n$ e OUP- $RS_n$
	C2	Correlation between OUP- $RS_n$ e OUP- $J_nRS_n$
Clusters	K1	NFC Mean K-Means Cluster Center obtained by the clustering of the groups' NFC Mean
	K2	Judge NFC K-Means Cluster Center obtained by the clustering of the judges' NFC
	K3	OUP K-Means Cluster Center obtained by the clustering of the groups OUP Mean ratings
2	NFC- $JS_n$	NFC Mean level of the panel of judges
	NFC- $J_n$	NFC level of the individual judge
	$J_n$	The judge's personal identification
	IPJ- $S_n$	The independent panel of judges identification
	POJ- $S_n$	The panel of judges identification
	OUP- $J_nS_n$	The judge's personal ranking of the products
	OUP- $J_nP_n$	The judge's personal rating of a product
	OUP- $P_n$	The independent panel of judges mean rating for a product
	OUP- $RS_n$	The independent panel of judges' final ranking of all products from one event
	O- $J_nP_n$	The judge's personal rating of a product's Originality assessment
	U- $J_nP_n$	The judge's personal rating of a product's User-Value assessment
	P- $J_nP_n$	The judge's personal rating of a product's Producibility assessment

## Second Part of the Study

At Part 2, the products are submitted to an independent panel of judges (IPJ-S1 to IPJ-Sn) through a consensual assessment technique (AMABILE, 1996; HENNESSEY; AMABILE, 2010; MAGNUSSON, 2003). The judges (J1 to Jn) rate the products on three dimensions: Originality, Producibility and User-Value (OUP-P1 to OUP-Pn).

The goal of these studies is to show if the highest perceived innovativeness (OUP-P1 to OUP-Pn) ratings are obtained by groups within a specific range of NFC's levels and NFC's coefficient of variation (NFC-RSn). To do that, the resulting correlations (C1) between the perceived innovativeness of the products and the NFC levels of the groups are analyzed, and probabilities values (p-value) are checked to be below the level of significance of 5% (0.05).

The correlation (C2) between the judges' personal product rankings (OUP-J1RS1 to OUP-JnRS1) and the resulting study's panel ranking (OUP-RE1) are also checked to verify if there are particular NFC levels that can consistently produce personal rankings close to the panel ones.

By applying the Microsoft Excel AVERAGE function to the whole set of individuals' NFC levels of the participants of a specific group, it is possible to determine: K1) the NFC Mean of the groups and to relate it with the Groups' OUP ratings; K2) the Judges NFC levels and compare it with the judges best individual ranking of ideas (when compared to the final ranking of each IPJ); and K3) the OUP Mean ratings of each group and relate it to K1.

### *The Panel of Judges*

*Task.* The second part of the study involves the rating (from 1 to 10 points) of products in three different aspects: Originality, User-Value and Producibility (MAGNUSSON, 2003). Each participant (defined as a Judge) is requested to watch a video presentation of one or several products and fill a survey by rating the referred three aspects of each one of the products. At the end of the related study each participant has to respond to a specific NFC questionnaire.

*Design.* This part of the study was done in two different forms: one can done with independent judges, completely on line via a set of digital tools; the other can be done at the end of the events via a set of printed tools.

*For the on-line assessment* – The first step is to define a list of up to ten potential participants (judges) according to defined requirements. The second, is to send a standard invitation to all names in the list. The first five potential judges that respond positively to the invitation are the ones who effectively become Judges on the study. After accepting the invitation, the five judges receive another message with instructions, a link (URL) and password to access the videos and the rating system on line. The two resulting data sets, which are only collected remotely according to the instructions presented in the Appendix II. Each Independent Panel of Judges is created for and related to a specific set of the workshops run on the first part of the study. *For the on-site assessment* – The first step is to run the workshop in its entirety. At the end, after each group has presented its innovative propositions, all participants receive a printed version of the OUP Questionnaire (see Instruments). Each participant/judge rate all propositions except the one created by the group to which he or she belonged.

*Materials.* At the end, the study has to produce (a) the NFC's questionnaire responses for each judge, (b) personal information about each one of the participants (first name, last name, date of birth, e-mail address and sex), (c) a set of three ratings for each product rated.

*Participants.* IPJ: The participants of the independent panel of judges were 15 persons coming from Brazil, Colombia, Croatia, Germany, Italy, Sweden, United Kingdom and were divided into three different independent panels of judges. They participated in the study as volunteers with up to two hours of work. All of the judges/participants were invited only once to take part of the study. None of them took part in more than one study. POJ: The participants of the panel of judges were 21 persons coming from Brazil. They participated in the study as students with up to two hours of work. All of the judges/participants were invited only once to take part of the study. None of them took part in more than one study.

*Procedure.* After informed consent was obtained, participants are shown instructions on how to respond to the products' rating and to the NFC's questionnaires. The data collections is done exclusively on line with digital tools (see Appendix II).

## Procedures of the Study

The groups' levels of closed mindedness are assessed with the Need For Closure (NFC) scale, computing a 15 items selection of its original 41 items (KRUGLANSKI, 2004; ROETS; VAN HIEL, 2011a).

The products' perceived innovativeness levels are assessed by panels of judges through the Consensual Assessment Technique (AMABILE, 1982).

The relations between the two types of levels are investigated with the use of the IBM SPSS Statistics version 21 (IBM CORP., 2012). The goal is to analyze the bivariate two-tailed Spearman rank correlation and the multiple linear regressions possibilities from the following set of variables.

## Variables

As described below, from the first part of the study it is possible to collect the NFC levels, age and gender of the participants and obtain four variables from them:

- a) NFC Standard Deviation: this number results from applying the Microsoft Excel STDEV function to the individuals NFC levels of the participants of a specific group. It is needed for the Coefficient of Variation calculation;
- b) NFC Mean: this number results from applying the Microsoft Excel AVERAGE function to the whole set of individuals' NFC levels of the participants of a specific group. This is the mean value of the individual NFC levels of the group's participants;
- c) NFC Coefficient of Variation: is obtained by dividing the standard deviation value of a group by its NFC Range.
- d) NFC Range: this data results from the subtraction of the lowest individual NFC level from the highest individual level founds in particular groups;
- e) Participant's Gender;
- f) Participant's Age.

From the second part of the study it is possible to collect the OUP ratings and the NFC levels, age and gender from the judges and obtain the following variables:

- a) NFC Level of each Judge: results from the NFC questionnaire fulfillment by each Judge;
- b) Originality Mean ratings of the Products: based on the rating (0-10) that each judge defined for each product on Originality (O);
- c) User-Value Mean ratings of the Products: based on the rating (0-10) that each judge defined for each product on User-Value (U);
- d) Producibility Mean ratings of the Products: based on the rating (0-10) that each judge defined for each product on Producibility (P);
- e) OUP Mean ratings of the Products: based on the compound OUP rating (0-10) that each judge defined for each product;
- f) General OUP ranking of the Products: ranking of classification based on the OUP Mean rating obtained by each product from the Independent Panel of Judges;
- g) Judge's OUP ranking of the Products: ranking of classification based on the OUP Mean rating obtained by each product from each judge;
- h) Judge's Gender;
- i) Judge's Age.

## Instruments

### *Need for Closure Questionnaire*

The levels of closed mindedness are assessed with a self-report questionnaire designed to measure the motivation for cognitive closure, also known as Need For Closure – NFC (KRUGLANSKI; WEBSTER, 1996; KRUGLANSKI, 2004; ROETS; VAN HIEL, 2007, 2011a). The NFC assessment instrument used to support the present discourse is a validated questionnaire, with 41 items (Likert-type) bipolar-response summated ratings scale measurements (ROETS; VAN HIEL, 2011a, 2011b). From which only 15 items are taken into account for obtaining the NFC levels of the participants. It is necessary to emphasize that (ROETS; VAN HIEL, 2011a, p. 93)

the brief NFC scale does not aim to replace the full scale [...]. Moreover, keeping in mind its purpose, the 15-item selection is designed to measure overall individual differences in NFC on a one-

dimensional scale, while preserving the content richness of the broad construct. The abridged scale is, however, not suitable for the assessment of the individual NFC facets.

The NFCS Questionnaire, in its revised 41 items version (ROETS; VAN HIEL, 2007) is presented at Table 13 highlighting the 15 item taken into account for the studies (ROETS; VAN HIEL, 2011a).

**Table 12 – NFCS 41 items Questionnaire**

41 Questions	15
1. I think that having clear rules and order at work is essential for success.	
2. Even after I've made up my mind about something, I am always eager to consider a different opinion.	
3. I don't like situations that are uncertain.	X
4. I dislike questions which could be answered in many different ways.	X
5. I like to have friends who are unpredictable.	
6. I find that a well ordered life with regular hours suits my temperament.	X
7. When dining out, I like to go to places where I have been before so that I know what to expect.	
8. I feel uncomfortable when I don't understand the reason why an event occurred in my life.	X
9. I feel irritated when one person disagrees with what everyone else in a group believes.	X
10. I hate to change my plans at the last minute.	
11. I don't like to go into a situation without knowing what I can expect from it.	X
12. When I have made a decision, I feel relieved.	X
13. When I am confronted with a problem, I'm dying to reach a solution very quickly.	X
14. When I am confused about an important issue, I feel very upset.	
15. I would quickly become impatient and irritated if I would not find a solution to a problem immediately.	X
16. I would rather make a decision quickly than sleep over it.	
17. Even if I get a lot of time to make a decision, I still feel compelled to decide quickly.	
18. I think it is fun to change my plans at the last moment.	
19. I enjoy the uncertainty of going into a new situation without knowing what might happen.	
20. My personal space is usually messy and disorganized.	
21. In most social conflicts, I can easily see which side is right and which is wrong.	
22. I almost always feel hurried to reach a decision, even when there is no reason to do so.	

*Table continues*



**41 Questions - continued****15**

23. I believe that orderliness and organization are among the most important characteristics of a good student.
24. When considering most conflict situations, I can usually see how both sides could be right.
25. I don't like to be with people who are capable of unexpected actions. **X**
26. I prefer to socialize with familiar friends because I know what to expect from them.
27. I think that I would learn best in a class that lacks clearly stated objectives and requirements.
28. When thinking about a problem, I consider as many different opinions on the issue as possible.
29. I like to know what people are thinking all the time.
30. I dislike it when a person's statement could mean many different things. **X**
31. It's annoying to listen to someone who cannot seem to make up his or her mind.
32. I find that establishing a consistent routine enables me to enjoy life more. **X**
33. I enjoy having a clear and structured mode of life. **X**
34. I prefer interacting with people whose opinions are very different from my own.
35. I like to have a place for everything and everything in its place.
36. I feel uncomfortable when someone's meaning or intention is unclear to me.
37. I always see many possible solutions to problems I face.
38. I'd rather know bad news than stay in a state of uncertainty.
39. I do not usually consult many different opinions before forming my own view. **X**
40. I dislike unpredictable situations. **X**
41. I dislike the routine aspects of my work (studies).
- Source: (KRUGLANSKI; WEBSTER, 1996; KRUGLANSKI, 2004; ROETS; VAN HIEL, 2007, 2011a)

*The OUP Consensual Assessment Technique*

Each one of the assessed ideas are classified by a panel of judges on a scale from one (1, the least) to ten (10, the most) on 3 different dimensions: Originality, User-Value and Producibility. Accordingly to the scale above, each idea gets a score reflecting as it was perceived by each one of the members of the jury. Using a form similar to the one depicted below, each judge informs her or his ratings for each product/group pair. Details can be obtained in Appendix II.

**Table 13 – OUP Questionnaire**

	<b>Originality</b>	<b>User-Benefit</b>	<b>Producibility</b>
<b>Group G1 Product P1</b>			
<b>Group Gn Product Pn</b>			

Source: Based on (MAGNUSSON, 2003).

## **Data**

The study was designed during the period from May 2011 to June 2012. The overall pool of workshops that were held to subsidize this research resulted in more than 30 different groups and involving more than 180 people from some 10 different countries.

From this pool, only 4 different workshops (with 18 different groups), 3 independent panel of judges and 1 panel of judges, with the participation of a total of 99 persons (55 women and 44 men) from eight different countries produced valid data sets. This was due to the fact that the Need For Closure (NFC) and the Originality, User-Value and Producibility (OUP) assessments were only developed into a point as to spur valid data after June 2012. These sets of data were obtained from the following elements:

- a) 84 workshop participants from Germany, Brazil, India, Italy, Mexico and Poland divided into 18 different groups; and
- b) 36 judges divided into 2 types of consensual assessment techniques:
  - a. one is composed by 3 independent panels of judges with 5 participants each (15 persons in total) coming from Brazil, Colombia, Croatia, Germany, Italy, Sweden and United Kingdom;
  - b. the other is composed by 21 persons from the 84 participants of one of the workshops.

Each one of the workshops' 18 different groups created a product proposition that was then submitted to be assessed by one of the panels of judges.

## Workshops' Data

As can be seeing in the data sets below, from the first part of the study it is possible to collect the NFC levels of the participants and calculate four variables from them:

- a) NFC Standard Deviation: this number results from applying the Microsoft Excel STDEV function to the individuals NFC levels of the participants of a specific group. It is needed for the Coefficient of Variation calculation;
- b) NFC Mean: this number results from applying the Microsoft Excel AVERAGE function to the whole set of individuals' NFC levels of the participants of a specific group. This is the mean value of the individual NFC levels of the group's participants;
- c) NFC Coefficient of Variation: is obtained by dividing the standard deviation value of a group by its NFC Range.
- d) NFC Range: this data results from the subtraction of the lowest individual NFC level from the highest individual level founds in particular groups;

Taken as a whole, the data collected from 84 participants are:

- a) Average Age: 26,6 years;
- b) Gender: 50 women (59,52%) and 34 men (40,48%);
- c) NFC Standard Deviation: 11,89;
- d) NFC Mean: 52,73;
- e) NFC Coefficient of variation: 0,23;
- f) NFC Range: 50,00 (Max NFC: 81,0; Min NFC: 31,0);
- g) OUP Mean: 6,57.

### *Data: Workshop WKS.2.01*

The first run of the study, as described below, was held on the 25th and 26th of June 2012 with 4 groups and 23 participants (16 women and 7 men), in Florianópolis, Brazil. The NFC Mean of the participants of this event is 53,26 and an average age of 32,66 years. Its Cronbach's alpha coefficient of internal consistency is 0,859 (15 items and 23 cases).

**Table 14 – Participants’ NFC levels from the Study WKS.2.01**

PARTICIPANT	Groups				
	WKS.2.01.A	WKS.2.01.B	WKS.2.01.C	WKS.2.01.D	WKS.2.01.E
1	39	58	51	49	59
2	45	35	39	55	47
3	67	53	65	59	70
4	57	47	31	38	
5		67	44	70	
6				75	
Women	2	3	4	5	2
Men	2	2	1	1	1

The main characteristic of this session is the fact that all participants came from a single organization, although from several areas within it. The groups were formed by previously collecting surface level differences information about the participants. The participants were assigned to groups towards increase its diversity.

**Table 15 – NFC levels analysis from the Study WKS.2.01**

	Groups				
	WKS.2.01.A	WKS.2.01.B	WKS.2.01.C	WKS.2.01.D	WKS.2.01.E
NFC Standard Deviation	12,49	12,00	12,88	13,59	11,50
NFC Mean	52,00	52,00	46,00	57,67	58,67
NFC Coefficient of Variation	0,2402	0,2308	0,2801	0,2357	0,1961
NFC Range	28,00	32,00	34,00	37,00	23,00

*Data: Workshop GSJ.1.01*

The second study was held from the 2<sup>nd</sup> until the 4<sup>th</sup> of November 2012 with 22 participants (14 women and 8 men), resulting in five valid groups: one from the city of Bangalore (India), one from Poznan (Poland) and three from Milan (Italy). The groups’ average NFC was found to be of 50,39 and an average age of 25 years. Its Cronbach's alpha coefficient of internal consistency is 0,780 (15 items and 22 cases).

**Table 16 – Participants’ NFC levels from the Study GSJ.1.01**

PARTICIPANT	Groups				
	GSJ.1.01.A	GSJ.1.01.B	GSJ.1.01.C	GSJ.1.01.D	GSJ.1.01.E
1	33	36	54	73	67
2	55	39	36	46	36
3	36	45		50	53
4	44	50		59	43
5	60	52			49
6					54
Women	1	4	2	3	4
Men	4	1	0	1	2

The groups were formed naturally by the participants themselves. The main characteristic of this session is the fact that it was run during the Global Sustainability Jam 2012<sup>50</sup>.

**Table 17 – NFC levels analysis from the Study GSJ.1.01**

	Groups				
	GSJ.1.01.A	GSJ.1.01.B	GSJ.1.01.C	GSJ.1.01.D	GSJ.1.01.E
NFC Standard Deviation	11,82	6,88	12,73	11,97	10,58
NFC Mean	47,83	44,40	45,00	57,00	50,33
NFC Coefficient of Variation	0,2472	0,1549	0,2828	0,2100	0,2101
NFC Range	27,00	16,00	18,00	27,00	31,00

*Data: Workshop KSD.1.01*

The third study started on the 8th of April 2013 and finished on the 23rd of May 2013 with 03 groups’ data being taken into account, 10 participants (6 women and 4 men), with a NFC Mean of 56,43 and an average age of 22 years. Its Cronbach's alpha coefficient of internal consistency is 0,830 (42 items and 15 cases).

This study was held at the Köln International School of Design, as part of a regular project done during a discipline hosted by Professor Birgit Mager and two former KISD students (11 and 12 years after their graduation) named André Poulheim and Thorsten Frackenhohl from the Design Studio Frackenhohl & Poulheim, from Cologne/Germany. The goal of the discipline was to explore different scenarios of possibilities to create Product/Service solutions.

<sup>50</sup> For more information, check: <http://planet.globalsustainabilityjam.org/gsusj12/buzz>

**Table 18 – Participants’ NFC levels from the Study KSD.1.01**

PARTICIPANT	Groups		
	KSD.1.01.A	KSD.1.01.B	KSD.1.01.C
1	41	48	37
2	52	56	38
3	69	68	72
4		61	
5			
6			
Women	1	3	2
Men	2	1	1

The groups were formed by previously asking the participants to fill the NFC Scale questionnaire. The participants were assigned to groups based on individual levels of NFC.

**Table 19 – NFC levels analysis from the Study KSD.1.01**

	Groups		
	KSD.1.01.A	KSD.1.01.B	KSD.1.01.C
NFC Standard Deviation	14,11	8,42	19,92
NFC Mean	54,00	58,25	49,00
NFC Coefficient of Variation	0,2612	0,1446	0,41
NFC Range	28,00	20,00	35,00

*Data: Workshop UNI.1.01*

The fourth study started on the 22<sup>nd</sup> of August 2014 and finished on the 6<sup>th</sup> of September 2014 generating 05 valid groups’ data, with 29 participants (6 women and 4 men), and a NFC Mean of 55,06 and an average age of 26,8 years. Its Cronbach's alpha coefficient of internal consistency is 0,839 (42 items and 29 cases).

This study was held at the Universidade do Vale de Itajaí – UNIVALI, as part of a regular a discipline hosted by Maurício Manhães. The goal of the discipline was to explore different scenarios of possibilities to create Product/Service solutions.

The groups were formed by previously asking the participants to fill the NFC Scale questionnaire. The participants were assigned to groups based on individual levels of NFC.

**Table 20 – Participants’ NFC levels from the Study UNI.1.01**

PARTICIPANT	Groups				
	UNI.1.01.A	UNI.1.01.B	UNI.1.01.C	UNI.1.01.D	UNI.1.01.E
1	34	37	39	40	40
2	41	48	50	50	50
3	51	51	53	53	55
4	56	56	58	59	60
5	66	62	64	62	75
6	67	63	81	76	
Women	6	0	1	5	2
Men	0	6	5	1	3

As stated before, these are the data relating to the four workshops/events’ study. Above were presented the NFC resulting data of 84 participants divided into 18 groups.

**Table 21 – NFC levels analysis from the Study UNI.1.01**

	Groups				
	UNI.1.01.A	UNI.1.01.B	UNI.1.01.C	UNI.1.01.D	UNI.1.01.E
NFC Standard Deviation	13,28	9,75	14,24	12,19	12,94
NFC Mean	52,50	52,83	57,50	56,67	56,00
NFC Coefficient of Variation	0,25	0,18	0,25	0,22	0,23
NFC Range	33,00	25,00	42,00	36,00	35,00

In the following pages are described the data collected from the three Independent Panel of Judges (IPJ) and one Panel of Judges (POJ) created to evaluate the products that were generated by the 18 groups related to the 4 workshops.

### **Data: Consensual Assessment Technique**

As can be seeing in the collected data sets from the second part of the study, 36 persons were divided into 2 types of consensual assessment techniques:

- a. Independent Panel of Judges: is composed by 3 independent panels of judges with 5 participants each (15 persons in total) coming from Brazil, Colombia, Croatia, Germany, Italy, Sweden and United Kingdom;
- b. Panel of Judges: is composed by 21 persons from the UNI.1.01 workshop. These judges rated only the products from the workshop

that they took part, but not rating the product created by the specific group in which s/he was assigned to.

Each participant of the Consensual Assessment Technique, be it Independent Panel of Judges or Panel of Judges rated each workshop's products into three aspects: Originality, User-Benefit and Producibility.

The NFC level (see the column NFC.IPJ0*n* at the following tables) of each judge was also assessed to enable the investigation of some possible relations.

One of these possible relations was the impact of the judges' NFC levels on the judges' rating profile and how this profile relates to the panel's overall rating for each product proposition.

Taken as a whole, the data collected from 36 judges are:

- a) Average Age: 31 years;
- b) Gender: 16 women (44,44%) and 20 (55,56%) men;
- c) NFC Standard Deviation: 10,59;
- d) NFC Mean: 50,33;
- e) NFC Coefficient of variation: 0,21;
- f) NFC Range: 49,00 (Max NFC: 75,0; Min NFC: 26,0);
- g) OUP Mean: 6,57.

*Data: Independent Panel of Judges 01 (IPJ01) – WKS.2.01*

This panel was composed by 4 men and 1 woman with an average age of 39,77 years and its objective was to assess the products created at the WKS.2.01 workshop. The assessment was done between the 1<sup>st</sup> and 2<sup>nd</sup> of August 2012.

**Table 22 – WKS.2.01's judges**

Judge	Man/Woman	Age (2014)	NFC
IPJ01.01	Man	38	44
IPJ01.02	Man	41	38
IPJ01.03	Man	44	40
IPJ01.04	Woman	32	42
IPJ01.05	Man	44	47

The following table presents the ratings given by each one of the judges of the Independent Panel of Judges 01 (IPJ01) to the products



created during the workshop WKS.2.01. The overall average ratings given by all judges from IPJ01 is 6,02.

Its Cronbach's alpha coefficient of internal consistency is 0,525 (5 items and 15 cases). By removing the data from IPJ01.01, the internal consistency coefficient is 0,621 (4 items and 15 cases).

It is possible to verify that the product WKS.2.01.E was considered the highest on the Originality level, the second lowest on the User-Benefit and Producibility dimensions, and ranking third on the final OUP-Mean level. In the opposite direction went the perception of the product WKS.2.01.A, ranked the highest on the OUP Mean, received the third Originality and User-Benefit mean ratings, and the highest Producibility one (along with Product WKS.2.01.D). The highest User-Benefit mean level product, the WKS.2.01.B, was rated fourth on Originality and a far third on Producibility. It ended up at a fourth place on the final OUP ratings of that group.

**Table 23 – WKS.2.01's OUP Ratings by Judges**

	WKS.2.01.A – Originality	WKS.2.01.A – User-Benefit	WKS.2.01.A – Producibility	WKS.2.01.B – Originality	WKS.2.01.B – User-Benefit	WKS.2.01.B – Producibility	WKS.2.01.C – Originality	WKS.2.01.C – User-Benefit	WKS.2.01.C – Producibility	WKS.2.01.D – Originality	WKS.2.01.D – User-Benefit	WKS.2.01.D – Producibility	WKS.2.01.E – Originality	WKS.2.01.E – User-Benefit	WKS.2.01.E – Producibility	NFC.IPJ01
IPJ01.01	8	6	6	8	8	8	7	8	7	8	9	9	8	7	9	44
IPJ01.02	4	5	4	7	5	7	6	5	4	5	4	6	7	5	5	38
IPJ01.03	5	6	9	2	5	5	7	3	1	7	7	2	9	8	2	40
IPJ01.04	8	10	8	5	8	3	9	2	4	3	9	9	9	5	2	42
IPJ01.05	8	4	8	6	9	1	9	6	3	2	5	9	9	4	2	47
<b>IPJ01.MEAN</b>	<b>6,6</b>	<b>6,2</b>	<b>7,0</b>	<b>5,6</b>	<b>7,0</b>	<b>4,8</b>	<b>7,6</b>	<b>4,8</b>	<b>3,8</b>	<b>5,0</b>	<b>6,8</b>	<b>7,0</b>	<b>8,4</b>	<b>5,8</b>	<b>4,0</b>	

The described relations reinforce what previous studies have shown about the reliability of using this kind of instrument to access the perceived innovativeness of new products propositions (AMABILE, 1982; MAGNUSSON, 2003).

At the WKS.2.01, the rating of the highest OUP Mean product is 18,18% higher than the last one.

**Table 24 –OUP mean levels from the Study WKS.2.01**

Perception Levels	Groups				
	WKS.2.01.A	WKS.2.01.B	WKS.2.01.C	WKS.2.01.D	WKS.2.01.E
Originality Mean	6,60	5,60	7,60	5,00	8,40
User-Benefit Mean	6,20	7,00	4,80	6,80	5,80
Producibility Mean	7,00	4,80	3,80	7,00	4,00
OUP Mean	6,60	5,80	5,40	6,27	6,07

*Data: Independent Panel of Judges 02 (IPJ02) – GSJ.1.01*

This panel was composed by 4 men and 1 woman with an average age of 33,27 years and its objective was to assess the products created at the GSJ.1.01 workshop. The assessment was done between the 20<sup>th</sup> and 24<sup>th</sup> of May 2013.

**Table 25 – GSJ.1.01's Judges**

Judge	Man/Woman	Age (2014)	NFC
IPJ02.01	Man	33	37
IPJ02.02	Man	33	45
IPJ02.03	Man	36	62
IPJ02.04	Woman	33	51
IPJ02.05	Man	31	26

The next table presents each of the 3 ratings for every product from GSJ.1.01 by each judge of the Independent Panel of Judges 02 (IPJ02). The average ratings given by all judges from IPJ02 is 5,92.

Its Cronbach's alpha coefficient of internal consistency is 0,453 (5 items and 15 cases). By removing the data from IPJ02.05, the internal consistency coefficient is 0,583 (4 items and 15 cases).

It is possible to verify that the product GSJ.1.01.D was considered the highest on the Originality, User-Benefit and Producibility dimensions, and ranking first on the final OUP-Mean level. In the opposite direction went the perception of the product GSJ.1.01.C, ranked the lowest on the OUP Mean, received the fifth Originality and User-Benefit (along with Product GSJ.1.01.A) mean ratings, and the lowest Producibility one.

**Table 26 – GSJ.1.01's OUP Ratings by Judges**

	GSJ.1.01.A – Originality	GSJ.1.01.A – User-Benefit	GSJ.1.01.A – Producibility	GSJ.1.01.B – Originality	GSJ.1.01.B – User-Benefit	GSJ.1.01.B – Producibility	GSJ.1.01.C – Originality	GSJ.1.01.C – User-Benefit	GSJ.1.01.C – Producibility	GSJ.1.01.D – Originality	GSJ.1.01.D – User-Benefit	GSJ.1.01.D – Producibility	GSJ.1.01.E – Originality	GSJ.1.01.E – User-Benefit	GSJ.1.01.E – Producibility	NFC:IPJ02
IPJ02.01	5	4	2	7	3	1	5	3	2	9	9	10	10	7	8	37
IPJ02.02	8	5	7	5	8	8	10	5	5	10	9	9	4	4	4	45
IPJ02.03	5	7	6	7	7	7	6	7	4	8	8	9	5	5	8	62
IPJ02.04	5	7	7	6	5	2	3	5	3	5	9	9	8	6	7	51
IPJ02.05	2	2	4	7	7	9	6	5	4	7	6	3	4	4	2	26
<b>IPJ02.MEAN</b>	<b>5,0</b>	<b>5,0</b>	<b>5,2</b>	<b>6,4</b>	<b>6,0</b>	<b>5,4</b>	<b>6,0</b>	<b>5,0</b>	<b>3,6</b>	<b>7,8</b>	<b>8,2</b>	<b>8,0</b>	<b>6,2</b>	<b>5,2</b>	<b>5,8</b>	

**Table 27 – OUP mean levels from the Study GSJ.1.01**

Perception Levels	Groups				
	GSJ.1.01.A	GSJ.1.01.B	GSJ.1.01.C	GSJ.1.01.D	GSJ.1.01.E
Originality Mean	5,00	6,40	6,00	7,80	6,20
User-Benefit Mean	5,00	6,00	5,00	8,20	5,20
Producibility Mean	5,20	5,40	3,60	8,00	5,80
OUN MEAN	5,07	5,93	4,87	8,00	5,73

At the GSJ.1.01, the rating of the highest OUP Mean product is 39,13% higher than the last one.

*Data: Independent Panel of Judges 03 (IPJ03) – KSD.1.01*

This panel was composed by 3 men and 2 women with an average age of 31,83 years and its objective was to assess the products created at the KSD.1.01 workshop. The assessment was done between the 22<sup>nd</sup> of May and 1<sup>st</sup> of June 2013.

**Table 28 – KSD.1.01's Judges**

Judge	Man/Woman	Age (2014)	NFC
IPJ03.01	Woman	36	36
IPJ03.02	Woman	31	56
IPJ03.03	Woman	31	54
IPJ03.04	Man	28	47
IPJ03.05	Man	33	44

The following table presents the ratings given by each one of the judges of the Independent Panel of Judges 03 (IPJ03) to the products created during the workshop KSD.1.01. The overall average ratings given by all judges from IPJ03 is 6,84. Its Cronbach's alpha coefficient of internal consistency is 0,705 (5 items and 9 cases).

Its Cronbach's alpha coefficient of internal consistency is 0,705 (5 items and 9 cases). By removing the data from IPJ03.05, the internal consistency coefficient is 0,911 (4 items and 15 cases).

It is possible to verify that the proposition KSD.1.01.B was considered the highest on the User-Benefit and Producibility dimensions, second on Originality, and ranking first on the final OUP-Mean level. In the opposite direction went the perception of the product KSD.1.01.A, ranked the lowest on the OUP Mean, received in both Originality and User-Benefit mean ratings a far third place, among 3 products from KSD.1.01.

**Table 29 – KSD.1.01's OUP Ratings by Judges**

	KSD.1.01.A – Originality	KSD.1.01.A – User-Benefit	KSD.1.01.A – Producibility	KSD.1.01.B – Originality	KSD.1.01.B – User-Benefit	KSD.1.01.B – Producibility	KSD.1.01.C – Originality	KSD.1.01.C – User-Benefit	KSD.1.01.C – Producibility	NFC.IPJ03
IPJ03.01	4	7	6	8	10	7	8	8	10	47
IPJ03.02	1	5	8	8	9	6	6	8	9	56
IPJ03.03	3	8	7	10	10	9	8	8	9	36
IPJ03.04	2	3	7	9	10	9	7	8	5	44
IPJ03.05	5	6	4	1	10	10	10	1	1	54
<b>IPJ03.MEAN</b>	<b>3,0</b>	<b>5,8</b>	<b>6,4</b>	<b>7,2</b>	<b>9,8</b>	<b>8,2</b>	<b>7,8</b>	<b>6,6</b>	<b>6,8</b>	

**Table 30 – OUP mean levels from the Study KISD.01**

Perception Levels	Groups		
	KSD.1.01.A	KSD.1.01.B	KSD.1.01.C
Originality-Mean	3,00	7,20	7,8
User-Benefit-Mean	5,80	9,80	6,6
Producibility-Mean	6,40	8,20	6,8
OUP Mean	5,07	8,40	7,07

At the KSD.1.01, the rating of the highest OUP Mean product is 39,64% higher than the last one.

*Data: Panel of Judges 01 (POJ01) – UNI.1.01*

This panel was composed by 10 men and 11 women with an average age of 28,07 years and its objective was to assess the products created at the UNI.1.01 workshop. The assessment was done between the 22<sup>nd</sup> of May and 1<sup>st</sup> of June 2013.

This panel was not an “Independent” type. The judges were also participants of the UNI.1.01 workshop, but they could not rate the product created by the group to which the judge was assigned to.

Table 32 presents the ratings given by each one of the judges of the Panel of Judges 01 (POJ01) to the products created during the workshop UNI.1.01. The overall average ratings given by all judges from POJ01 is 7,18. As can be seen, the judges did not rate every product that was created during the workshop. Whenever at the following table there is a sign of minus (-), it means that the judge was assigned to the group identified at the column.

**Table 31 – UNI.1.01's judges**

Judge	Man/Woman	Age (2014)	NFC
POJ01.01	Woman	30	39
POJ01.02	Man	30	40
POJ01.03	Woman	23	40
POJ01.04	Woman	27	41
POJ01.05	Man	39	48
POJ01.06	Woman	27	50
POJ01.07	Woman	24	50
POJ01.08	Man	25	50
POJ01.09	Woman	42	51
POJ01.10	Man	30	51
POJ01.11	Man	22	55
POJ01.12	Man	25	56
POJ01.13	Woman	26	56
POJ01.14	Woman	25	59
POJ01.15	Man	30	60
POJ01.16	Man	31	62
POJ01.17	Man	22	63
POJ01.18	Man	33	64
POJ01.19	Woman	23	66
POJ01.20	Woman	28	67
POJ01.21	Woman	31	75



on the OUP Mean, received in both Originality and User-Benefit mean ratings a far third place, amongst 5 products from UNI.1.01.

**Table 33 – UNI.1.01 Cronbach's alpha coefficient**

Results	Groups				
	UNI.1.01.A	UNI.1.01.B	UNI.1.01.C	UNI.1.01.D	UNI.1.01.E
Cronbach's alpha coefficient	0,938	0,791	0,570	0,541	0,728
Number of Cases (O, U, P)	3	3	3	3	3
Number of Items	16	17	18	17	16

**Table 34 – OUP mean levels from the Study UNI.1.01**

Perception Levels	Groups				
	UNI.1.01.A	UNI.1.01.B	UNI.1.01.C	UNI.1.01.D	UNI.1.01.E
Originality-Mean	8,06	6,84	6,45	7,28	8,06
User-Benefit-Mean	8,71	5,26	7,50	8,11	8,22
Producibility-Mean	6,35	6,16	7,15	7,56	7,33
<b>OUP Mean</b>	<b>7,71</b>	<b>6,09</b>	<b>7,50</b>	<b>7,65</b>	<b>7,87</b>

At the UNI.1.01, the rating of the highest OUP Mean product is 25,00% higher than the last one.

#### *NFC and OUP's Correlations*

With the above presented data it was possible to investigate the possible relations between NFC and OUP from two different perspectives:

- a) Groups NFC Mean and Products OUP Mean: The groups NFC Mean and the respective resulting OUP Mean for the products;
- b) Individual and Collective OUP from the Judges: The individual Judges' means ratings for each one of the products and the final OUP mean attributed by all judges.

On Table 37 it is possible to verify how the 18 groups are ranked based on their OUP Mean. The difference between the five first and five

last OUP positions yields a 10,32% increase on the groups' NFC Mean levels and a 35,30% increase on their OUP Mean favoring the top ones.

The following tables present several relations that were established through bivariate two-tailed Spearman rank correlation, using the IBM SPSS Statistics version 21 (IBM CORP., 2012).

These relations are presented as 4 different sets of 18, 13, 12 and 6 groups. The first present the correlations obtained by all data from all 18 groups taken together. From these 18 groups, the correlation analysis revealed two different sets of groups, one composed by 12 and another by 6. Basically, the difference between these two sets of groups is at the Spearman correlation of the NFC Coefficient of Variation (NFC CoV) and the OUP Mean. While for the 18 and 12 sets of groups, this correlation is positive, at the 6 set it is negative, as it is presented in the next pages.

Due to the fact that UNI.1.01 workshop's product were rated by the participants themselves, a correlation analysis was done without the 5 groups from the cited workshop.



## Analysis of 18 groups (Total)

Table 35 presents the basic data used to obtain the correlations. Its Cronbach's alpha coefficient of internal consistency is 0,694 (7 items and 18 cases). Figure 8 and Figure 9 portray the OUP Mean relations with NFC CoV and NFC Mean. Both presented with their exponential trend lines.

The Table 35 presents the bivariate two-tailed Spearman rank correlation obtained with the data generated by the referred 18 groups of the study. Considering only the correlations that have a significance (2-tailed) level equal or below the 0,05 threshold, the data shows that:

- a) NFC Mean and OUP Mean correlate positively with a coefficient of 0,606 and a level of significance of 0,008;
- b) NFC Mean and Producibility Mean correlate positively with a coefficient of 0,614 and a level of significance of 0,007;
- c) NFC Mean and User-Benefit Mean correlate positively with a coefficient of 0,590 and a level of significance of 0,010;

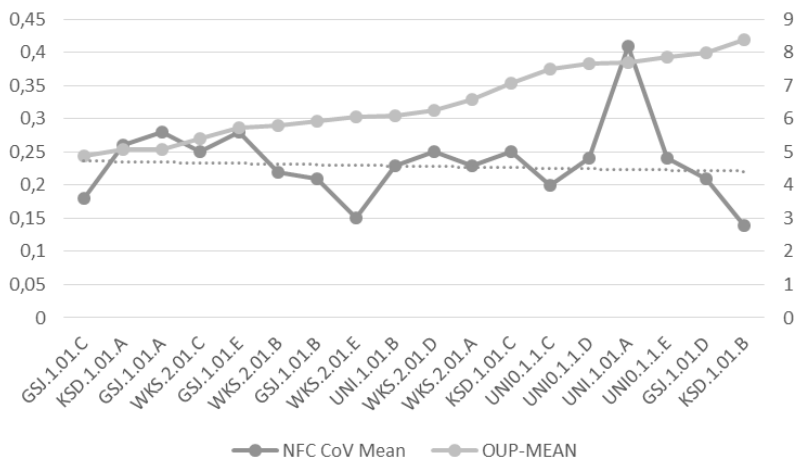
The correlations between NFC Mean, OUP Mean, User-Benefit Mean and Producibility Mean were positive consistently high with significance below 0.05 level.

Table 37 displays the 18 groups (50 women and 34 men, with an average NFC level of 52,8) divided into 3 sets, representing the highest, the middle and the lowest according to their OUP ratings. It is possible to calculate the average NFC level of the individuals for each set. Therefore, as can be seen at Table 37, when considering the NFC levels of all members of the groups of each set, the average NFC levels are:

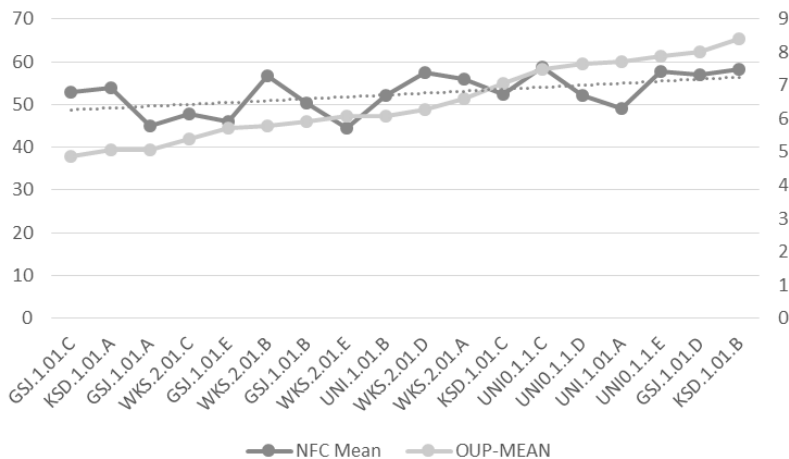
- a) The average NFC level of the 31 members (20 women and 11 men) of the 6 highest OUP ratings groups is 56,16;
- b) The average NFC level of the 27 members (16 women and 11 men) of the 6 middle OUP ratings groups is 52,44;
- c) The average NFC level of the 26 members (15 women and 11 men) of the 6 lowest OUP ratings groups is 49,29;

It worth note that the sequencing of groups from the lowest to the highest on Originality ratings produces almost diametrically opposed Producibility rated sequencing. This dynamic has already been described by Magnusson (p. 79, 2003): “The enhanced level of originality did, however, simultaneously result in a decreased level of producibility.” In

a sense, having produced the same scenario creates the perception that I applied the OUP instruments in a coherent way.



**Figure 8 – OUP Mean and NFC CoV relation**



**Figure 9 – OUP Mean and NFC Mean relation**

Table 35 – Groups’ NFC and OUP characteristics – 18 groups

Groups	NFC Mean	NFC CoV	Women / Men	Originality	User-Benefit	Productivity	OUP Mean
GSI.1.01.A	47,83	0,25	0,20	5,00	5,00	5,20	5,07
GSI.1.01.B	44,40	0,15	0,80	6,40	6,00	5,40	5,93
GSI.1.01.C	45,00	0,28	1,00	6,00	5,00	3,60	4,87
GSI.1.01.D	57,00	0,21	0,75	7,80	8,20	8,00	8,00
GSI.1.01.E	50,33	0,21	0,67	6,20	5,20	5,80	5,73
KSD.1.01.A	54,00	0,26	0,33	3,00	5,80	6,40	5,07
KSD.1.01.B	58,25	0,14	0,75	7,20	9,80	8,20	8,40
KSD.1.01.C	49,00	0,41	0,67	7,80	6,60	6,80	7,07
UNI.1.01.A	52,50	0,25	1,00	8,06	8,71	6,35	7,71
UNI.1.01.B	52,83	0,18	0,00	6,84	5,26	6,16	6,09
UNI0.1.1.C	57,50	0,25	0,17	6,45	7,50	7,15	7,50
UNI0.1.1.D	56,67	0,22	0,83	7,28	8,11	7,56	7,65
UNI0.1.1.E	56,00	0,23	0,40	8,06	8,22	7,33	7,87
WKS.2.01.A	52,00	0,24	0,50	6,60	6,20	7,00	6,60
WKS.2.01.B	52,00	0,23	0,60	5,60	7,00	4,80	5,80
WKS.2.01.C	46,00	0,28	0,80	7,60	4,80	3,80	5,40
WKS.2.01.D	57,67	0,24	0,83	5,00	6,80	7,00	6,27
WKS.2.01.E	58,67	0,20	0,67	8,40	5,80	4,00	6,07

**Table 36 – Groups' correlations NFC/OUP – 18 groups**

	Mean	Standard Deviation	1	2	3	4	5	6	7
1 NFC Mean	52,6472	4,71603							
2 NFC CoV	0,235	0,05844	-0,391						
3 OUP Mean	6,5056	1,12794	0,606**	-0,362					
4 Originality Mean	6,6272	1,37011	0,279	-0,17	0,629**				
5 User-Benefit Mean	6,6667	1,47533	0,590**	-0,293	0,896**	0,402			
6 Productibility Mean	6,1417	1,41488	0,614**	-0,267	0,842**	0,229	0,783**		
7 Women/Men Ratio	0,6094	0,28612	-0,119	0,058	0,091	0,183	0,15	-0,081	

*Note.* \*\*, Correlation is significant at the 0.01 level (2-tailed). \*, Correlation is significant at the 0,05 level (2-tailed).  $N = 18$

Table 37 – Groups' ranking based on OUP – 18 groups

Groups	W	M	W/M	1	2	3	4	5	6	Intergroup NFC Mean	Group NFC Mean	Coefficient of Variation	OUP Mean	OUP- Class.
KSD.1.01.B	3	1	0,75	48	56	61	68			56,16	58,25	0,14	8,40	1
GSI.1.01.D	3	1	0,75	46	50	59	73				57,00	0,21	8,00	2
UNI.1.01.E	2	3	0,4	40	50	55	60	75			56,00	0,23	7,87	3
UNI.1.01.A	6	0	1	34	41	51	56	66	67		52,50	0,25	7,71	4
UNI.1.01.D	5	1	0,83	40	50	53	59	62	76		56,67	0,22	7,65	5
UNI.1.01.C	1	5	0,17	39	50	53	58	64	81		57,50	0,25	7,50	6
KSD.1.01.C	2	1	0,67	37	38	72				52,44	49,00	0,41	7,07	7
WKS.2.01.A	2	2	0,5	39	45	57	67				52,00	0,24	6,60	8
WKS.2.01.D	5	1	0,83	38	49	55	59	70	75		57,67	0,24	6,27	9
UNI.1.01.B	0	6	0	37	48	51	56	62	63		58,67	0,20	6,09	10
WKS.2.01.E	2	1	0,67	47	59	70					52,83	0,18	6,07	11
GSI.1.01.B	4	1	0,8	36	39	45	50	52			44,40	0,15	5,93	12
WKS.2.01.B	3	2	0,6	35	47	53	58	67		49,29	52,00	0,23	5,80	13
GSI.1.01.E	4	2	0,67	36	43	49	53	54	67		50,33	0,21	5,73	14
WKS.2.01.C	4	1	0,8	31	39	44	51	65			46,00	0,28	5,40	15
GSI.1.01.A	1	4	0,2	33	36	44	55	59	60		47,83	0,25	5,07	16
KSD.1.01.A	1	2	0,33	41	52	69					54,00	0,26	5,07	16
GSI.1.01.C	2	0	1	36	54						45,00	0,28	4,87	18

### Analysis of 13 groups (without UNI.1.01)

Because of the particular characteristic of the UNI.1.01 study, an analysis of the data set was necessary. It was supposed that, due to the fact that the workshop participants also acted as judges, the resulting data could distort the sought correlations. After removing the data from UNI.1.01 the Cronbach's alpha coefficient of internal consistency is 0,619 (6 items and 13 cases). Table 38 presents the basic data used to obtain the correlations between the NFC and OUP related data.

Table 39 presents the bivariate two-tailed Spearman rank correlation obtained with the data generated by the referred 13 groups of the study. Considering only the correlations that have a significance (2-tailed) level equal or below the 0,05 threshold, the data shows that:

- a) NFC Mean and OUP Mean correlate positively with a coefficient of 0,554 and a level of significance of 0,05;
- b) NFC Mean and User-Benefit Mean correlate positively with a coefficient of 0,588 and a level of significance of 0,05;

The correlations between NFC Mean, User-Benefit Mean and OUP Mean were positive consistent with the correlations obtained when all 18 groups were considered. Therefore, the inclusion of UNI.1.01 data seems not to deteriorate the consistency of the whole set of data.

**Table 38 – Groups' OUP – 13 groups (without UNI.1.01)**

Groups	NFC Mean	NFC CoV Mean	W/M	Originality	User-Benefit	Productibility	OUP Mean
GSJ.1.01.A	47,83	0,25	0,20	5,00	5,00	5,20	<b>5,07</b>
GSJ.1.01.B	44,40	0,15	0,80	6,40	6,00	5,40	<b>5,93</b>
GSJ.1.01.C	45,00	0,28	1,00	6,00	5,00	3,60	<b>4,87</b>
GSJ.1.01.D	57,00	0,21	0,75	7,80	8,20	8,00	<b>8,00</b>
GSJ.1.01.E	50,33	0,21	0,67	6,20	5,20	5,80	<b>5,73</b>
KSD.1.01.A	54,00	0,26	0,33	3,00	5,80	6,40	<b>5,07</b>
KSD.1.01.B	58,25	0,14	0,75	7,20	9,80	8,20	<b>8,40</b>
KSD.1.01.C	49,00	0,41	0,67	7,80	6,60	6,80	<b>7,07</b>
WKS.2.01.A	52,00	0,24	0,50	6,60	6,20	7,00	<b>6,60</b>
WKS.2.01.B	52,00	0,23	0,60	5,60	7,00	4,80	<b>5,80</b>
WKS.2.01.C	46,00	0,28	0,80	7,60	4,80	3,80	<b>5,40</b>
WKS.2.01.D	57,67	0,24	0,83	5,00	6,80	7,00	<b>6,27</b>
WKS.2.01.E	58,67	0,20	0,67	8,40	5,80	4,00	<b>6,07</b>

**Table 39 – Groups' correlations NFC/OUP – 13 groups (without UNL.1.01)**

	Mean	Standard Deviation	1	2	3	4	5	6	7
1 NFC Mean	51,7038	5,12752							
2 NFC CoV	0,2385	0,06719	-0,441						
3 OUP Mean	6,1754	1,09648	0,554*	-0,459					
4 Originality Mean	6,3538	1,48134	0,177	-0,216	0,594*				
5 User-Benefit Mean	6,3231	1,41784	0,588*	-0,474	0,830**	0,184			
6 Productibility Mean	5,8462	1,53873	0,525	-0,329	0,777**	0,09	0,759**		
7 Women/Men Ratio	0,6592	0,21407	-0,175	-0,058	0,097	0,213	0,025	-0,105	

Note. \*\*. Correlation is significant at the 0.01 level (2-tailed). \*. Correlation is significant at the 0.05 level (2-tailed). N = 18

## Results

The following table presents the resulting data from a linear regressions analysis done with SPSS.

**Table 40 – Data results from linear regressions analysis**

Description	Analysis
Dependent Variable	OUP Mean
Independent Variables (Predictors)	NFC Mean
R value	0.628
R square	0.394
Adjusted R square	0.356
Durbin-Watson index	1,000
<i>F</i> Change	10,41
Significance <i>F</i> Change	0,005

To test that the aggregated motivated cognitive tendencies of a group is related to the innovativeness perception of products created by those same groups, a linear regression analysis was made of the dependent variable OUP Mean on the independent variable NFC Mean. Results showed that NFC Mean predicted innovativeness perception (OUP Mean) significantly, explaining 35,6 percent of the adjusted variance ( $F(1; 16) = 10,41; p=0,005$ ). The NFC Mean level is significant, despite  $N = 18$ , and having a high Beta value (0,628) and R square change (0,356), both indicators of effect size. Which confirms the a positive Spearman Rank correlation of 0,606 significant at 0,01 level (2-tailed) between NFC Mean level of a group and the OUP Mean of products created by it.

The presented data and results answer positively the research question of this thesis by indicating that there is a relation between the motivated cognitive tendency of an individual in a group (NFC Mean) and the potential of that group to create products perceived as innovative (OUP Mean). These results enable to describe NFC Mean as a positive and significant predictor of OUP Mean.







**Stone:** noun. 1 [mass noun] hard solid non-metallic mineral matter of which rock is made, especially as a building material: *the houses are built of stone.*<sup>51</sup>

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<sup>51</sup> <http://oxforddictionaries.com/definition/english/stone?q=stone>



**Metaphor:** *noun* – a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable: *when I speak of gene maps and gene mapping, I use a cartographic metaphor*. Origin: late 15th century: from French *métaphore*, via Latin from Greek *metaphora*, from *metapherein* 'to transfer'.<sup>52</sup>

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<sup>52</sup> <http://oxforddictionaries.com/definition/english/metaphor?q=metaphor>



## 2.2 STONE: INTERPRETATION.

“Verstehen ist hier immer schon Anwenden.”<sup>53</sup>

Hans-Georg Gadamer  
(GADAMER, 2010, p. 314)

My intended goal for the following text is to make sense of the possible relations, if any, between the characteristics of closed mindedness of specific groups of individuals and the levels of perceived innovativeness of the products created by these groups. Whilst the previous part was focused on an instrumental presentation of this research, this one focus on presenting the practical (HABERMAS, 1971) interpretations of it. Therefore, presents interpretations that enables to act within common traditions.

Jahnke (2013), in the Suggestions for Further Research topic of his doctoral dissertation, pointed that futures researchers should take into account the interest of policymakers for hard evidence or quantifiable results. To which he advocated that

A specific area of research could be to investigate the possibility of measuring or finding other types of indicators that can show the effects of activated process of meaning-making in innovation. An early example of this is the work under development by Manhaes et al. (2013) on indicators and the work by Acklin et al. on design integration in SMEs (2013). (JAHNKE, 2013, p. 355)

His comment was made after having read the paper “Innovation and Prejudice: a Pre-Study on Prejudice Related Innovativeness Determinants – PRIDE” (MANHÃES; MAGER; VARVAKIS, 2013) presented at the 10<sup>th</sup> European Academy of Design Conference – Crafting the Future 2013 in Gothenburg, Sweden.

Therefore, in order to do that research, I started with the belief that it should make sense to investigate the possibility of measuring or finding

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<sup>53</sup> “Understanding here is always application” (GADAMER, 2004, p. 308). I would translate it as “All understanding occurs at the lived moment (here) and is always already and application.”

indicators to show that innovative propositions usually come from minds that are perceived to be rather “open” (ELING; GRIFFIN; LANGERAK, 2013). Considering that thinking minds have this characteristic of “thrownness” into socio-cultural contexts (GADAMER, 2004), it should be logic to suppose that groups with open mindedness characteristics have better odds at producing innovative propositions. I also believe that it should be – at least theoretically – feasible to identify social groups that are more capable than others to create new value propositions that are perceived as potentially more innovative than others (CHIRUMBOLO et al., 2004, 2005; KRUGLANSKI et al., 2006).

My reading of Gadamer’s works convinced me of a particular possible linkage between innovativeness, social groups and closed mindedness through the German concept of *Bildung*. In English, this word corresponds to *formation* and can be described as (GADAMER, 2004, p. 15):

[...] keeping oneself open to what is other – to other, more universal points of view. It embraces a sense of proportion and distance in relation to itself, and hence consists in rising above itself to universality.

Therefore, in my opinion, keeping oneself open to what is other can be considered a fundamental condition for groups’ creative efforts, especially towards obtaining innovative propositions. But as explained by Kruglanski & Webster (1996), people “may delimit their constructive endeavors” to very specific knowledge domains. And, depending on the personal history of the participants at such effort, this is something that is not simple to avoid. Certainly, the desire of *opening oneself to what is other* it is much more complex than just adopting a co-creation framework as the ones related to the contemporary popular zeal displayed for the concept of “Design Thinking” (JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013).

To my understanding, Gadamer’s concept of the “distorting mirror” offers a valuable argument to discuss the relation between thinking minds and groups’ innovative efforts (GADAMER, 2004, p. 278):

In fact history does not belong to us; we belong to it. Long before we understand ourselves through the process of self-examination, we understand ourselves in a self-evident way in the family,



society, and state in which we live. The focus of subjectivity is a distorting mirror. The self-awareness of the individual is only a flickering in the closed circuits of historical life. *That is why the prejudices of the individual, far more than his judgments, constitute the historical reality of his being.* (Italics are from the original text)

It follows that it is difficult for one to be *self-aware* and aware of what is the Other. The process of awareness, as Gadamer explains, starts from a particular historical standpoint. Then, through a process of *Bildung*, the individual moves “in a circular pattern centrifugally towards understanding” (JAHNKE, 2012) what is the Other and oneself. Jahnke explains also that this movement starts from one’s own historical standpoint and goes on in encountering the Other in an interpretive process, i.e. in a hermeneutic process.

And as a concluding thought, Gadamer adverts that far more than judgments, the historical standpoint of the individual – which means the prejudices of someone – constitutes the reality of being. This reality, sometimes, can be overwhelming.

### Closed Mindedness

Based on Gadamer’s hermeneutics, “in order to create anything new of importance” (SCHUMPETER, 1912, p. 74), an individual has to overcome the triple challenge of (i) a flickering self-awareness, (ii) to understand what is the Other and (iii) create innovative propositions. Demanding that to any person seems to be all too much.

What is supposed to happen, when someone has to overcome this triple challenge of innovativeness, is that new knowledge to be created. To create innovative propositions, it is expected that people find creative pathways to solve problems or conquer obstacles that seemed impossible based on previous perspectives. These goals can only be attained by creating new knowledge: by finding new ways of augmenting the potential to act (KROGH et al., 2013, p. 4). *Grosso modo*, it can be said that

Knowledge is created in the spiral that goes through seemingly antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, deduction and induction, and creativity and efficiency. (NONAKA; TOYAMA, 2003, p. 02)

Knowledge is created by building bridges with the Other, as *arcs herméneutiques* (RICOEUR, 1986, p. 158) between seemingly incompatible concepts. Down that theoretical path, knowledge is created by connecting seemingly antithetical concepts. Connection which must be done by individuals that have to overcome the triple challenge mentioned above through a process of Socialization, Externalization, Combination and Internalization (NONAKA; TOYAMA; KONNO, 2000; NONAKA; TOYAMA, 2003).

The possibility of being aware of one's own closed mindedness, which is "of key importance to the ways in which our thoughts, often inchoate and unwieldy, congeal to form clear-cut subjective knowledge" (KRUGLANSKI, 2004, p. 01), has merited a fair amount of discussions, particularly after the Second World War (ALLPORT, 1979). Nevertheless, it remains a controversial subject. One of the most academically accepted or least criticized ways of reducing ignorance about the negative impacts of a person's own closed mindedness is through group dynamics, which fosters "cooperative learning" under positive conditions of equal status, shared goals, cooperation, and sanction by authority (PALUCK; GREEN, 2009, p. 345).

### Intergroup Contact

The above presented perspective lead me to tap, through an extensive literature review, into intergroup contact research. Specifically, to the work of Gordon W. Allport and the Four Key Conditions for intergroup contact (ALLPORT, 1979). As presented by Pettigrew (1998), who wrote that Allport

held that positive effects of intergroup contact occur only in situations marked by four key conditions: equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom.

The four key conditions defined by Allport to foster positive intergroup contact are described in several research works to have reduced the ignorance about the negative impacts of one's own prejudice by augmenting self-awareness during situations of cultural diversity, i.e. intergroup contacts (BROWN; HEWSTONE, 2005; HODSON; BUSSERI, 2012; PETTIGREW, 1998; ROETS; VAN HIEL, 2011b).

These key conditions, as consolidated by Pettigrew (PETTIGREW, 1998, p. 66–67), are<sup>54</sup>:

**EQUAL STATUS.** Allport stressed equal group status within the situation. Most research supports this contention, although “equal status” is difficult to define and has been used in different ways (Cagle 1973, Riordan 1978). It is important that both groups expect and perceive equal status in the situation (Cohen & Lotan 1995, Cohen 1982, Riordan & Ruggiero 1980, Robinson & Preston 1976). Some writers emphasize equal group status coming into the situation (Brewer & Kramer 1985). Thus, Jackman & Crane (1986) show negative effects from contact with outgroup members of lower status. Yet Patchen (1982), in research on racially mixed high schools, found this to be less important than equal status within the situation. The meta-analytic results of Mullen et al (1992) clarify these disparities. They noted that ingroup bias increased with relative status in laboratory groups but decreased in field research with real groups.

**COMMON GOALS** Prejudice reduction through contact requires an active, goal-oriented effort. Athletic teams furnish a prime example (Chu & Griffey 1985, Miracle 1981, Patchen 1982). In striving to win, interracial teams need each other to achieve their goal. Goal attainment, such as a winning season, furthers this process.

**INTERGROUP COOPERATION** Attainment of common goals must be an inter-dependent effort without intergroup competition (Bettencourt et al 1992). Sherif (1966) demonstrated this principle vividly in his Robbers’ Cave field study. Intergroup cooperation in schools provides the strongest evidence (Brewer & Miller 1984, Desforges et al 1991, Johnson et al 1984, Schofield 1989, Slavin 1983, Slavin & Madden 1979). Drawing on this thinking, Aronson’s jigsaw classroom technique

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<sup>54</sup> The citations that were used by Pettigrew in that specific excerpt (PETTIGREW, 1998, p. 66–67) are not present on the references of this thesis, unless if used directly by me elsewhere in this document.

structures classrooms so that students strive cooperatively for common goals (Aronson&Patnoe 1997). This technique has led to positive results for a variety of children: Australians (Walker & Crogan 1997), Germans (Eppler & Huber 1990), Japanese (Araragi 1983), and Mexican Americans (Aronson & Gonzalez 1988).

SUPPORT OF AUTHORITIES, LAW, OR CUSTOM The final condition concerns the contact's auspices. With explicit social sanction, intergroup contact is more readily accepted and has more positive effects. Authority support establishes norms of acceptance. Field research underscores its importance in military (Landis et al 1984), business (Morrison&Herlihy 1992), and religious (Parker 1968) institutions.

In experiments where these conditions were tested, as described by the literature (PETTIGREW; TROPP, 2006; ROETS; VAN HIEL, 2011b), the level of attrition between the members of the groups were significantly reduced. This reduction is one of the necessary conditions for knowledge creation, such as “autonomy, creative chaos, redundancy, requisite variety, and love, care, trust and commitment” (NONAKA; TOYAMA; KONNO, 2000, p. 25). And, at innovative efforts, mutual understandings can only arise “if and only if, for all participants, there is a symmetrical distribution of chances to choose and to apply speech-acts” as quoted from Habermas (ALVESSON; SKÖLDBERG, 2009, p. 152). In other words, groups where a few people dominate the conversation are less likely to attain a higher potential of collective intelligence “than those with a more equal distribution of conversational turn-taking” (WOOLLEY et al., 2010, p. 688).

At this point the work of Allport supply an actionable approach to intergroup contacts negative perspectives (ROETS; VAN HIEL, 2011b):

Moreover, not only did Allport's work provide valuable insight into the prejudiced personality, it is also considered foundational for the intergroup-contact hypothesis, which states that contact (under certain conditions) with outgroup members diminishes prejudice against this group.

The combination of all these reasoning lead me to believe that one viable alternative to face the triple challenge cited above is through a

socio-technical design (MUMFORD, 2006) of groups of individuals. Both, individuals and groups, with specific characteristics.

#### Need for Closure – NFC

It seems logical to me that, in a culturally diversified context such as the one that favors innovative opportunities, the ability to exercise intergroup contacts is an advantage. And this is the very aspect that supports this research into understanding how socio-technical design can augment the awareness of the prejudices at play in specific socio-cultural contexts. Paluck and Green, based on a literature review about “observational, laboratory, and field experimental literatures on interventions for reducing prejudice” (PALUCK; GREEN, 2009), suggest that “[c]ooperative learning is the most outstanding example of theoretically driven, programmatic laboratory and field research.” In this 2009 work, they found that (p. 358):

The persuasive and positive influence of peers (indirectly via observation or directly via discussion) is a promising area of prejudice reduction supported by laboratory research [...] and by creative real-world interventions [...] highlighting the communicative and normative nature of prejudice change.

Because intergroup contact is cognitively demanding it may present some difficulties to individuals with particular motivated cognitive tendencies (HODSON; BUSSERI, 2012). These kinds of motivated cognitive tendencies, instead of being understood as a debilitating condition (which is not supported in any way by me), can be conceptually related to the framework for the cognitive-motivational aspects of human knowledge formation known as Need for Closure, or NFC (Kruglanski & Webster, 1996). This relation is supported within the NFC literature, due to the fact that the effects of closed mindedness “encompass veritabily all topics of human judgment,” as Kruglanski (2004, p. 2) explains:

Our closed mindedness potential has a plethora of significant social implications. For one, it implies that in thinking about others we may often stick to prior impressions or preconceived notions rather than flexibly altering our opinions whenever

relevant new information turns up. This suggests an ingrained capacity for prejudice and stereotyping in our social judgments. Similarly, it implies the potential to jump to conclusions about others, and to form impressions based on limited and incomplete evidence.

Although the concept of NFC originates from outside the literature on prejudice (both from Gadamer's and Allport's perspectives), it has a "striking similarity to the prejudice-prone cognitive style proposed by Allport" (ROETS; VAN HIEL, 2011b). The necessity for high-NFC individuals to satisfy their "need for quick, easy, firm, and stable knowledge about the world" leads them to "resort to essentialist categorization and authoritarian ideologies, which represent some of the most powerful, proximal determinants of stereotyping and prejudice" (ROETS; VAN HIEL, 2011b). In high need for closure groups can be perceived significantly greater pressures for conformity as its members

focus on shared information because of their strong desire for consensus and because shared information provides a common knowledge base on which consensus can be built. (KRUGLANSKI, 2004, p. 121)

On the other hand, the low-NFC individuals can disrupt the cohesion of groups due to their resistance to conform to rules and accepted behaviors and to the fact that "they may actually be intrigued by uncertainties" (KRUGLANSKI, 2004, p. 154).

By accepting the central and critical role that closed mindedness plays in innovative efforts, the next step would be to devise how to enable humans to act upon it, since one of the goals of this research is to enable people to act (KROGH et al., 2013). To do that I choose to follow the Marxist<sup>55</sup> path from the concrete to the abstract. Which, for me, relates to the hermeneutic circle "path" from the part to the whole and back.

As suggested by Karl Marx on his work *Gründrisse*, at page CII (MARX, 1993):

It seems to be correct to begin with the real and the concrete, with the real precondition, thus to begin,

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<sup>55</sup> As explained to me by Professor Michael Erlhoff, what I have named the "Marxist path" means going from the concrete/landscape to the abstract/mineral. As I understood it by reading *Gründrisse*, by Marx terms, the more quantifiable something seems to be, the more abstract it is. The more close to reality (discursive, complex, holistic, etc.) the more concrete it is.

in economics, with e.g. the population, which is the foundation and the subject of the entire social act of production.

By population, in the present context, I mean the people involved in a particular innovative effort. On close examination though, as pointed by Marx, “this would be a chaotic conception [Vorstellung] of the whole.” If also Gadamer states that “we do not even know who “we” are” (GADAMER, 2000), how can be possible for a researcher to face the challenge of understanding the Other?

To be able to tackle this sense making effort of producing some “qualitatively new understanding of relevant fragments of social reality” (ALVESSON; SKÖLDBERG, 2009, p. 307) from the proposed relation between closed mindedness and innovativeness, it is necessary to move towards ever thinner abstractions until arriving at the simplest determination possible (MARX, 1993). This possible simplest determination should also “function generatively as a springboard for interpretations” (ALVESSON; SKÖLDBERG, 2009, p. 305).

This is where I fit the Need for Closure (NFC) along the designed discourse of this thesis. NFC is a one-dimensional construct, indicated by five facets and developed from around 1980 by Professor Arie W. Kruglanski. Since the first decade of the 21<sup>st</sup> century,

the NFC construct has captured the interest of many researchers and hundreds of studies indexed in Web of Science have used the (revised) NFC scale in a wide variety of domains within psychology, as well as in business and management literature. (ROETS; VAN HIEL, 2011a, p. 91)

Basically, as written up stream, NFC “refers to individual’s desire for a firm answer to a question and an aversion towards ambiguity” (KRUGLANSKI; WEBSTER, 1996, p. 264). In a simple way, it is the level of closed mindedness of a person. I also relate it to the sensemaking processes “of making do with whatever resources are at hand” (WEICK; SUTCLIFFE; OBSTFELD, 2005, p. 145). As stated above, the NFC is a one-dimensional construct with five major aspects or facets that are assumed to broadly represent it (ROETS, 2007, p. 5–6): Preference for order; Preference for predictability; Decisiveness; Discomfort with ambiguity; Closed-mindedness (see Annex III).

Important to note that NFC is not a biological characteristic of an individual, not like some sort of organic tissue deficit (KRUGLANSKI; WEBSTER, 1996). It is a motivated tendency to act as soon as possible, given the pressure that time and the lack of information and other resources may impose to an individual. To some individuals, this tendency is high. To others, it is low. Although it can be considered a stable personality trait of a person, it is also situationally malleable. Thus, it can vary along a continuum due to the social context she or he finds her or himself into.

Briefly stated, it is possible to devise two interrelated motivational continua, resulting the table displayed below.

**Table 41 – A typology of epistemic motivations**

		Closure Approach/Avoidance	
		Approach	Avoidance
Specificity	Nonspecific	Need for a Nonspecific Closure	Need to Avoid a Nonspecific Closure
	Specific	Need for a Specific Closure	Need to Avoid a Specific Closure

Source: (KRUGLANSKI, 2004, p. 6)

One continuum represents a measure for the NFC scale as a distinction “whether the individual’s goal is to approach or avoid closure” (KRUGLANSKI, 2004, p. 05). That one has at its extreme points the *low* and the *high* NFC characteristics and, at its center, the *medium* ones.

The other continuum, which are of no particular interest for my research, depicts whether “the closure one is seeking or avoiding is of a specific kind or any closure or absence of closure would do” (KRUGLANSKI, 2004, p. 05). Below are presented short descriptions of each one of the points from the first cited continuum.

## High NFC

Individuals with high NFC (versus<sup>56</sup> low) tend to adopt workflows and guidelines more rapidly, i.e. tend to crystallize<sup>57</sup>. They also present a

<sup>56</sup> I will use the same notation as Kruglanski (KRUGLANSKI, 2004) usually does indicating that *high* and *low* NFC are extremes of an unique continuum. Therefore, a characteristic that is implicated to one end has its diametrically opposed characteristic applied to the other.

<sup>57</sup> Is the process of reaching beliefs that are held with certainty and an “inversely related tendency to change them in light of new information” (KRUGLANSKI, 2004, p. 15). In other words, “a demarcation point separating seizing phenomena from those of freezing is the juncture during



high task orientation characteristic and low engagement in acts of social-emotional nature (KRUGLANSKI, 2004). So, they are also psychologically more comfortable in situations of clear hierarchy and informational clarity, but tend to be perceived as a less creative individual. It prompts to the understanding that, in situations characterized by

uncertainty, ambiguity, and lack of definite knowledge that typically surround negotiations should be particularly aversive to negotiators with high versus low need for non-specific closure. (KRUGLANSKI, 2004, p. 100)

The High NFC (versus Low) individual has this characteristic of a strong desire to closure approach, which can be specific or non-specific. It can be a desire for one-and-only specific kind of closure or to any one. This aspect can, for example, lead to confusing a High NFC (versus Low) individual who is looking for a specific closure with a Low NFC one avoiding closures altogether.

#### Low NFC

On the other hand, individuals with Low NFC (versus High) usually avoid adopting rule-based and linear frameworks. That is what, perhaps, makes them more creative. They are also psychologically more comfortable in ambiguous situations and tend to prolong precrystallization periods.

They tend to be oriented “more toward the social aspects of the group interaction” (KRUGLANSKI, 2004) and neglect aspects of task execution.

The Low NFC (versus High) individual is characterized by a strong desire to closure avoidance, which can be specific or non-specific. Therefore, it can be an avoidance to one specific closure or to any one.

#### Medium NFC

The NFC characteristics, although stable, are malleable. People under time pressure, for instance, tend to gravitate towards the higher

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which a belief crystallizes and turns from hesitant conjecture to a subjectively firm ‘fact.’ ” (KRUGLANSKI; WEBSTER, 1996).

limits of their NFCs. Hence, a Low NFC (versus High) individual submitted to a condition of time pressure “tends to lower the degree of creativity in interacting groups” and should produce more “conventional ideas (reflecting perceived consensus)” (KRUGLANSKI, 2004, p. 124). Also, a High NFC (versus Low) individual involved in a situation where non-closure is expected and even rewarded, should prolong the precrystallization period.

This particular perspective lend support to the “experimental hypothesis predicting higher quality of task performance and motivation in the absence (as opposed to presence) of extrinsic incentives” (KRUGLANSKI; FRIEDMAN; ZEEVI, 1970). As I understand it, Medium NFC individuals do not need to rely so much on extrinsic incentives. They are focused and pragmatic enough to respond to the constraints of a situation, and open minded enough to sense novel opportunities. Practically, all that they may need is a time frame. The fact that they are located at the hypothetical best place of the continuum – the middle – should permit them to reap the highest benefits of the malleability of the NFC levels.

## NFC and Groups

The possibility to design *ad-hoc* groups to lead innovative efforts based on NFC measurements has the advantage of not need any pre-given “method” or enlisting only specific NFC level individuals for a team. The individual-to-group NFC transposition is a promising line of theory and research proposed by Kruglanski and his colleagues (KERR; TINDALE, 2004, p. 631). Kruglanski advocates that stressful work conditions tend to increase the need for closure of individuals in a group, with a number of consequences for information exchange and utilization (KRUGLANSKI et al., 2002).

The concept of an *epistemic-social nexus*, defined by Kruglanski as “a tight connection between individuals’ subjective knowledge and the shared realities of groups to which they belong and with which they identify” (KRUGLANSKI et al., 2006, p. 94), is precondition for group locomotion. The epistemic–social nexus revealed in need for closure effects on groups was manifest both in restricted laboratory contexts and in broader real-world settings suggesting that (KRUGLANSKI et al., 2006, p. 95):

the social psychological phenomena we are tapping  
are deeply ingrained in our cognitive functioning

and that societal processes of appreciable real-world significance may derive from the basic epistemic workings of the human mind.

This reasoning prompts me to think that groups with a specific combination of diverse NFC levels might be able to create their own “immanent logic” (ADORNO, 1965) which is a prerequisite to obtain the “original nonsense” of great works. A particular design of groups may also diminish the necessity of relying on “enlightened” leaders as the main driving force for innovative efforts. As advocated by Amabile (1996) and Verganti & Öberg (2013) the key role toward innovation should be played, primarily, by the highest levels of management (AMABILE, 1996; HENNESSEY; AMABILE, 2010; VERGANTI; ÖBERG, 2013). This assumption presupposes a “Renaissance” leadership, the existence of “enlightened” leaders throughout the organization. Based on my research, this dependence on *Renaissance Scholars* “is not reasonable” (FISCHER et al., 2005).

#### NFC Measurement

Individuals NFC levels are assessed with the Need for Closure Scale (NFCS). Which is a self-report measure questionnaire “designed to tap stable individual differences in the motivation for cognitive closure” (WEBSTER; KRUGLANSKI, 1994). As described in a previous paper (MANHÃES; MAGER; VARVAKIS, 2013), the NFCS assessment instrument used to support the present discourse is a validated questionnaire (see Appendix I), with 41 items (Likert-type) bipolar-response summated ratings scale measurements (ROETS; VAN HIEL, 2011a, 2011b) rated on six-point scales from “Strongly disagree” (1) to “Strongly agree” (6).

Moreover, due to possible future interests of using the NFC construct along with many other variables in a particular context of study, I opted to use an abridge version of the full scale. Given its substantial length, many researchers often use an “idiosyncratic” item-sets (ROETS; VAN HIEL, 2011a, p. 91). My decision was to use a specific 15 item version (ROETS; VAN HIEL, 2011a), which was scientifically validated to maintain the content richness and the predictive power of the NFC construct (ROETS; VAN HIEL, 2011a, p. 91). This 15-items version of the Need for Closure Scale is

designed to measure overall individual differences in NFC on a one-dimensional scale, while preserving the content richness of the broad construct. (ROETS; VAN HIEL, 2011a, p. 93)

And ultimately, the NFC construct provides a standing point from which can be observed the relationship between the perceived innovativeness<sup>58</sup> measurements of products created by a social group and the level of closed mindedness of its participants. From that point of view I can define NFC as a “simplest determinant” of the *Bildung*’s propensity of a person or a group.

### Innovativeness Measurement

Despite several academic researches on the assessment of innovative ideas (AMABILE, 1982, 1996; AMABILE et al., 2005), there are still no uniformly accepted criteria both for academic or corporative purposes (MAGNUSSON, 2009). The decision to opt for the OUP dimensions assessment (MAGNUSSON, 2003) combined with the Consensual Assessment Technique (AMABILE, 1982) was that it enabled the possibility to work within several constraints faced by the present research. Due to the restrictions of time and resources faced by me at the time of this research, the assessments of ideas should have to be done online, autonomously and by a broad range of participants (judges). The OUP assessment permits that the judges are “not calibrated before assessing the ideas” (MAGNUSSON; NETZ; WÄSTLUND, 2014). This characteristic is fundamental for this assessment because “a calibration like this would be difficult due to the heterogeneity of the ideas” (idem).

To be able to compare ideas without taking different business contexts into account, I will use the three dimensions as developed by Magnusson (2003) as stated (MAGNUSSON, 2009, p. 585):

1. Originality: representing the innovative dimension; a positive relationship has been shown

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<sup>58</sup> “‘Innovativeness’ is most frequently used as a measure of the degree of ‘newness’ of an innovation. ‘Highly innovative’ products are seen as having a high degree of newness and ‘low innovative’ products sit at the opposite extreme of the continuum. However, little continuity exists in the new product literature regarding from *whose* perspective this degree of newness is viewed and *what* is new.” (GARCIA; CALANTONE, 2002)

- to exist between the originality of a product and the consumers' willingness to pay for it [...].
2. User value: representing the user's perspective of whether the implemented service idea create will create value for its users.
  3. Producibility: representing the producer's perspective regarding the ease with which the service can be produced.

Each one of the assessed ideas are then classified by a panel of judges on a scale from one (1, the least) to ten (10, the most). Accordingly to the dimensions above, each idea gets a score as it was perceive by each one of the members of the jury. To summarize, the three criteria of

Originality, User Value and Producibility jointly represent an idea's innovativeness, its ability to create value for the intended user, and the ease with which it can be implemented. (MAGNUSSON; NETZ; WÄSTLUND, 2014, p. 316)

Several studies on innovation have focused on understanding “the new capabilities required to achieve a breakthrough” (VERGANTI; ÖBERG, 2013). These kinds of intents were sought for by a countless number of researchers, producing interesting results ranging from the “Value Innovation Potential Assessment Tool” (AIMAN-SMITH et al., 2005; BALSANO et al., 2008) to the “Blue Ocean Strategy” (KIM; MAUBORGNE, 1997, 2004), to name but a few.

In the present research, this “breakthrough” is considered a direct result from the capability of a group to “create value for an intended user, and the ease with which it can be implemented.” Based on the readings that support my research, one of these possible new capabilities might be the creation of *Bildung* prone social groups. A particular stream of research based on the concept of Need for Closure (NFC) suggests a possibility to enable the design of groups (KERR; TINDALE, 2004) with special characteristics that can emulate a kind of open-mindedness that relates to the concept of *Bildung*. A characteristic that can be named “actively open-minded thinking,” which can be defined as

a multifaceted construct encompassing the cultivation of reflectiveness rather than impulsivity, the seeking and processing of information that disconfirms one's belief (as opposed to confirmation bias in evidence seeking),

and the willingness to change one's beliefs in the face of contradictory evidence. (STANOVICH; WEST, 1997, p. 346)

Having that relation established enables me to set it as a line of thought that will make sense of this research about the relation between the concepts of innovativeness, of social groups and of closed mindedness.

## Studies Contextualization

In 2011, two service design consultants – Markus Edgar Hormess and Adam StJohn Lawrence – initiated a worldwide call for the realization of simultaneous workshops under the banner of Global Service Jam (GSJ)<sup>59</sup>. As presented on its website, the GSJ is an open invitation for “experimentation, innovation, co-operation and friendly competition, teams [...] have less than 48 hours to develop and prototype completely new services inspired by a shared theme.” And an important aspect of this initiative, at least from an academic perspective, is the fact that “[a]t the end of the [workshops], their collection of brand new services [are] published to the world.”

Whilst starting my doctorate research, I was invited to be a facilitator (i.e. a group's process manager) at the Global Service Jam 2011 in São Paulo<sup>60</sup> (GSJSP), Brazil. The main structure of the event, as proposed by the initiators, received some important contributions from the hosts of the Brazilian edition, Juliana Proserpio and Ricardo Ruffo. Juliana and Ricardo had been strongly influenced by their recent experience at the School of Design Thinking, at the Hasso Plattner Institut located in Potsdam-Babelsberg nearby Berlin, Germany.

The way that GSJSP actually occurred generated a conceptual structure that was perceived by me as having almost all the elements necessary to support what I considered to be an ideal study (HARRISON; LIST, 2004). The way this study was designed, besides having open access to the resulting data, it is possible “to observe a subject in a controlled setting but where the subject does not perceive any of the controls as being unnatural and there is no deception being practiced” (HARRISON; LIST, 2004).

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<sup>59</sup> Further details about this event can be obtained at: <http://www.globalservicejam.org/>

<sup>60</sup> Further details about this event can be obtained at: <http://globalservicejamsaopaulo.wordpress.com/> (available only in Portuguese).

In the year that followed (from May 2011 until June 2012), based on the format proposed by GSJ and GSJSP combination, I had the opportunity, in partnership with Maria Augusta Orofino, to stage thirteen events and workshops<sup>61</sup> in several Brazilian cities, with over 250 participants in total. I also had the opportunity to meet Markus Edgar Hormess and Adam StJohn Lawrence in Nuremberg (Germany), during the JamJam 2012 (between June 1<sup>st</sup> and 3<sup>rd</sup> of that year). With their support, a global call was sent to the participants of the Global Sustainability JAM 2012, which happened between November 2<sup>nd</sup> and 4<sup>th</sup>. It was from that particular event that the workshops participants from India, Italy and Poland came from.

The main differences between the original GSJ workshops and the ones that actually were staged for this research were the fact that these last ones were academically committed to two conceptual bases:

- the four key conditions of intergroup contact (ALLPORT, 1979), supported indirectly by several other streams of research (HÜLSHEGER; ANDERSON; SALGADO, 2009; WEST, 2002) ; and
- the definition of design as an “hermeneutic circle” (JAHNKE, 2013, p. 89), in a conjunction with the works about effectuations networks (SARASVATHY; DEW, 2005; SARASVATHY et al., 2008).

These two fundamental conceptual bases resulted in workshops that follow Allport’s conditions, with non-teleological characteristics and having participants sorted based on the widest possible surface-level differences (KANG; YANG; ROWLEY, 2006) from each other. In brief, the workshops were designed to create an “entrepreneurial design space” characterized by being an isotropic, ambiguous and Knightian uncertain environment (SARASVATHY et al., 2008, p. 337), where:

- i. The goals were defined as an hermeneutic “outline” (GADAMER, 2004, p. 409);
- ii. No set of tools were presented, enforced or suggested;
- iii. Every participant had equal status within the situation;
- iv. The goals could only be reached through participants cooperation;

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<sup>61</sup> Further details about these workshops can be obtained at: <https://innovaservice.wordpress.com/> (available only in portuguese).

- v. The participants had to establish common goals (SCHIPPERS et al., 2003, p. 780) that were attainable during the duration of the workshops;
- vi. The facilitators acted as authorities, enforcing the equal status and actions between participants.

In the following items I briefly comment the above cited topics:

- Topic (i) was adopted as a way to anchor the situation in an “implausible range” where “there should be little elaborative activity to begin with, hence little generated knowledge that could be seized and frozen upon by the need for closure” (KRUGLANSKI, 2004, p. 72).
- Topic (ii) was established so that each group could use or create their own set of tools, following the factor Group Task Characteristics<sup>62</sup> as defined by (WEST, 2002).
- Topics (iii) was based on the fact that the groups were predefined and formed by participants with surface-level differences (KANG; YANG; ROWLEY, 2006) and no stable roles were allowed to be defined amongst them, so that workloads and roles be more evenly distributed to foster learning (KOZLOWSKI; ILGEN, 2006, p. 87).
- On Topic (iv) it can be said that “goal interdependence was found to be the most influential team structural variable for innovation in the workplace” (HÜLSHEGER; ANDERSON; SALGADO, 2009). Hülsheger et al. (2009), based on reports of a quantitative summary of “three decades of primary studies into direct relations between team characteristics and team processes and innovation” affirm that “the way in which team goals are designed influences the interaction among team members – whether they cooperate or compete, help or hinder each other” (HÜLSHEGER; ANDERSON; SALGADO, 2009, p. 1137).

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<sup>62</sup> “The joint optimization of the two subsystems [the social and technical subsystems] is more likely when autonomous work groups have the following characteristics: – The team is a relatively independent organisational unit that is responsible for whole tasks. – The tasks of members are related in content so that awareness of a common task is evoked and maintained and members are required to work interdependently. – There is a “unity of product and organisation”, i.e. the group has a complete task to perform and group members can “identify with their own product” [...]” (WEST, 2002, p. 360)



- Topic (v) refers to how time compression plays an important role in design process given its “daunting epistemological freedom” (RITTEL, 1987, p. 5). Later (after May 2012) I also found on the literature related to NFC several descriptions of correlations between time pressure and the levels of open-mindedness of participants during group dynamics (KRUGLANSKI; WEBSTER, 1996).
- Topic (vi) was mainly driven by the Allport’s works (ALLPORT, 1979; PETTIGREW, 1998) and to foster the cooperation amongst participants (HÜLSHEGER; ANDERSON; SALGADO, 2009; WEST, 2002).

Regarding Topic (iii. Every participant had equal status within the situation), I think that an important fact to highlight is that the participants were not allowed to choose with whom they would interact. This designing of group characteristics is supported by Pettigrew and Tropp (2006, p. 766):

Moreover, the investigations that allowed no choice for their participants to avoid the intergroup contact yield a slightly larger mean effect size in reducing prejudice than do studies that allowed choice.

Due to that, before every workshop hosted by me during the studies, participants were asked to fill in an online questionnaire about some of their personal characteristics and some of their surface level differences. Based on the information gathered, the groups were formed focusing on the surface-level difference of its members. After running several workshops based on surface-level differences, I could perceive that the “identity diversity” (HONG; PAGE, 2004) was not enough. Although a diverse group of people create opportunities for more potential solutions,

These additional solutions are only possible if people differ. If all people encoded and solved problems identically, multiple heads would be no better than one. (HONG; PAGE, 2001, p. 130)

At tackling the issue of functional-diversity (HONG; PAGE, 2004), is where the NFC Scale assessment brought a valuable tool to the design of diverse groups.

On Topic (iv. The goals could only be reached through participants cooperation) it can be said that “goal interdependence was found to be the most influential team structural variable for innovation in the workplace” (HÜLSHEGER; ANDERSON; SALGADO, 2009). Hülsheger et al. (2009), based on reports of a quantitative summary of “three decades of primary studies into direct relations between team characteristics and team processes and innovation” affirm that “the way in which team goals are designed influences the interaction among team members—whether they cooperate or compete, help or hinder each other” (HÜLSHEGER; ANDERSON; SALGADO, 2009, p. 1137).

Through the experience of producing several of these workshops, it was possible to witness some breakdowns that I considered interesting enough to deserve further investigation (ALVESSON; KARREMAN, 2007). The breakdowns, as interpreted by me, may be summarized by the fact that the perception of innovativeness is not guaranteed simply by adopting *design allegories*. These perceptions made me reflect on my understanding about the role of design, and, more precisely, that design tools or design practices do not suffice for the creation of innovative opportunities. It follows that diversified socio-cultural perspectives seem to be not only desirable but obligatory in quests for innovativeness. That diversified socio-cultural perspectives and the building of bridges between these differences are the two *sine qua non* conditions – although not sufficient ones – to enact what can be called a *design phenomenon*. Therefore, the design process can be seen “as the building of a ‘bridge’ between the problem space and the solution space by the identification” of key concepts (DORST; CROSS, 2001, p. 435).

This encompassing breakdown can be perceived through these two different perspectives:

- The perceived degree of innovativeness of the resulting products of each group seemed to me to be somehow connected to the historical standpoint of the participants, specifically to their levels of closed mindedness. Groups that were neither too open nor too close-minded produced the *best* results, indicating a curvilinear characteristic that seemed to be inverse to the level of diversity pointed out by Østergaard et al. (2011). The best performance laying in the middle of the curve (DE DREU, 2006);
- Although the workshops were designed to be isotropic, ambiguous and uncertain, in some particular situations, the

resulting products of the different groups had very similar characteristics. Again, it seemed to me that it was due to the fact that participants had congruent and/or similar historical standpoints (all came from the same cultural, or educational, or organizational background).

These breakdowns echo several studies of organizations, regions and nations that indicate a connection between economic success and human capital (FLORIDA, 2003). Human capital being understood as a diversity of knowledge formed by the cultural, educational and ethnic background of a human group. I advocate that the notion of prejudice, as presented by Gadamer (2004), encompasses this notion of human capital by Richard Florida (FLORIDA, 2014, p. 337). Florida writes that “New ideas are generated most efficiently in places where different cognitive styles are tolerated.” He goes on and explains that

Tolerance – or, broadly speaking, openness to diversity – provides an additional source of economic advantage that works alongside technology and talent. (FLORIDA, 2014, p. 232–233)

Østergaard et al. (2011) explain that, as social context becomes more diverse, “this creates possibilities for new combinations of knowledge.” And their research also indicates that there is a positive relationship between human diversity and the organization’s likelihood to innovate. But, at the same time that diversity presents possibilities of innovativeness, it strengthens the need for intergroup interaction and communication and “might lead to conflict and distrust” (ØSTERGAARD; TIMMERMANS; KRISTINSSON, 2011, p. 500). Other streams of research also indicate that cognitive diversity “may be detrimental to team satisfaction, affect, and members’ impressions of their own creative performance” (HENNESSEY; AMABILE, 2010). Also “heterogeneous groups experience more conflict, higher turnover, less social integration and more problems with communication” (BASSETT-JONES, 2005). And that diversity can just as easily “lead to negative as to positive outcomes” (HENNESSEY; AMABILE, 2010, p. 580). These events and previous research indicatives lead to tapping into intergroup contact literature. Specifically, to the work of Gordon W. Allport and the Four Key Conditions for intergroup contact (ALLPORT, 1979). As presented by Pettigrew (1998):

Allport [...] held that positive effects of intergroup contact occur only in situations marked by four key conditions: equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom.

In some of the experiments these conditions were tested and, as described by the literature (PETTIGREW; TROPP, 2006; ROETS; VAN HIEL, 2011b), the level of attrition between the members of the groups were significantly reduced. Which prompted to the suggestion that the design of *Bildung* prone organizational groups should have to take into account the implementation of these Allport's key conditions (PETTIGREW, 1998, p. 66–67).

Summing up, this research is aimed at investigating and understanding a particular breakdown<sup>63</sup>: the apparent relationship between the level of perceived innovativeness of the products resulting from creativity workshops and the closed mindedness levels of its participants.

### Studies Description

To be able to investigate the relation between closed mindedness and innovativeness I thought necessary a study that favored the observation of these specific aspects, as described above. A set of studies where participants would have to be explicitly faced with their pre-understandings. A sensemaking study that would throw “into question the nature of self and the world” (WEICK, 1995, p. 14) of the participants. In other words, a study that would augment the participants' awareness of the socio-cultural impacts of their prejudices. And, specifically, the kinds of prejudices that reinforce the phenomenon of human closed mindedness.

The highly diverse organizational contexts and frameworks of creativity workshops hampers the possibility of an explanation that “generates new and better ways to understand” (KRISTENSSON UGGLA, 2010, p. 52) this very kind of practice. Also, most of these workshops are conducted by organizations under various kinds of non-

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<sup>63</sup> “A breakdown is a lack of fit between one's encounter with a tradition and the schema-guided expectations by which one organizations experience” (Agar, 1986: 21 *apud* Alvesson & Karreman, 2007).

disclosure agreements, which creates even more obstacles to open academic studies.

The studies done as part of this research were staged during creativity workshops where participants are divided into groups and each group have to create an innovative proposition at the end of a two days rally. The NFC levels of the participants are collected and the resulting product ideas (goods and/or services) are submitted to an independent panel of judges through a consensual assessment technique (AMABILE, 1996; HENNESSEY; AMABILE, 2010; MAGNUSSON, 2003). These judges rate the products on three dimensions: Originality, Producibility and User-Value (OUP). A detailed description of these studies can also be found in a previous paper (MANHÃES; MAGER; VARVAKIS, 2013).

The judges NFC levels were also assessed. Then, the ranking attributed by each judge to the set of products were compared with the overall ranking that resulted from each panel. Thus, it was possible to verify which judges created rankings of products similar to the ones resulting from the overall panel.

The study described here aims at investigate the possibility to emulate the characteristics of Medium NFC individuals on groups of people. And, as it takes into account a socio-cultural perspective, this possibility of designing groups presents innovativeness favorable characteristics: instead of relying on rule-based development processes to “foster” innovativeness, it follows the Minimal Critical Specification<sup>64</sup> principle of socio-technical design (MUMFORD, 2006).

Hence, the possibility of conducting innovative efforts through the design of groups based on NFC levels has the advantage of not need any pre-given “method” or enlisting only specific NFC level individuals for a team. Groups within a specific range of diverse NFC levels should be able to create their own “immanent logic” (ADORNO, 1965), which is a prerequisite to obtain the “original nonsense” of great works. *Original sense* implies innovativeness, in this present context.

This particular design of groups may also diminish the necessity of relying on “enlightened” leaders as the main driving force for innovative efforts. Amabile (1996) and Verganti & Öberg (2013) advocate that the key role toward innovation should be played, primarily, by the highest

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<sup>64</sup> “Principle 2. Minimal Critical Specification. No more should be specified than is absolutely essential. But the essential must be specified. This is often interpreted as giving employee groups clear objectives but leaving them to decide how to achieve these” (MUMFORD, 2006, p. 322).

levels of management (AMABILE, 1996; HENNESSEY; AMABILE, 2010; VERGANTI; ÖBERG, 2013).

This assumption presupposes a “Renaissance” leadership, the existence of “enlightened” leaders throughout the organization. The present research reflects my beliefs that this dependence on *Renaissance Scholars* “is not reasonable” (FISCHER et al., 2005). The possibility to design *ad-hoc* groups to lead innovative efforts seems to be a more pragmatic solution than the one of finding and hiring Jobs-like<sup>65</sup> leaders.

On these previous pages I tried to design a landscape of the intertwined relationship between groups, innovativeness and prejudice. The horizon that I can see from my historical vantage point, shows me that the perception of innovativeness is a retrospectively understandable result of building hermeneutic arcs between different human subjectivities, between different prejudices.

## Measurements

The numbers that support this research are the result of data sets from four studies based on four different workshops (forming 18 valid groups with 84 participants from Germany, Brazil, India, Italy, Mexico and Poland), three independent panel of judges and one panel of judges (involving 36 judges coming from Brazil, Colombia, Germany, Italy, Sweden and United Kingdom). At the end, the total studies participation was of 99 persons (55 women and 44 men).

Due to the socio-cultural context described here, I have chosen two different sets of variables to measure:

- The perceived innovativeness of a product; and
- The closed mindedness of the participants.

Based on the referred literature review, the set of measurements for this research was compounded by several instruments. One kind of instrument that fitted the described research characteristic is the validated questionnaire, with multiple items (Lykert-type) bipolar-response summated ratings scale measurements. There are several of these instruments available.

In this text I will describe the results of the two fundamental ones, divided into two main categories of variables:

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<sup>65</sup> Steve Jobs (1955-2011), Co-founder, Chairman and CEO, Apple Inc.

1. Closed mindedness assessment questionnaire:
  - 1.1. Need For Closure 15-items questionnaire (ROETS; VAN HIEL, 2011a);
2. Consensual Assessment Technique questionnaire (AMABILE, 1982):
  - 2.1. OUP Indices (MAGNUSSON, 2003).

On Table 42 can be seen the resulting ranking of the groups perceived innovativeness (OUP Mean) based on data gathered after the referred studies.

The resulting dataset from the NFC assessment of the groups was compared (correlated) to the judges' ratings resulting from the OUP indices. The Spearman rank correlation analyses was performed by means of IBM SPSS v21 (as can be seen at Table 36). It enabled comparing the values of the closed mindedness assessments with the perceived innovativeness of the innovative propositions.

At this point, I need to draw a parallel with Magnusson's research (2003). In 'For further research', he suggests that, although his "study could not find any link between personality factors and outcome, this is indeed an important area for further investigation." At that time, his findings did not produce correlations at or above 0.6 point between OUP ratings and specific "personal characteristics that make users useful for involvement" (MAGNUSSON, 2003, p. 77). He assessed the participants on three different tests: a) FS test, a Swedish test measuring a person's creativity; b) the Life Orientation Test (LOT), a test for measuring dispositional optimism; and c) Technology Readiness (TR), indicating a person's willingness to adopt new technology. From these, "only the TR test displayed any correlation with the dependent variables" (MAGNUSSON, 2003, p. 71), with a -0.289 for User Value and a 0.224 point Producibility rating.

### Making Sense of the Data

The present research did produce correlations at or above 0.6 point between OUP ratings and NFC levels (see Table 36). The following pages present several analysis about possible relations between NFC Mean, NFC Coefficient of Correlation, OUP rankings and demographics generated by this research. As can be interpreted from the data, the NFC variables correlate positively with the OUP ratings. I will focus the analysis mainly at:

- i. Spearman rank correlations from moderate (0.4 – 0.6) to strong (0.7 – 0.9) strengths (DANCEY; REIDY, 2007, p. 176). Whereas about the significance level, I will consider the ones below 0.05, as can be seen at Table 36;
- ii. Indices averages; and
- iii. Linear regression analysis, as can be seen at Table 40.

The findings are presented in two different sets. One portrays the findings as indexes of reference for the Innovativeness Production Groups. The other presents indexes of reference for the Innovativeness Perception Judges.

### **Innovativeness Production Groups**

When analyzing the 18 groups' data altogether, it is possible to verify a moderate positive association between NFC Mean and User-Benefit, Producibility and OUP Means. Thus, given the data sets under scrutiny, the NFC Mean of groups co-vary with the perception of innovativeness of products created by those same groups. The probability of obtaining that correlation due to sampling error is less than 5% for the NFC/OUP Mean and less than 1% for the others. Although moderate and positive, when there is a change at the NFC Mean of groups, the OUP Mean changes in a predictable way. Which shows that the variables are not independent.

Dividing the 18 groups into three sets of 6 groups based on their OUP ratings (6 high, 6 middle and 6 low ratings, see Table 43), it is possible to note that:

- a) From the 31 participants of the 6 top groups:
  - a. 20 (64,52%) presented NFC levels above 52,5 (on a scale from 15 to 90);
  - b. 20 (64,52%) are women and 11 (35,48%) are men;
- b) From the 27 participants of the 6 middle groups:
  - a. 16 (59%) presented NFC above 52,5;
  - b. 15 (55,56%) are women and 11 (44,44%) are men;
- c) From the 26 participants of the 6 lower groups:
  - a. 12 (44%) presented NFC above 52,5;
  - b. 15 (57,69%) are women and 11 (42,31%) are men.



**Table 42 – Groups’ NFC and OUP characteristics – 18 groups**

Rank	Groups	NFC Mean	NFC CoV	W/M	OUP Mean
1	KSD.1.01.B	58,25	0,14	0,75	8,40
2	GSJ.1.01.D	57,00	0,21	0,75	8,00
2	UNI0.1.1.E	56,00	0,23	0,40	7,87
2	UNI.1.01.A	52,50	0,25	1,00	7,71
2	UNI0.1.1.D	56,67	0,22	0,83	7,65
6	UNI0.1.1.C	57,50	0,25	0,17	7,50
7	KSD.1.01.C	49,00	0,41	0,67	7,07
8	WKS.2.01.A	52,00	0,24	0,50	6,60
9	WKS.2.01.D	57,67	0,24	0,83	6,27
11	UNI.1.01.B	52,83	0,18	0,00	6,09
10	WKS.2.01.E	58,67	0,2	0,67	6,07
12	GSJ.1.01.B	44,40	0,15	0,80	5,93
13	WKS.2.01.B	52,00	0,23	0,60	5,80
14	GSJ.1.01.E	50,33	0,21	0,67	5,73
15	WKS.2.01.C	46,00	0,28	0,80	5,40
16	GSJ.1.01.A	47,83	0,25	0,20	5,07
16	KSD.1.01.A	54,00	0,26	0,33	5,07
18	GSJ.1.01.C	45,00	0,28	1,00	4,87

The 6 highest perceived innovativeness ratings (with an average of 7,85 points at the OUP Mean) were attributed to products that were created by groups with a NFC Mean of 56,16 and a NFC Coefficient of Variation of 0,217, both on average (see Table 43). The lowest perceived innovativeness ratings were obtained by groups with a NFC Mean of 49,19 and a NFC Coefficient of Variation of 0,252, both on average (see Table 43). This means that an increase of 14,49% at NFC Mean level corresponds to an increase of 47,57% at the innovativeness perception level.

As can be verified at Figure 8 (page 146) the correlation between NFC Coefficient of Variation (NFC CoV) and OUP Mean, for the whole set of 18 groups, is negative (-0,362), but with a Significance (2-tailed) of 0,140 (N=18). Nevertheless, it was possible to spot a difference at NFC CoV between different sets of groups. Because of that, they were split into two sets: one with 12 groups (Table 44) and one with the remaining 6 (Table 45).

**Table 43 – Average composition per tiers of groups**

Indexes		Top 6	Middle 6	Bottom 6	Total 18
W/M Ratio	Mean	0,650	0,578	0,600	0,609
	SD	0,305	0,306	0,295	0,286
NFC Mean	Mean	56,320	52,428	49,193	52,647
	SD	2,019	5,347	3,518	4,716
NFC CoV	Mean	0,217	0,237	0,252	0,235
	SD	0,040	0,091	0,255	0,058
OUP Mean	Mean	7,855	6,338	5,323	6,505
	SD	0,318	0,426	0,382	1,127
Women per Group	Mean	3,333	2,500	2,500	2,777
	SD	1,861	1,760	1,378	1,628
Men per Group	Mean	1,833	2,000	1,833	1,888
	SD	1,834	2,000	1,329	1,640

### NFC Coefficient of Variation

The biggest set, aggregating 2/3 of the total groups, presented a NFC CoV from moderate to strong correlating negatively to the OUP Mean of -0,729 with a Significance (2-tailed) of 0,007 (N=12). For this set of 12 groups, the correlations between NFC Mean and Originality Mean, User-Benefit Mean and Producibility Mean were positive and consistently high with significance below 0.01 level. Except for the correlation between Originality Mean and OUP Mean that yield a significance level below 0.05.

**Table 44 – Groups' OUP – 12 groups**

Groups	NFC Mean	CoV	Originality	User-Benefit	Producibility	OUP Mean
<b>GSJ.1.01.A</b>	47,83	0,25	5,00	5,00	5,20	<b>5,07</b>
<b>GSJ.1.01.C</b>	45,00	0,28	6,00	5,00	3,60	<b>4,87</b>
<b>GSJ.1.01.D</b>	57,00	0,21	7,80	8,20	8,00	<b>8,00</b>
<b>GSJ.1.01.E</b>	50,33	0,21	6,20	5,20	5,80	<b>5,73</b>
<b>KSD.1.01.A</b>	54,00	0,26	3,00	5,80	6,40	<b>5,07</b>
<b>KSD.1.01.B</b>	58,25	0,14	7,20	9,80	8,20	<b>8,40</b>
<b>UNI.1.01.A</b>	52,50	0,25	8,00	8,00	7,50	<b>8,00</b>
<b>UNI.1.01.C</b>	57,50	0,25	7,00	8,00	8,00	<b>7,50</b>
<b>UNI.1.01.D</b>	56,67	0,22	8,00	9,00	6,00	<b>8,00</b>
<b>UNI.1.01.E</b>	56,00	0,23	7,50	8,50	8,00	<b>8,00</b>
<b>WKS.2.01.B</b>	52,00	0,23	5,60	7,00	4,80	<b>5,80</b>
<b>WKS.2.01.C</b>	46,00	0,28	7,60	4,80	3,80	<b>5,40</b>

The smallest set, with 1/3 of the total units, presented a NFC CoV strong and positive correlation to the OUP Mean of 0,986 with a Significance (2-tailed) of 0,000 (N=6). For this smaller set, the correlations between User-Benefit Mean and Producibility Mean were positive consistently high with significance below 0.05 level. Taken as a whole, my interpretation about this set of 6 groups is that the persons assigned to each one of these last groups shared a same social context.

Although several studies provide “compelling evidence that interpersonal contact can reduce prejudice, there appears to be a ceiling effect” (SCHIAPPA; GREGG; HEWES, 2005, p. 100). The present study demonstrates that there is not a linear relationship between NFC and perceived innovativeness. It seems that the more individuals know each other and the more they share a social context, the wider must be the coefficient of variance of their NFC levels.

**Table 45 – Groups' ranking based on OUP – 6 groups**

Groups	NFC Mean	CoV	Originality	User-Benefit	Producibility	OUP Mean
<b>GSJ.1.01.B</b>	44,40	0,15	6,40	6,00	5,40	<b>5,93</b>
<b>KSD.1.01.C</b>	49,00	0,41	7,80	6,60	6,80	<b>7,07</b>
<b>UNI.1.01.B</b>	52,83	0,18	7,00	6,00	6,00	<b>6,00</b>
<b>WKS.2.01.A</b>	52,00	0,24	6,60	6,20	7,00	<b>6,60</b>
<b>WKS.2.01.D</b>	57,67	0,24	5,00	6,80	7,00	<b>6,27</b>
<b>WKS.2.01.E</b>	58,67	0,20	8,40	5,80	4,00	<b>6,07</b>

In a sense, this relation is supported by the results of a study on minority/majority contact (SCHIAPPA; GREGG; HEWES, 2005, p. 100), which suggest that the possible beneficial effects of this kind of diversity contact

would be strongest with those viewers with the least direct interpersonal contact with the minority group, and have less or no effect for those with a great deal of interpersonal contact with that minority group.

Research shows that “a homogeneous group composed of largely similar members may agree on the same basic premises and fundamental assumptions” (KRUGLANSKI, 2004, p. 136). Self-similar groups would have higher difficulties for “shattering the common threads of understanding at heart of the shared reality” (KRUGLANSKI, 2004, p.

136). It is interesting to relate these understandings about similar and dissimilar groups with what Schippers *et al.* (2003) describe as

two possible and contrasting ways in which group longevity can moderate the relationship between diversity and team process and outcomes. One possibility is that highly diverse teams, which are higher on group longevity, will be more reflexive than less diverse teams, because in diverse groups people will spend more time exploring and reflecting on the differences in opinion and insight. (SCHIPPERS *et al.*, 2003, p. 784)

These aspects related to high self-similarity could be seen in groups WKS.2.01.A, WKS.2.01.D and WKS.2.01.E, as they were from a same organization, and participants were co-workers or knew each other well. Groups KSD.1.01.C and UNI.1.01.B, although both were formed by class mates, based on their NFC levels and during regular classes at two different faculties, it was possible to verify that members shared a same social context too. They either were mutually sympathetic or knew each other previously. There are no further information about group GSJ.1.01.B.

Hence, it makes sense to infer that, in order to create innovative propositions that are perceived as such by a panel of judges, self-similar groups or longevous groups should have a selection of its members be drawn by a kind of difference that could foster reflexivity like the ones presented by different cognitive motivations.

Another aspect was also brought to my attention by the negative, although not significant, relation between NFC CoV, NFC Mean and OUP Mean for the whole set of 18 groups. When the lowest OUP Mean rated groups have their NFC Mean and NFC CoV analyzed, it is possible to infer that the combination of low NFC Mean with high NFC CoV generates group dynamics that seem to hamper innovativeness. Most likely due to the clash between (i) the characteristic comfort with ambiguity of low NFC individuals and (ii) the personal differences amongst members of a high NFC CoV group.

Based on the Women/Men proportion (W/M) and the NFC Coefficient of Variation (NFC CoV) findings presented above, it was done two simultaneous regression to test that the dependent variable OUP Mean could be influenced by either independent variables W/M and NFC CoV when combined with NFC Mean (see Table 46).

Considering the regression of variables W/M and NFC Mean on the OUP Mean of the groups, the predicted R value of 0,668, R square of 0,446, adjusted R square of 0,372 and a Durbin-Watson index of 1,261 indicate a small increase at the moderate explanatory power of this model over one considering only NFC Mean<sup>66</sup>. At a 0,012 confidence level, the  $F(2; 15)$  of 6,03 is statistically significant. Although there were no significant Spearman Rank correlations between Women/Men ratio and other variables, this test indicates a positive influence of the W/M ratio, when combined with NFC Mean, on the perception of innovativeness of groups' proposition represented by the dependent variable OUP Mean.

The regression of variables NFC CoV and NFC Mean on the OUP Mean of the groups, the predicted R value of 0,628, R square of 0,395, adjusted R square of 0,314 and a Durbin-Watson index of 1,022 indicate a small decrease at the moderate explanatory power of this alternative model when compared to the W/M. At a 0,023 confidence level, the  $F(2; 15)$  of 4,896 is statistically significant. This time there were significant Spearman Rank correlations between NFC CoV and other variables when separating the groups into two sets, as explained by the texts related to Table 44 and Table 45.

**Table 46 – Data results from regressions of NFC Mean and W/M**

Description	Results W/M	Results NFC CoV
Dependent Variable	OUP Mean	OUP Mean
Independent Variables (Predictors)	NFC Mean and W/M	NFC Mean and NFC CoV
R value	0.668	0.628
R square	0.446	0.395
Adjusted R square	0.372	0.314
Durbin-Watson index	1.261	1.022
$F$ Change	6.032	4.896
Significance $F$ Change	0.012	0.023

### Interpretation about Production Groups

The present studies indicate that group NFC Mean level is a significant predictor at the models analyzed. The NFC Mean level is

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<sup>66</sup> The regression of independent variable NFC Mean on the OUP Mean of the groups, results in a predicted R value of 0,628, R square of 0,394, adjusted R square of 0,356 and a Durbin-Watson index of 1,000 indicate a moderate explanatory power of this model. At a 0,005 confidence level, the  $F(1; 16)$  of 10,41 is statistically significant.

significant, despite  $N = 18$ , and having a high Beta value (0,668) and R square change (0,446), both indicators of effect size.

Given that  $N = 18$ , that the NFC Mean range is 14,27 (between GSJ.1.01.B = 44,40 and WKS.2.01.E = 58,67), and that there is a substantial negative correlation between NFC Mean and NFC CoV, the non-significance of NFC CoV do not necessarily mean that it is unimportant. The Women-Men (W/M) ratio seems relevant based on the Beta value of 0,261 when considered as the only independent variable.<sup>67</sup>

Therefore, the predictors' variables indicate that this model can explain 37,2% of OUP ratings obtained by each group.

Base on that data, it is possible to inductively infer<sup>68</sup> (see Table 47) ideal ranges of references for designing groups that are potentially better at creating innovative propositions. These groups, based on the analysis of W/M ratios should have a predominance of women (65% to 35%), and should follow the reference ranges as presented by the following table. If the participants share a clearer socio-historical context, the NFC Coefficient of Variation should be around 0,24. If they don't, if their generic subjectivity is low, it should be towards 0,14.

**Table 47 – Findings as indexes of reference for groups**

Indexes	References
NFC Mean	52 to 59
NFC Coefficient of Variation	Self-similar contexts: 0,24 Self-dissimilar contexts: 0,14
Women/Men Ratio	0,65

<sup>67</sup> These two last paragraphs are based on some of the considerations made by Prof Dr Roets on two private messages sent to me between the 16<sup>th</sup> and 18<sup>th</sup> of December 2014.

<sup>68</sup> “Although inductive inference is not easily characterized, we do have a clear mark of induction. Inductive inferences are contingent, deductive inferences are necessary. Deductive inference can never support contingent judgments such as meteorological forecasts, nor can deduction alone explain the breakdown of one's car, discover the genotype of a new virus, or reconstruct fourteenth century trade routes. Inductive inference can do these things more or less successfully because, in Peirce's phrase, inductions are ampliative. Induction can amplify and generalize our experience, broaden and deepen our empirical knowledge. Deduction on the other hand is explicative. Deduction orders and rearranges our knowledge without adding to its content.” From <http://plato.stanford.edu/entries/induction-problem/#ConNotInd> (accessed on 29/04/2015).

## Innovativeness Perception Judges

As noted upstream in this document, the judges NFC levels were assessed. The ranking attributed by each judge to the set of products were correlated with the overall ranking that resulted from each panel. It was also possible to verify which judges created rankings of products similar to the ones resulting from each panel. Based on those data it was possible to inductively infer NFC levels that could favor innovativeness assessment processes.

### *Judges' NFC Correlations*

The following tables present the Spearman Rank correlation between each judge individual final rankings (based on the aggregated Mean Originality, User-Benefit and Producibility from each Judge for the products created at the respective workshop) of the products and the ranking resulting from the aggregated data of each panel.

#### *IPJ01*

This panel was composed by 4 men and 1 woman with an average age of 39,77 years and its objective was to assess the products created at the WKS.2.01 workshop. The assessment was done between the 1<sup>st</sup> and 2<sup>nd</sup> of August 2012. The IPJ01 judges had an NFC average of 43,20 and their mean OUP rating was of 6,03 points.

**Table 48 – IPJ01 and OUP correlations**

	<b>IPJ01TOT</b>	<b>IPJNFC</b>
IPJ0101	-0,076	44
IPJ0102	0,163	38
IPJ0103	0,593*	40
IPJ0104	0,809**	<b>42</b>
IPJ0105	0,851**	<b>47</b>

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).  $N = 15$

#### *IPJ02*

This panel was composed by 4 men and 1 woman with an average age of 33,27 years and its objective was to assess the products created at the GSJ.1.01 workshop. The assessment was done between the 20<sup>th</sup> and

24<sup>th</sup> of May 2013. The IPJ02 judges had an NFC average of 44,40 and their mean OUP rating was of 5,92 points.

**Table 49 – IPJ02 and OUP02 correlations**

	IPJ02TOT	IPJNFC
IPJ0201	0,715**	37
IPJ0202	0,443	45
IPJ0203	0,629*	62
IPJ0204	0,451	51
IPJ0205	0,406	26

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).  $N = 15$

### *IPJ03*

This panel was composed by 3 men and 2 women with an average age of 31,83 years and its objective was to assess the products created at the KSD.1.01 workshop. The assessment was done between the 22<sup>nd</sup> of May and 1<sup>st</sup> of June 2013. The IPJ03 judges had an NFC average of 46,00 and their mean OUP rating was of 6,84 points.

**Table 50 – IPJ03 and OUP03 correlations**

	IPJ03TOT	IPJNFC
IPJ0301	0,650	36
IPJ0302	0,504	56
IPJ0303	0,787*	54
IPJ0304	0,840**	47
IPJ0305	0,449	44

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).  $N = 9$

### *POJ01*

This panel was composed by 10 men and 11 women with an average age of 28,07 years and its objective was to assess the products created at the UNI.1.01 workshop. The assessment was done between the 22<sup>nd</sup> of May and 1<sup>st</sup> of June 2013. The POJ01 judges had an NFC average of 54,68 and their mean OUP rating was of 7,19 points.



**Table 51 – POJ01 and OUP04 correlations**

	POJ01TOT	NFC
POJ0101	0,253	39
POJ0102	0,644*	40
POJ0103	0,820**	40
POJ0104	0,393	41
POJ0105	0,553	48
POJ0106	0,812**	50
POJ0107	0,727**	50
POJ0108	0,473	50
POJ0109	0,566	51
POJ0110	0,973**	51
POJ0111	0,755**	55
POJ0112	0,721**	56
POJ0113	0,354	56
POJ0114	0,762**	59
POJ0115	0,707*	60
POJ0116	0,709**	62
POJ0117	0,463	63
POJ0118	-0,175	64
POJ0119	-0,072	66
POJ0120	0,071	67
POJ0121	0,405	75

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).  $N = 12$

### *All Panels of Judges*

At Table 52 it is possible to see a ranking of the judges based on the level of correlation between their personal ranking of the products created at a specific workshop and the respective panel's final one.

The average NFC of the highest judges (5 women and 7 men) on the Spearman Rank correlation (above 0,7 with significance  $= < 0,01$ ) is 49,66 with an average age of 28,66 years.

The 19 lowest judges (10 women and 9 men), with correlation below 0,7 and significance above 0,05 have an average NFC level of 50,53 and age of 31,68. And the average NFC for correlations below 0,5 and significance above 0,5 is 55,80 (the bottom 5 judges).

A comparative between the 5 tops and bottoms reveals that, although both average ages are in a range between 30,40 and 32,60 years (see *italics* at Table 52), the average NFC is 47,00 (top) and 55,80 (bottom). Thus, the top 5 performers (2 women and 3 men: POJ01.10, IPJ01.05, IPJ03.04, POJ01.03, POJ01.06) have an average NFC which is 7,80 points lower than the bottom five judges (2 women and 3 men: IPJ01.02, POJ01.20, POJ01.19, IPJ01.01, POJ01.18).

**Table 52 – IPJOUJ and OUP correlations**

Num.	Judge	Man/ Woman	Age	NFC	CORR	SIG	Ave. Age	Ave. NFC
01	POJ01.10	Man	30	51	0,973**	0,000	30,29	50,12
02	IPJ01.05	Man	44	47	0,851**	0,000		
03	IPJ03.04	Man	28	47	0,840**	0,005		
04	POJ01.03	Woman	23	40	0,820**	0,001		
05	POJ01.06	Woman	27	50	0,812**	0,001	30,40	47,00
06	IPJ01.04	Woman	32	42	0,809**	0,000		
07	IPJ03.03	Woman	31	54	0,787*	0,012		
08	POJ01.14	Woman	25	59	0,762**	0,004		
09	POJ01.11	Man	22	55	0,755**	0,005		
10	POJ01.07	Woman	24	50	0,727**	0,007		
11	POJ01.12	Man	25	56	0,721**	0,008		
12	IPJ02.01	Man	33	37	0,715**	0,003		
13	POJ01.16	Man	31	62	0,709**	0,010		
14	POJ01.15	Man	30	60	0,707*	0,011		
15	POJ01.02	Man	30	40	0,644*	0,024		
16	IPJ02.03	Man	36	62	0,629*	0,012		
17	IPJ01.03	Man	44	40	0,593*	0,020		
18	IPJ03.01	Woman	36	36	0,650	0,058	31,68	50,53
19	POJ01.09	Woman	42	51	0,566	0,055		
20	POJ01.05	Man	39	48	0,553	0,062		
21	IPJ03.02	Woman	31	56	0,504	0,166		
22	POJ01.08	Man	25	50	0,473	0,121		
23	POJ01.17	Man	22	63	0,463	0,129		
24	IPJ02.04	Woman	33	51	0,451	0,091		
25	IPJ03.05	Man	33	44	0,449	0,226		
26	IPJ02.02	Man	33	45	0,443	0,098		
27	IPJ02.05	Man	31	26	0,406	0,133		
28	POJ01.21	Woman	31	75	0,405	0,191		
29	POJ01.04	Woman	27	41	0,393	0,206		
30	POJ01.13	Woman	26	56	0,354	0,259		
31	POJ01.01	Woman	30	39	0,253	0,427		
32	IPJ01.02	Man	41	38	0,163	0,563	32,60	55,80
33	POJ01.20	Woman	28	67	0,071	0,827		
34	POJ01.19	Woman	23	66	-0,072	0,823		
35	IPJ01.01	Man	38	44	-0,076	0,787		
36	POJ01.18	Man	33	64	-0,175	0,585		

\*. Correlation is significant at the 0.05 level (2-tailed). \*\*. Correlation is significant at the 0.01 level (2-tailed). CORR: Correlation Coefficient. SIG: Sig. (2-tailed).

The top 50% of judges (6 women and 11 men) with a correlation above 0,5 and a significance coefficient below 0,05 presented an average NFC of 50,12.

On the innovativeness rating part of the study, the 5 judges who generated rankings with the highest correlation coefficient ( $= < 0.01$ ) with the aggregated Panel of Judges final ones were the judges with average NFC level of 47 (see Table 52).

By separating all 36 judges based on if they had their rankings correlated with significance coefficient below 0.05 from the ones that had it above the referred level of significance, it is possible to devise the following:

- a) Below 0.05: from the 17 judges with significance below 0.05:
  - a. 10 (58,82%) presented NFC levels below 52,5;
  - b. The average NFC level and age are 50,10 and 30,29, respectively;
  - c. 11 (64,71%) are men and 6 (35,29%) are women;
  
- b) Above 0.05: from the 19 judges with significance above 0.05:
  - a. 12 (63,16%) presented NFC levels below 52,5;
  - b. The average NFC level and age are 50,50 and 31,68, respectively;
  - c. 9 (47,37%) are men and 10 (52,63%) are women.

Therefore, the only significant difference between these two sets is a higher proportion of men (11 men to 6 women) with a significance coefficient below 0,05. Adding to that, when comparing the 5 tops and bottoms judges (see Table 52), it is clear the top 5 performers have an average NFC which is 7,80 points lower than the bottom five judges.

As can be inductively inferred from the data available, judges with specific NFC levels seem to be more assertive in their assessment of innovative potentials. These findings have interesting implications for the design of committees responsible for evaluating innovative propositions.

#### Interpretation about Perception Judges

Base on that data, it is possible to inductively infer (see Table 53) ideal ranges of references for designing panel of judges that are potentially better at assessing innovative propositions. These groups, with a predominance of men (approximately 65% to 35%), should follow the reference ranges as presented on the following table.

**Table 53 – Findings as indexes of reference for judges**

Indexes	References
NFC	40 to 51
Women/Men Ratio	0,35

On the innovativeness rating part of the study, the 5 judges who generated rankings with the highest correlation coefficient ( $= < 0.01$ ) with the aggregated Panel of Judges final ones were the judges with average NFC level of 47 (see Table 52).

### **Considerations to Reflect**

I think that it is necessary, as suggested by Prof Dr Roets on a personal message sent to me on the 9<sup>th</sup> of March 2015, to frame the obtained results into two fundamental perspectives.

The first is to acknowledge that, as can be seen at Table 36, although the correlation is significant between NFC Mean and OUP Mean (0,606 significant at the 0,008 level (2-tailed and  $N=18$ )), when analyzed the correlations at the level of OUP Mean's aspects (Originality, User-Benefit and Producibility) it is possible to verify a more complex scenario. The available data show that the correlation between the Originality Mean rates and NFC Mean is 0,279 and significant at the 0,262 level (2-tailed and  $N=18$ ). Which means that there is no significant correlation. Therefore, it seems that the NFC Mean effect on OUP Mean is primarily on the User-Benefit and Producibility aspects.

The second is the possibility of a curvilinear (inverted U) relationship between NFC Mean and OUP Mean. Although the data collected by this study depicts a range of individuals' NFC levels from 31 to 81, the resulting 18 groups have a NFC Mean span from 44,4 to 58,67, which produces a NFC Mean range of only 14 points. Given that the NFC scale, as applied at the present study, goes from 15 to 90 points (roughly, the mid 20% of the scale), it is most likely that the present groups only tap into a portion of the scale. Neither the lowest 40% (from 15 to 44), nor the highest 40% (from 59 to 90) of the scale were tested at the aggregated NFC Mean group level.

Even though the present data could not demonstrate that curvilinear relationship between NFC Mean and OUP Mean, a paper (MIRON-SPEKTOR; BEENEN, 2015) published in January 2015 seems to corroborate that possibility.

### **Considerations to Act**

The analysis of the present study seems to yield many more interesting interpretations than the mathematical correlation. Nevertheless, I am focusing on the "magic of numbers" (KRISTENSSON UGGLA, 2010, p. 80) due to my belief that *numbers* can consensually

enable the construction of a coordinated system of action (TAYLOR; VAN EVERY, 2000).

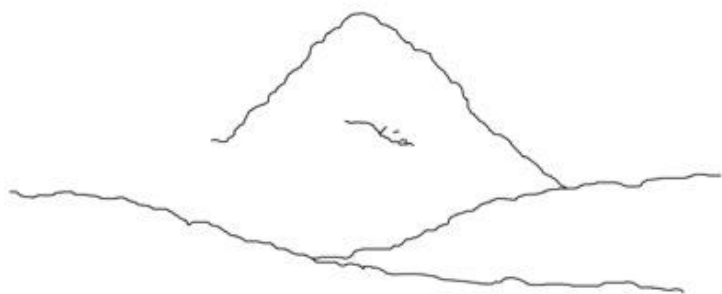
I need to affirm that the focus on developing a quantitative-based discourse is not an egregious conceptualization of the organizational discourse. On the contrary, it results from the respect that I have for the organizational characteristic, i.e. an elicitation of the awareness of the prejudices at play in the cited socio-cultural context.

Thus, as a sensemaking discourse concerning the design of groups to create or judge innovative propositions, it can be interpreted that:

- Groups with mid-to-high NFC Mean should have their products propositions perceived as more innovative;
- Groups predominantly composed by women should have their products propositions perceived as more innovative;
- Groups with mid-to-low NFC Mean should be more assertive in assessing the innovativeness of new product propositions;
- Groups predominantly composed by men should be more assertive in assessing the innovativeness of new product propositions.

As a final step in the consensual construction of a coordinated system of actions, I presented above what could be called the resulting “innovativeness sweet spot” for designing groups. The reference numbers highlight the ranges of NFC should a group be designed to fit in order to be better than the rest at enacting innovativeness efforts.









**Mountain:** *noun.* 1 a large natural elevation of the earth's surface rising abruptly from the surrounding level; a large steep hill: I *set off down the mountain*; they *sought refuge in the mountains*.<sup>69</sup>

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<sup>69</sup> <http://oxforddictionaries.com/definition/english/mountain?q=mountain>



**Synecdoche:** *noun.* a figure of speech in which a part is made to represent the whole or vice versa, as in *England lost by six wickets* (meaning ‘the English cricket team’). Origin: late Middle English: via Latin from Greek *sunekdokhē*, from *sun-* ‘together’ + *ekdekhēsthai* ‘take up’.<sup>70</sup>

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<sup>70</sup> <http://oxforddictionaries.com/definition/english/synecdoche?q=Synecdoche>



## 2.3 MOUNTAIN: CRITICAL INTERPRETATION.

Une théorie peut être puissamment explicative et faiblement appuyée par des tentatives rigoureuses de falsification. Or c'est bien cette coïncidence des deux critères qui fait encore et peut-être pour toujours défaut aux théories globales dans les sciences sociales. On a, ou bien des théories unifiantes, mais non vérifiées, ou bien des théories partielles bien vérifiées, comme en démographie et en général dans tous les segments théoriques à base mathématique ou statistique, mais qui, pour cette raison même, renoncent à l'ambition d'être intégratives. Ce sont en général les tenants des théories unifiantes, mais peu exigeantes en fait de vérification et de falsification, qui dénoncent avec le plus d'arrogance l'idéologie de leurs adversaires. Je voudrais m'employer à démontrer quelques-uns des pièges dans lesquels il est trop facile de tomber. Un argument courant est de dire que l'idéologie est un discours de surface qui ignore ses propres motivations réelles.<sup>71</sup> (RICOEUR, 1986, p. 314–315)

With this text I intend to walk through a particular knowledge mountain, passing by and connecting different discussions about the impacts of this research on the lifeworld of people. The whole text is based on two specific studies: one made in Germany and the other in Brazil. I will try to weave some considerations about the relationship between the part and the whole, while trying to explore the possibilities of being statistically verifiable *sans renoncer à l'ambition d'être intégratif* (RICOEUR, 1986, p. 314–315). From a critical theory perspective I will walk through the influence of overriding systems, “especially politics and ideology” (ALVESSON; SKÖLDBERG, 2009,

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<sup>71</sup> “A theory can be powerfully explanatory and weakly supported by rigorous attempts at falsification. It is this coincidence of two criteria that disqualifies, and perhaps always will disqualify, general theories in the social sciences. Such theories are either unifying and unverified or partial and well verified, as in demography and other theoretical domains that have a mathematical or statistical basis but that, for this very reason, renounce any ambition to be integrative. In general it is the proponents of the unifying and unverified theories who denounce with the most arrogance the ideology of their adversaries. Here I should like to dismantle some of the traps into which it is very easy to fall. One common argument is to say that ideology is a surface discourse that remains unaware of its own real motivations.” (RICOEUR, 2007, p. 256–257)

p. 318), dealing with ideology, power and social reproduction based on the discussion of two specific studies.

From a cognitive interest perspective (HABERMAS, 1971), this part is focused at the emancipatory one.

### Breaking down

The theme of my doctoral research emerged from my work experience on Information & Technology projects, which started around 1995, with organizations from a particular geography: the coastal region of the state of Santa Catarina, Brazil. The breakdown emerged from my perception that these organizations seemed to be *over-focused* on efficiency (KRISTENSSON UGGLA, 2010, p. 80). As if *efficiency* was equated to *good performance*: better efficiency would lead to better performance. As if efficiency was the key ingredient for an organization to endure through time. Which, in part, resonates with Karl E. Weick (Weick, 1995) organizational definition as having sensemaking as a central activity in it. Citing Scott (SCOTT, 1987, p. 23), he subscribes to the definition that organizations are

Collectivities whose participants share a common interest in the survival of the system and who engage in collective activities, informally structured, to secure this end.

This definition is particularly instrumental when considering that Sebhatu, in his doctoral thesis (SEBHATU, 2010, p. 40), based on several lines of research on the theme of corporate social responsibility, presents the following relation:

reducing conflicts with their stakeholders or activists may help companies build trust or reputation, which boosts stakeholders' confidence in them and protects their brands.

It is also of note Sebhatu's compilation of several studies that explain the profit maximization effect that social responsibility of companies produces, "even in the absence of external pressures" (SEBHATU, 2010, p. 40). Therefore, those actions can be considered as profit-maximizing strategies as well, which clearly indicates the

advantages of social responsibility for companies for assuring their longevity<sup>72</sup> through time.

### Organizational mechanics

One conceptual parallel that kept coming to my thoughts was the comparison between the potential levels of efficiency of an internal combustion engine and of an organization. From the perspective of the 30% of maximum thermal efficiency of an internal combustion engine (AGARWAL, 2007), any kind of *organizational efficiency* seems to be elusive. If a tangible and highly controllable system can, at most, attain a 30% efficiency level, under which logic could be expected that an organization composed of people should be anyhow more efficient than that? In a sense, it could be effective and or productive, but not “just” efficient (TANGEN, 2005).

If it could be said that organizations can be managed efficiently, it should be logic then to presuppose that the survival rate of these organizations would be well above the *chance rate* of 50%, i.e. of flipping a coin. But it occurs that the organizational survival rate in Brazil is 51,8% for organizations above four years old (IBGE, 2012). Which can also be considered low in terms of efficiency, meaning that almost half of the organizations do not survive to its fifth anniversary. As if 48,2% of combustion engines would necessarily melt after 4 years of work, despite proper maintenance.

At a first glimpse, the over-focus on efficiency from the referred coastal organizations seemed to me geared by the “Cartesian Anxiety” (WEICK, 1995). As Weick explains, it was either they had a “fixed and stable foundation for knowledge” or it was chaos. Therefore, this focus on efficiency seemed to me to be an enabler, a direction, a sensemaking discourse to commit<sup>73</sup> people to act although they had not all the information necessary to do so. As if organizational members had an urge to commit to “a judgment that is rendered before all the elements that determine a situation have been finally examined” (GADAMER, 2004, p.

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<sup>72</sup> “Group longevity refers to the time a team has existed and differs from team tenure, which refers to the length of time an individual has been with the team.” (SCHIPPERS et al., 2003, p. 783)

<sup>73</sup> “Through interactions, meanings were thrashed out on which commitments to action could then be based; joint experience of carrying out the action successfully then advanced the relationship, providing opportunities for retrospective monitoring and learning that served to firm up meanings, to increase the strength of commitments and to enhance relationships further still.” (COOPEY; KEEGAN; EMLER, 1997, p. 308)

272). This kind of “efficiency prejudice” can be one of the results of a particular type of *Aufklärung*; of a particular kind of educational process guided by the Enlightenment’s objectivistic perspectives, as a relentless illusory pursuit of the “spirit of artificial symmetry.” In particular, it seems to be the case with the applied sciences or the strictly technical focused organizations. As Ricoeur explains<sup>74</sup>:

Le préjugé, en effet, est une catégorie de l’*Aufklärung*, la catégorie par excellence, sous la double forme de la précipitation (juger trop vite) et de la prévention (suivre la coutume, l’autorité). Le préjugé est-ce donc il faut se débarrasser pour commencer à penser, pour oser penser – selon le fameux adage *sapere aude* – pour accéder à l’âge adulte, à la *Mündigkeit*. (RICOEUR, 1986, p. 338)

This, in fact, can be described as one of the main characteristics of these coastal organizations’ mechanic that I worked with: most of them were managed essentially by “educated technologists” (DRUCKER, 1999), which were mostly originated from the efficient engineering academies of the Santa Catarina’s region. Academies that were created under the influence of the century of absolutism (GADAMER, 2004, p. 51) and focused on “efficiency enhancers” (KELLEY; BOSMA; AMORÓS, 2010). These organizations’ characteristics can be related to two contemporary knowledge paradigms of competence and evidence. *Competence* is associated with the “lifelong learning as the new life script” and *Evidence* manifests as a “focus on measurements, efficiency, accounting, and the ‘magic’ of numbers” (KRISTENSSON UGGLA, 2010, p. 80). All workers are forced to this new lifelong learning narrative identity mainly due to the global race for competitive advantage and the constant creative destruction (SCHUMPETER, 1927). Which, instead of resulting in a *flexible man*, creates “a man without memory, conviction, accountability and capability of be responsible” (KRISTENSSON UGGLA, 2010, p. 112). Therefore, undermining the very essence of the two cited paradigms as it seems to convey “a dualistic order where

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<sup>74</sup> “For “prejudice,” in the double sense of precipitation (to judge too quickly) and predisposition (to follow custom or authority), is the category par excellence of the *Aufklärung*. Prejudice is what must be put aside in order to think, in order to dare to think – according to the famous adage *sapere aude* – so that one may reach the age of adulthood or *Mündigkeit*.” (RICOEUR, 2007, p. 274)



practice and theory are separated in a dangerous dichotomy” (KRISTENSSON UGGLA, 2010, p. 80).

But, most strikingly, are the similitudes that I found between the efficiency-driven organizations that I knew and the description by Allport (ALLPORT, 1979) of the Prejudice-prone motivated cognitive style. It is important to remember that Allport defines prejudice as “an antipathy based on faulty and inflexible generalization. It may be felt or expressed. It may be directed toward a group or an individual of that group” (Allport, 1979, p. 10).

Nevertheless, Allport asserts that “the style of thinking that is characteristic of prejudice is a reflection, by and large, of the prejudiced person’s way of thinking about anything” (Allport, 1979, p. 400). As highlighted by Roets and Van Hiel, this “habit of thinking about the world” (Allport, 1979, p. 175) has the following characteristics (ROETS; VAN HIEL, 2011b, p. 350):

- “Urge for quick and definite answers” (p. 403)
- “Cling to past solutions” and “More given to perseverance” (p. 402)
- “Like order, especially social order” (p. 404)
- “Feel more secure when they know the answers” (p. 402) and “Latch onto what is familiar” (p. 403)
- “Afraid to say ‘I don’t know’” (p. 402) and “Better not to hesitate” (p. 403)
- “Cannot tolerate ambiguity” (p. 175, see also p. 401)
- “Narrow-minded” and “Fails to see all relevant sides to his problem” (p. 402)

To explore a little further what Allport describes as the prejudiced personality, he points at its psychological *repression* as an essential feature of it. And that the consequences of such repression are likely to be the following: ambivalence towards parents, moralism, dichotomization, a need for definiteness, externalization of conflict, institutionalism and authoritarianism (ALLPORT, 1979, p. 397). All of which can be transposed to the organizational setting almost directly, and could serve as interesting perspectives to analyze several organizational phenomena.

From a myriad of possibilities, I will focus on one: the innovativeness potential of social groups.

## Innovativeness and Social Groups

Along with the previous knowledge paradigms of evidence and competence, the 21<sup>st</sup> century is testimony of an emerging new one: innovation. This last one composes, with the two previous, the three major trends distinguishing the so called *cognitive capitalism* (KRISTENSSON UGGLA, 2010, p. 112). Innovation, as one of the trends of this new capitalism paradigm, can be understood as a determination towards creativity with a “human face” (KRISTENSSON UGGLA, 2010, p. 80).

This new paradigm crystalizes the challenges of an innovation-driven economy (KELLEY; BOSMA; AMORÓS, 2010), which are demanding organizations to increase the call for the myth of creativity, novelty and diversity. But, given their habits of thinking about the world, their calling risks of being done through banal rhetorical formulations. Which, most of the times, evade a confrontation with a real legitimization of something that “modernidade procurou apagar definitivamente no seu necessário processo de contínuo renascimento do efêmero: a tradição e o preconceito”<sup>75</sup> (GINOULHIAC, 2009, p. 282).

These same organizations, increasingly interested in augmenting their capacity to innovate, are adopting several practices mainly associated with the creative industries (KRISTENSSON UGGLA, 2010, p. 112), particularly the ones related to the “design thinking” practices<sup>76</sup>. This last one can be defined as design practice and competence that

are used beyond the design context (including art and architecture), for and with people without a scholarly background in design, particularly in management. (JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013, p. 123)

Besides their promises to spur innovations, these practices have an explicit and formal focus on superseding an innovation framework “anchored within engineering, and much occupied with statistical relationships and rational models of innovation” (JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013, p. 123). Organizational management saw Design Thinking as a framework to deal

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<sup>75</sup> As translated by me: “modernity sought to permanently delete in its necessary process of continuous renewal of the ephemeral: tradition and prejudice.”

<sup>76</sup> For a very well carved introduction on the issue of “Design and Innovation in the Design Management Discourse” see Jahnke (2013).

with complex realities by “creating a team-based approach to innovation” (BROWN, 2008). But, as expected, practitioners could not perceive that the main goal of “designerly ways of knowing, thinking and act” (CROSS, 2001, p. 5) is to create connections, of meaning-making, to gain awareness of different perspectives of reality, of making sense of things (KRIPPENDORFF, 1989, 2006). In other words, “making the familiar strange and the strange familiar” (AMABILE, 1996). That is to say that, to reap most of the potential offered by Design – in a broad sense and Design Thinking in particular, it is necessary that organizations’ members commit to *build bridges between the different*. Organizations characterized by dichotomization, definiteness, conflict, institutionalism and authoritarianism (ALLPORT, 1979, p. 397) will most likely not benefit from Design to generate innovative propositions. This kind of inference is supported by long-term real-world tests suggesting that better forecasters, defined as the ones that better identify future options (CUHLS, 2003), “had higher scores on measures of fluid and crystallized intelligence and open-mindedness” (MELLERS et al., 2014, p. 8). After all, the “phenomena of closed and open mindedness are at the heart of the interface between cognitive and social processes” (KRUGLANSKI, 2004, p. 04). One of which is fundamental to innovativeness, that is: creativity. As explained by Simonton, creativity is positively related with personal traits

associated with the capacity to general blind variations, namely, divergent thinking, openness to experience, and reduced latent inhibition. (SIMONTON, 2010a)

Thus, creativity can be understood metaphorically as an evolutionary process of blind variation and selective retention (CAMPBELL, 1960; SIMONTON, 2010b). From some of the work of Simonton (SIMONTON, 1997, 1999, 2010b) and Ashby (1958), it is possible to justify that, to generate records of “quality,” records must be produced in “quantity.” Quantity, in that context, must be understood along blind variation processes, or as product of “fortuitous intersects” (BANDURA, 2006). To clarify the relation between blind variation and open-mindedness, it worth mention that this particular “variation” must be the product of explorations “going beyond the limits of foresight” (CAMPBELL, 1960). In that sense,

the successful explorations were in origin as blind as those which failed. The difference between the successful and unsuccessful was due to the nature of the environment encountered, representing discovered wisdom about the environment. (CAMPBELL, 1960)

Fundamentally, the majority of these Design Thinking practices are based on the assumption that people are sensible enough to understand different points of view. That these frames of work will enable people to free themselves of their prejudices and produce blind variations; that they will enable people to make the “fusion of horizons”, as described by the hermeneutical literature (GADAMER, 2004). As noted by Jahnke (JAHNKE, 2013, p. 349), despite the radical innovation rhetoric of these frames of work, “most innovation through design thinking in these firms was incremental.” Unfortunately, the necessary empathic understanding to “pivot” (RIES, 2011, p. 177) its own view of the world is not evenly distributed on a population. That is exactly why it makes sense to suppose that groups should be composed by a diversity of minds.

### The Triple Challenge of Innovativeness

Several studies of organizations, regions and nations indicate a connection between economic success and human capital diversity (FLORIDA; GOODNIGHT, 2005; FLORIDA, 2003, 2014). Østergaard, Timmermans and Kristinsson (2011) explain that, as social context becomes more diverse, “this creates possibilities for new combinations of knowledge.” And their research also indicates that there is a positive relationship between human diversity and the organization’s likelihood to innovate. More precisely, diversity of backgrounds should give “groups a larger pool of resources that may be helpful in dealing with nonroutine problems” (VAN KNIPPENBERG; SCHIPPERS, 2007).

One interesting perspective on diversity is presented by the work of Hong and Page (2004), as they differ identity-difference (“differences in their demographic characteristics, cultural identities and ethnicity, and training and expertise”) from functional-difference (“how people represent problems and how they go about solving them”). Based on a series of computational experiments they demonstrate that

a collection of diverse agents can be highly effective collectively, locating good and often optimal solutions, confirming the widely accepted belief.

More interestingly, we find that a random collection of agents drawn from a large set of limited-ability agents typically outperforms a collection of the very best agents from that same set. This result is because, with a large population of agents, the first group, although its members have more ability, is less diverse. To put it succinctly, diversity trumps ability. (HONG; PAGE, 2004, p. 16386)

But, at the same time that diversity presents possibilities of innovation, it strengthens the need for intergroup interaction and communication and “might lead to conflict and distrust” (ØSTERGAARD; TIMMERMANS; KRISTINSSON, 2011, p. 500). Other streams of research also indicate that cognitive diversity “may be detrimental to team satisfaction, affect, and members’ impressions of their own creative performance” (HENNESSEY; AMABILE, 2010). And that diversity can just as easily “lead to negative as to positive outcomes” (HENNESSEY; AMABILE, 2010, p. 580). Hong and Page (2004) also highlight the fact that “problem solvers with diverse perspectives may have trouble understanding solutions identified by other agents” (p. 16389). In other words, the ability “to actively bridge different knowledge traditions” (JAHNKE, 2013, p. 353), to hermeneutically *build bridges with the Other* is an important aspect of solving problems and creating meaning. As stated by the following text:

Differently than established theories that often consider innovation as stemming from a process of problem solving, or from a process of ideation, hermeneutics provides a framework to look at innovation as a process of interpreting and envisioning (or generative interpretation). It therefore better suits the investigation of change in meaning, and has the potential to lead to complimentary explanations of why some companies are more effective in managing the radical innovation of meanings. In addition, hermeneutics offers an important angle to investigate the role of networks in the process of making sense of things, since external players may significantly affect the way firms reframe their interpretation of the meaning of product and services. (VERGANTI; ÖBERG, 2013, p. 87)

Therefore, departing from the mentioned individual triple challenge<sup>77</sup>, to be innovative organizations should have to overcome the triple challenge of (i) understand the prejudices of its members, (ii) to understand its historical context and (iii) create innovative meaning propositions. These challenges can only be overcome by creating new knowledge: by finding new ways of augmenting the potential to act (KROGH et al., 2013, p. 4). And knowledge, by its turn, can only be created by building bridges, as *arcs herméneutiques* (RICOEUR, 1986, p. 158), between seemingly incompatible concepts. Thus, organizations have to enable individuals to overcome the triple challenge mentioned above through a process of Socialization, Externalization, Combination and Internalization (NONAKA; TOYAMA; KONNO, 2000; NONAKA; TOYAMA, 2003).

Organizations can facilitate this process by providing for its members two enablers. The first one is the possibility of being aware of one's own closed mindedness, which is "of key importance to the ways in which our thoughts, often inchoate and unwieldy, congeal to form clear-cut subjective knowledge" (KRUGLANSKI, 2004, p. 01). The second one is by adopting the Four Key Conditions for intergroup contact (ALLPORT, 1979). As presented by Pettigrew (1998), these conditions are: equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom.

### Need For Closure and its role

La seconde acception que l'on peut donner au mot "science," dans son rapport à l'idéologie, est une acception critique. Cette dénomination est conforme à la requête des hégéliens de gauche qui, modifiant le terme kantien de critique, ont exigé une critique vraiment critique.<sup>78</sup> (RICOEUR, 1986, p. 319)

The concept of Need for Closure, as I understand it, can serve as the sensemaking discourse which can provide a vantage point that fits into the prejudices of contemporary organizations. A point from which the

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<sup>77</sup> The individual triple challenge of (i) a flickering self-awareness, (ii) to understand what is the Other and (iii) create innovative propositions, as detailed at page 162.

<sup>78</sup> "The second meaning that can be given to the term *science* in its relation to ideology, is a *critical* meaning. This designation accords with the request of the left Hegelians, who, modifying the Kantian notion of critique, demanded a truly critical critique." (RICOEUR, 2007, p. 258)

relationship between the innovativeness of the propositions created by a group and the level of closed mindedness of its participants can be observed from a favorable organizational perspective.

Besides presenting tools for investigate the cited relationship that are academically validated (WEBSTER; KRUGLANSKI, 1994), NFC's role is to enable the construction of a sensemaking discourse that is closer to contemporary cognitive capitalism paradigms, particularly its beliefs in the "magic" of numbers (KRISTENSSON UGGLA, 2010, p. 80). Because of its relative easiness to be applied, and the quantitative results that are obtained from the NFC assessments, it is possible to provide information presented with low levels of "quantity, ambiguity and variety" (WEICK, 1995, p. 87) as to commit and enable organizational members to act. Which, paraphrasing the French philosopher Paul Ricoeur, reinforces *l'ideologie capitaliste* in the sense that it offers *une base mathématique ou statistique* for a discourse which has as its declared intention to *dénoncer avec pas tant d'arrogance l'idéologie* of organizations against diversity.

To be able to construct a discourse that can be critical and relevant for organizational employees; that can commit them to act, it is necessary to use the "magic" of numbers, i.e. quantitative methods. Hence, approaching closed mindedness through the concept of NFC can give the management ranks facts and figures that can persuade them to commit and act towards assessing the corporate prejudices, i.e. to be aware of the impact of them into innovative efforts. By being aware of the impact of the prejudices of its members into their innovative efforts, organizations may commit to adopt the four conditions of intergroup contact. Thus, through the prejudices related to evidence, competence and innovation; and building on top of organizational traditions, with this text I try to create a critical discourse that aims precisely at collaborating to improve openness towards diversity in corporations. In other words, to design *a discourse to compromise organizations to act towards assessing prejudice among its members as a way to create knowledge to support innovative opportunities*.

It may seem that diversity is already embraced by organizations. But that cannot be farther from the contemporary organizational realities. And for very good reasons, backed by several academic researches. After all, Page asks (PAGE, 2014, p. Discussion): "Is not diversity one cause of complexity?" The meta-analyses of studies showed

that neither diversity on readily observable attributes nor diversity on underlying job-related

attributes could be reliably linked to group performance. (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009)

Moreover, comprehensive review of literature (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009) on research about work-group diversity and performance, from a social categorization perspective, found that

the more homogeneous the work group, the higher member commitment [...] and group cohesion [...] will be, the fewer relational conflicts will occur [...], and the less likely membership will be to turn over [...]. Together, these processes are proposed to result in higher overall group performance when groups are homogeneous rather than heterogeneous [...].

Therefore, diversity strengthens the need for intergroup interaction and communication and “might lead to conflict and distrust” (ØSTERGAARD; TIMMERMANS; KRISTINSSON, 2011, p. 500). As a way of saying, organizations’ contradictory positioning about diversity is by no means unjustifiable. Even more by the fact that diversity can just as easily “lead to negative as to positive outcomes” (HENNESSEY; AMABILE, 2010, p. 580). This permits to watch up-close *un combat*<sup>79</sup> *entre l'idéologie et l'utopie*. At one extreme, the ideology of *de la classe dirigeante* accommodates, justifies and dissimulates reality to somehow cope with this undecided question about the positive/negative role of diversity. At the other, the utopia *des classes montantes* tries to attack and explode whatever reality the other class constructs.

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<sup>79</sup> *Original text:* Les idéologies sont plutôt professées par la classe dirigeante et ce sont les classes sous-privilegiées qui les dénoncent. Les utopies sont plutôt portées par les classes montantes; les idéologies regardent en arrière, les utopies regardent en avant. Les idéologies s'accrochent de la réalité qu'elles justifient et dissimulent; les utopies attaquent de front la réalité et la font exploser. Ces oppositions entre utopie et idéologie sont certes considérables, mais elles ne sont jamais décisives et totales [...] (RICOEUR, 1986, p. 324). *English version:* Ideologies are, for the most part, professed by the ruling class and denounced by under-privileged classes; utopias are generally supported by the rising classes. Ideologies look backwards, while utopias look forwards. Ideologies accommodate themselves to a reality that they justify and dissimulate; utopias directly attack and explode reality. These oppositions between ideology and utopia are certainly considerable, but they are never decisive and total [...].



At the confluence of these issues, where ideology and utopia overlap, there may be a possibility to construct a discourse about a “sweet spot, or at least a preferred region” (PAGE, 2014, p. Discussion) for the impacts of diversity on organizational performance. Although the social categorization perspective indicates negative impacts of diversity, the “information/decision-making perspective arrives at quite different predictions” (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009), holding that

diverse groups should outperform homogeneous groups. The idea is that diverse groups are more likely to possess a broader range of task-relevant knowledge, skills, and abilities that are distinct and nonredundant and to have different opinions and perspectives on the task at hand. This not only gives diverse groups a larger pool of resources, but may also have other beneficial effects. (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009)

The role NFC can play, from my point of view, is to help devise “how much and what types of diversity would create a more robust, innovative, and fair society,” thus producing one more alternative answer to that call made by Page in 2014 (PAGE, 2014, p. Discussion). Because of its basis is on the phenomena of closed and open mindedness, which are at “the heart of the interface between cognitive and social processes” (KRUGLANSKI, 2004, p. 04), with NFC it is possible to construct a discourse along a continuum that helps to make sense of the “creation and spread of diverse perspectives, categories, analogies, mental models, and heuristics” (PAGE, 2014, p. Discussion).

### NFC’s Continuum

NFC is not a biological characteristic of an individual, not like some sort of organic tissue deficit (KRUGLANSKI; WEBSTER, 1996). It is a motivated tendency to act as soon as possible, given the pressure that time and the lack of information and other resources may impose to an individual. To some individuals, this tendency is high. To others, it is low. Thus, it can vary along a continuum due to the social context an individual finds her or himself into. Briefly stated, it is possible to devise a continuum representing the NFC scale as a distinction “whether the

individual's goal is to approach or avoid closure" (KRUGLANSKI, 2004, p. 05), having at its extreme points the *low* and the *high* NFC characteristics and, at its center, the *medium* ones.

Individuals with High NFC (versus Low) tend to adopt workflows and guidelines more rapidly, i.e. tend to crystallize. They also tend to present an "unfounded confidence", which may lead them to have a more closed mindedness (KRUGLANSKI; WEBSTER, 1996). They feel uncomfortable in ambiguous situations, are highly task orientated, and tend to be perceived as a less creative individual. Although the High NFC (versus Low) individuals present low engagement in acts of social-emotional nature (KRUGLANSKI, 2004), they tend to preserve the cohesion of groups due to their tendency to conform to rules and accepted behaviors (KRUGLANSKI, 2004).

This is a perfect match for efficiency-driven sensemaking discourse of organizations that focuses on "conformance, control, alignment, discipline and efficiency" as expressed by Gary Hamel (DENNING, 2012). These characteristics can also be related to what Verganti and Öberg (2013, p. 89) describe as the contemporary dominant theories of innovation:

[...] see problem solving as a process of progressive reduction of uncertainty (the earlier in the process the better, [...]), and that assume that there is an optimal solution out there, you just need to find it [...]

This bias towards reduction of uncertainty and efficiency enhancements are elements of a discourse that cannot be taken only for its face value. The organizational prejudices seem to ignore that approaching uncertainty can be done through different perspectives, like: "whereas the uncertainty-oriented persons approach uncertainty in order to resolve it, the certainty-oriented persons avoid it altogether" (KRUGLANSKI, 2004, p. 55).

This enables me to infer that it is not efficiency or certainty itself – as self-justifiable ends, which are at play in organizations at large. The flip-a-coin survival rate of organizations seems to confirm that. What is at play is the commitment to act. A commitment that must be rendered before analyzing all pertinent information. Information which must be provided with low levels of quantity, ambiguity and variety. Thus, resulting in an act guided by prejudice. Which is not good or bad, when considering the diversity of organizational tasks. But when organizations

are dealing with clear signs of uncertainty, as during innovative efforts, relying on prejudice has a clear negative impact.

On the other hand, individuals with Low NFC (versus High) levels feel uncomfortable facing repression. They tend to be oriented “more toward the social aspects of the group interaction” (KRUGLANSKI, 2004) and neglect aspects of task execution, but are perceived as highly creative. They are psychologically more comfortable in ambiguous situations and tend to prolong precrystallization periods. In a sense, this characteristic relates to the hermeneutic approach to innovation proposed by Verganti and Öberg (2013, p. 89):

Instead, the hermeneutic approach, and in particular the iterative hermeneutic circle, opens up for a constant reinterpretation of the surrounding world. Rather than detecting new or uncertain information as early as possible in the process, it points to repeatedly bringing in new insights. Instead of keeping one constant perspective it is about bringing in several perspectives. Instead of deciding the course once and for all, the focus lies within the continuous turns within.

The Low NFC (versus High) individual is characterized by a strong desire to closure avoidance; by a “constant reinterpretation on the surrounding world,” which is positive for the hermeneutic approach to innovation. But, on the negative perspective, that characteristic can disrupt the cohesion of groups due to their resistance to conform to rules and accepted behaviors (KRUGLANSKI, 2004).

These NFC characteristics, although stable, are malleable. People under time pressure, for instance, tend to gravitate towards the higher limits of their NFCs. So, a Low NFC (versus High) individual submitted to a condition of time pressure “tends to lower the degree of creativity in interacting groups” and should produce more “conventional ideas (reflecting perceived consensus)” (KRUGLANSKI, 2004, p. 124). Also, a High NFC (versus Low) individual involved in a similar situation would make the probability of creating non-empathic and non-innovative results to be insurmountable. This kind of relationship has been registered in several studies as “the more time pressure people are under, the less likely they will be to engage in creative cognitive processing” (AMABILE et al., 2002, p. 12). And this is what seems to happen most of the time at organizations.

This prompts to investigate what would be the impacts on groups, either positive or negative, if organizations provide for its members the upstream cited two enablers: the possibility of being aware of one's own closed mindedness and the adoption of Four Key Conditions for intergroup contact.

### Impacts of Intergroup Contact

To empirically illustrate the impacts of intergroup contacts and the necessity and effectiveness of having implemented the Allport's Four Key Conditions, I will describe and interpret the events of two studies that were done during this research: the KISD 6 WEEKS MID-TERM-PROJECT (KSD.1.01) and UNIVALI-BRANDING-MBA (UNI.1.01). The interest on detailing these studies resides in the fact that, from the 18 groups that were considered as valid to be included in this research, I could follow those two particular studies during more time and in more depth. I think that it is important to highlight the fact that:

- a) Allport Conditions were enforced at UNI.1.01 study, but not at KSD.1.01 one;
- b) From the six top OUP rated groups, four came from the UNI.1.01 study and the highest rated group came from KSD.1.01;
- c) KSD.1.01 study had one of its three groups rated amongst the top, one in the middle and one at the bottom groups;
- d) Both studies had one of its groups among the six ones considered self-similar (see Table 45).

During several occasion in all studies that were done to subsidize this present text I had the opportunity to witness particular impacts that can happen when different NFC levels individual are asked to work on a same group and under certain circumstances. Interesting enough, in four cases it happened that one of the participants abandoned his or her group before the completion of the activities. Two aspects of these events would deserve further elaboration (which will not be possible to be done thoroughly by this present text):

- a) Low NFC: the four participants that abandoned his or her groups were assessed as low NFC levels individuals, as compared to the average of each specific study's participants.

- b) Confrontational: in all cases, the participants left their groups after a progressively escalating confrontational coexistence with the other members.

Worth of note the fact that their peers considered their behaviors simply as “rude.” Which, it seems to me, relates to the eccentric personalities described as not being favorable to creative results (AMABILE, 1996). Although they were assessed as of low NFC levels, in the sense that they have the "need to avoid any specific closure" characteristic, they acted as though they had a "need for specific closure" characteristic. In one of these situations, an eccentric Low NFC individual abandoned the group because the other members could not accept a certain idea in the exactly way that sthis individual wanted it to be.

Based on the NFC premises, it should be expected that they would tend to be oriented “more toward the social aspects of the group interaction” (KRUGLANSKI; WEBSTER, 1996). On the other hand, High NFC (versus Low) individuals should be more process oriented and unaware of the social aspect involved. But, as pointed by Professor Dr Roets (in personal message on the 9<sup>th</sup> of July 2013): “high nfc individuals are supposed to be much more sensitive to group norms and they dislike deviating from group consensus.” So, it seems to make sense that Low NFC (versus High) individuals are the ones who can really disrupt a group effort. On the following few pages I will try to describe some of the richness that I perceived during these two specific studies.

#### Study: KISD 6 WEEKS MID-TERM-PROJECT

This study was done under the supervision of Professor Birgit Mager, during a 6 weeks Mid Term Project discipline entitled “Product Service Innovation” at the Köln International School of Design (KISD), in Cologne, Germany. The discipline started on the 8<sup>th</sup> of April and finished on the 13<sup>th</sup> of May 2013. The final feedback session was scheduled to the 23<sup>rd</sup> of May 2013.

This discipline/project was conducted by Professor Birgit Mager and two former KISD students (11 and 12 years after their graduation) named André Poulheim and Thorsten Frackenhohl from the Design Studio Frackenhohl & Poulheim, situated in Cologne, Germany. The goal of the discipline, as stated by André and Thorsten during the last feedback session (23<sup>rd</sup> of April 2013) was to explore different scenarios of possibilities to create innovative Product/Service solutions. At the

beginning it was proposed to the students to develop their projects on 4 main industries areas: retail, shoes, public transport and airlines.

Taken as a sole group, the initial 13 participants had an NFC Mean level of 48.15 and a NFC Coefficient of Variation (NFC CoV) of 0.23. In the following two weeks after the beginning of the project (until the 19<sup>th</sup> of April 2103), two participants joined the project (a total of 15 participants); then five left it, changing its characteristics as it is shown on Table 54. The final number of participants was 10 and the ensemble had an NFC Mean of 54.20 and a NFC CoV of 0.24. Then, as the discipline evolved through time, the whole group had an increase of 6.05 point in its NFC Mean and almost maintained its NFC CoV, varying only 0.01 point. It is symptomatic that, as participants abandoned the project, the average NFC increased. That confirms my understanding about the tendency that low NFC individuals are usually the ones who disrupt the cohesion of groups and abandon them.

**Table 54 – KISD variations of NFC Mean and NFC CoV**

	Groups		
	Initial	Intermediate	Final
NFC Mean	48.15	50.60	54.20
NFC CoV	0.23	0.24	0.24

The initial idea was to create groups with average indexes distributed along the reference scales as seen on Table 55. With groups starting from low, to middle, and to high NFC mean levels. That study structure was suggested by Professor Dr Roets during our meeting on the 16<sup>th</sup> of November 2012. The suggestion was to have, in an optimal research scenario, 8 to 12 unities of each of the five types of groups based on the different levels of NFC Mean and NFC Coefficient of Variation (NFC CoV).

After analyzing the suggestion from Professor Dr Roets and all the possible combinations, I came up with four more types of groups. Although running the study with only the five suggested types seemed to me to be reasonable enough, those four other types would help me describe and point out the different possible groups. That would sum up to a study involving up to 90 groups from 9 different types. Thus, besides having one type of group defined within the ideal ranges of reference (based on the data analysis of the previous studies), eight more types should be sought to be designed, as shown at Table 55.

**Table 55 – Different types of NFC based groups**

	Type	NFC Mean	NFC CoV
Ideal	01	52 to 59	0,14 to 0,24
NFC-Partial	02	52 to 59	> 0,24 (high)
	03	52 to 59	< 0,14 (low)
CoV-Partial	04	> 59 (high)	0,14 to 0,24
	05	< 52 (low)	0,14 to 0,24
Non-Ideal	06	> 59 (high)	> 0,24 (high)
	07	> 59 (high)	< 0,14 (low)
	08	< 52 (low)	> 0,24 (high)
	09	< 52 (low)	< 0,14 (low)

### Initial Groups' Compositions – KSD.1.01

Initially, the KSD.1.01 four groups were designed to have as much types as possible. But the first obstacle, as can be seeing in Table 56, was the fact that among the initial 13 participants there were only two with high NFC levels (above 60). Which reduced the possibilities of combination of participants. This is probably due to the fact that KIDS' students may have, taken as a hypothetical generalization, an average NFC that can be rather considered as gravitating towards some characteristic mid-to-low NFC scale region.

**Table 56 – KISD initial NFC Mean and NFC CoV**

PARTICIPANT	KSD.1.01.A	KSD.1.01.B	KSD.1.01.C	KSD.1.01.D
1	35	47	37	42
2	41	48	38	51
3	52	56	42	68
4	69	-	-	-
5	-	-	-	-
NFC Mean	49.25	50.33	39.00	53.67
NFC CoV	0.30	0.10	0.07	0.25

Although, on average, the aggregated NFC Mean of KISD students that participate at this study started at 48,15 (see Table 54) and finished at 54,20 (higher than the average 52,73 from the four studies), within a range of 30 points (smaller than the range of 50, from the whole set of students). Anyway, this is just a hypothesis and it was never verified by me.

I was able to create groups with NFC Means between 49 and 54. And NFC CoV between 0,07 and 0,30. Which means that, at the beginning of the project, the groups had the following types:

- KSD.1.01.A was a Type 08 (NFC < 55 and CoV > 0,24);
- KSD.1.01.B, Type 09 (NFC < 55 and CoV < 0,14);
- KSD.1.01.C, Type 09 (NFC < 55 and CoV < 0,14); and
- KSD.1.01.D was a Type 08 (NFC < 55 and CoV > 0,24).

Group KSD.1.01.D, Type 01, was considered an “ideal” group due to the range of NFC levels of the participants. The group KSD.1.01.A was designed to have the highest possible levels of CoV, i.e. the highest difference between its members.

#### Intermediate Groups’ Compositions – KSD.1.01

The original project structure with 4 designed groups was changed by the circumstances mentioned above. Although the Group KSD.1.01.A was not modified, Group KSD.1.01.D was dissolved and its remaining participants went to groups KSD.1.01.B and KSD.1.01.C (some of the original participants left the discipline/project).

**Table 57 – KISD intermediate NFC Mean and NFC CoV**

<b>PARTICIPANT</b>	<b>KSD.1.01.A</b>	<b>KSD.1.01.B</b>	<b>KSD.1.01.C</b>
<b>1</b>	35	-	37
<b>2</b>	41	48	38
<b>3</b>	52	56	-
<b>4</b>	69	68	72
<b>5</b>	-	61	-
NFC Mean	49.25	58.25	49.00
Coefficient of variation	0.30	0.14	0.40

From the initial 13 participants, 3 left the project at this intermediate stage. But 2 others joined at the final one, which started with 11 participants. One more participant left the project during the final stage.



## Final Groups' Compositions – KSD.1.01

At the last phase of the project, participant 1.A.1 (NFC=35) left the group due to irreconcilable differences about the goals of the project.

Participant 1.C.4 (NFC=72) did not take part on the final presentation (13<sup>th</sup> May 2013), although he was present during the last rehearsal (01<sup>st</sup> May 2013). The parents of Participant 1.C.4 (NFC=72) came from abroad to a visit, and the family would be traveling around Europe during the week of the final presentation. So the group thought that it was better not having him presenting. Participant 1.B.4 was initially located on the extinct group KSD.1.01.D, and identified again as 1.D.3. Participants 1.B.5 and 1.C.4 integrated the discipline after the second week. The following table presents the final participants NFC levels and the groups' NFC Mean and NFC CoV.

**Table 58 – KISD final NFC Mean and NFC CoV**

PARTICIPANT	KSD.1.01.A	KSD.1.01.B	KSD.1.01.C
1	-	-	37*
2	41*	48*	38*
3	52*	56*	-
4	69*	68**	72***
5	-	61***	-
NFC Mean	54.00	58.25	49.00
NFC CoV	0.26	0.14	0.41

*Legends:* \*: did not changed group; \*\*: changed group; \*\*\*: new participants

This is somehow illustrative of the complexity of any research activity that involve humans or human groups. Although on most of the other studies done by me – including GSJ.1.01 and WKS.2.01 – groups did not change that much, there were several episodes of participants changing or abandoning groups. Contrary to research on other kinds of “objects” which lend themselves with more docility *à la mathématique ou statistique*, with human groups it is not the case. So, it can even be possible to construct *théories unifiantes* based on that kind of studies, but never *bien vérifiée*.

Therefore, to further test that the motivated cognitive tendencies of a group is related to the innovativeness perception of products created by those same groups, with the help of Prof Dr Annika Lantz Friedrich, on the 10<sup>th</sup> of December 2014 we regressed dependent variable OUP Mean

on the independent variable NFC Mean. Results showed that NFC Mean predicted innovativeness perception (OUP Mean) significantly, explaining 35,6 percent of the adjusted variance ( $F(1; 16) = 10,41; p = 0,005$ ), see Table 40.

Nevertheless, the above mentioned research complexities are precisely why I will not claim in any sense that this research will produce any objective and verifiable truth about the phenomenon under study (SMYTHE et al., 2008).

As a way to facilitate the reading of this document by relating the NFC based references presented in the previous two tables with the lifeworld of people at study KSD.1.01, the following table presents the references suggested by these studies. After that, follow brief descriptions of each group.

**Table 59 – Findings as indexes of reference for groups**

Indexes	References
NFC Mean	52 to 59
NFC Coefficient of Variation	Self-similar contexts: 0,24 Self-dissimilar contexts: 0,14

#### Group KSD.1.01.A – Type 08

This group was intended to be the one with participants with the broadest NFC levels. Thus, it should be the one with the highest friction amongst its members and the highest innovative potential. At the beginning of the activities, the group had a NFC Mean of 49,25 and a NFC CoV of 0,30. These indexes set the group as an extreme Type 08, since both indexes were well above (NFC CoV > 0,24) and below (NFC Mean < 52) the ideal references. At the end of the discipline, this group was still a Type 08, but its indexes were rather close to the references: NFC Mean of 54 and NFC CoV of 0,26. Which would, in my opinion, almost turn this group into an “ideal” Type 01.

At the first meeting this group choose to develop a project for the shoe industry and, specifically, for NIKE. After the first couples meetings it was clear that Participants 1.A.1 (NFC=35, male) and 1.A.4 (NFC=69, male) had extremely different views on the goals of their project. Coincidentally they also represented the extremes NFC levels of this group.

On the session of the 23<sup>rd</sup> of April 2013, participants 1.A.1 (NFC=35) and 1.A.4 (NFC=69), each did a different presentation, without active participation of the other members of the group. To make it very

clear: from the four members of the group, two did each a separate presentation, not involving the other two.

The presentation done by participant 1.A.4 (NFC=69) was very much aligned with NIKE's prejudices as a world market leader of the shoes industry, the proposition was to take the final 4 steps of the shoe production and move it to the shop and offer an "experience" for the buyer to assemble his or her own shoe (with the help of an employee from the shop), while doing some fitness exercises. The Participant 1.A.1 (NFC=35) presented a whole discourse about how NIKE is helping damage the ecosystem and exploring the work of people on sweat-shops on third world countries. This participant also proposed that NIKE should create a Do-It-Yourself (DIY) project that would enable people to build their own shoes without having to buy anything from NIKE.

As the group could not reach an agreement on how to proceed, the two different project proposals (mainly geared by 1.A.1 and 1.A.4) were submitted to the vote of the students from all groups. Proposal 1.A.4 was selected. At the end of the session, André and Thorsten discussed with the members of the group on how they should proceed, trying to build some sort of an agreement between them. Participants 1.A.2 (NFC = 41, female) and 1.A.3 (NFC = 52, male) expressed that they both were tired of trying to get the two others to agree upon a common goal.

On the week of 06<sup>th</sup> of May 2013 I was informed that Participant 1.A.1 had abandoned the group and the discipline altogether. That event was shocking to me. For the first time I encountered a lifeworld situation that mimic exactly the literature about it. The respective literature says that Low NFC level (versus High) individuals tend to disrupt the cohesion of groups due to their resistance to conform to rules and accepted behaviors and to the fact that "they may actually be intrigued by uncertainties" (KRUGLANSKI, 2004, p. 154).

At the final stage, group KSD.1.01.A managed to create a proposal that somehow combined the two initial ones, although very much more influenced by 1.A.4's view on the project. They proposed a DIY shoe based on a kit that NIKE would sell. That kit could be used by the purchaser as a basis upon which it could have added several components developed by NIKE itself or by third parties, including ONGs and communities based business, building on a business model similar to the "app stores," like Apple and Google does.

As time passed, participant 1.A.4 (NFC=69), assumed the role of the group's leader, with participants 1.A.2 (NFC=48) and 1.A.3 (NFC=52) exemplary acting to build group's cohesion and commitment to create the best possible result of the experience. By that time, the group

assumed almost a Type 01 characteristic with a NFC Mean of 54 and a NFC CoV of 0,26.

It is important to note that this group was designed to have the highest NFC CoV, meaning that it would be the most self-dissimilar group. This lead me to understand that a NFC CoV above 0,30 and a NFC Mean below 52,5 (the middle mark of the scale) will most likely make the group “implode.” Nevertheless, I am absolutely convinced that if this group had adopted Allport’s key conditions (PETTIGREW, 1998, p. 66–67), it would not be among the 6 bottom OUP ranked groups. I believe that by adopting a governance based on Allport’s key conditions would have avoided most of the hassles and conflicts that undermined this groups work and results.

Results which would be fairly different had being implemented, since the very beginning of the project, a governance sustaining that each step of the group would have to be (i) marked by conditions of equal individual status; (ii) necessarily directed to common goals; (iii) obligatorily done in cooperation; and (iv) supported by clear messages and actions from authorities reinforcing these conditions.

#### Group KSD.1.01.B – Type 09 to Type 09/01

Initially, this group was designed as a Type 09. With the dissolution of group KSD.1.01.D (from where female participant 1.B.4 came from), having participant 1.B.5 (NFC = 61, female) joining in and participant 1.B.1 leaving the group, it became a Type 01. The impact of participant 1.B.4 (previously 1.D.3 and NFC = 68, female) was significant on this group. Participant 1.B.4 has a NFC level of 68, and did almost the whole presentation of the idea alone, although supported by the 3 other participants in minor aspects.

This group had the most detailed presentation about its project, as they opt to work on the suggested airline alternative (AEROMEXICO). And the idea that was presented, although they did not know at that time (so it seemed), was actually already being developed by a real business ([www.trackdot.com](http://www.trackdot.com)). The real product was scheduled to be released by June 2013. Which, in a sense, confirms the originality and closeness of that idea to the innovative objectives of the discipline/project. In fact, this is the group that obtained the highest OUP rating among the whole 18 groups set: 8,40 points.

As time passed, group KSD.1.01.B had a shift on its leadership. Although the leadership of the group started with female participant 1.B.4 (NFC=68), she was replaced by the only male participant 1.B.2, which

was assessed as having a low NFC level of 48. At the end, he was leading the group at the rehearsal stage, often forcing a particular point of view over the other participants. Although contrary to what literature says about the tendency of Low NFC individual (versus High) to exercise group leadership, it may be understood due to the fact that all other members were assessed as having high NFC levels. Thus,

because of their craving for epistemic permanence and a stable “social reality” [...], high (vs low) need for closure individuals should be likely to (1) exert pressures toward conformity upon one another and (2) encourage the emergence of dominant leadership that may shape uniformity of opinions in the group rather than allowing the expression of multiple views likely to foster a heterogeneity of opinions. (DE GRADA et al., 1999, p. 349)

By this perspective, makes sense to suppose that three female high NFC level participants, who are supposed to reinforce stable “social reality,” would exert pressure towards having a male leading the group. Even if that male was not theoretically focused on task-oriented actions and at shaping uniformity of opinions in the group. As a matter of fact, as mentioned above, 1.B.2 assumed the leading role with easiness. And, as far as I could perceive, he was rather enjoying being the “boss.” It is true that 1.B.4 was always next to him and, at several occasions, she would complement his words or lead the presentation herself.

To better understand what exactly happened, it is useful to know that

members’ high need for closure encourage a conversational pattern wherein some of the members manifest greater dominance of the discourse (or a more extensive “floor control”) than others. (KRUGLANSKI, 2004, p. 125)

Therefore, members with high NFC levels (versus low) tend to enact a conversational pattern wherein some of the members can manifest dominance. Kruglanski goes on and adds that

groups high on such a need were shown to encourage the emergence of centralistic or

hierarchical structures with a considerable differentiation in members' degree of prestige, centrality, and dominance over the group activities. Groups whose members are high on the need for closure have been shown to exhibit conservative tendencies and a considerable degree of norm stability as compared with groups whose membership is low in the need for closure. (KRUGLANSKI, 2004, p. 129)

Based on that consequence of ideas, it should be logic to think that members' high NFC should direct the group towards stable notions of reality. Participant 1.B.2, following that logic, would just be a plaything in the hands of the herd. It is important to keep in mind the fact that KSD.1.01.B, without 1.B.2, would have a NFC Mean of 61,67 and a NFC CoV of 0,10 (a Type 07 group). No other group, taken the 18, had characteristics like that. The present studies suggest that a group with those characteristics (high NFC Mean and low NFC CoV) would create innovative propositions ranked low at the OUP score. But, I did not test that alternative. The final top 6 OUP ranked groups, as a whole, had 65% of members assessed as high NFC and women were (a not overlapping) 65% of its participants. Having a group composed by women with high NFC may be a good indicator that its potential to create highly innovative proposition is high. Then, the pressing issue is to understand which impact had the low NFC leader at that group.

I believe that the present data, in a sense, depicts the patriarchal *here and now* in which we are living. As the magic numbers indicates, women are better at working in groups and men are better at assessing disruption (GILLIGAN, 2009, 2014; LEONARD; TRONTO, 2007; TRONTO, 1999). Women are better at understanding and integrating the needs of group, i.e. at caring for. Men are better at assessing and hierarchizing the needs of groups, i.e. at taking care.

One interesting hermeneutic arc can be build by acknowledging that "empathy and caring are human strengths" (GILLIGAN, 2014, p. 89) as much as being able to enact "true solicitude," which "is not to care for the Other, but rather to let the Other come freely into one's own being self – as opposed to taking care of (*Versorgung*) the Other" (GADAMER, 2000, p. 284). Another kind of strength is also to be able to know "of what is feasible, what is possible, what is correct, here and now" (GADAMER, 2004, p. xxxiv). The same can be said about the capacity to disrupt groups and feel comfortable at ambiguous situations.

So, based on the available data, I believe that groups with high innovative potential are the ones that combine two characteristics: (i) a set of members that can display true solicitude (which seems to be identified with Women as in the Ethics of Care) and the drive to pursue what is feasible here and now (which seems to be identified with High NFC individuals) with (ii) a leadership that can enact competitive independency (which seems to be identified with Men as in the Ethics of Care) and to feel comfortable on ambiguous situations (which seems to be identified with Low NFC individuals).

I can visualize another interesting connection between that group of high NCF level women lead by a low NFC man and the role leader exert on groups of people. Hannah Arendt<sup>80</sup> (LUDZ, 1999) answers a questions by Roger Errera, in 1974, about a contemporary persistence of thinking based on historical determinism with the phrase: “Action is a WE and not an I.” An action “in which a We is always engaged in changing our common world” (ARENDR, 1981). Thus, I cannot help but to reflect about the following text, as I mentally replace “monster” by “leader”:

Despite all the efforts of the prosecution, everybody could see that this man was not a "monster," but it was difficult indeed not to suspect that he was a clown. And since this suspicion would have been fatal to the whole enterprise, and was also rather hard to sustain in view of the sufferings he and his like had caused to millions of people, his worst clowneries were hardly noticed and almost never reported. (ARENDR, 2006, p. 54)

Could it be that the KSD.1.01.B male leader with all his “clowneries,” as synonymous to the characteristics of a Low NFC individual, was hardly noticed by the high NFC females of the group? Or this “monster’s” actions, considered clownish, were decisive to get the highest OUP score? Was his low NFC characteristics, bringing the NFC Mean and the NFC CoV to ideal reference levels, that assured the rating?

The literature review and my experience doing these studies make me think that his role, clownish or not, was decisive. I believe that the comfort and persistence of low NFC level individuals “of questioning ever further,” while being able to preserve the “orientation towards

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<sup>80</sup> Hannah Arendt 1974’s interview with the French writer Roger Errera. Accessed in 23/06/2014 at <http://www.youtube.com/watch?v=b1u5OjatwqA> , around 3’40”.

openness” is precisely what Gadamer calls “the art of thinking” (GADAMER, 2004, p. 360) and what is needed to create innovative propositions. His theoretical tendency to seize (i.e., by processing new information) confronted with their theoretical tendency to freeze (i.e., by reluctance of processing new information) might help make sense of what made this group so successful (KRUGLANSKI, 2004, p. 31).

The point is that they succeeded at obtaining the highest OUP score.

#### Group KSD.1.01.C – Type 09 to Type 08

The group KSD.1.01.C was supposed to be a Type 09, with low NFC CoV and NFC Mean values. Although it lost one of the original members (1.C.3 with NFC of 42), a new one was added: 1.C.4 (NFC= 72, male). The arrival of 1.C.4 made the group become a kind of extreme Type 08, not so much because of its NFC Mean of 49, but due to its NFC CoV of 0,40.

The group was very much driven by the leadership of female participant 1.C.2 with a NFC level of 38. Which, by different reasons, made this group to be similar to KSD.1.01.D, having both leaders with low NFC characteristics. The final OUP rating of this group (7,07) ranked it as the first one amongst the 6 middle groups, based on OUP ranking. Although it had the highest NFC CoV of the whole 18 groups set, that index cannot be taken independently. What I saw happening was that the group was, in fact, composed by just the two low NFC females. That would give the group a NFC Mean of 37,50 and a NFC CoV of 0,02. Which make it an extreme Type 09 group. Due to this high self-similarity (1.C.1 NFC = 37 and 1.C.2 NFC = 38), the group ended-up out of the 12 groups considered as having self-dissimilar characteristics (see Table 44).

KSD.1.01.C worked on the MARIMEKKO project, based on a brand that comes from the same country of this group’s leader. Although the presentation was done in a very distributed way (all participants have presented equal amounts of the project at the rehearsal), it was clear to me that participant 1.C.2 was in control of the whole process. It was interesting to note that the presentation was done using a “persona” based on the only male participant 1.C.4, exactly the one with the highest NFC level (72). The whole narrative and illustrations were focused on a 1.C.4 fake experience of travelling to Finland.

One important fact to highlight is that, at the rehearsal presentation, this group was the only one that invested time and effort to picture an emotional journey involving the user of the proposed product. That kind



of care and attention to the emotions involved in a process is predicted by NFC's literature. Which states that groups in a low need for cognitive closure tend to "orient more toward the socio-emotional aspects of the group interaction to the relative neglect of task execution" (KRUGLANSKI, 2004, p. 113). In other words, literally,

high (vs low) need for closure members should be particularly likely to exhibit a preponderance of task-oriented responses relative to task-irrelevant responses of a social-emotional nature. (DE GRADA et al., 1999, p. 349)

This is precisely what was seen at the presentation, the lowest NFC Mean group (not considering participant 1.C.4's NFC), is the one which spent the most effort at portraying the emotional aspects relating to a broad range of aspects. It was not only focused on customer journey inherent at their proposition, but also related to 1.C.4's participation at the group's project. Although he arrived later at the group, and could not stay for the final sessions and presentation, he was impersonated by the *persona* chosen to illustrate their innovative proposition.

### Final Presentations

The final presentations occurred on the 13<sup>th</sup> of May 2013 at the KISD Auditorium. They were video recorded by me, but to preserve the participants I will not publicize the videos.

Interesting enough, participant 1.A.1 (NFC=35), which had abandoned the project, took a sit at the very first row at the Auditorium. When all groups had done their presentations, 1.A.1 unplugged the computer that was in use and switched to 1.A.1's own. The Head of the Faculty tried to convince him not to do such a rude act. But 1.A.1 kept installing the presentation, without the consent of anyone, including the students. André and Thorsten tried to express their feelings about the incident, with no success. So they left the Auditorium as a way to express their disagreement with the attitude of 1.A.1. At some point, 1.A.1 said loudly to the Dean that "when he [the Dean] was young, he also acted that way." 1.A.1 tried to explain that he was forced to abandon the project for the simple reason that he wanted to do a project without being for "profit," and that the groups and instructors prevented him from doing that. The audience, which at first seemed to support him, started to challenge his

ideas and propositions, shouting at him to stop his presentation and answering negatively to whatever he said.

Participant 1.A.1 was one of the lowest NFC level members of this particular study. He should have an inclination to be more social and to work better at open ended situations. But, as Kruglanski highlights when explaining the characteristics of specific *versus* non-specific closure tendencies (KRUGLANSKI, 2004, p. 100), it seemed to me that 1.A.1 needed the project to have a specific closure (non-profit) or that he needed to avoid a specific closure (profit). But in both senses, 1.A.1 did not present any specific solution for the project in a way that would accommodate his beliefs with the beliefs of other members from KSD.1.01.A. This could well be understood as a need to avoid non-specific closure coupled with his Low NFC characteristics, since 1.A.1 in any sense proposed a clear cut way to proceed towards or against any closure at all.

The presentation done by 1.A.1 did not offered any actionable way to solve the impasse that was created by him. On the other side, the group from which 1.A.1 left effectively tried to create a bridge between the two opposite propositions. Also of interest, was the 1.A.1's rudeness towards the surrounding social context. As a Low NFC (versus High) person, it was supposed that a more socially sensible behavior should be presented. But, as pointed by Professor Arne Roets (in personal message on the 9<sup>th</sup> of July 2013): "high nfc individuals are supposed to be much more sensitive to group norms and they dislike deviating from group consensus." Thus, this disruptive behavior should be supposed to come exactly from a Low NFC (versus High) individual.

As I said before, it was a shocking experience for me. First, I had this feeling of breakdown by perceiving that I was able to have predicted this disruptive behavior from 1.A.1, based on his NFC level. Second, I was feeling that I somehow contributed for the whole stress and tense outcomes of the discipline. Which culminated with André and Thorsten leaving KISD's Auditorium.

Feed-back Session on the 23<sup>rd</sup> of April 2013

The main purpose of the last feed-back session, as stated by André and Thorsten, was to get some feedback from the students on how the discipline was conducted and their suggestions for improvement. André and Thorsten also gave some specific feedbacks on the students' final presentations on the 13<sup>th</sup> of April.

Not all students were present at this session. From Group KSD.1.01.A: 1.A.2 (NFC=41), 1.A.3 (NFC=52) and 1.A.4 (NFC=69). From Group KSD.1.01.B: 1.B.2 (NFC=48) and 1.B.3 (NFC=56). From Group KSD.1.01.C: 1.C.2 (NFC=38).

It went from 5:30pm to 6:50pm. The case of the “independent” participant 1.A.1 was discussed; aspects of 1.A.1 refuse to integrate different visions and with the other participants received some considerations from all participants. The group was reminded by Thorsten that to talk about a person that was not present was not a fair thing to do.

André commented, during his feedback to each group, that he had the impression that Group KSD.1.01.C (2 women and 1 men, NFC Mean = 49 and NFC CoV = 0,41) was the one that really was integrated, that was aligned, that “really discussed about their work”, where participants worked together as a team. He did not have that clear impression from Group KSD.1.01.B (3 women and 1 men, NFC Mean = 458,25 and NFC CoV = 0,14). No to mention Group KSD.1.01.A (1 women and 3 men, initially presenting NFC Mean = 49,25 and NFC CoV = 0,30).

Interesting enough is the fact that participants from Group KSD.1.01.B disagreed to that impression of him, stating that they met actually every day to talk about the project “except during weekends”, participant 1.B.2 added.

In a sense, in my opinion, the impressions from André mirrored the different NFC combinations of the groups: Group KSD.1.01.C was composed by the most self-similar NFC levels participants, group KSD.1.01.B with a bigger range of NFC levels was perceived as intermediate and group KSD.1.01.A as “not working as a Group”.

The 1.2.C participant explained that they also had encountered some frictions between the participants, although not at the same level as experienced by Group KSD.1.01.A. This is interesting, especially that after the changing of participants, the third one to join Group KSD.1.01.C had a NFC level of 72, which can explain that comment from participant 1.2.C.

André and Thorsten also presented what were their interests upon conducting this discipline at KISD. The three main reasons were:

- a) to exercise the design of product/service solutions, which is a business offer that is growing in demand from their clients;
- b) to get to know how young designers are working, thinking and experiencing life;
- c) to have a teaching experience, as they intend to become professors in the future (Thorsten already have a 3 years of

experience on setting up and teaching at the M.A. Industrial Design Course at the Technical University of Munich).

### Independent Panel of Judges – IPJ03

The group KSD.1.01.B (Final NFC Mean = 58,25; NFC CoV = 0,14 and OUP = 8,40) was considered as having the highest perception of innovativeness by the judges. Coincidentally, this was the group that presented a proposition that was effectively being carried out by a real company in a real world context. As mentioned above, from that experiment I learned that the success of that particular group was precisely due to the combination of a low NFC “clownish” male leader and a set of high NFC female group members.

I would like to reinforce the *low NFC “clownish” male leader* argument by bringing into the fore the results from analyzing the judges OUP ratings correlations. The 5 top judges, based on the similitude between their individual propositions’ ratings and the panel’s aggregated ratings, are composed by 3 men and 2 women and all had NFC levels below 52,5 points. At the 5 bottom, only 2 had their NFC below 52,5 (also 3 men and 2 women). The same characteristics hold true if taken into account the top 17 judges, where 11 are men and 6 are women. And from their NFC levels it is possible to see that 10 had them below 52,5 points. See Table 52 for further details.

With all that, I want to state that this *low NFC “clownish” male leader*, as in the role of a judge, was able to assess the innovative potential of the actions and results obtained from each step made by his group. The final rating of the judges were as can be seen at the following tables.

**Table 60 – KISD Groups OUP ratings**

Perception Levels	Groups		
	KSD.1.01.A	KSD.1.01.B	KSD.1.01.C
Originality-Mean	3,00	7,20	7,8
User-Benefit-Mean	5,80	9,80	6,6
Producibility-Mean	6,40	8,20	6,8
<b>OUP Mean</b>	<b>5,07</b>	<b>8,40</b>	<b>7,07</b>

**Table 61 – KISD Judges OUP ratings**

	KSD.1.01.A – Originality	KSD.1.01.A – User-Benefit	KSD.1.01.A – Productivity	KSD.1.01.B – Originality	KSD.1.01.B – User-Benefit	KSD.1.01.B – Productivity	KSD.1.01.C – Originality	KSD.1.01.C – User-Benefit	KSD.1.01.C – Productivity	NFC-IPJ03
IPJ03.01	4	7	6	8	10	7	8	8	10	47
IPJ03.02	1	5	8	8	9	6	6	8	9	56
IPJ03.03	3	8	7	10	10	9	8	8	9	36
IPJ03.04	2	3	7	9	10	9	7	8	5	44
IPJ03.05	5	6	4	1	10	10	10	1	1	54
<b>IPJ03.MEAN</b>	3,0	5,8	6,4	7,2	9,8	8,2	7,8	6,6	6,8	

### Making Sense of this Study – KSD.1.01

The difference between the groups' dynamics could be an argument in favor of adopting the 4 Key Allport conditions. While in group KSD.1.01.C the development of the idea and its presentation was done equally by all members of the group (although it was possible to see the leadership of one member and an almost complete passiveness of another), at group KSD.1.01.B the development of the idea was done collaboratively but the presentation was done basically by one of the members. In group KSD.1.01.A, two members did two different presentations at the initial ideas presentation, and the two others did nothing. If all projects were done under the guidance of Allport's conditions, the members would have to collaborate. And the final result of all groups could have been changed significantly. As a matter of fact, I am convinced of that.

In my opinion, Group KSD.1.01.A had the best idea, the most promising one. Nevertheless, it got only 5,07 points on the OUP rating done by the judges. The group started with an NFC Mean of 49,25 and a CoV of 0,30 and ended the project with a NFC Mean of 54 and a CoV of 0,26. The low rating obtained by this group may be explained by the stress that the participants went through during the whole project duration.

Initially, Group KSD.1.01.A was the one designed to have the highest levels of friction, represented by the largest NFC Range (34)

among the groups and the highest NFC CoV. The highest and lowest NFC participants, at the beginning of the discipline, were assigned to this group. It was supposed that conflicts would arise and, if design practices and tools were rightly used (hermeneutically, as to build bridges between the different), all the energy released by friction would be directed towards a compelling new product proposition. I assumed it as a test for the need of having the Four Allport Key Conditions. As these conditions were not embedded into the project, the tendency would be to have groups composed of more “similar” participants (as Group KSD.1.01.B with NFC CoV of 0,14 and NFC Range of 20) perform better as a whole.

With the abandon of participant 1.A.1 (NFC=35), Group KSD.1.01.A focused the development on the “high-NFC” member idea, aiming to integrate it as much as possible into NIKE’s actual operations. In my perspective, if the group had worked on a more comprehensive integration between high and low NFC’s perspectives, that would make the idea stand-out before the judges. Although the “low-NFC” perspective did not cause much of an impact on the final idea form, they discussed several times the possibility of NIKE integrate into its operations the alternative of having world-wide poor communities producing shoe components that would be seamlessly added into company’s website and sold to be assembled into NIKE’s shoes.

As I could perceive, while following the development of this project history, if the Four Allport Key Conditions were at place, the design process of building bridges between the different (as a communication facilitator) would make a decisive impact on projects outcomes. Based solely on this specific study, it makes sense to me that the simple adoption of designish allegories<sup>81</sup> is not sufficient to create innovative propositions. By “allegories,” in this case, I mean all imaginable elements that can be taken into account by the fact that this study was done inside a Design school, with Design students and having experienced Designers as responsible for the discipline.

The highest OUP rating group, amongst the whole 18 set, came from a Design school, this is a fact. But that provenience could not assure a better rating for the other two groups. Not to mention that members of KSD.1.01.A, all Design students, could not *design* their own way through

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<sup>81</sup> “For this sense an allegory is a form of metaphor developed so continuously as to make its surface meaning, the meaning associated with its source domain, independent, autonomous and so unobviously metaphorical. [...] The modern sense of allegory defines it in effect as a form of extended metaphor whose extension is so radical that it is no longer obviously a metaphor.” (CRISP, 2001, p. 6–7)

the hassle caused by the NFC study. The need for cognitive closure, along with its scale and assessment, by itself, may be

considered value neutral, a motivation “for all seasons,” as it were, serving to facilitate such judgments, whatever their nature, whose attainment brings about epistemic security most promptly and stably. (KRUGLANSKI, 2004, p. 163)

And it is precisely here that I call for the adoption of Allport’s key conditions for intergroup contact in order to augment the innovative potential of Design efforts. By designing groups based on the NFC reference index resulting from this study, and embedding into their structure a governance policy based on Allport’s key conditions, I believe that with that it is possible to effectively habilitate groups to design better innovative propositions. The majority of Design researchers agree that teaching “tools” is not what design is at its core. After all,

Schools of engineering, as well as schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design. (SIMON, 1996, p. 111)

More than that understanding of design as a seamless connection between all sciences of the artificial, I would like to reinforce Weick’s call to “drop your tools.” The shocking cases of firefighters fatalities, as described by Weick, can help make sense of the above mentioned call:

Learning to drop one’s tools to gain lightness, agility, and wisdom tends to be forgotten in an era where leaders and followers alike are preoccupied with knowledge management, acquisitions, and acquisitiveness. Nevertheless, human potential is realized as much by what we drop, as what we acquire. That theme is what I want to explore as a crucial component of teaching excellence. I want to ground the idea of dropping one’s tools in investigations of wildland fire fatalities. I am going to explore some of the reasons why firefighters refused to drop their tools when ordered to do so, were overrun by fire, and died with their tools beside them within sight of safety zones. As I do

so, I want you to be thinking about analogous situations where students and professors hold onto concepts, checklists, and assumptions that similarly weigh them down, reduce their agility, and blind them to what is happening right here and now and how they can cope with it. (WEICK, 2007)

I think about the situations where Design students and Professors hold onto concepts, checklists, and assumptions that weigh them down, reduce their agility, and their capacity of creating innovative propositions. Simon also, some 10 years before Weick, made a connected claim by saying that design tools are in general less formal (SIMON, 1996, p. 166). And no matter if we “Design without final goals”, and that we have “the formal tools we need or not” (SIMON, 1996, p. 166), this “daunting epistemological freedom” (RITTEL, 1987) is too important to be ignored or omitted from the curriculum of Design schools.

#### Study: UNIVALI – BRANDING – MBA

This second study was done 16 months after the KISD one, during a 3 weeks discipline, under my supervision, entitled “Design Thinking and Innovation” at the Universidade do Vale do Itajaí (UNIVALI), in Camboriú, Brazil. The discipline started on August 22<sup>nd</sup> and ended on September 06<sup>th</sup>, 2014.

The initial idea was to use the opportunity of that study to check my understanding that adopting Allport’s key conditions for intergroup contact would augment the innovative potential of Design efforts. To do that, I did the design of all groups within the reference indexes (within the limits of actual NFCs available). And, most importantly, I applied and enforced the cited conditions on the resulting groups on the four encounters that we had during the discipline.

Thus, contrary to what I tried to do during the KISD study, all groups were from the same Type 01, the ideal reference one. But, at that time, I was already adopting the reference values as seen on Table 59.

If my understandings were to make sense, all groups from UNI.1.01 study should be ranked amongst the top groups on OUP ratings.



## Groups' Compositions

Within the limits of the available NFC levels of the participants, I tried to design 5 groups that would present a NFC Mean between 52 and 59 points and a NFC CoV between 0,14 and 0,24. One aspect of the design process is the fact that I intentionally did not divided the participants based on them being men or women. I did the design of the groups based solely on the NFC levels of each participant, without taking their gender into account. By chance, groups UNI.1.01.A and UNI.1.01.B were respectively only women and only men. Again, by chance, groups UNI.1.01.C and UNI.1.01.D were 5-to-1 in terms of gender. The former had 5 men to 1 woman, and the latter, 5 women to 1 man. Group UNI.1.01.E had 3 men and 2 women.

**Table 62 – UNI.1.01's Individual NFC, NFC Mean and NFC CoV**

PARTICIPANT	Groups				
	UNL1.01.A	UNL1.01.B	UNL1.01.C	UNL1.01.D	UNL1.01.E
1	34	37	39	40	40
2	41	48	50	50	50
3	51	51	53	53	55
4	56	56	58	59	60
5	66	62	64	62	75
6	67	63	81	76	
NFC Mean	52,50	52,83	57,50	56,67	56,00
NFC CoV	0,25	0,18	0,25	0,22	0,23

As stated above, the main goal of this study was to see if adopting Allport's key conditions for intergroup contact would augment the innovative potential of the groups. Below are brief descriptions of specific events from specific groups during the discipline's four encounters and then, I discuss the results.

### Group UNI.1.01.B

Group UNI.1.01.B was composed only by men, with high self-similarity, although their NFC CoV was 0,25. The average age of them was 29 years, with the youngest having 22 and the oldest, 38 years.

Its first presentation, on the 23<sup>rd</sup> of August 2014, was so noisy that university personnel and other professors rushed to the room to check if there was something very bad going on. One of the professors from a

classroom nearby came and told me that he had the impression that I was being beaten by students.

The fact is that the group developed a proposition about some kind of “male certificate.” The whole proposition evolved around offering experiences for men from which they could get a certificate as “Alfa Male.” The idea raised several voices against it, especially from women.

At the end, the participants’ ratings considered that idea the worst amongst the five propositions resulting from this study. At that time, I thought that that judgment was unfair, in my opinion that idea had several interesting possibilities. At the end, after comparing the results from this study with the others, I was satisfied to see that idea amongst the 6 middle ones on OUP ratings. It definitely was not the best idea ever, but it was not that bad as the protests from participants made it seem. Women did not like the way it was presented, what the idea was about, its commercial name, its customer journey, nothing. For them, it was a sound failure all the way through. After the presentations, during the feed-back session, I had to intervene to keep the voices down so the group could explain its idea.

#### Group UNI.1.01.C

Group UNI.1.01.C was composed by 5 men and 1 woman, with the highest NFC Mean (57,50) and one of the two highest CoV (0,25). This group also had the widest range of NFCs (from 39 to 81). The average age of them was 28 years, with the youngest having 25 and the oldest, 32 years.

What is interesting to note about this group (“Brasil Aqui”) is the fact that it was always the first to complete the tasks and take action. It was the first group to have 3 “first” ideas to present to the class. Was also the first to leave the room to rehearse its presentation, before having me to say to the participants that they could leave the room. Maybe that behavior makes sense by considering the presence of a male participant with a NFC level of 81 (26 years).

#### Group UNI.1.01.E

Group UNI.1.01.E was composed by 3 men and 2 women, with NFC Mean of 56 and its NFC CoV was 0,23. The average age of them was 27 years, with the youngest having 22 and the oldest, 31 years.

What is interesting to note about group UNI.1.01.E (“Helpers”) is the fact that, although it was composed by members with a rather high

NFC combination, the members were several times stuck, not being able to decide what to do next. At one time, on the second encounter (23<sup>rd</sup> of August 2014), after they did poorly a divergent exercise to generate ideas (discovery phase) on the day before, they could not generate any convergent concepts from the “discovery” ideas. When I got close to check what was going on, I saw that they choose to work with words as “fear,” “ego” and “belonging.” And they were getting anxious and frustrated. I could witness several times discussions between the members about their frustration and, sometimes, their shame of not being able to create ideas as good as they were supposed to have.

What was also interesting about this group was the fact that two of its male members were young bodybuilders. They presented NFCs of 40 and 60. The third man member was openly gay (NFC=55). On the feminine side, one of the women members had a NFC of 75 (the highest in the group), and was labeled by me as a “preppy.” She was very enthusiastic and polite.

Although indecisive on several occasions, it was the second group to leave the room to rehearse its presentation.

During the last break of the second day, just before the presentations start, while all other groups left the room, group UNI.1.01.E kept working.

#### Panel of Judges – POJ01

Due to the lack of time to assemble an Independent Panel of Judges, I opted to ask to the participants of this study to rate the propositions that they created. It was done at the last encounter, on the 6<sup>th</sup> of September 2014. Each participant was asked to rate all other groups excluding their own on three dimensions: Originality, User-Benefit and Producibility.

As it is depicted at the two tables below, it is interesting to verify that one of the lowest NFC Mean and the lower CoV group (UNI.1.01.B – “Certificado de Macho”), obtained the lower OUP Mean amongst UNI.1.01 groups. As in other studies, it seems to confirm an impact of NFC CoV on the final OUP.

Given the analysis done on the ratings data, although this study was a subsidiary of the KISD one, the results can be considered acceptable. Not only because of the Cronbach indexes of internal consistency deemed acceptable, but mainly because I agree with the assessment that was done. Having seen the propositions created by all 18

groups, I believe that the final ranking presented at Table 37 represents a consistent ranking of innovativeness.

**Table 63 – OUP mean levels from the Study UNL1.01**

Perception Levels	Groups				
	UNL.1.01.A	UNL.1.01.B	UNL.1.01.C	UNL.1.01.D	UNL.1.01.E
Originality-Mean	8,06	6,84	6,45	7,28	8,06
User-Benefit-Mean	8,71	5,26	7,5	8,11	8,22
Producibility-Mean	6,35	6,16	7,15	7,56	7,33
<b>OUP Mean</b>	<b>7,71</b>	<b>6,09</b>	<b>7,5</b>	<b>7,65</b>	<b>7,87</b>

**Table 64 – UNL1.01's OUP Ratings by Judges**

	UNL.1.01.A – Originality UNL.1.01.A – User-Benefit UNL.1.01.A – Producibility			UNL.1.01.B – Originality UNL.1.01.B – User-Benefit UNL.1.01.B – Producibility			UNL.1.01.C – Originality UNL.1.01.C – User-Benefit UNL.1.01.C – Producibility			UNL.1.01.D – Originality UNL.1.01.D – User-Benefit UNL.1.01.D – Producibility			UNL.1.01.E – Originality UNL.1.01.E – User-Benefit UNL.1.01.E – Producibility			NFC.POJ01
POJ01.01	8	10	10	8	6	6	-	-	-	8	5	4	8	8	8	39
POJ01.02	7	7	6	8	6	6	5	7	6	9	9	9	-	-	-	40
POJ01.03	8	8	6	7	5	5	6	8	9	-	-	-	9	9	8	40
POJ01.04	-	-	-	7	7	9	6	7	7	7	8	7	8	8	7	41
POJ01.05	8	10	7	-	-	-	7	9	8	9	9	8	8	8	7	48
POJ01.06	9	10	3	8	6	6	7	6	8	-	-	-	8	9	8	50
POJ01.07	8	10	9	3	3	3	8	9	8	8	10	10	-	-	-	50
POJ01.08	8	8	8	8	5	8	-	-	-	8	10	7	8	10	5	50
POJ01.09	-	-	-	9	2	1	9	7	7	10	9	9	10	9	9	51
POJ01.10	9	10	5	-	-	-	5	7	7	7	9	8	9	10	7	51
POJ01.11	8	6	3	3	0	3	3	3	0	6	9	10	-	-	-	55
POJ01.12	7	8	4	-	-	-	4	9	3	4	7	6	6	8	3	56
POJ01.13	-	-	-	8	6	4	7	8	9	9	9	9	7	7	8	56
POJ01.14	9	9	5	8	6	6	7	6	8	-	-	-	8	9	9	59
POJ01.15	7	8	5	7	5	7	6	9	6	6	8	7	-	-	-	60
POJ01.16	9	9	6	8	3	5	9	9	8	-	-	-	9	8	7	62
POJ01.17	6	8	5	-	-	-	3	7	10	5	7	9	7	8	7	63
POJ01.18	8	9	8	6	8	9	-	-	-	7	7	9	7	4	7	64
POJ01.19	-	-	-	7	6	9	8	8	8	8	7	8	8	7	7	66
POJ01.20	-	-	-	5	6	9	8	10	9	4	7	3	9	8	8	67
POJ01.21	9	9	9	4	5	5	5	3	3	7	7	7	-	-	-	75
POJ01.MEAN	8,1	8,7	6,4	6,7	5,1	6,0	6,4	7,4	7,0	7,2	8,1	7,6	8,1	8,2	7,3	

## Making Sense of this Study – UNI.1.01

As can be inferred by examining the tables above, 4 out of 5 groups got the OUP rating ranging from 7,5 to 7,87 points. A fifth was further below with a 6,09 points OUP rating.

I believe that this homogeneity on the OUP ratings could be related to the adoption of Allport's key conditions. The fact that 4 of the 6 top OUP groups came exactly from the study that had the implementation of these conditions as its main goal, seems to me to be something significant. Of course, more in depth studies should have to be done. But, with what I have experienced so far, with the readings that I did, I believe that makes sense to say that the Allport's key conditions are potentializers for groups' capacity to create innovative propositions.

I also believe that I am, from what I learned with this study, constructing a sense making discourse that, at its core, define Design as a knowledge creation process (KROGH et al., 2013): a collaborative cognitive process of augmenting the potential to act of humans. Or, as I like to say, a process of building bridges between the different.

And by designing groups based on their motivational cognitive tendencies differences and implementing conditions to foster intergroup contact, the "daunting epistemological freedom" (RITTEL, 1987) of Design will make its way to create higher potential innovative propositions. And this is possible, contrary to common beliefs, not fitting people into processes, but by enabling different kinds of people to act towards creating their own "immanent logic" (ADORNO, 1965), a prerequisite to obtain the "original nonsense" of great works.

I think that the most important discourse element that results from this research is something that contradicts commonly accepted organizational paradigms about what kinds of people should be involved at innovative efforts. This research was based on two distinct phases of innovative efforts: one is the creative phase, and the other the judgment one. As the commonly accepted organizational paradigms seem to suggest, at the creative phase people with higher seizing tendencies should be involved. In NFC terms, these are Low NFC individual (versus High). It would be also common to involve people with higher freezing tendencies to analyses innovative propositions. Which in NFC terms, these would be High NFC individual.

The evidences of this research is pointing exactly to the opposite direction. According to the mentioned evidences, creative groups should be composed in a way that their Nfc Mean should be rather mido-to-high on the NFC scale. And judgment groups, by mid-to-low NFC Mean.

Based on these evidences, the fuzzy front-end should be faced by High NFC Mean groups and the investment decisions should be carried by Low NFC Mean groups. These interpretations echo what Stevens *et al.* (STEVENS; BURLEY; DIVINE, 1999) wrote when reporting research on the analysis of ideas for innovation, showing the importance of the presence of analysts with creative profile (which at the present research is a Low NFC profile) to achieve a more efficient analysis of innovative propositions.

This, in a sense, fulfils one of the intentions of this research which is realize a “potential for novel insights that will add significantly to – or against – previous understandings” (ALVESSON; KARREMAN, 2011, p. 57–58). In this case, I think it adds against previous understandings.

Considering all variables

As a quantitative analysis of the complexity that was described upstream, it is interesting to note that when considering all the above mentioned independent variables (W/M, NFC CoV and NFC Mean), it results in a model that has a weaker power of prediction than when compared with the other more simpler models (see Table 40 and Table 46). The regression to test a model that takes into account all four variables yields the data at Table 65.

When considering OUP Mean as a dependent variable and W/M Ratio, NFC CoV and NFC Mean as independent variables (Predictors), a multiple linear regression can verify that the resulting model yields the following data: the predicted R value of 0.668, R square of 0.446, adjusted R square of 0.328 and a Durbin-Watson index of 1,294, with a 0,036 confidence level; which indicates that the  $F(3;14) = 3,762$  of the model is statistically significant (above the critical value of 3,34).

**Table 65 – Data results from regressions analysis from all variables**

Description	Results
Dependent Variable	OUP Mean
Independent Variables (Predictors)	NFC Mean, W/M, NFC CoV
R value	0.668
R square	0.446
Adjusted R square	0.328
Durbin-Watson index	1.294
F Change	3.762
Significance F Change	0.036

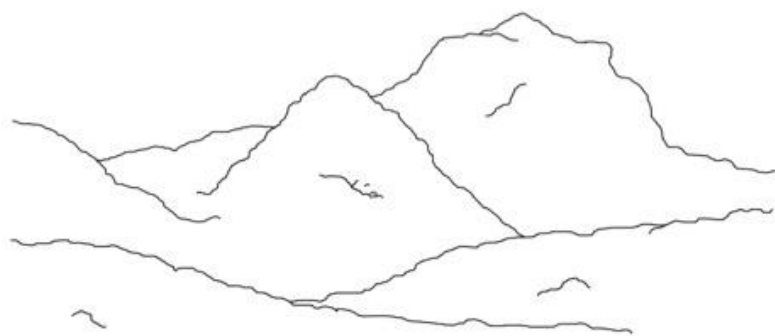
Therefore, the predictors' variables indicate that the model can explain 32,8% of OUP ratings obtained by each group. This level of explanatory power is accepted by many psychology studies due to the fact that the level of unpredictability of human behavior is high, which generates inherently unexplainable variability<sup>82</sup>.

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<sup>82</sup> “In some cases, it’s possible that additional predictors can increase the true explanatory power of the model. However, in other cases, the data contain an inherently higher amount of unexplainable variability. For example, many psychology studies have R-squared values less than 50% because people are fairly unpredictable.” Accessed on the 20/01/15 at <http://goo.gl/9kyGEG>









**Landscape:** *noun.* 1 all the visible features of an area of land, often considered in terms of their aesthetic appeal: *the soft colours of the Northumbrian landscape; a bleak urban landscape.* Origin: late 16th century (denoting a picture of scenery): from Middle Dutch *lantscap*, from *land* 'land' + *scap* (equivalent of -SHIP).<sup>83</sup>

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<sup>83</sup> <http://oxforddictionaries.com/definition/english/landscape?q=Landscape>



**Irony:** *noun (plural ironies)* [mass noun] the expression of one's meaning by using language that normally signifies the opposite, typically for humorous or emphatic effect: '*Don't go overboard with the gratitude,*' he rejoined with heavy irony.

a state of affairs or an event that seems deliberately contrary to what one expects and is often wryly amusing as a result: *the irony is that I thought he could help me.*

(also dramatic or tragic irony) a literary technique, originally used in Greek tragedy, by which the full significance of a character's words or actions is clear to the audience or reader although unknown to the character.

Origin: early 16th century (also denoting Socratic irony): via Latin from Greek *eirōneia* 'simulated ignorance', from *eirōn* 'dissembler'.<sup>84</sup>

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<sup>84</sup> <http://oxforddictionaries.com/definition/english/irony?q=irony>



## 2.4 LANDSCAPE: OPENNESS TO OTHER INTERPRETATIONS

220. *Reaction against machine-culture.* – The machine, itself a product of the highest intellectual energies, sets in motion in those who serve it almost nothing but the lower, non-intellectual energies. It thereby releases a vast quantity of energy in general that would otherwise lie dormant, it is true; but it provides no instigation to enhancement, to improvement, to becoming an artist. It makes men *active* and *uniform* – but in the long run this engenders a counter-effect, a despairing boredom of soul, which teaches them to long for idleness in all its varieties. (NIETZSCHE, 1913)

The Landscape part of this document, although all others are permeated by an ironical style, is the most ironical one. Here I try to present as much and as diverse as possible voices about the research. The interplay between design, innovation and knowledge management metaphors are worked at it, trying to reconstruct a landscape from my prejudices.

“[I]nconsistencies, fragmentation, irony, self-reflection and pluralism must pervade” here (ALVESSON; SKÖLDBERG, 2009, p. 201). As “a palatte of imageric possibilities” (Tausig apud ALVESSON; SKÖLDBERG, 2009, p. 203) the previous parts serve as springboards to pluralistic interpretations. This part takes the emancipatory interest (HABERMAS, 1971) at its broadest and encompassing sense. After all, although presented as separate, emancipation is dependent upon the empirical-analytical knowledge to be able to understand the difference between what is given by nature and what is socially constructed (ALVESSON; SKÖLDBERG, 2009, p. 156).

Represented by the image of a *landscape*, this text composes a complex ship of land, giving voice not just to criticism, but to different perspectives on the mineral/stone/mountain metaphors. The ironic tone allows to uncover other meanings to the words and actions described from my personal history vantage point, my horizons, prejudices and traditions.

Due to their non-consistency in relation to each other, this *collage de textes* is numbered and presented in a sequence guided only by what I think makes sense, which does not say much. There are no obvious relations between previous or posteriors texts, except the fact that it seemed comfortable for me. The numbering of texts, inspired by

Nietzsche' aphorisms, will follow a sequence starting from 2.4.1 and will go on until reaching 2.4.23.

### 2.4.1. Efficiency as an Ideology for the Reduction of Diversity

The reflections presented by this research, as a results of these regularity-seeking studies, are not understood by me as *revelations of the truth*. What I learned from it, the results of this research process do not equate to finding the truth, as I am not claiming in any sense that this research will or had produce any objective, nor simplified, and neither scientific concepts of truth (SMYTHE et al., 2008). I learned that a good research must be an invitation to others to think along and to feel enabled to act. Thus, its main contribution is to “enrich our self-understanding and affect the way we act” (ALVESSON; SKÖLDBERG, 2009, p. 223). As I understand it, a research

is always about offering new ideas, concepts, interpretations, and lines of reasoning that can credibly be shown to throw some light on the mystery and which seem to have a broader theoretical value for our thinking about a specific subject matter. (ALVESSON; KARREMAN, 2011).

Thus, my main goal was to vary and expand the interpretative repertoires – *a lá* Alvesson – about the relations between social diversity and knowledge creation processes.

It is interesting to see that the very “magic” numbers that support the concept of efficiency (and the contemporary knowledge paradigms of evidence and competence) can, at the same time, be used to make sense of a discourse that promotes diversity. In my opinion, this research questions the contemporary political trend where

Technology, science and administration have increasingly taken over, and politics is becoming more and more a matter of administering the social apparatus. In this way, as Habermas sees it, science and technology have come to function as ‘ideology’. Political conditions and decisions are thus concealed beneath a technocratic ideology, so that problems formulated and the solutions suggested are those best suited to a narrow means-end logic [...]. (ALVESSON; SKÖLDBERG, 2009) p. 148-149



What interests me about this issue on the ideological role of science is what Ricoeur says about “l’acceptation critique que l’on peut donner au mot “science” dans son rapport à l’idéologie” (RICOEUR, 1986, p. 319). The whole *enchantment* of the organizational lifeworld for the concept of efficiency, supported by a technocratic ideology disguised as “science,” conceal an unconcerted effort to reduce inadequacies, and to reduce diversity. This is why makes sense for me to reflect from a critical theory perspective, which

opposes the use in social contexts of experimental knowledge, or other types of regularity-seeking knowledge in imitation of the natural sciences. It warns us against social engineering and the expert-led handling of society’s various inadequacies. (ALVESSON; SKÖLDBERG, 2009, p. 156)

Although this research uses experimental knowledge in social contexts, the resulting “magic” of numbers’ true fiction discourse (supposedly to promote an increase of organizational productivity) tries to enable and commit organizations to act through an alternative way, which positively correlates diversity with organizational performance. I insist at the “true fiction” discourse because this research stands on grounds where

The evidence for none is complete or incontrovertible; but each represents as good an “educated guess” as can be made at the present time. (ALLPORT, 1979, p. 221)

Even though the evidences from this research can only be considered an “educated guess,” I believe that this resulting text, this “true fiction,” can offer interesting contributions for theories about creativity and interdisciplinary science while being statistically verifiable *sans renoncer à l’ambition d’être intégratif*<sup>85</sup> (RICOEUR, 1986, p. 314–315).

My ambition was to produce a true fiction research that can be “puissamment explicative” even though “faiblement appuyée par des tentatives rigoureuses de falsification” (RICOEUR, 1986, p. 314). After all, the epistemological strength or weakness of a social research is proportional to the force with which it denounces ideology, as Ricoeur

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<sup>85</sup> The original phrase is: “[...] pour cette raison même, renoncent à l’ambition d’être intégratives.” (RICOEUR, 1986, p. 314–315)

explains (RICOEUR, 2007, p. 256). And I believe that the present research has shown its strengths at denouncing the organizational technocratic ideology to reduce diversity.

#### 2.4.2. Three Types of Academic Research

I have a clear recollection that I have read it somewhere on Kristensson Uggla, or Alveesson, or Sköldbberg, or Karreman, or Habermas writings. Maybe it was in one of Gamdamer's text... The fact is that I could not find the text again. As I can remember, the text was: "There are three types of academic research: the first and foremost is the one that enables to reflect. The second, is the one which enables to act. And the third is just bad literature."

From these three categories of *academic research*, two can be directly related to Habermas' three cognitive interests (HABERMAS, 1971, p. 313). The *enable to reflect* type makes sense to be related to any research that "free consciousness from its dependence on hypostatized powers." And the *enable to act* type relates to both the ones that "expands our power of technical control" and the ones that "make possible the orientation of action within common traditions."

To be honest, I do not think that the text was exactly like the one above. At least, I do not like it in the form that I recollect it. I would prefer it to be like that: "There are only 3 types of discernable academics research. The first and foremost is the one that enables to question even further. The second, is the one which enables its results to be promptly applied at the lifeworld of people. And the third, is just bad literature."

#### 2.4.3. Horizons of Innovation

It seems, I believe, that we cannot *escape* our own history. Each one of us is located at an individual historical vantage point, from which a particular horizon can be seen. Nevertheless, the concept of *horizon* cannot be taken as a fixed condition faced by an individual (ALVESSON; SKÖLDBERG, 2009, p. 120):

The word 'horizon' is also meant to refer to something flexible, something that changes or can change from one time to another [...]. An individual can put herself into another individual's horizon, first moving into the other's meaning-field, using what I have previously termed

'empathy'. This, however, is not enough. For existential hermeneutics, prior to anything else ('always already') every individual is enmeshed in her meaning-field, intentional in time and space. In other words, she is never free from preconceptions inherited from the past, preconceived meanings. Nobody proceeds from a *tabula rasa* and this includes the one seeking to understand.

Applying this concept to the thinking mind it is possible to say that a person can have a starting point with *no horizon*, thus he “does not see far enough and hence over-values what is nearest to him” (GADAMER, 2004, p. 301). On the other hand, it also offers the perspectives of *narrowness of horizon*, of the “possible expansion of horizon, of the opening up of new horizons” (GADAMER, 2004, p. 301) and the *fusion of horizons*. Therefore, no matter what frames of work adopted, every group of people will have its innovative efforts concealed by its horizons diversity and its capacity to make them fuse. After all, the innovative effort demands groups to define what is “out there,” what is “in here” and “who we must become” in order to deal with these questions (WEICK, 1995, p. 70). Who “we must become” usually is limited by “who we are,” in other words, is limited by the generic subjectivity<sup>86</sup> in which “we” act.

And it is the invention rather than the discovery of the distinction between “out there” and “in here,” between “who we are” and “who we must become”

that results in people creating their own constraints, and that triggers the strange sequence in which outputs become the occasion to define retrospectively what could have been plausible inputs and throughputs. (WEICK, 1995, p. 70)

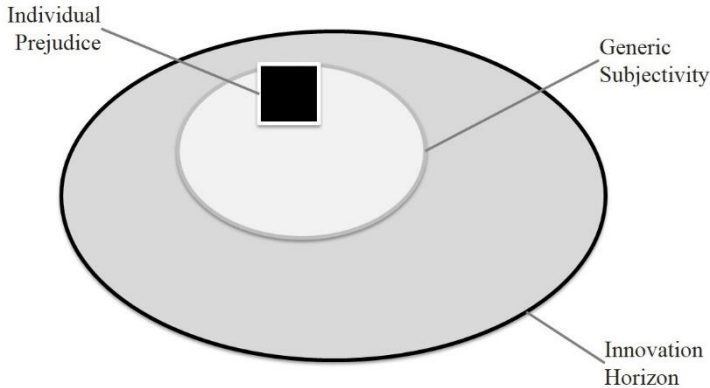
When I look at innovation process from the vantage point created by the fusion of Gadamer and Weick’s propositions, I am able to give meaning to three concepts: (i) individual prejudice, (ii) generic subjectivity and (iii) innovation horizon (see Figure 10).

*Individual prejudice* is the historical vantage point of a human being. When taken the phenomenon of innovation from a social perspective, it is possible to devise a human being as situated in a complex and wide social context along with other humans. Among this

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<sup>86</sup> “Intersubjectivity is largely irrelevant (unless gaps need to be filled) when artifacts such as standard plots create generic subjectivity and allow people to substitute for one another and adopt their activities and meanings.” (WEICK, 1995, p. 71)

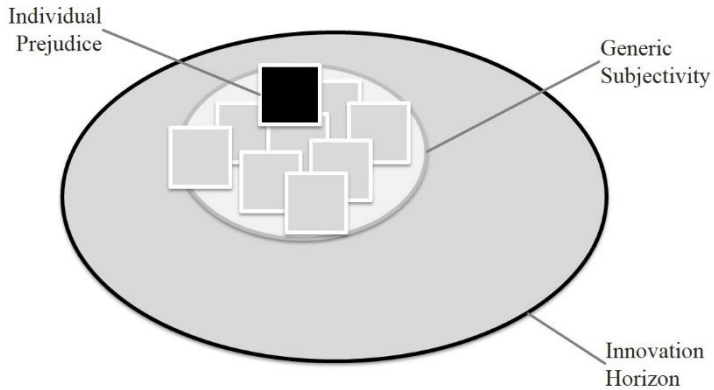
kaleidoscopic social context, it is possible to locate a self-similar group that shares more deeply some “standard plots” (WEICK, 1995, p. 71). This socio-cultural group can be said to constitute a *Generic Subjectivity*.



**Figure 10 – Horizons of Innovation and other elements**

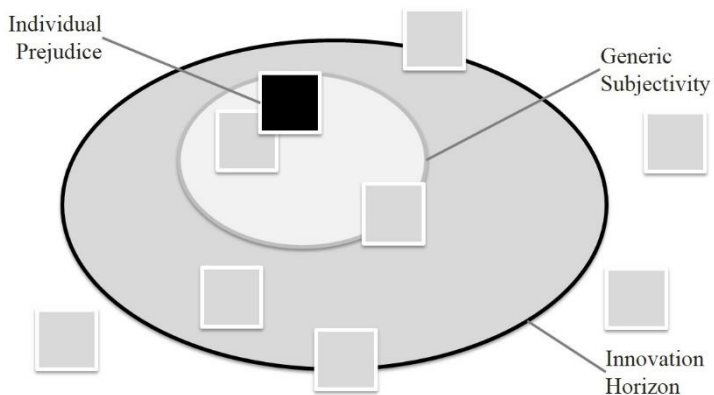
Beyond that generic subjectivity of “who we are,” there is a horizon where it is possible to expose generic subjectivity to antithetical concepts, to opportunities for reframing, learning, or comprehend of that “which seems incomprehensible” (WEICK, 1995, p. 73). From this horizon the group will be able to define retrospectively what could be plausible inputs and throughputs. By being aware of this *Innovation Horizon*, groups will be able to create new knowledge, and to augment its people’s capacity to act.

Working with these three elements, (i) individual prejudice, (ii) generic subjectivity and (iii) innovation horizon, I am able to make sense of three different situations to illustrate the three most common challenges faced by innovative efforts. The first one (see Figure 11) occurs when an innovative group or organization is composed by self-similar people, which shares a steady generic subjectivity. The latter will limit what is plausible for innovation to what is “in here,” inside the standard plot of the organization. Only a narrow range of the potential innovation horizon will seem plausible and comprehensible to the group.



**Figure 11 – Narrowness of Horizon and other elements**

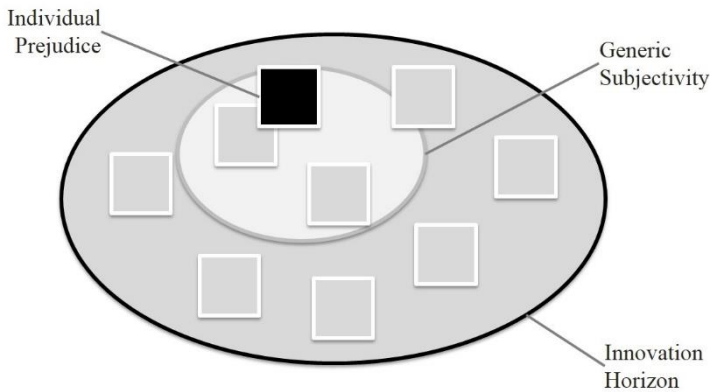
The second situation occurs when an innovative group or organization is composed by self-dissimilar people (Figure 12), which shares a small or none generic subjectivity.



**Figure 12 – High diversity of Horizon and other elements**

With such diverse group there is not enough generic subjectivity to generate a vantage point from where a horizon can be pictured. This situation does not permit a distinction between “out there” and “in here,” making anything and nothing plausible for innovation. For being a too wide range of the potential innovation horizon nothing will seem plausible and comprehensible for the group to define retrospectively.

The third situation, as seen in the next figure, occurs when an innovative group or organization is composed by a mix of different levels of self-similarity and self-dissimilarity of people, with some that share a generic subjectivity and some that do not or do little. This kind of group is, as I could learn from this research, the ideal one for innovative efforts. The relative closeness of a same generic subjectivity permits, from a plausible construction of shared historical vantage point, to picture several horizons. It is from the fusion of those horizons that individuals will be able to invent propositions that seem to be, retrospectively, plausible and comprehensible for the group to define.

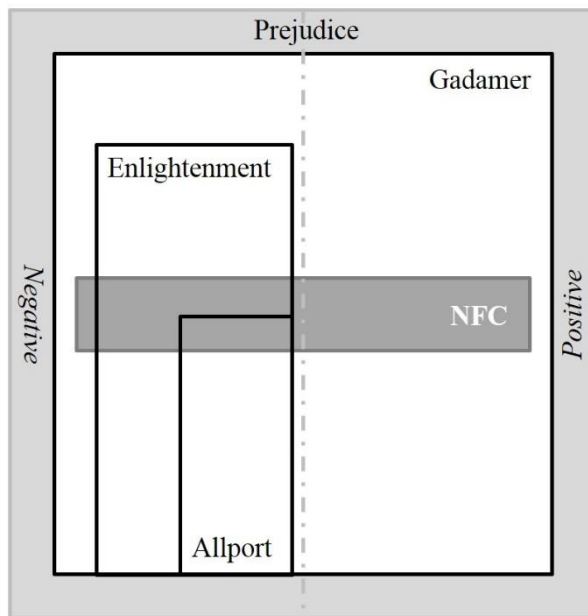


**Figure 13 – Fusion of Horizons and other elements**

#### 2.4.4. Gadamer, Allport and Kruglanski

Although since the Enlightenment the concept of prejudice acquired the negative connotation familiar today, it does not “necessarily mean a false judgment, but part of the idea is that it can have either a positive or a negative value” (GADAMER, 2004, p. 273). For example, one of its positive senses lies in the fact that it enables us “[...] to understand history as well as ourselves” (DOBROSAVLJEV, 2002). To make sense of Gadamer’s detailed discussion on the subject, I adopted the description of prejudice *as a historical vantage point where human finite understanding is situated, and which may result on judgments that are rendered before a fair amount of elements have been examined* (ALLPORT, 1979; DOBROSAVLJEV, 2002; GADAMER, 2004; KRUGLANSKI, 2004; ROETS; VAN HIEL, 2011b).

As can be seeing at Figure 14, from a hermeneutical perspective I propose to build an *arc herméneutique* (RICOEUR, 1986, p. 158) between the Need for Closure (NFC) concept and the definitions of Gadamer and Allport about prejudice. From my historical vantage point, the concept of NFC can serve as a sensemaking (WEICK; SUTCLIFFE; OBSTFELD, 2005) discourse that fits into Gadamer's notion of prejudice (with both its broad *Positive* and *Negative* connotations) and also tangentially Allport's description of prejudice. I believe that NFC supplies a *verifiable* sense making discourse while avoiding relying exclusively on the outgroup perspective on prejudice (i.e., racism and discrimination as negative connotations).



**Figure 14 – Proposed positioning between NFC and Prejudices**

Source: Based on (ALLPORT, 1979; GADAMER, 2004; KRUGLANSKI, 2004)

#### 2.4.5. Design Thoughts about Method

On the 21<sup>st</sup> of September 2012, during the d.Confessional at the Hasso Plattner Institut located in Potsdam-Babelsberg nearby Berlin

(Germany), I had the opportunity to ask David Kelley<sup>87</sup> if “Design Thinking was about to becoming a sort of an *engineering of empathy*.” As a response, in a very friendly way, he said: “*You know, we are cheating people here! We had to create step-by-step processes to help people become more creative. But in the future I hope to see less and less rules. It is like when you are learning to tie your shoes. In the beginning you have to think of each step you take. After, you just know how to do it.*” To which I answered: “*I am glad to know that you think like that!*” He just burst out laughing!

As it is known, there are several examples of organizations that adopted particular creative frameworks without resulting in any significant achievement towards fostering innovative propositions (VERGANTI; ÖBERG, 2013). As noted by Jahnke (JAHNKE, 2013, p. 349), despite the radical innovation rhetoric of these frames of work, “most innovation through design thinking in these firms was incremental.” This is supported by several hermeneutical scholars, especially Gadamer, who emphasize that the process of listening to new and external interpreters (VERGANTI; ÖBERG, 2013) “cannot be reduced to the application of a ‘method’” (THOMPSON, 1997, p. 439). A method, as any kind of control, seems to drive out the potential for innovativeness. The necessary “immanent logic” (ADORNO, 1965) of originality will not blossom whenever

organization becomes synonymous with control, and generic subjectivity becomes sealed off from any chance for reframing, learning, or comprehension of that which seems incomprehensible. (WEICK, 1995, p. 73)

The possibility to make sense of what seems incomprehensible, the possibility to retrospectively create “innovations to manage complexity” (WEICK, 1995, p. 73) increases when tension between intersubjective meaning<sup>88</sup> and generic subjectivity (control) does not so much confine “as suggest incitements to play” (GADAMER, 2004, p. 41). To be able to

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<sup>87</sup> David Kelly (born 1951) is an American businessman, entrepreneur, designer, engineer, and teacher. He is founder, chairman, and managing partner of the design firm IDEO and a professor at Stanford University. He has received several honors for his contributions to design and design education. – [http://en.wikipedia.org/wiki/David\\_M.\\_Kelley](http://en.wikipedia.org/wiki/David_M._Kelley) – accessed on the 14/01/2014.

<sup>88</sup> “Intersubjective meaning becomes distinct from intrasubjective meaning when individual thoughts, feelings, and intentions are merged or synthesized into conversations during which the self gets transformed from “I” into “we.” (WEICK, 1995, p. 71)



reflect about organizational tradition, and its enactments of control, it is necessary to take into account the fact that “even most genuine and pure tradition does not persist because of inertia of what existed” (GADAMER, 2004, p. 282). Essentially, preservation is as much a freely chosen act of reason as are revolutions and innovations. Thus, revolutions are not extraneous acts to organizations, they are as much acts of reason as the control ones are. But organizational knowledge paradigms, like “Evidence” (KRISTENSSON UGGLA, 2010, p. 80), constitute beliefs embedded in frames and ideologies that influence what is noticed and how events unfold (WEICK, 1995, p. 133): “believing is seeing.”

Fundamentally, these Design Thinking frameworks should enable groups to create new knowledge; i.e. to discover wisdom about the environment. But most of the times, if any, they seem to enable knowledge sharing only, particular knowledge sharing (NONAKA; TOYAMA; KONNO, 2000; NONAKA; TOYAMA, 2003) and in very precise directions. Sharing knowledge it is not enough for enacting creativity. To do that, it is necessary to create knowledge. Which can only be created in

the spiral that goes through seemingly antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, deduction and induction, and creativity and efficiency. (NONAKA; TOYAMA, 2003, p. 02)

Summing it up, knowledge can only be purposely created by organizations if they avoid controlling the creative process. If it enables generic subjectivity to be exposed to antithetical concepts. An organization will be able to create new knowledge, to augment its members capacity to act, only if it promotes opportunities for reframing, learning, or comprehend of that “which seems incomprehensible” (WEICK, 1995, p. 73).

Even though innovative frames of works can be said to be self-deceiving<sup>89</sup> tools, it seems that in some cases its use did help enact an empathic understanding of the Different and spur innovative solutions (BROWN, 2008). One good “educated guess” (ALLPORT, 1979, p. 221) that could help explain that phenomenon may lie in the very own characteristics of the group of people that created that particular solution.

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<sup>89</sup> “In matters of sensemaking, believing is seeing.” (WEICK, 1995, p. 133)

Not in the framework itself. Therefore, organizations that adopted successfully an innovative framework, would be successful if had it adopt any frames of work. The success of its innovative effort was due to the particular generic subjectivity that characterize that organization. It was due to its creative people.

#### 2.4.6. Creativity and Prejudice

Creativity can be understood as a process that “entails some variation-selection process (or set of such processes) that generates and winnows out numerous conceptual combinations” (SIMONTON, 1997, p. 67). The capacity to assess the resulting combinations is directly related to the capacity of a group to define retrospectively what seems plausible and comprehensible (WEICK, 1995, p. 73). Nevertheless, contemporary organizations call often for the myth of creativity, novelty and diversity through banal rhetorical formulations. Which, most of the times, evade a confrontation with a real legitimization of something that “modernidade procurou apagar definitivamente no seu necessário processo de contínuo renascimento do efêmero: a tradição e o preconceito”<sup>90</sup> (GINOULHIAC, 2009, p. 282).

Fundamentally, those calls for creativity are based on the assumption that people are sensible enough to understand different points of view; and to abandon their tradition and prejudice. There is an organizational belief that just by adopting a creative frame of work, it will enable its members to free themselves of their prejudices and embrace the “Other;” or that these frames will enable people to make the “fusion of horizons,” as described by the hermeneutical literature (GADAMER, 2004). Unfortunately, the necessary empathic understanding to “pivot” (RIES, 2011, p. 177) its own view of the world is not evenly distributed on a population. Open-mindedness seems not to be an open-entrance territory. Nevertheless, since the end of the Second World War (1940-1945), “open-mindedness is considered to be a virtue” (Allport, 1979, p. 20).

But, strictly speaking, it cannot occur. A new experience *must* be redacted into old categories. We cannot handle each event freshly in its own right. If we did so, of what use would past

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<sup>90</sup> As translated by me: “modernity sought to permanently delete in its necessary process of continuous renewal of the ephemeral: tradition and prejudice.”

experience be? Bertrand Russel, the philosopher, has summed up the matter in a phrase, “a mind perpetually open will be a mind perpetually vacant. (Allport, 1979, p. 20)

And, as this research and other studies (MANHÄES; MAGER; VARVAKIS, 2013, 2014) are showing, a simple adoption of a “Design Thinking” framework (JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013) may not be enough to free people of their own history and of the generic subjectivity in which they act. Kruglanski and Webster point that (KRUGLANSKI; WEBSTER, 1996, p. 263):

Specifically, individuals may desire knowledge on some topics and not others, and they may delimit their constructive endeavors to those particular domains.

And thus, it can happen exactly the opposite: some of these frames of work may actually reinforce particular kinds of visions and then not deliver on their promises of creativeness. Although more research needs to be done about the mentioned promises offered by creative frames of work, it is possible to assume that one of their main one should be to offer the possibility to enact a process of *Bildung*. In English, this word corresponds to *formation* and can be described as (GADAMER, 2004, p. 15):

[...] keeping oneself open to what is other – to other, more universal points of view. It embraces a sense of proportion and distance in relation to itself, and hence consists in rising above itself to universality.

Therefore, keeping oneself open to what is other can be considered a fundamental condition for groups’ creative efforts, especially towards obtaining innovative propositions. But, as explained by Kruglanski & Webster (1996), depending on the personal history of the participants at such effort, this is something that is not simple to attain. Certainly, the desire of *opening oneself to what is other* it is much more complex than just adopting a creative framework as the ones related to the contemporary popular zeal displayed for the concept of “Design Thinking” (JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013).

To facilitate the understanding of the involved complexity, Gadamer's concept of the "distorting mirror" offers a valuable argument to discuss the relation between thinking minds and groups' innovative efforts (GADAMER, 2004, p. 278):

In fact history does not belong to us; we belong to it. Long before we understand ourselves through the process of self-examination, we understand ourselves in a self-evident way in the family, society, and state in which we live. The focus of subjectivity is a distorting mirror. The self-awareness of the individual is only a flickering in the closed circuits of historical life. *That is why the prejudices of the individual, far more than his judgments, constitute the historical reality of his being.* (Italics are from the original text)

It follows that it is difficult for one to be *self-aware* and aware of what is the Other. The process of awareness, as Gadamer explains, starts from a particular historical standpoint. Then, through a process of *Bildung*, the individual moves "in a circular pattern centrifugally towards understanding" (JAHNKE, 2012) what is the Other and oneself. Jahnke explains also that this movement starts from one's own historical standpoint and goes on in encountering the Other in an interpretive process, i.e. in a hermeneutic process.

#### **2.4.7. Collaborative creativity**

Departing from understanding hermeneutics as a practical philosophy<sup>91</sup>, Gadamer clearly states that (GADAMER, 2004, p. xxxiv):

What man needs is not just the persistent posing of ultimate questions, but the sense of what is feasible, what is possible, what is correct, here and now.

As in any creative effort, it is not just about the genuineness of an idea, it is also "the ingenious manipulation of fixed forms and modes of statement" (GADAMER, 2004, p. 62) that generates a creative solution

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<sup>91</sup> In a sense that "there are no universals given in advance that could be cognized and afterwards in an unchanged form utilized: the field of praxis depends on concrete situation" (DOBROSAVLJEV, 2002, p. 606).

at the end. The concept of prejudice as “fixed forms and modes of statements” can be of a very practical application at the “here and now” of groups. Especially, if considering that it can be ingeniously manipulated to enable organizations to “act into the future” toward fostering creativity. Hannah Arendt<sup>92</sup> perspective of *acting into the future* as a “We” not “I” helps make sense of how groups can approach creative efforts. In her own words, when she answers a questions by Roger Errera about a contemporary persistence of thinking based on historical determinism (LUDZ, 1999, p. 56):

The trouble with this whole business – and it is really an open question – is the following: We don’t know the future, everybody acts into the future [which] nobody can at all know. Nobody knows what he is doing, because the future is being done. Action is a WE and not an I. Only where I am the only one, if I were the only one, could I foretell what’s going to happen from what I am doing. Now it looks as though what actually happens is entirely contingent, and contingency is indeed one of the biggest factors in all history. Nobody knows what is going to happen simply because so much depends on an enormous amount of variables, as they say, that is, in other words, on the simple hazard.

What Arendt brings to the concept of group creativity is the perspective that, as it is a WE-action into the future that involves an “enormous amount of variables,” its level of predictability is forcefully lower than the one of an I-action that involves few variables. This WE-action of manipulating fixed forms and modes of statement could be promoted by increasing the awareness of groups’ members about the impacts that their own prejudices have on creative efforts. What an organization, as a social context, itself part of a society, considers valid is what receives a “stamp from the commonalities of social life. Such a society chooses and knows what belongs to it and what does not” (GADAMER, 2004, p. 73). If a group, as a generic subjectivity, decides that itself is not creative, then the sum of its members will not be able to make sense of anything “new.”

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<sup>92</sup> Hannah Arendt 1974’s interview with the French writer Roger Errera. Accessed in 23/06/2014 at <http://www.youtube.com/watch?v=b1u5OjatwQA> , around 3’40”.

### 2.4.8. Creative People

The contemporary organizational literature and sense making discourses (WEICK; SUTCLIFFE; OBSTFELD, 2005) have several examples and anecdotes that help shed some light on how are “creative people.” One of these anecdotes, to mention but a few, was brought to life by Steve Blank, who declared on an interview that Steve Jobs (one of the founders of Apple Computers, Inc) “was truly a renaissance man.” Describing that Jobs “actually talked to a lot of people from a variety of fields” (COOK, 2013). Maybe what Blank meant is that Jobs was just curious and interested in knowing different perspectives. As do most creative frameworks, especially Design Thinking ones, they suggest that organizational people should have to free themselves from their entrenched standpoint and go “out there” to meet the other, to meet the different.

Taking Jobs personality as an example, it is important to understand that he was a very “different” person. As several anecdotes that can be read in his biography (ISAACSON, 2011), he used to be a radical vegan, and taking a shower was a rare event for him during his early adult life. To release stress he used to soak his feet in the toilet (p. 82); and, before having a family, he used to rent bedrooms of his house to all sorts of “crazy people” (p. 87). This kind of person has a privileged vantage point of the social context. She or he can better reap the benefits of co-creation, on viewing the perspective of others; on creating “reality distortion fields” (ISAACSON, 2011, p. 117); and enacting the fusion of horizons. But creativity is *not* about “eccentric personality,” as described by Amabile (1996, p. 2) in a text about creativity and innovation in organizations, reinforcing that “truly creative work is not only novel; it is also appropriate.”

Thus, these anecdotes about Steve Jobs are also suitable to make sense of two characteristics endorsed by the hermeneutical perspective: the openness to the Other and the “sense of what is feasible, what is possible, what is correct, here and now” (GADAMER, 2004, p. xxxiv). In that sense, “creative people” can be defined as a combined capability of “persistent posing of ultimate questions” (GADAMER, 2004, p. xxxiv) in one extreme, *and* having a sense of what is “feasible here and now” on the other. Which means that either questioning endlessly a situation *or* focusing solely on what is feasible here and now will not commit people

in a determined social context to act “into the future.”<sup>93</sup> This *commitment to act* being understood as a sense making process (WEICK; SUTCLIFFE; OBSTFELD, 2005) that produces new knowledge, i.e. increases the capacity to act (NONAKA; VON KROGH, 2009).

#### 2.4.9. Creativity as Thinking

One key ingredient for creativity is the awareness of the prejudices at play on a determined social context. To understand what it is meant by the word *prejudice* it is necessary to consider Gadamer’s discussion about it. First, he advocates “that all understanding inevitably involves some prejudices.” And, by prejudice, Gadamer means “a judgment that is rendered before all the elements that determine a situation have been finally examined” (GADAMER, 2004, p. 272). Based on that assumption, creativity can only be enacted when prejudice is metaphorically

put aside in order to think, in order to dare to think – according to the famous adage *sapere aude* – so that one may reach the age of adulthood or *Mündigkeit*.” (RICOEUR, 2007, p. 274)

In that sense, accepting that one must be aware of his/her prejudices in order to think, creativity (as an act of thinking) can only be enacted by an individual after daring to reframe, learn, or comprehend “which seems incomprehensible” (WEICK, 1995, p. 73).

One description that gives meaning to the enactment of creativity is understanding it as a process of blind variation and selective retention (CAMPBELL, 1960; SIMONTON, 2010b). This perspective, although built upon Darwin’s theory (DARWIN, 1860), cannot be farther from the liberal ideology. Which created its discourse based on Newtonian naturalistic philosophy, oriented by the principle of least action, as masterfully explained by Celso Furtado<sup>94</sup> (FURTADO, 2008, p. 83).

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<sup>93</sup> Hannah Arendt 1974’s interview with the French writer Roger Errera. Accessed in 23/06/2014 at <http://www.youtube.com/watch?v=b1u5OjatwqA>, around 3’40”.

<sup>94</sup> “A primitiva ideologia liberal formou o seu discurso com elementos da filosofia naturalística que se impôs de forma avassaladora no século subsequente à publicação dos *Principia* de Newton. Os indivíduos, orientados pela lei do menor esforço (expressão da razão inerente à natureza humana) e impulsionados pelo desejo de melhorar o próprio bem-estar, produziram coletivamente um sistema de forças sociais cuja adequada canalização institucional assegurava o *progresso*.” (FURTADO, 2008, p. 83)

The demands of *sapere aude* are diametrically opposed to the principle of least action. Blind variation can only be obtained by daring to reframe, learn, or comprehend “which seems incomprehensible” (WEICK, 1995, p. 73). Although named “blind,” these “variations are not inevitably random, and are actually seldom so” (SIMONTON, 2010b, p. 157). This blindness characteristic have a direct connection with the depiction of Ancient Rome’s female goddess of justice, called Iustitia<sup>95</sup>. Since Roman times, she has been depicted blindfolded, carrying a sword and scales. Interesting enough, the blind variation effort of creativity can be better understood as an act of *critique vraiment critique par rapport à l’idéologie* (adapted from RICOEUR, 1986, p. 319).

Besides that qualitative difference of the created variations, it is also necessary variations in quantity. From the work of Simonton (SIMONTON, 1997, 1999, 2010b), it is possible to justify that, for the creativity enactment to generate records of “quality”, records must be produced in “quantity”. According to Simonton (1997, p. 73): “Quality is then a probabilistic function of quantity.”

By adopting the evolutionary process as a generative metaphor (SCHÖN, 1979) to approach creativity of groups, makes possible to understand it as a self-organizing phenomenon (ABEL; TREVORS, 2006). Which, as the evolutionary process, can make complex global patterns emerge from local interactions (LANSING, 2003). Which can also be interpreted “as the building of a ‘bridge’ between the problem space and the solution space by the identification” of key concepts (DORST; CROSS, 2001, p. 435).

Some of these interactions occur from and between certain people with certain attitude and aptitude (SCHUMPETER, 1927). Interactions which “require creativity and energetic activity in order to create anything new of importance” (SCHUMPETER, 1912, p. 74). This reasoning draws the focus to the capacity to create anything new of importance; i.e. back to the phenomenon of creativity. As explained by Simonton, creativity is

positively associated with personal traits that I associated with the capacity to general blind variations, namely, divergent thinking, openness to experience, and reduced latent inhibition. (SIMONTON, 2010a)

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<sup>95</sup> More information at: [http://en.wikipedia.org/wiki/Lady\\_Justice](http://en.wikipedia.org/wiki/Lady_Justice) (accessed on the 09th of November 2014).



Thus, creativity can be understood metaphorically as an evolutionary process of blind variation and selective retention (CAMPBELL, 1960; SIMONTON, 2010b). To clarify the relation between blind variation and open-mindedness, it worth mention that this particular “variation” must be the product of explorations “going beyond the limits of foresight” (CAMPBELL, 1960). In that sense,

the successful explorations were in origin as blind as those which failed. The difference between the successful and unsuccessful was due to the nature of the environment encountered, representing discovered wisdom about the environment. (CAMPBELL, 1960)

Campbell (1960) advocates that discovered wisdom about the environment, which can be understood as a creation of knowledge, occurs through a process of blind variation and selective retention. And it is important to note

that blind does not mean random nor unintended; rather, it means that the validity of new conjectures can never be known in advance since those tests of validity always lie in the future when the relevant knowledge has emerged and been tested. (SHIONOYA; NISHIZAWA, 2009, p. 134)

Fundamentally, the majority of the contemporary organizational creativity practices are based on the assumption that people are sensible enough to understand different points of view. That these frames of work will enable people to free themselves of their prejudices and produce blind variations; that they will enable people to make the “fusion of horizons”, as described by the hermeneutical literature (GADAMER, 2004). As noted by Jahnke (JAHNKE, 2013, p. 349), despite the radical innovation rhetoric of these frames of work, “most innovation through design thinking in these firms was incremental.” I should even add “accidental,” as an opposition to blind variation.

### 2.4.10. Etymology of Innovation

The origin of the English word innovation comes from the Latin word *innovare*. By its turn, the Latin word *innovare*<sup>96</sup>, is composed by the Latin prefix *in-*, which means *no* or *not* (like *in-visible*, *in-dependent*, *in-tolerant*); and the Vulgar Latin word *novare* meaning *renovate* or *renew*, very close to the notion of *to repeat*, *to do again*. Thus, the word *renovation* can help define *innovation* in the sense that the former means making *something old* feeling or looking like new. While the latter, *innovation*, means making a new thing without repeating anything previously done. Therefore, *innovation* means to “not repeat”.

From a hermeneutic perspective, do “not repeat” sounds quite challenging. After all, “far more of the old is preserved” in ages of revolution than anyone can ever know (GADAMER, 2004, p. 282–283).

### 2.4.11. Innovation’s Sweet Spot

On December the 16<sup>th</sup> 2014 Prof Dr Roets sent a message to me with the following words:

*The determination of ideal range is a tricky one, you have tested the data with linear regression. Who is to say that 59 is the upper limit for NFC in the ideal group? Your findings only indicate that the higher NFC groups generally produce better outcomes. Maybe a (fictitious) group with a score of 75 would even do better. In order to make strong claims about ideal range, your results should show a curvilinear effect (reverse U).*

Then, on the 18<sup>th</sup> of December 2014, he added in another message:

*Anyway, the finding that high NFC groups do better on creative tasks (at least if that is what the OUP variable reflects) is highly counterintuitive. I think you will have a big challenge ahead explaining this finding...*

The fact that the “numbers” were indicating a linear relation between NFC and OUP was counterintuitive in, at least, two perspectives. First, as echoed by Prof Dr Roets, the literature seems to point to the opposite direction: Low NFC individual (versus High) should be perceived as more creative. Second, my experience doing these studies lead me to believe that there was an inverted U relation between NFC and

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<sup>96</sup> Information obtained on the 29<sup>th</sup> of October 2014, from the internet address: <http://www.myetymology.com/latin/innovare.html>

OUP. As a matter of fact, a paper (MIRON-SPEKTOR; BEENEN, 2015) published in January 2015 seems to corroborate that belief of mine.

Therefore, to check my perception, which was not portrayed by the data set resulting from the 18 groups, I had the opportunity to make one more study during a 3 weeks discipline, under my supervision, entitled “Design Thinking and Innovation” at the Universidade do Vale do Itajaí (UNIVALI), in Florianópolis, Brazil. The discipline started on the 21<sup>st</sup> of November and ended on the 06<sup>th</sup> of December of 2014. Thus, before Prof Dr Roets sent me the above mentioned messages.

This particular study, named UNI.1.02, focused on designing groups that would present 3 distincts levels of NFC Mean: low, mid and high. As with the other studies, I did the design of the groups based solely on the NFC levels of each participant, without taking their gender into account. Due to the fact that I had already done all the analysis based on the 18 groups’ data set, I opted not to add these 3 new groups in order to avoid having to analyze everything all over again.

As stated above, the main goal of this study was to verify the belief that I had of an inverted U relation between NFC and OUP. Interestingly enough, designing groups based on extreme characteristics (low, mid and high NFC levels) creates a lot of stress during the development of the workshop’s activities. It is clear to me that, excluding the mid-NFC group, both the low and high groups’ participants endured several stressful events. From facing difficulties for divergent thinking within the high-NFC group, to lack of agreements on tasks within the low-NFC one, significant amounts of tension emerged as these groups had to act collaboratively towards reaching the due goals. These kind of tensions, which produced stressful consequences during the KISD study, were the reason I withdrew from designing extreme groups. Instead, I started designing groups with mid-to-low NFC Coefficient of Variation (below 0,25).

It is also worth of note that two male students did not fill the NFC questionnaire. One, did not due to the fact that he made his enrollment too late and the other, officially refused to fill it. As an automatic reaction from me, I assigned the latter to the low NFC group (UNI.1.02.A). The other, I assigned to the high NFC group (UNI.1.02.C). During the development of the discipline, the student assigned to the low group was perceived by me as having a low NFC. Although assigned to the high NFC group, the other one was clearly a mid-NFC individual. They are both identified at the following table by “n.a.” as not available.

**Table 66 – UNI.1.02’s Individual NFC, NFC Mean and NFC CoV**

PARTICIPANT	Groups		
	UNI.1.02.A	UNI.1.02.B	UNI.1.02.C
1	40	51	59
2	46	51	61
3	47	53	65
4	48	56	77
5	n.a.	58	n.a.
6			
Women	2	4	3
Men	3	1	2
NFC Mean	45,25	53,80	65,00
NFC CoV	0,08	0,06	0,11

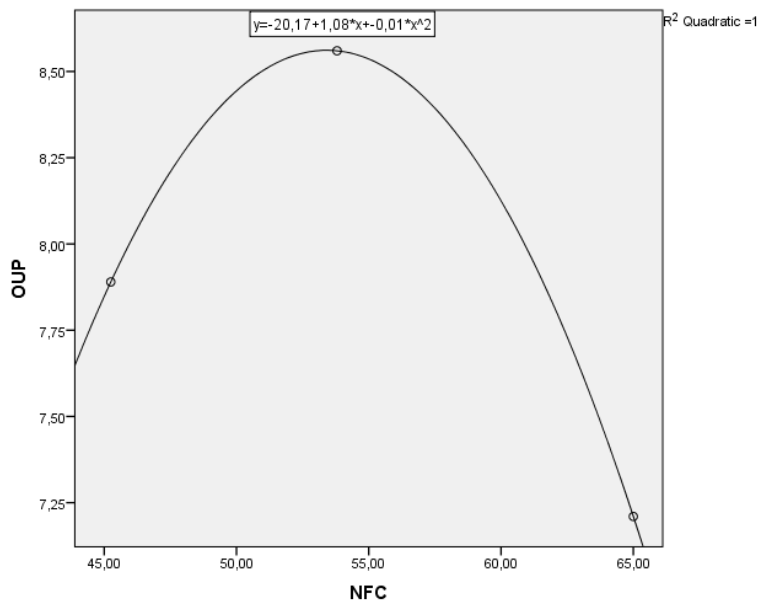
### Panel of Judges – POJ02

Based on my previous experience with study UNI.1.01, I opted to ask for the participants of this study to rate the propositions that they created. Thus, a Panel of Judges was created (POJ02) at the last encounter, on the 6<sup>th</sup> of December 2014. Although not all students were present at the final meeting, each participant was asked to rate all other groups excluding their own on three dimensions: Originality, User-Benefit and Producibility.

The following table presents the consolidated results for the UNI.1.02 study. Although this single study (UNI.1.02) cannot be taken as evidence that my perception of an inverted U relation between NFC Mean and OUP Mean proceeds, it is nevertheless symptomatic that it indeed yielded a  $R^2$  quadratic = 1, as can be seen at Figure 15.

Based on this research, considering my whole experience during these 4 years, hosting more than 20 workshops, involving some 300 participants from 10 different countries, it makes sense to me that there is a sweet spot where innovation occurs. The Need for Closure scale, in the format that I used, which considers only 15 items (ROETS; VAN HIEL, 2011a), leads to a specific range where innovative propositions seem to have a greater potential to occur.

NFC literature proposes a continuum where on an edge there is the Low NFC individual, and on the other, the High NFC individual. The resulting range can go from 15 points on the lower side, to 90 points on the high end. It means that the Middle NFC individual should present 52,5 points. The present research and its studies indicate that the sweet spot for innovation is located between 52 and 59 points. Which means that individuals with a greater potential for innovation are the ones that tend to the High NFC side of the continuum.



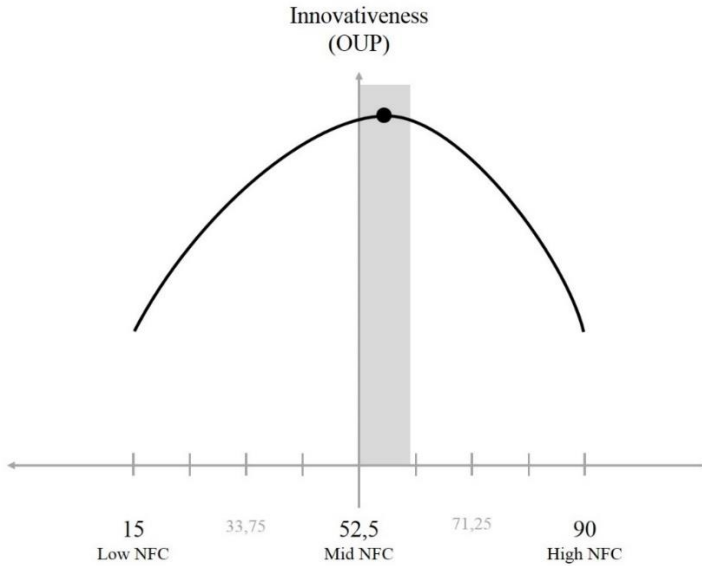
**Figure 15 – OUP/NFC Inverted U Relation at UNI.1.02**

**Table 67 – OUP mean levels from the Study UNI.1.02**

Perception Levels	Groups		
	UNI.1.02.A	UNI.1.02.B	UNI.1.02.C
Originality-Mean	9,00	7,67	6,38
User-Benefit-Mean	7,78	8,56	9,00
Producibility-Mean	6,89	9,44	6,25
<b>OUP Mean</b>	<b>7,89</b>	<b>8,56</b>	<b>7,21</b>
<b>NFC Mean</b>	<b>45,25</b>	<b>53,80</b>	<b>65,00</b>

This is the same as to say that, instead of inviting the obvious “creativity” people to work on new business propositions, it should be invited people with a higher closure tendency, a tendency to “get things done.”

On the propositions analysis side of the innovative effort, this same research indicates that the analysis should not be done by the higher NFC individuals. On the contrary, the “investment” analysis should be done by individuals with a tendency to avoid closure, which is located below 52,5 points.



**Figure 16 – Innovativeness Sweet Spot**

The above mentioned NFC range can also help to define innovation itself. As the highest OUP products were created by groups located at this particular NFC range, it is possible to infer that *innovation* is located almost at the middle way between chaos/disorder and structure/order with a light but clear tendency to this latter one.

#### **2.4.12. Innovation as Interdisciplinarity**

In the same way that a text is detached from its author, an action is detached from its agent and develops consequences of its own. This autonomization of human action constitutes the *social* dimension of action. An action is a social phenomenon not only because it is done by several agents in such a way that the role of each of them cannot be distinguished from the role of others, but also because our deeds escape us and have effects we did not intend. (RICOEUR, 2007, p. 153)

More than 80 years have passed since Joseph Schumpeter wrote that the childhood of every science is characterized by the prevalence of “schools,” each claiming to be in “exclusive possession of Truth and to

fight for absolute light against absolute darkness” (SCHUMPETER, 1927). Describing the characteristics of the Economic Science, he writes in 1927, that it was still plenty of “products of bad workmanship passing themselves off as new departures” (SCHUMPETER, 1927). Following which he adds that the living part of the Economic Science showed signs of “convergence effort, which is the necessary and sufficient condition of serious achievement” (SCHUMPETER, 1927).

Although Schumpeter himself did not relate explicitly innovation with interdisciplinarity, his “The Explanation of the Business Cycle” starts with interesting considerations about different economic “schools” trying to explain the problem of economic cycle. He reasons that, although each of these “bodies of men” (i.e.; “bodies of doctrine,” as defined by him) stress on points of difference, “their results mostly point towards common goals” (SCHUMPETER, 1927).

Nowadays it is academically accepted that, beyond having an “inter-school” perspective towards explaining the business cycle, he adopted an interdisciplinarity one for finding explanations “where facts and problems are before all of us in a clear and in the same light” (SCHUMPETER, 1927). It is also interesting to note that, immersed in his own time, he expected that a convergent analysis and description of the business cycle could “co-operate in something like the spirit of physical science” (SCHUMPETER, 1927). Expectative to which he was not totally mistaken, due to the fact “there is something strangely, almost uncannily, repetitive in the changes” of business cycle (SEWELL, 2008). While it is true that social processes are understood as unpredictable, uneven and discontinuous “there is some central mechanism of capitalism that has remained essentially unchanged for a century and a half” (SEWELL, 2008). Recognizing this contradiction at the core of capitalism, and the business cycle within it, opens up a wide horizon for interdisciplinary research.

Nevertheless, although imbued with the spirit of physical science, Schumpeter was one of the first economists to associate innovation with social phenomenon and economic growth.

As succinctly presented above, innovation can be approached as a multi, inter and transdisciplinary phenomenon. Its components, processes and application landscapes allow several approaches to research and studies. Regarding the goals of HOI2, describing innovation as an interdisciplinarity phenomenon implies in presenting some perspective that could at the same time recognize the contradictions of its eventful timeliness as a social process and the mechanistic regularities of capitalism’s abstract forms (SEWELL, 2008). Which means to open

opportunities for interdisciplinarity research to connect its simultaneously “still and hyper-eventful temporality” (SEWELL, 2008).

Innovation and interdisciplinarity can be connected through several bridges, composed by many elements, and subjected to different lens of analysis (including disciplines). Hence, this text will focus on how to relate innovation and interdisciplinarity in three specific ways: (1) by recognizing that innovation is an interdisciplinarity phenomenon; (2) by recognizing that interdisciplinarity is an innovation to classical disciplinary systems; and (3) by trying to present both innovation and interdisciplinarity in the same light. In the following texts, I describe these three connections from an interdisciplinarity perspective.

As a complex system, innovation has been studied according to several lights and by a myriad of researchers in the last century. However, going back to its academic birthplace, by the hands of Schumpeter (1912, 1927, 1943), seems an illuminating exercise.

*Grosso modo*, he describes the economic business cycle as a series of waves of economic depressions and booms. The latter being the result of re-established equilibrium (business routine), as a consequence of actions developed by innovators that “rush ahead” (SCHUMPETER, 1927), that then are followed by others as *tried and tested* new business routines start to crystalize and yield attractive profits. As soon as an equilibrium is established, more and more organizations adhere to these new routines, driving profits to diminish. Due to that decrease of return on capital, “*certain people*” with certain attitude (SCHUMPETER, 1927) focus their “brain” on developing new combinations of factors of production. Schumpeter explicitly claims that “there seems to be more “brain” in business during depression” (SCHUMPETER, 1927). And it is during depression that errors augment by the fact that organizations are acting outside of routine, and by acting in “a situation disturbed by action outside of routine” (SCHUMPETER, 1927).

What is of note is the fact that most of those errors would not have being errors at all during the previous equilibrium, and should be considered consequences and not causes of depression. It is *extremely probable*, as Schumpeter ponders, that these recurring “crises” are an essential element of the capitalistic process and “not merely occasional breakdowns” (SCHUMPETER, 1927). Citing Clément Juglar (1819-1905), he subscribes to the notion that “La cause unique de la dépression c’est la prospérité” (SCHUMPETER, 1927). This cyclical process of Creative Destruction, in his words, “is the essential fact about capitalism” (SCHUMPETER, 1943). However predictable is the incessant revolution of the economic structure *from within*, there is no point in appraising its



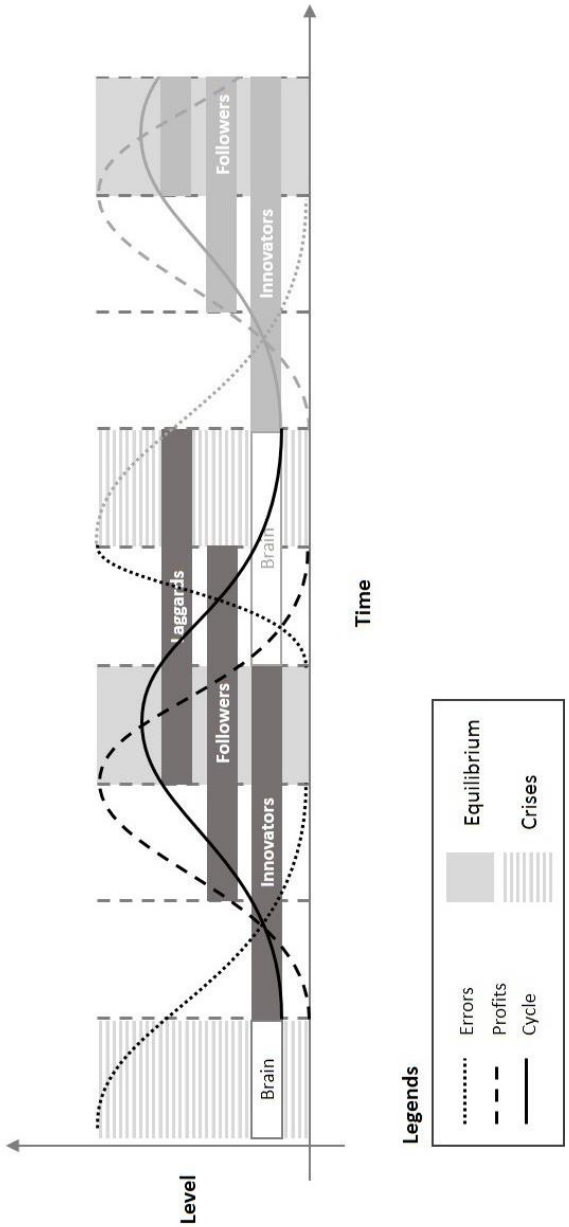
performance on a given point in time (SCHUMPETER, 1943). Its performance can only be judged over time “as it unfolds through decades or centuries” (SCHUMPETER, 1943). I propose, in Figure 17, a simplified graphical representation of the economic business cycle as described by Schumpeter himself in one of his seminal works (SCHUMPETER, 1927).

What can be inferred from Schumpeter’s definition of innovation is its knowledge creation characteristic. As described by Sewell (SEWELL, 2008), after “new combinations” (i.e.; innovations) start to yield results,

investments rush in, searching for enhanced profits; credit, employment and production expand in the area of innovation; meanwhile firms, regions or industries disadvantaged by the innovation experience the destructive side of creative destruction. Over time, the enhanced profits earned by the innovator will inevitably decline as others copy the innovation and scramble for their share of the spoils; credit will shrink as some of the new firms fail or are unable to meet earnings projections; and recession, local or general, arrives.

In summary, Schumpeter’s logic describes innovation as a cyclical process that goes through (i) “brain” activities during crises, (ii) then a series of experiments of new combinations, and (iii) reaches a new equilibrium, which is supported by new organizational routines that are, finally, (iv) copied by others. These routines, resulting from new combinations of production factors, can be considered as explicit knowledge obtained through a knowledge creation process (NONAKA; VON KROGH; VOELPEL, 2006).

Although economic viable *new combinations* may already be available as knowledge (scientific and/or other) or as invention, they may lie unused indefinitely. And that may be as so, “[b]ecause doing what has not yet stood the test of experience is no mere act of ordinary business practice” (SCHUMPETER, 1927). And that unordinary business practice prompt for certain people with certain attitude and aptitude (SCHUMPETER, 1927): entrepreneurs. In addition, it is worth to note that the dynamics of innovation – as in the case of entrepreneurship – occur “in the space of Knightian uncertainty, goal ambiguity and environmental isotropy” (Sarasvathy et al., 2008).



**Figure 17 – The Explanation of the Business Cycle**  
 Source: adapted from Schumpeter (1927)

Economic life goes on in that environmental isotropy; an environment that changes and “by its change alters the data of economic action” (SCHUMPETER, 1943). Under such conditions of uncertainty, one of the possibilities to understand the economic cycle is viewing it as an evolutionary process, metaphorically. It worth cite Dosi and Nelson’s notes (DOSI; NELSON, 1994) on how the underlying structures of Economic Science should be sought for on biology rather than on mechanics. They also note that “[i]t is quite straight forward that one cannot construct a satisfactory theory of economic evolution simply by way of analogy with the biological model” (p.155). Nevertheless, they consider that “the biological model might help in illustrating the specificities of evolution in the social domain” (p.155).

The text above, by describing succinctly the inner structures of innovation, presents the main arguments for an understanding of innovation as an interdisciplinary phenomenon. From what I learned while writing this text, the brain activities necessary to create new combinations of production factors is, by its very definition, an interdisciplinary process.

#### **2.4.13. Interdisciplinarity as Innovation**

It is interesting to register that the first appearances of what is now called “innovation” occurred at the Eighteenth century, from 1760 onwards (SCHUMPETER, 1927). The appearance of what is now called “scientific disciplines” occurred at the Nineteenth century (1800), but its roots can be traced back to the previous one (FOUCAULT, 1975). That simultaneity should deserve further investigations by future works.

At this point it is interesting to note that Foucault named “disciplines” as the methods to control “bodies of men” in order to submit them to a “rapport de docilité-utilité” (FOUCAULT, 1975, p. 139). In Foucault’s terms, disciplinarity dissociates power from bodies:

elle en fait d'une part une « aptitude », une « capacité » qu'elle cherche à augmenter; et elle inverse d'autre part l'énergie, la puissance qui pourrait en résulter, et elle en fait un rapport de sujétion stricte. Si l'exploitation économique sépare la force et le produit du travail, disons que la coercition disciplinaire établit dans le corps le

lien contraignant entre une aptitude majorée et une domination accrue.<sup>97</sup> (FOUCAULT, 1975, p. 140)

Scientific disciplines evolve precisely to, *selon* Foucault, obtain *strict subjection* of bodies of knowledge. He goes further and says that

La discipline est un principe de contrôle de la production du discours. Elle lui fixe des limites par le jeu d'une identité qui a la forme d'une réactualisation permanente des règles.<sup>98</sup> (FOUCAULT, 2014, p. 37–38)

In that sense, scientific disciplines arise as a continuous updating of rules – as some kind of “innovation” – at the Nineteenth century, ending ages of interdisciplinary knowledge creation. As an innovation, disciplinarity enacted the precise dynamics of experimenting, reaching equilibrium and routines; which were then copied largely by other cognitive endeavors. Nevertheless, the invention of disciplinarity must not be seen as a “soudaine découverte.”

Mais comme une multiplicité de processus souvent mineurs, d'origine différente, de localisation éparse, qui se recourent, se répètent, ou s'imitent, prennent appui les uns sur les autres, se distinguent selon leur domaine d'application, entrent en convergence et dessinent peu à peu l'épure d'une méthode générale.<sup>99</sup> (FOUCAULT, 1975, p. 140)

In other words, as in the business cycle, disciplinarity arouse out of countless combinatorial essays; until some equilibrium was reached and new routines were established. And, as the counterpart in the scientific creative destruction cycle, as soon as disciplinarily reached a *plateau*,

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<sup>97</sup> [...] on the one hand, it turns it into an 'aptitude', a 'capacity', which it seeks to increase; on the other hand, it reverses the course of the energy, the power that might result from it, and turns it into a relation of strict subjection. If economic exploitation separates the force and the product of labour, let us say that disciplinary coercion establishes in the body the constricting link between an increased aptitude and an increased domination. *Translated by me.*

<sup>98</sup> The discipline is a principle of control over the production of discourse, fixing its limits through the action of an identity taking the form of a permanent reactivation of the rules. *As translated by me.*

<sup>99</sup> It is rather a multiplicity of often minor processes, of different origin and scattered location, which overlap, repeat, or imitate one another according to their domain of application, converge and gradually produce the blueprint of a general method. *As translated by me.*

interdisciplinarity started its brain activities. It can be said that the equilibrium and crises of the business and the scientific cycles are, respectively, boom/depression and disciplinarity/interdisciplinarity. Paraphrasing Juglas *apud* Schumpeter (1927): “La cause unique de l’interdisciplinarité c’est la disciplinarité.”<sup>100</sup> It can be said that Interdisciplinarity, at the present moment, represents the innovation of the “scientific cycle.”

Interdisciplinarity has as its underlying structure the concept of building bridges between different disciplines. Which means not to solve the contradictions and incongruences between them. But, specifically, to expand the possibilities of dialogue by building bridges. This definition, based on the generative metaphor of a bridge as an *arc herméneutique* (RICOEUR, 2007, p. 121), is inspired by the French Philosopher Paul Ricoeur and his insistence

on building bridges between concepts that are otherwise seemingly incompatible and between which there might be controversy. (JAHNKE, 2010, p. 106)

Interdisciplinarity, if it follows the dynamics of innovation – as it is supposed by this text, will find its way through the traditional institutions of science and education, forcing them to study new combinations of structures. Then, after the emergence of these new routines, academic institutions from all sorts of range will start to copy these. After reaching a new equilibrium *plateau*, new crises will start to germinate. Which will put the “brains” into the creative destruction activities once again.

Perceiving interdisciplinarity as an element of a creative destruction process enables to understand it based on the same elements proposed by Schumpeter for innovation. From this point of view, interdisciplinarity is a “new combination” approach to the disciplinary way of researching, teaching and practicing. In addition, as innovation in the business cycle, it arises in a moment of “crises” (scientific, environmental, energetic), demands a concerted effort of brain activities, then a series of experiments until reaches a new equilibrium.

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<sup>100</sup> The sole cause of interdisciplinarity is disciplinarity. *As translated by me.*

#### 2.4.14. Innovation as a WE-Action

From a hermeneutical perspective, it is possible to describe innovation as a social process of understanding and sense making (COOPEY; KEEGAN; EMLER, 1997). Thus, as a social process of interpreting and envisioning, and also of generative interpretation (VERGANTI; ÖBERG, 2013). By having at its basis the concept of understanding, innovation can be seen as a process aimed at fulfill certain human “cognitive interest” (HABERMAS, 1971). One key aspect of this process of understanding is the fact that it does not proceed from a *tabula rasa*. So, to “understand presupposes preunderstanding.” Alvesson and Sköldberg (2009, p. 120) also explain that preunderstanding is an obstacle to understanding. And to prevent it from developing into a vicious circle they write that:

[...] the existential hermeneuticians advocate a constant alternation between merging into another world and linking back into our own reference system. By means of this movement back and forth, we can successively come to an understanding of the unfamiliar reference system, something which also leads to the gradual revising and/or enriching of our own: there is a 'fusion of horizons' [...].

From that statement, an innovation process can be described as starting from a new value proposition created by and presented to a determined social context. This new proposition has to be understood by that same social context from preunderstandings shared by that group. Where an understanding of a new part fosters a new understanding of a whole. This would happen first individually, with each member of a group going through an interpretative process based on his own horizon of understanding. Then, in an iterative process involving the other members of the group. The same can be said about the innovation process as described by Schumpeter’s business cycle. And it proceeds until it express “a nexus of personal meanings that are formed in a complex field of social and historical relationships” (THOMPSON, 1997, p. 439). In other words, this nexus of meanings can be understood as the new routines described by Schumpeter. Weick provides an interesting discourse to help make sense about the strategic process of establishing new nexus of meanings (WEICK, 1995, p. 55):

Once people begin to act (enactment), they generate tangible outcomes (cues) in some context (social), and this helps them discover (retrospect) what is occurring (ongoing), what needs to be explained (plausibility), and what should be done next (identity enhancement).

Innovation, then, can be understood as resulting from a group effort. Effort which departs mainly from previous accepted ideas and solutions, and is usually focused on a single artifact, be that tangible or not. Whereas invention can be the result of an individual's work, innovation is a social process. Although the results of both can hardly be foretold, the commonly accepted notion that invention can be achieved by a single person<sup>101</sup>, creates a contrast with the notion that innovation can only be achieved in and by groups of people. And this contrast, as in the contradictory characteristics of the Schumpeterian business cycle, yields interesting possibilities of understanding both of these concepts. By viewing both, invention and innovation, as extremities of a continuum from "one" person to "many," opens up the possibility to create a frame to help make them a bit less puzzling, less ambiguous; to create a line of reasoning, a metaphor, which will give sense of what to expect and how to intellectually understand them (ALVESSON; KARREMAN, 2011, p. 111–112).

To do so, it is possible to propose (in an interdisciplinary way) the creation of a frame combining two sets of concepts. One set presents a one-to-many continuum through Hannah Arendt<sup>102</sup> perspective of *acting into the future* as a "We" not "I" effort. In her own words, when she answers a questions by Roger Errera about a contemporary persistence of thinking based on historical determinism (LUDZ, 1999, p. 56):

Yes, and I think this has very good reasons, this belief in this historical necessity. The trouble with this whole business – and it is really an open question – is the following: We don't know the future, everybody acts into the future [which] nobody can at all know. Nobody knows what he is

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<sup>101</sup> Refers to the notion that invention can be achieved by a single person as a result of an adaptive search process over a space of combinatorial possibilities (YOUN et al., 2014) that were enabled by previous socially created knowledge.

<sup>102</sup> Hannah Arendt 1974's interview with the French writer Roger Errera. Accessed in 23/06/2014 at <http://www.youtube.com/watch?v=b1u5OjatwqA>, around 3'20". A transcription of it can be found at: <http://www.hannaharendt.net/index.php/han/article/viewFile/190/313>

doing, because the future is being done. Action is a WE and not an I. Only where I am the only one, if I were the only one, could I foretell what's going to happen from what I am doing. Now it looks as though what actually happens is entirely contingent, and contingency is indeed one of the biggest factors in all history. Nobody knows what is going to happen simply because so much depends on an enormous amount of variables, as they say, that is, in other words, on the simple hazard. On the other hand, if you look back on history retrospectively, then you can, even though all this was contingent – you can tell a story that makes sense. How is that possible? That is a real problem of every philosophy of history: How is it possible that in retrospect it always looks as though it couldn't have happened otherwise? All the variables have disappeared, and reality is of such an overwhelming impact upon us that we cannot be bothered with actually an infinite variety of, perhaps, possibilities.

What Arendt brings to the concept of innovation is the perspective that, as it is a WE-action into the future that involves an “enormous amount of variable,” its level of predictability is forcefully lower than the one of an I-action that involves few variables. Another important aspect that apprehends from Arendt's words is the fact that innovation, as portrayed by the cited action continuum (WE to I), only makes sense retrospectively.

This proposed characteristic to further understand innovation is aligned with Schumpeter's perception that the appraisal of the creative destruction performance can only be judged in its entirety as it unfolds through time (SCHUMPETER, 1943). In other words, innovation is a sensemaking process that

involves the ongoing retrospective development of plausible images that rationalize what people are doing. Viewed as a significant process of organizing, sensemaking unfolds as a sequence in which people concerned with identity in the social context of other actors engage ongoing circumstances from which they extract cues and make plausible sense retrospectively, while enacting more or less order into those ongoing



circumstances. (WEICK; SUTCLIFFE; OBSTFELD, 2005, p. 409)

The characteristic that innovation only makes plausible sense retrospectively was already described by Schumpeter in 1943. When writing about the process of Creative Destruction as an essential fact of capitalism, he pondered that its performance can only be judged over time “as it unfolds through decades or centuries” (SCHUMPETER, 1943, p. 83).

The referred WE-I continuum, for an interdisciplinary research, could be divided and ordered into a specific taxonomy. One that could present human arrangements ranging from an *individual* (*I*) to a *society* (*WE*), as an example, through levels of: team, group, and organization. Although it is fundamental to establish such taxonomy, which could be done by considering different aspects of Coordination, Cooperation, and Communication (KOZŁOWSKI; ILGEN, 2006), it is not possible to do so by the present text.

And on the other set, the Jürgen Habermas views of knowledge in terms of what he defines as three *cognitive interests* (ALVESSON; SKÖLDBERG, 2009, p. 155): “a technical, a historical-hermeneutic, and an emancipatory interest.” In Habermas terms (HABERMAS, 1971):

There are three categories of processes of inquiry for which a specific connection between logical-methodological rules and knowledge-constitutive interests can be demonstrated. This demonstration is the task of a critical philosophy of science that escapes the snares of positivism. The approach of the empirical-analytic sciences incorporates a technical-cognitive interest; that of the historical-hermeneutic sciences incorporates a practical one; and the approach of critically oriented sciences incorporates the emancipatory cognitive interest that, as we saw, was at the root of traditional theories.

What Habermas brings to the concept of innovation is the perspective that it is an effort directed towards fulfilling a human cognitive interest. Or, as Schumpeter describes it, “in order to create anything new of importance” (SCHUMPETER, 1912, p. 74). Habermas goes on and explains that (HABERMAS, 1971):

The specific viewpoint from which, with transcendental necessity, we apprehend reality ground three categories of possible knowledge: information that expands our power of technical control; interpretations that make possible the orientation of action within common traditions; and analysis that free consciousness from its dependence on hypostatized powers.

Although presented as separate, “there is a close relationship between the three varieties of cognitive interest” (ALVESSON; SKÖLDBERG, 2009, p. 156). After all, emancipation is dependent upon the empirical-analytical knowledge to be able to understand the difference between what is given by nature and what is socially constructed.

In a schematic view, the three domains of knowledge from Habermas can be presented as follows at Figure 18. These two perspectives – from Arendt and Habermas presented at Figure 19, by their turn, can be assembled in a way that creates a line of reasoning to give sense of how predictable is the process of innovation based on (i) how many people are involved (individual, team, group, organization and society) and (ii) to which type of human interest it will serve.

Based on the proposed relations between cognitive interests and levels of human arrangement, it appears less puzzling to define modes of innovation. Within this frame, it is possible to view the contradictory perspectives of innovation under a clear and same light. It can range from a low predictability innovation as a “social innovation” on the upper-right cell (WE-Emancipatory), to a high predictable one as the “technical invention” on the lower-left corner (I-Technical).

The level of predictability relates to the concept of understanding. One of the definitions of the latter is “to be able to predict.” Thus, understanding a particular phenomenon entails “establishing similarities, regularities and conformities to law which would make it possible to predict individual phenomena and processes” (GADAMER, 2004, p. 03). When a phenomenon is considered as understood, the main result of this understanding is the capacity to predict its behavior or consequences. Understanding innovation through different levels of predictability permit to devise better approaches for individual, organizational and collective endeavors. In a sense, it enables social contexts to commit to action (WEICK; SUTCLIFFE; OBSTFELD, 2005).

An interdisciplinary classification of innovative endeavors should not be based solely on technical innovations (product innovations, process

innovations, organizational innovations and marketing innovations), as proposed by OECD (OECD/EUROSTAT, 2005). In terms of the Arendt/Habermas frame, the proposed OECD classification covers only I/Technical and We/Technical categories. It leaves untapped – OECD’s model is unaware of – all innovation initiatives that are not technical, such as social innovation to name but one.

Instead, an interdisciplinary approach should enable different perspectives of cognitive interests. Departing from the premise that an innovation phenomenon can only be fully appraised retrospectively, the Arendt/Habermas perspective permit to shed new light on how to *act into the future* when innovation is subject of a cognitive interest. Under the auspices of Arendt and Habermas it is possible to shed an interdisciplinary light into innovation so it becomes more understandable (ALVESSON; KARREMAN, 2011, p. 111–112). By giving sense of what to expect and how to intellectually understand the mysteries of innovation it is possible to enable organizations to act (ALVESSON; KARREMAN, 2011, p. 111–112).

<b>Cognitive Interest</b>	<i>Technical</i> (prediction)	<b>Historical-Hermeneutic</b> (interpretation and understanding)	<i>Emancipatory</i> (criticism and liberation)
<b>Kind of Knowledge</b>	<i>Instrumental</i> (causal explanation)	<i>Practical</i> (understanding of meaning)	<i>Emancipation</i> (reflection)
<b>Research Methods</b>	<i>Positivistic Sciences</i> (empirical-analytic methods)	<i>Historical Sciences</i> (hermeneutic methods)	<i>Critical Social Sciences</i> (critical theory methods)
<b>Viewpoint to apprehend reality</b>	<i>Information that expands our power of technical control</i>	<i>Interpretations that make possible the orientation of action within common traditions</i>	<i>Analysis that free consciousness from its dependence on hypostatized powers</i>

**Figure 18 – Cognitive Interests, Knowledge and Research**

Source: Based on (HABERMAS, 1971; TINNING, 1992)

These potentials to act should reach beyond disciplinary technicalities and support wide interdisciplinary understanding that put under the same light seemingly disparate innovative initiatives. This is precisely what the Arendt/Habermas frame enables to do. By bridging

different innovative initiative through their expected levels of predictability – their levels of *docilité* to be understood – it enables organizations to devise better approach methods for each specific case.

Those possible approaches can be preliminarily disciplined as:

- a) I/Technical – High Predictability: initiatives from empirical-analytic sciences that aim to expand the power of technical control of a small number of humans should be highly predictable. Therefore, it should be reasonable to use well-known methods to apply resources into developing highly repeatable routines;
- b) I/Historical-Hermeneutic – Medium/High Predictability: initiatives from historical-hermeneutic sciences that aim to expand the *repertoire* of interpretations that make possible the orientation of action within common traditions of a small number of humans should be medium-to-highly predictable. Therefore, it should be reasonable to test different methods to apply resources into developing highly customizable routines;
- c) I/Emancipatory – Medium Predictability: initiatives from critically oriented sciences (which incorporates the emancipatory cognitive interests) that aim to free consciousness of a small number of humans from their dependence on hypostatized powers should have a medium level of predictability. Therefore, it should be reasonable to modify methods to apply resources into developing meta-routines to support *ad hoc* approaches;
- d) We/Technical – Medium Predictability: initiatives from empirical-analytic sciences that aim to expand the power of technical control of an undefined number of humans should a medium level of predictability. Thus, it should be reasonable to modify methods to apply resources into developing highly customizable routines;
- e) We/Historical-Hermeneutic – Medium/Low Predictability: initiatives from historical-hermeneutic sciences that aim to expand the *repertoire* of interpretations that make possible the orientation of action within common traditions of an undefined number of humans should have a medium-to-low level of predictability. Therefore, it should be reasonable to modify methods to apply resources into developing meta-routines to support *ad hoc* approaches;

- f) We/Emancipatory – Low Predictability: initiatives from critically oriented sciences (which incorporates the emancipatory cognitive interests) that aim to free consciousness of an undefined number of humans from their dependence on hypostatized powers should have a low level of predictability. Therefore, it should be reasonable to create new methods to apply resources into developing meta-routines to support ad hoc approaches;

These directives are summarized in the following Figure. For the purpose of this thesis, I understand innovation as a WE-action towards fulfilling a Historical-Hermeneutic cognitive interest, which only makes sense retrospectively. That understanding implies the fact that, for the purpose of this thesis, the concept of innovation cannot be tamed through an empirical-analytical approach. In other words, my work definition of innovation is that it is a social phenomenon (MANHÃES, 2010) with two folds: (a) of new knowledge creation and (b) of generation of opportunities for “coping with interruptions” (WEICK, 1995) that will enable a social group to understand, adopt and enact the new propositions of values resultant from the referred knowledge creation process.

	Technical	Historical-Hermeneutic	Emancipatory
I	High Predictability		
We			Low Predictability

**Figure 19 – Cognitive Interests and Levels of Predictability**

Source: Based on Habermas and Arendt as cited above.

Thus, my approach is guided by the Historical-Hermeneutic approach, towards reducing ambiguities and to intellectually interpret and understand it without relying on finding an intrinsic mechanism of innovation.

As I understand it, innovation cannot rely on truisms; it has to have its own immanent logic (ADORNO, 1965). And, as the mentioned over-focus on efficiency, “rules” can hinder the innovative performance of organizations in the long-run. The whole situation can be aggravated even more by the contemporary compound effect of a social movement towards knowledge work (DRUCKER, 1999) and the challenges of an innovation-driven economy (KELLEY; BOSMA; AMORÓS, 2010).

#### 2.4.15. Design and Prejudice

On the 24<sup>th</sup> of November 2011 I had the opportunity to meet Professor Henry Chesbrough during the annual Open Innovation Week<sup>103</sup> held in São Paulo, Brazil. At that day, Maria Augusta Orofino and I, we asked Professor Chesbrough about what seemed to us a clear similarity between his concept of Open Innovation and what we understood as a “normal” Design process. To our surprise, he told us that he also sees that similarity. And the reason why he did not use the word “Design” at the title of his famous book *Open Innovation: The new imperative for creating and profiting from technology* (CHESBROUGH, 2003) was because, if he had done so, the book would end up on Art shelves of libraries. And “corporate people” would not buy it. I remember that his honesty overwhelmed us. This anecdote helped me put in perspective the impacts of prejudice on innovative efforts. When working with concepts as ethereal as innovation and design, the awareness of prejudices involved becomes of utmost importance. To be aware of beliefs, ideologies and paradigms and how they influence events is inescapable (WEICK, 1995, p. 133). Specifically, at innovative efforts where design plays a major role, beliefs

affect how events unfold when they produce a self-fulfilling prophecy. In matters of sensemaking, believing is seeing. To believe is to notice selectively. (WEICK, 1995, p. 133)

Through this text I advocate that being aware of the prejudices at play is a key condition for driving a new value proposition towards becoming an innovation. And this *understanding of the Other*, as a process of knowledge creation, resembles the subjacent structure of the

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<sup>103</sup> More information about his event can be obtained here: <http://www.openinnovationweek.com.br/>

design process of material and immaterial objects (JAHNKE, 2012). This same perspective can help understand design as a practice

where new meaning, as well as new ingenious practical solutions, can emerge through a process of interpretation, and where more “rational” problem solving is inscribed within rather than define the process as such. (JAHNKE, 2012, p. 40)

The literature review done by me enlists various studies indicating that “ordinary users create significantly more original and valuable ideas than professional developers and advanced users” (KRISTENSSON; GUSTAFSSON; ARCHER, 2004, p. 4). These same authors suggest that the “opportunity to combine different information elements that appeared separate at the outset” (generated by ordinary users, professional developers and advanced users) can be facilitated by a process of divergent thinking (KRISTENSSON; GUSTAFSSON; ARCHER, 2004, p. 4). Design, as a creative process, with its divergent and convergent phases (SIMONTON, 2010b), and its focus on understanding of the socio-cultural perspectives involved (JAHNKE, 2012), seems to be an ideal dynamic metaphor to enable the combination of the *different* (GADAMER, 2004).

Situated in the realm of praxis, in my opinion, design processes can be described and operationalized as a collection of various social group dynamics, performed with the use of multimodal images to generate new value propositions and new knowledge (MANHÃES, 2010). And, as a knowledge creation process, it seems to me that design occurs within the relation between antithetical concepts. And, on top of that, it can be added that it occurs in social groups; i.e. intergroups. Which brings up the notion of closed-mindedness as one of the aspects of the broader concept of prejudice. Most of what happens to a person “is related to activities of groups to which” she or he does or does not belong to. Tajfel (2011, p. 131) describes the design process that humans go through because

the changing relations between these groups requires constant readjustments of our understandings of what happens and constant causal attributions about why and how of the changing conditions of our life.

The studies and the literature review that I did lead me to reflect on the co-creation characteristics of design processes as frameworks for

creating bridges between different prejudices. Or, the role of design processes as enablers of cooperative learning during intergroup contacts. As I noted elsewhere in this text, it seems that the perception of innovativeness is not guaranteed by a process of design *per se* and that *design tools* or *design practices* do not suffice for the creation of innovative opportunities. But, “looking at the whole design process as a matter of meaning creation provides new perspectives on both design and innovation” (JOHANSSON-SKÖLDBERG; WOODILLA; ÇETINKAYA, 2013).

As presented by Jahnke (2013, p. 93), the need for a process of on-going “corporate *Bildung*” that would free oneself from the shackles of *organizational* despotism and other powers:

In the context of history of effect Gadamer discusses the importance of “*Bildung*”, the notion anchored in humanism of the importance to free oneself from the shackles of despotism and other powers, and the broad study of, as well as practice in many subjects, such as the arts, science, music, philosophy and so on.

As it seems clear, at least in my opinion, the existence of a diversified socio-cultural contexts seem to be not only desirable but obligatory for design intents. Therefore, one way to free oneself from the shackles of organizational despotism is doing that through a process of design.

The findings from this study connect to the notion of design as a hermeneutical practice (JAHNKE, 2013). As the referred studies have produced strong correlations between a group’s NFC levels (as a motivated way of thinking) and the group’s capacity of creating innovative opportunities, it contributes to the hermeneutical conceptualization discussions of design.

#### **2.4.16. Design and Innovation**

Since the second half of the 20th Century, mainly geared by the trends and paradigms of the new *cognitive capitalism* (KRISTENSSON UGGLA, 2010), organizations have gradually accepted and adopted practices of the creative industries. One of the consequences has being the rise in interest about holding creativity workshops (JAHNKE, 2013). It seems that many of those organizations have used that kind of group



dynamics with a focus (perhaps unintended) on promoting knowledge sharing between its members. Although group dynamics that aim at socialization and combination of knowledge have been recognized by academia as a tool for creating new knowledge (NONAKA; TOYAMA; KONNO, 2000; NONAKA; TOYAMA, 2003), the possible innovative results are somewhat questionable.

With the advent of the term Design Thinking<sup>104</sup>, as one of the responses to a broad organizational interests for the practices of the creative industries, many organizations were attracted by the idea of holding group dynamics. Several of them adopted creativity workshops with the explicit goal of creating innovative product propositions (goods and/or service). Thus, reaffirming the contemporaneous understanding “that knowledge handled in a creative and non-reproductive way is of strategic importance” for organizations (KRISTENSSON UGGLA, 2010).

I assume that in situations where creativity is desired by organizations, then human diversity has to be welcomed. This connection is supported by several research works that indicate positive relationships between human diversity and organizations likelihood to create potentially innovative products (ØSTERGAARD; TIMMERMANS; KRISTINSSON, 2011) and the diversity between the organizations themselves is “a fundamental and permanent characteristic of industrial environments undergoing technical change” (SILVERBERG; DOSI; ORSENIGO, 1988). And, confirming the above understanding, Jensen et al. (2007) concluded after their empirical analysis over 1643 Danish firms that institutions that use mixed strategies to promote learning “are much more innovative than the rest” (p. 685).

This kind of approach makes particularly sense due to the fact that the process of innovation impose to economic agents to be “confronted with irreducible uncertainty and holistic interactions between each other and with aggregate variables” (SILVERBERG; DOSI; ORSENIGO, 1988). They are also obliged to make decisions today “the correctness of which will only be revealed considerably later” (idem). And the winners at this *creative destruction* game seem to be the ones

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<sup>104</sup> The notion of Design Thinking can be traced back from Herbert A. Simon's 1969 book *The Sciences of the Artificial* and Peter Rowe's 1987 book *Design Thinking* and the 1992 article by Richard Buchanan titled "Wicked Problems in Design Thinking" and the adaptation for business purposes by IDEO through the works of David M. Kelley. Source: [http://en.wikipedia.org/wiki/Design\\_thinking](http://en.wikipedia.org/wiki/Design_thinking), accessed in 29th of August 2012.

“that can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences.” (TEECE; PISANO; SHUEN, 1997).

Organizations’ managers wish that innovation and planning to be the result of pure reason. “But this is an illusion,” as Gadamer (2004) states. Most of their decisions about the future have to rely on their own historical standpoint, on their prejudices. These later ones being understood as judgments that are “rendered before all the elements that determine a situation have been finally examined” (GADAMER, 2004).

At this very point in the history of an organization, when diversity – in a broad sense – may be one of the most decisive factors, the closed mindedness of its members may limit the creation of innovative opportunities. In order to make sense of these particular situations and its outcomes, it is necessary to generate a sensemaking discourse (WEBER; GLYNN, 2006; WEICK; SUTCLIFFE; OBSTFELD, 2005; WEICK, 1995). A sensemaking discourse that enables organizational managers to act towards augmenting the odds of obtaining potentially successful innovative propositions.

An important perspective for the discourse adopted by this research is the fact that “behind every innovation is a new design” (Baldwin et al., 2005). The complementarity between design and innovation, specifically taking the role of design as a “facilitator of communication” have been written by several researchers, writings which were elegantly described by Janhke (2013) in the introduction of his thesis. Thus, this text advocates that the existence of a design process is a *sine qua non* condition to innovation, although not a sufficient one.

And it is worth also to note that, as the dynamics of innovation, the design phenomenon seems to me to occur “in the space of Knightian uncertainty, goal ambiguity and environmental isotropy” (Sarasvathy et al., 2008). These latter cited authors propose a discourse that could commit people to act within the entrepreneurial design space (p. 339):

It is clear that such a logic has to be non-predictive (i.e. not taking the event space for probabilities as given and immutable), non-teleological (i.e. not taking preferences and goals as pre-existent or unchangeable) and non-adaptive (i.e. not taking the

environment as exogenous or as something to respond to and ‘fit’ with).

The above described space can be related to the notion of design, to the hermeneutical circle and, therefore, to the notions of innovation (Kristensson Uggla, 2010). So, for the purpose of this research, I define *design* as a hermeneutical practice, characterized by an active questioning and answering, that “moves in a circular pattern centrifugally towards understanding” (Jahnke, 2012). Jahnke also explains that this movement starts from our own historical standpoint and goes on in encountering the Other in an interpretive process.

#### 2.4.17. Design and Knowledge

Understanding the design phenomenon as a knowledge creation process entails adopting the perspective that *to design is to build bridges between the different*. This definition, based on the generative metaphor of a bridge as an *arc herméneutique* (RICOEUR, 2007, p. 121), is inspired by the French Philosopher Paul Ricoeur and his insistence

on building bridges between concepts that are otherwise seemingly incompatible and between which there might be controversy. (JAHNKE, 2010, p. 106)

To better understand this definition of design we need to build several conceptual bridges. The first one starts at the etymology of the word. The word design comes from

the Latin *de + signare* and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users, or gods. Based on this original meaning, one could say: design is making sense (of things). (KRIPPENDORFF, 1989)

Building on Krippendorff explanation, it is interesting to note that the process of making sense – or sensemaking – can be described as a “consensually constructed, coordinated system of action” (TAYLOR; VAN EVERY, 2000, p. 275). Verganti also says that “[d]esign, by definition, includes to bring meaning” (VERGANTI; ÖBERG, 2013, p.

88). The “founder of sensemaking”, Karl Weick, explains it as (WEICK; SUTCLIFFE; OBSTFELD, 2005, p. 409):

Sensemaking involves turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action.

Which take us to “la dernière pile du pont, l’ancrage de l’arche dans le sol du vécu”<sup>105</sup> (RICOEUR, 2007, p. 124), in the ground of *knowledge* (KROGH et al., 2013, p. 4):

Knowledge is also what enables people to act and should therefore be thought of as potential rather than actuality.

The above definition of knowledge as *potential to act*, and the fact that this potential was consensually constructed and coordinated into a system of action is, by its turn, a sensemaking discourse adopted by me to approach the knowledge creation process to the field of design.

After accepting that design *is* a knowledge creation process, it is possible to go further and incorporate the notion that

Knowledge is created in the spiral that goes through seemingly antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, deduction and induction, and creativity and efficiency. (NONAKA; TOYAMA, 2003, p. 02)

I would like to draw attention to the fact that the above authors can be interpreted as saying that knowledge is created through the *building of bridges* between seemingly antithetical concepts. That kind of understanding brings *knowledge creation process* to a tantalizingly close distance from the text of Ricoeur where he explains how to integrate the opposed attitudes of explanation and understanding. And this integration, as it seems to me, can only be possible through the creation of a new knowledge. It is worth reading the original text from Ricoeur (2007, p. 121):

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<sup>105</sup> “the last stack of the bridge, anchoring the arch in the ground of the lived experience,” as translated by me.

If, on the contrary, we regard structural analysis as a stage – and a necessary one – between naïve and a critical interpretation, between surface and a depth interpretation, then it seems possible to situate explanation and interpretation along a unique *hermeneutical arc* and to integrate the opposed attitudes of explanation and understanding within an overall conception of reading. (RICOEUR, 2007, p. 121)

The notion of building bridges also help to deal with the paradox of sensemaking which is the one that occurs

between the aim of making something new and different from what was there before, and the desire to have it make sense, to be recognizable and understandable. The former calls for innovation, while the latter calls for the reproduction of historical continuities. (KRIPPENDORFF, 1989)

It is from this intended ability to articulate the cited paradox that breeds the promise of design: the *radical* change of products' *meanings* (VERGANTI; ÖBERG, 2013, p. 88). Promise which is named by Verganti as “Design-Driven Innovation” (VERGANTI; ÖBERG, 2013; VERGANTI, 2006, 2008).

In the scientific fields, the balancing between conventional knowledge and atypical knowledge seems to be “critical to the link between innovativeness and impact” (UZZI et al., 2013). The result of an analysis of 17.9 million papers, spanning all scientific fields,

suggests that science follows a nearly universal pattern: The highest-impact science is primarily grounded in exceptionally conventional combinations of prior work yet simultaneously features an intrusion of unusual combinations. Papers of this type were twice as likely to be highly cited works. (UZZI et al., 2013, p. 468)

This last bridge anchorage brings me to affirm that “design and innovation are both knowledge creation processes” (Maurício Manhães apud DUBBERLY; EVENSON, 2011, p. 75). Thus, both demand the capacity of building bridges between the different. Which, as I understand

it, is far from being an easy task. The prejudices that are at play in any given context may hinder the capacity of connecting with the different.

My belief is that design is the locus within which diverse human subjectivities interact to increase the potential act, i.e. to create knowledge. The design process is a particular kind of knowledge creation process that, beyond augmenting the potential to act of social groups, leads them to devising “courses of action aimed at changing existing situations into preferred ones” (SIMON, 1996). And that it is why I believe design, as a social process, is at the heart of the innovation process. So, to understand the innovation process, I have to understand what kind of impact the interaction of diverse human subjectivities has on the creation of knowledge.

The proposed bridges between design, innovation and knowledge, led me to believe

that the most important aspect of economics and business studies from now on will be the focus on knowledge and the subjectivity of the humans, who create and utilize the knowledge. (NONAKA et al., 2014, p. 139)

Based on the above presented reasoning, this research is focused on designing a particular sensemaking discourse. Which aims to compromise organizations to act towards assessing prejudice among its members as a way to create knowledge to support innovative opportunities.

#### **2.4.18. NFC, Innovativeness and Gender**

When considering the studies involving the whole set of 18 groups composed of 50 women (59,52%) and 34 men (40,48%), it is possible to infer from analyzing the top 6 OUP groups that they are predominantly composed by women and that these groups have High NFC Mean levels. Groups with these characteristics tend to have a greater potential at creating propositions perceived as more innovative. For instance, the average group on the whole set had each 2,78 women and 1,89 men. As can be seen at the following table, the top 6 had 3,33 and 1,83, respectively (see Table 68). Other studies also found that the proportion of women in the groups was a strong predictor of collective intelligence (ENGEL; WOOLLEY; JING, 2014).

Another inference comes from the innovativeness assessment front. From a total of 36 judges, 16 women (44,44%) and 20 men (55,56%), it seems that males with Low NFC tend to have a greater potential of being more assertive at analyzing innovative propositions.

These inferences, when combined, yield a “strange” symmetry. Which, at first, did not seem to be right. I found it really strange that the proportions of women and men and groups’ NFC characteristics be, at one, the exact opposite of the other. Based on the “magic” of numbers resulting from this research, the creative group should be composed by 65% of women and have High NFC mean. For the best judgments’ group, it should be composed by 64,71% of men and have Low NFC mean.

**Table 68 – Women and Men averages per Tiers**

	<b>Top 6</b>	<b>Mid 6</b>	<b>Bottom 6</b>	<b>All 18</b>
<b>Women-Avg</b>	3,33	2,50	2,50	2,78
<b>Men-Avg</b>	1,83	2,00	1,83	1,89
<b>NFC-Mean</b>	56,16	52,44	49,19	52,80
<b>OUP-Mean</b>	7,85	6,34	5,32	6,50

This strange symmetry caused in me, once more, a new breakdown and cast a possible new mystery (ALVESSON; KARREMAN, 2007). Both interesting enough, in my point of view, for further studies and futures research. Although I will not deepen this issue here, there is an interesting point to highlight: the “ethics of care” (GILLIGAN, 2014; TRONTO, 1999).

After a while of having that discomfort on the back of my head, on the 23<sup>rd</sup> of October 2014, I finally had a chance to talk to Professor Celso Braida about it. He suggested that I should talk about that to Professor Regina Bragagnolo. On the 4<sup>th</sup> of November 2014 I met Professor Bragagnolo. It was during that meeting that she suggested that I should check if the “Ethics of Care” framework could help.

After reading some of the papers about that, it clicked. It seemed perfect to me. It makes sense to think that groups of women are better at innovation because they know how to care for others, i.e. to understand others’ needs, to build bridges between the different. Which is extremely useful when designing solutions for changing people's "existing situations into preferred ones" (SIMON, 1996, p. 111).

The ethics of care can be understood as a framework to look at moral and political life (TRONTO, 1995). To make it short, it deals with a moral that sustains that

Men are bad at caring, then, not only because they have escaped from its burdens through a public/private split in responsibilities but also because our construction of masculinity makes it more difficult for men to develop the skills of caring. (TRONTO, 1999, p. 115)

And, as a diametrically opposed image (see Figure 20), that moral sustains that “empathy and caring,” instead of being viewed as human strengths should be

heard as “feminine” because emotions and relationships were associated with women and seen as limiting their capacity for rationality and autonomy. (GILLIGAN, 2014, p. 89)

Therefore, the way I can make sense from the symmetry of “numbers” resulting from my related studies is by viewing them from the Ethics of Care perspective. The mentioned symmetry seems to be a reflection of the one found in situations of patriarchy where women are morally driven to face a “gender hierarchy that privileges the masculine (reason and self) over the feminine (emotions and relationships)” (GILLIGAN, 2014, p. 95).

To make things a little bit more complex, I believe that the best approximations of High NFC individuals (versus Low) can be a mix of “reason and relationships,” and of Low NFC ones, “emotions and self.” Thus, the hermeneutic arc has to connect two different points:

- a) the “numbers” suggest that the best innovative propositions came from groups of High NFC women, which entails gender-independent tendencies to maintain group’s cohesiveness and high need for closure (experiencing discomfort with ambiguous situations), and
- b) the ethics of care locate women at the “emotion and relationship” moral grounds, which point to characteristics focused on cooperation, to care for and relationships.



That same reasoning can be applied symmetrically to the Low NFC male judges' situation, as follows:

- a) the “numbers” suggest that the best innovative assessments came from groups of Low NFC men, which entails gender-independent tendencies to disrupt group's cohesiveness and low need for closure (feeling comfortable at ambiguous situations), and
- b) the ethics of care locate men at the “reason and self” moral grounds, which point to characteristics focused on competitiveness, to take care and independency.

From what I learned, to be able to connect these two streams of thought – Need for Closure and the Ethics of Care – I have to acknowledge that “empathy and caring are human strengths” (GILLIGAN, 2014, p. 89) as much as knowing “of what is feasible, what is possible, what is correct, here and now” (GADAMER, 2004, p. xxxiv). The same can be said about the capacity to disrupt groups and feel comfortable at ambiguous situations. So, I do not believe that this is a situation of bad versus good characteristics.

As a first summarizing thought, I believe that the present studies, in a sense, depicts the patriarchal *here and now* in which we are living. As the magic numbers indicates, women are better at working in groups and men are better at assessing disruption. Women are better at understanding and integrating the needs of group, i.e. at caring. Men are better at assessing and hierarchizing the needs of groups, i.e. at taking care.

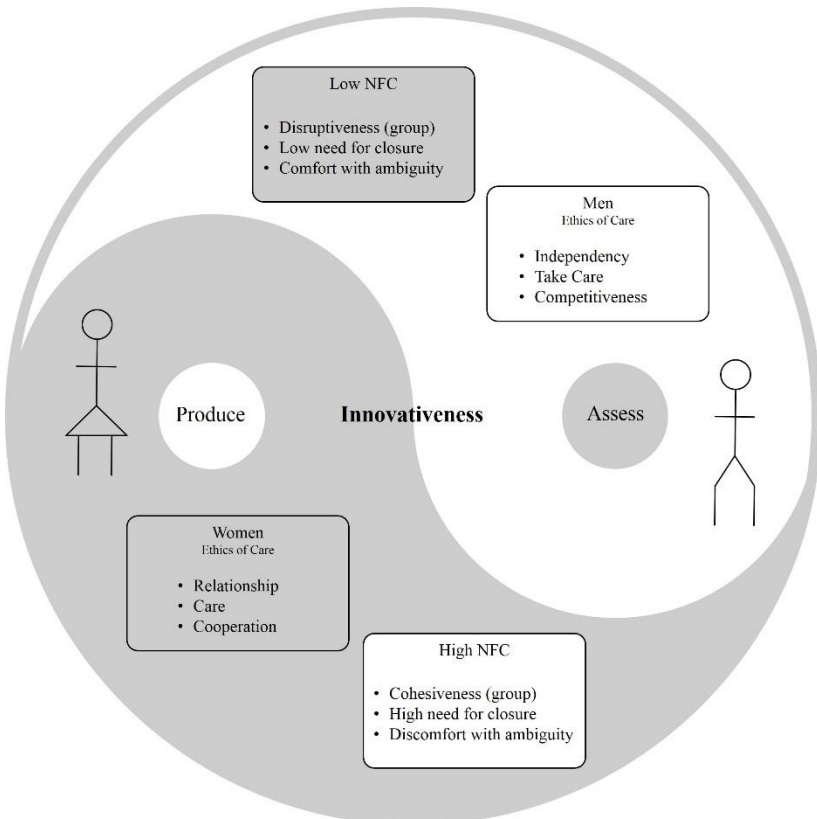
As a second thought, I believe that the *High NFC women of innovative potential* are any human that is able to enact “true solicitude,” which “is not to care for the Other, but rather to let the Other come freely into one's own being self – as opposed to taking care of (*Versorgung*) the Other” (GADAMER, 2000, p. 284). A similar reasoning points to the “importance of individuals' ability to make inferences about others' mental states” (ENGEL; WOOLLEY; JING, 2014), based on concept termed “theory of mind” (ToM). From what I have learned, any person with this kind of true solicitude (which seems to be identified as a *Woman* as in the Ethics of Care) and the drive to pursue what is feasible here and now (High NFC individuals), should have a greater potential for creating innovative propositions.

At the men's side, the *Low NFC men of innovative assessment* is any human capable of a competitive independency (which seems to be

identified as a *Man* as in the Ethics of Care) and to feel comfortable at ambiguous situations (Low NFC individuals), should have a greater potential for assessing innovative propositions. In a sense, it seems that those magic numbers could help discuss a false dichotomized gendered representation of human nature (GILLIGAN, 2014, p. 90). As if that complex kind of innovative human nature could join

thought with emotion and the self with relationships, because it was embodied rather than disembodied, located in time and place. (GILLIGAN, 2014, p. 89)

As a last phrase, I would further question: Is not that kind of “feminine” characteristic what *human-centered design* is all about?



**Figure 20 – The strange symmetry of Innovativeness**

### **2.4.19. NFC and Leadership**

I would like to make another suggestion for further research. That is to better understand the relation between NFC and groups' performance focused on leadership.

One interesting focus for further research can be the relationship between NFC levels and leadership characteristics. This particular relationship was exemplarily illustrated during the KSD.1.01 study.

Although participants 1.B.2 and 1.C.2, from the KSD.1.01 study, presented NFC levels of 48 and 38 respectively, they were both acting as leaders on their groups. Considering the 7 highest OUP ranked groups, the first (KSD.1.01.B) and the seventh (KSD.1.01.C) had Low NFC leaders. From the third to the sixth (UNI.1.01.E, A, D, and C), all worked under the Allport's key conditions with a horizontal hierarchy, which seems to produce a "distributed" Low NFC like leadership. From group GSJ.1.01.D I do not have any information about who was the leader.

The NFC literature suggest that Low NFC (versus High) individuals tend to prolong seizing and should have higher propensities to avoid freezing. These are characteristics that contrast with the commonly accepted organizational paradigms about the role of leaders.

This contrast, to use Alvesson and Karreman terms, causes in me a new breakdown and casts a new mystery (ALVESSON; KARREMAN, 2007).

I think it would be interesting to understand this breakdown and solve this mystery by, in futures research, study what would be the possible relations between different NFC levels, leadership styles and groups' performance.

The leadership and gender issues mentioned above, in a sense, fulfils one more of the intentions of this research which is realize a "potential for novel insights that will add significantly to – or against – previous understandings" (ALVESSON; KARREMAN, 2011, p. 57–58). In this case, I think it adds novel insights for futures research.

### **2.4.20. The Impacts of Prejudice on Originality**

On several occasions, during the workshops that I have personally hosted, I could witness several times (I cannot precise exactly how many) groups having and developing the same ideas. In one occasion in Brasília (Brazil), on the 22<sup>nd</sup> of September 2011, during a workshop at a public institution, five of the seven groups (with a total of 35 participants) had the same idea and used the same approach to present it. One interesting

aspect of this specific workshop was the fact that each group went to work on a separate rooms, and came back to the main room just for the presentation.

The following were the more often “created” ideas by several groups in different workshops:

- a) digital solutions based on social network platforms for helping others;
- b) sustainable and human-powered energy generation solutions;
- c) all sorts of environmental-friendly versions for ordinary products.

It was clear to me that different groups composed by what I could perceive as “similar participants” had a tendency to have and work on similar ideas. Therefore, I witnessed several groups from different countries having the same ideas in different occasions. In a sense, it seems that I witnessed global streams of prejudices directing groups towards the same kind of solutions for different kind of problems. This aspect of groups creating the same solution for different problems seems to me very interesting. It is exciting to see in practice how hard is for people to escape their own history.

#### **2.4.21. Interdisciplinary Discourse**

Que la signification des actions humaines, des événements historiques et des phénomènes sociaux puisse être *construite* de différentes manières est bien connu de tous les experts en sciences humaines. Ce qui est moins connu et moins bien compris est que cette perplexité méthodologique est fondée dans la nature de l’objet lui-même et, de plus, qu’elle ne condamne pas l’homme de science à osciller entre dogmatisme et scepticisme. (RICOEUR, 1986, p. 203)

Ricoeur suggests that scientists, when trying to investigate human actions, should adopt a logic of “plurivocité spécifique” (RICOEUR, 1986, p. 203). Although human actions, as a scientific object, are grounds of limited possible constructions, he believes in the possibility of specific plurality of voices. A plurality comprised between dogmatism and skepticism. A plurality of voices that fosters “le conflit entre interprétations rivales,” which takes the role of falsifiability, where “Une

interprétation ne doit pas être seulement probable, mais plus probable qu'une autre” (RICOEUR, 1986, p. 202).

Following Foucault’s reflections about the disciplines as principles for controlling the production of discourses, *le vrai* aim of this reflection is pointed towards the originality of an interdisciplinary text. Based on what I have learned during this research, the purpose of an interdisciplinary research should be to provide, although based on a *collage de textes préexistents*, some sort of a *discours fondateur*. A discourse that will not necessarily be “*dans le vrai*” of a particular contemporaneity, but has to be “*vrai*,” to offer a “truth,” to obligatorily create a possibility for a “nouvel objet qui appelle de nouveaux instruments conceptuels, et de nouveaux fondements théoriques” (FOUCAULT, 2014, p. 36–37). Foundational discourse which performance, as enabling a process “of questioning ever further” (GADAMER, 2004, p. 360), can only be judged over time “as it unfolds through decades or centuries” (SCHUMPETER, 1943).

#### 2.4.22. Further interpretations

Besides the texts presented at this document, there are several others that I wrote about and because of this research. These texts can be divided into two different sets. One that are academic related. The other, are texts posted online as a free written thoughts from my own.

The academic related papers are:

- Innovation and Prejudice: a Pre-Study on Prejudice Related Innovativeness Determinants – PRIDE (MANHÃES; MAGER; VARVAKIS, 2013);
- Prejudice and innovation – A critical relation for creating new products by organizations (MANHÃES et al., 2013);
- Prejudice and Innovation: a critical relation for designing potentially innovative solutions (MANHÃES; MAGER; VARVAKIS, 2014).

On the internet were published the following texts based on this research. I will inform just the titles of them. It will be necessary to search for their actual URL. The titles are:

- The Surfers of Innovation;
- 5 Myths about Innovation Teams;
- Leadership is dead! Long live the Team;

- Design is not Engineering: a Different Bridge;
- Rainmaker's Manual. Or, how to hinder innovation;
- Service Design is not about ‘pampering’: a brief overview on prejudice;
- Women are Better at Innovation: what human-centered-design is about;
- The Innovation Secret of Steve Jobs: an Apple from Darwin.

#### 2.4.23. Productivity as an antithetical process

*The following text is a revised, abridged and translated to English version of a 2010 book chapter that I wrote entitled<sup>106</sup> “A Produtividade como um Processo Antitético: uma proposta para a ilustração da relação entre estabilidade e criatividade nas organizações” (MANHÃES; VANZIN, 2010). This text is, with absolute certainty, the conceptual locus from which this landscape journey begun.*

Organizations, pressured by increasing market competition, are continually forced to adopt strategies focused on augmenting productivity. However, issues regarding how to measure this variable has not received adequate scientific attention. Metrics and process optimizations of productivity are adopted without a clear definition of important factors concerning the competitiveness and success of those organizations (SINGH; MOTWANI; KUMAR, 2000; TANGEN, 2005). Success that is often tied to the potential for innovation and creativity of a company.

The concept of productivity, especially in industries, seems to be perceived by organizational people as a physical phenomenon, as counting unities of items produced by a given amount of resources used. It is also expressed in various and divergent forms. Such as the ones based in time factor. Some authors even suggest that the effective measurement of physical efficiency of a manufacturing process is impossible, “since there is no physical common nominator for combining different kinds of inputs” (TANGEN, 2005, p. 38). In addition to this characteristic of measurement’s difficulty, there is the fact that productivity is a relational concept, contextual. For example, it can be changed on an *ad hoc* or on a

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<sup>106</sup> As translated by me, its title in English would be: Productivity as an antithetical process: a proposal for the illustration of the relationship between stability and creativity in organizations.

permanent mode, either positively or negatively, even abruptly. Singh et al (SINGH; MOTWANI; KUMAR, 2000) ponder that a positive and permanent change on the productivity of an organization can only occur as a result of an innovative process.

The relationship between innovation and productivity gains can be made in several ways. Be it through the concepts of gains in effectiveness and efficiency of the organization, or of levels of profitability (TANGEN, 2005). Within these conceptual relations, innovation can be viewed as a social phenomenon, which occurs within a value network<sup>107</sup> and “includes the concepts of novelty, commercialization and/or implementation” (POPADIUK; CHOO, 2006, p. 303). Thus, seeing innovation as positively impacting on productivity permits the former to be linked to the broad concept of organizational success and longevity. According to Drucker (DRUCKER, 1985, p. 149), successful entrepreneurs have one thing in common: “a commitment to the systematic practice of innovation.” In other words, it can be seen – from Drucker’s perspective – that the systematic and, therefore, productive practice of innovation leads to business success and longevity; i.e. improves organizational performance<sup>108</sup>.

Having set that relation between productivity, innovation and performance, it is possible to establish as a consequence the relation between performance and creativity. Therefore, it is necessary to clarify that if a company or organization depends on innovation, it is obligatorily dependent on creative people (SUTTON, 2001). After all, as proclaims Takeuchi (TAKEUCHI, 2006, p. 91), “companies do not innovate; people do.” A kind of people with the ability to see things and situations that are around them in new ways, with new meanings. This ability requires something more than simple processing of objective information. And despite that a change in perception does not alter facts, it profoundly changes their meanings (DRUCKER, 1985; SUTTON, 2001; TAKEUCHI, 2006). Takeuchi (TAKEUCHI, 2006, p. 85) makes the following reservations about the innovation process:

Innovation is a highly subjective process of personal and organizational self-renewal, requiring

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<sup>107</sup> This one is understood as a system of value creation, within which different economic actors – suppliers, partners, allies and customers – work together to co-produce value (PEPPARD; RYLANDER, 2006).

<sup>108</sup> “Furthermore, performance can be described as an umbrella term for all concepts that considers the success of a company and its activities. Nevertheless, the types of performance that a particular company strives to fulfil are very case specific.” (TANGEN, 2005, p. 40)

the personal commitment of employees as well as their identification with the company and its mission. It is not simply about putting together diverse bits of data and information.

Innovations are hard to imitate when they are based on tacit knowledge rather than on explicit knowledge. Explicit knowledge is expressed in words and numbers, and thus is easily communicated and shared in the form of data, formulas, or codified procedures. This makes it an easy target for imitation.

In fact, innovation is a highly subjective process. Predictions about which ideas will be successful are difficult to do. Sutton (SUTTON, 2001) also agrees on the importance of the people's commitment to a new idea as a way to increase its chances of success. Also, in line with Simonton (SIMONTON, 1999), he suggests that if there is commitment of the people to the success of a group's effort, the ideas that will serve as basis for an innovation process can be selected "randomly."

Simonton (1999), compiling several studies, shows that the most innovative ideas were obtained from the composition of random selections from a wide range of ideas. He suggests that because "starting with the totally unexpected, these experiments' participants were required to expand their creativity to the highest degree" (p. 72). The logic presented by Simonton (1999, p. 71) regarding the use of random combinations, as trial and error, it is quite clear:

If what to do in a given situation is self-evident, by all means do it. If not, try out all behaviors that have worked under comparable circumstances. If none of those do the trick, then generate various combinations of behaviors that have solved similar problems, until a behavioral combination is found that receives reinforcement. Thus, trial and error is a last resort, but is a resource that must be available [...].

In this scenario, trial and error is the best "ability to reach a desired goal," which in the words of Tangen (2005, p. 41) means effectiveness. By inference, one can arrive at the obvious statement that committed creativity is the most effective way to innovate. And that committed creativity, recollecting Takeuchi (2006, p. 91), requires the presence of people and, more precisely, creative people. After all, "creative people



work for the love of a challenge” (FLORIDA; GOODNIGHT, 2005, p. 126). To which I would add that people that are committed to their work (love) face challenges with creativity. The creative potential of these people is fully utilized only by maintaining high levels of intellectual engagement and commitment (FLORIDA; GOODNIGHT, 2005). When reporting research on the analysis of ideas for innovation, Stevens *et al.* (STEVENS; BURLEY; DIVINE, 1999) show that the presence of analysts with creative profile is important to achieve a certain efficiency<sup>109</sup> of such process. They also report that the lack of an original meaning – for an innovative product proposition, is considered the main reason for failure in the launching of new products. These same authors write (p. 460):

Creativity is also important because the starting idea is almost never commercial [...]. Starting ideas need to be reshaped substantially, often involving several iterations, before becoming commercial. This may require several “leaps of thought” or “branching” to different ideas. This occurs especially in the early stages of the project, often referred to as the “fuzzy front end.” It therefore seems logical to infer that a firm is more likely to develop “meaningfully unique” and commercially successful new products if they are using highly innovative and imaginative people to manage the early stages of their NPD discipline.

Studies point to the fact that creativity is fundamental for the success of organizations. However, as early as 1963, Levitt (LEVITT, 1963, p. 137) wrote that it “is not the miraculous road to business growth and affluence that is so abundantly claimed these days.” One of the examples that creativity sometimes leads to business success is of Thomas Alva Edison (1847-1931), founder of U.S. company General Electric. Drucker (DRUCKER, 1985, p. 157) cites Edison as a practitioner of systematic innovations, which are all clearly focused “only in the electrical field”. Drucker’s position is that “innovators rarely work in more than one area”. Brown (2008, p. 85), on the other hand, celebrates

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<sup>109</sup> “Efficiency is commonly defined as the minimum resource level that is theoretically required to run the desired operations in a given system compared to how much resources that are actually used” (TANGEN, 2005, p. 41)

Edison's "ability to conceive of a fully developed marketplace" for his inventions. Brown also cites numerous examples where, despite not having predicted the correct use of his inventions (he developed the phonograph to be used for corporate meetings), he was able to create new markets from a "great consideration to users' needs and preferences". Simonton (SIMONTON, 1997, p. 66) also reports the case that only one of Edison's "failed" invention, cost the inventor of all profits he collected with the invention of the light bulb.

Either a more disciplined interpretation of innovation (DRUCKER, 1985), or a more interdisciplinary (BROWN, 2008), in both cases the presence of creativity, i.e. creative people, is essential in the early stages of new products development, whether goods and/or (STEVENS; BURLEY; DIVINE, 1999). But, citing the title of the famous article written by Levitt in 1963: *Creativity Is Not Enough*. Elsewhere, Rietzschel *et al.* (RIETZSCHEL; NIJSTAD; STROEBE, 2006, p. 250) studying how to increase the productivity of the processes of *brainstorming*, said "*productivity clearly is not enough*". These authors maintain that (*idem*)

instead of simply making groups more *productive*, it may be more fruitful to make them more *effective* in all stages of the creative process. (Italics are in the original version).

They advocate that, from an applied perspective, brainstormers should pay more attention on the idea selection phase if their intention is to get brainstorming "to yield high-quality solutions" (RIETZSCHEL; NIJSTAD; STROEBE, 2006, p. 250).

### Productivity and Creativity

The relations between productivity and creativity can be constructed from analyzing these very words along with *performance*, *profitability*, *efficiency* and *effectiveness*. Tangen (2005, p. 43) proposes a model called the *Triple P-model* in which the concept of *Productivity* is nested inside of *Profitability* which, in its turn, is under the umbrella term *Performance*. As can be seen in the next figure, the model also has among its elements the concepts of *effectiveness* and *efficiency*.

According to Tangen (2005, p. 43) the main concepts depicted at the next figure have the following definitions:

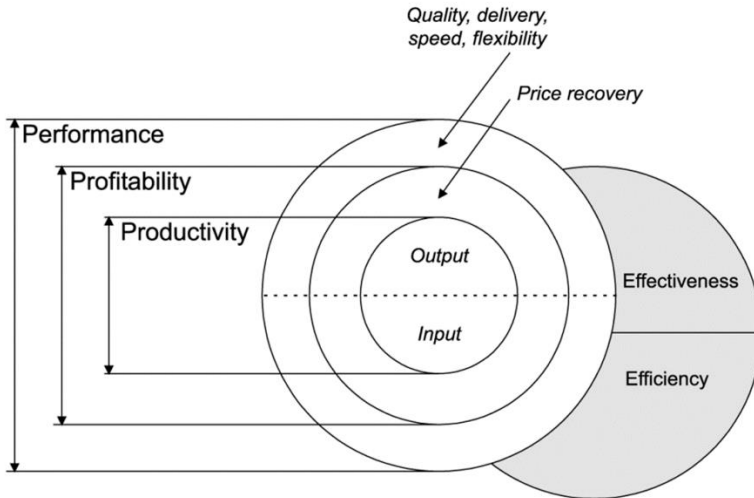
- a. Productivity is the central core of the triple P-model and has a rather straightforward operational definition of productivity as the relation between output quantity (i.e. correctly produced products which fulfil their specifications) and input quantity (i.e. all resources that are consumed in the transformation process). [...] the concept of productivity is purely a physical phenomenon and must therefore be defined as one;
- b. Profitability is also seen as a relationship between output and input, but it is a monetary relationship in which the influences of price-factors (i.e. price recovery) are included;
- c. Performance is the umbrella term of excellence and includes profitability and productivity as well as other non-cost factors such as quality, speed, delivery and flexibility.

Two other terms, efficiency and effectiveness are transversals with respect to the other three. According to Tangen (2005, p. 41), efficiency is defined “as the minimum resource level that is theoretically required to run the desired operations in a given system compared to how much resources that are actually used”. It is a concept easily measured and similar to the rate of use (in the sense of how a specific equipment or process is used in practice compared to its maximum capacity). The effectiveness, however, can be defined simply as “the ability to reach a desired objective”. However, it is a term more diffuse and difficult to quantify than that of efficiency. Tangen (2005, p. 41) weaves an important distinction to say that the effectiveness “it is often linked to the creation of value for the customer and mainly influences the numerator (outputs) of the productivity ratio”. He concludes writing that this definition leads to an interesting concept: “there are usually no limits as to how effective an organization can be”, since the *input* is the denominator of the ratio.

On the basis of what was exposed it is possible to initiate a *rapprochement* between the concepts of efficiency and creativity. Drucker himself (DRUCKER, 1985, p. 96) notes that it is undeniable that there are “innovations that spring from a flash of genius.” Innovations which can change all basis of measuring the productivity of an industry. On the other hand, he also advocates a purposeful search for innovation opportunities from two sources (DRUCKER, 1985, p. 96):

- a. Internal to the organization, divided into four specific areas: “unexpected occurrences, incongruities, process needs, and industry and market changes.”

- b. Outside the organization, divided into three aspects: “demographic changes, changes in perception, and new knowledge.”



**Figure 21 – Model of the Triple P**

Source: (TANGEN, 2005, p. 43)

The processes of generation and selection of ideas are essential for innovation. Although trying to establish a correct relation between them is an “onerous task” (RIETZSCHEL; NIJSTAD; STROEBE, 2006, p. 245). After all, to remain competitive, an organization must be not only effective but also operate “efficiently and orderly” (SINGH; MOTWANI; KUMAR, 2000, p. 240). The scientific management of organizations, sometimes, “calls for blindly reducing variability” (HALL; JOHNSON, 2009, p. 60) in the name of maximum efficiency. In certain situations, such as innovation, variability should not be avoided. Rather, it needs to be encouraged. Hall and Johnson (2009, p. 60) makes the following comment on this onerous task:

The traditional scientific approach to such situations is to try to tame the environment by imposing complex rules that spell out what to do in every possible circumstance.

Not only does that reduce accountability, but it often causes workers to switch to autopilot instead of trying to understand the specifics of each job.

On the same conceptual stream, Sarasvathy and Dew (SARASVATHY; DEW, 2005, p. 539), through the notion of isotropy, reinforce the difficulty of determining *ex ante* the conduct of an innovation:

Isotropy refers to the fact that in decisions and actions involving uncertain future consequences it is not always clear *ex ante* which pieces of information are worth paying attention to and which not [...]. In other words, a phenomenon that looks *ex post* either like an exploration of all possible Internet markets, or the exploitation of the Internet for commercial purposes, may instead be the result of a series of transformations on the original reality, caused by cognitively bounded and idiosyncratically motivated agents trying to solve a variety of problems in a local and contingent fashion.

That is, a phenomenon that *ex post* seems a consistent result of certain events may actually be the result of an idiosyncratic sequence of actions performed by entities cognitively bounded and just trying to solve immediate problems (SARASVATHY; DEW, 2005). The intention behind this argument is to raise the possibility that, in a process of innovation, attention to peripheral opportunities (BJÖRK; MAGNUSSON, 2009) requires a process that allows for the existence of ambiguity, doubt, i.e. the so-called “weak-problem” (BUCHANAN, 1992). Roughly speaking, this problem is characterized by not presenting a complete and definitive solution. In such a situation, the most effective metaphor to understand it seems to be the evolutionary process. Thus, to approach it metaphorically through the theory of evolution laid down by Charles Darwin in 1845 (DARWIN, 1860). At its core there is a process named by Campbell (CAMPBELL, 1960) and developed by Simonton (SIMONTON, 1999) as “blind variation and selective retention.” According to that, this is the process from which happens the Darwinian phenomenon of “survival of the fittest” creative ideas (AYRES, 2004).

Following this observation, it is necessary to relate that to the fact that organizations also need to operate “efficiently and orderly” (SINGH;

MOTWANI; KUMAR, 2000, p. 240). In the “business world,” there are abundant records of supposedly “creative” companies, that have adopted policies and systems based on collegiality and trust that went “directly to financial ruin.” There are also records of innumerable businesses in ruins that were saved by the imposition of neo-Taylorist controls (FLORIDA; GOODNIGHT, 2005, p. 130). According to Levitt (1963, p. 143), this raises a frighten issue:

If conformity and rigidity are necessary requisites of organization, and if these in turn help stifle creativity, [...] does all this mean that modern organizations have evolved into such involuted monsters that they must suffer the fearful fate of the dinosaur [...]?

Of course the situation is not that extreme. After all, ultimately, an organization will cease to exist when it stops producing something of value to people, something that people want or need (FLORIDA; GOODNIGHT, 2005). In a way, this requires that organizations have to, in addition of being efficient, also to be effective. And creativity comes back to fit into the context. Although the systematic and scientific study of creativity requires its examination within the specific context of an area and a domain, it is fair to say that creativity “occurs in a social scene that goes beyond pure disciplinary concerns” (SIMONTON, 2010b, p. 172). Creativity, most of the time, normally emerges from social interaction, in collaborative groups rather than solitary individuals. Simonton (2010) proposes that in these situations, the critical question is how to form a collaborative group to obtain the maximum possible level of creativity. Or, in the words of Tangen (2005), to make the creative process pendularly efficient as well as effective. One of the possible inferences that can be made from the work of Simonton is about the need to ensure that group members do not have identical knowledge domains. Or, as suggested by Warr and O’Neill (2005), that individuals have different collections of “matrices of thoughts.” In that sense, a creative group should present domains of knowledge fields greater than each member separately (SIMONTON, 2010b). This issue of multiple matrices and knowledge is also treated by the knowledge creation process, which occurs through the exploration of antithetical contexts (NONAKA; TOYAMA, 2003). In summary, for the organization to produce innovation from creativity is necessary that a divergent process of

generating ideas (blind variation) is followed by a convergent process of selective retention (RIETZSCHEL; NIJSTAD; STROEBE, 2006).

Therefore, it makes sense from this perspective that an organization can be both efficient and effective in the search for innovation. According to Drucker (DRUCKER, 1985), this search is the most important function of a company. He further defines innovation as “the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth” (DRUCKER, 1985, p. 149). And, these arguments are aligned to what Takeuchi (TAKEUCHI, 2006, p. 92) advocates, which is that the same can be said of the innovation management process:

A synthesis of both order (thesis) and chaos (antithesis) has been instrumental in the continued international competitiveness of many Japanese firms. After all is said and done, putting this kind of thinking (dialectics) into practice may be the most difficult thing for others to imitate.

This is to say that *serendipity* does have its role at the management of innovation. Takeuchi (TAKEUCHI, 2006, p. 86) explains that:

[...] today, many of the best innovations come from observing and interacting with customers to discover what they want, forming alliances with suppliers and retailers, and pulling in universities, communities, and even competitors. The environment has become much more open and collaborative. In other words, the process requires the involvement of a lot of people, both within and outside the company in what is being called the networked society.

The ability to create value for a much broader set of people is a major challenge to the resources of an organization. And if these resources do not create value efficiently and effectively, the organization’s productivity is compromised. This leads to the conclusion that it is necessary to eliminate all waste in order to improve productivity, that waste is antagonistic to what productivity symbolizes (TANGEN, 2005). On the one hand, an organization must be efficient to be productive and profitable. On the second one, what are the chances of it being

effective and creative and still be profitable? And in being that, would it be necessarily innovative?

It was presented above that biological evolution, according to Darwin, occurs through the “survival of the fittest” (DARWIN, 1860). In the economic field, the survival of organizations is related to the profitability factor. In it, the evolutionary dynamics seems to be characterized by an adversarial relationship between forces toward increasing diversity and forces directed to decrease it (AYRES, 2004). Ayres (AYRES, 2004, p. 433) adds by saying that “the expansion process can be considered disequilibrating, whereas the selection process operates to reequilibrate” the system. That aspect can be complemented by saying that the disequilibrating process tends to efficacy and creativity, because it generates a final set of alternatives from which emerges the winner. Otherwise, the reequilibrating process can be related to a tendency toward efficiency.

Tangen (2005) argues that organizational productivity can come from an ideal pendularly relation between efficiency and effectiveness. Creativity, by what is possible to infer from the cited literature, can be understood as an unbalanced relationship in favor of effectiveness. In this context it may be necessary to define a term to an inverse relationship in favor of efficiency. Perhaps this imbalance towards efficiency may be called “stability”. Unlike efficiency, efficacy is linked to the *input* (as the denominator of the productivity equation) and can draw unlimited upside lines. The efficiency in the long term, can describe a line in the format of “long tail” with a clear trend towards stability, *ceteris paribus*. Tangen (2005, p. 41) reinforces this image to define the efficiency as the “minimum resource level that is theoretically required to run the desired operations”.

In defining productivity as an optimum relationship between effectiveness and efficiency, it can be established branches toward creativity and stability. Starting with the effectiveness term, it is possible to create a direct conceptual sequence passing through creativity and innovation, evolving to disequilibrium. Likewise, one can establish a sequence between the terms efficiency, stability and maintenance, in the quest for equilibrium. This relationship is illustrated by Figure 22, developed from the Triple P model proposed by Tangen (2005). At the extremes of these sequences may be, on one hand, the concepts of “blind variation” as a way to generate the diversity needed to innovate and on the other hand, the “selective retention” as a dynamic reduction of waste linked to the term maintenance or equilibrium. Something like what Ayres (2004) describes as an evolutionary dynamic which takes place



through a confrontation between forces that increase and others that tend to reduce diversity.

Thus, it can be inferred that an organization is productive when there is an optimal relationship between stability and creativity. In certain situations and periods it must be stable and act “as if the future will be a perfect imitation of the past” (SUTTON, 2001, p. 103). Alternatively, it should exercise a “daunting epistemological freedom” (RITTEL, 1987, p. 5) in order to devise new ways to follow. Thus, entering into the creative process of *design*. Both, in one case as in the other, ultimately, the metric that governs that performance is determined externally by a particular “out there” (WEICK, 1995, p. 70), i.e. the “market.” As occurs with the production of artists, in a sense, is the continuous exposure to customer *feedback* that prevents the producers “from constructing their own idiosyncratic notion of quality” (HALL; JOHNSON, 2009, p. 62).

In summary, the term productivity is “strongly connected to the creation of value” (TANGEN, 2005, p. 37). From this perspective, the productivity can be measured by the value aggregated to a particular process or product, be it a service or a good (SAARI, 2006). It is not a complex task to imagine situations in which the simple novelty or stability of a production process cannot add value to the product. However, the effort to determine the correct balance between the quest for maintenance and innovation is by no means trivial. A creative solution to a challenge like this can be achieved by a large number of different processes. But, as suggested by Simonton (2010b, p. 169), unless it is demonstrated that the success of the entity was obtained precisely by the use of a particular process, “it seems safe to infer that its choice was blind to the likelihood that this would produce the desired solution.”

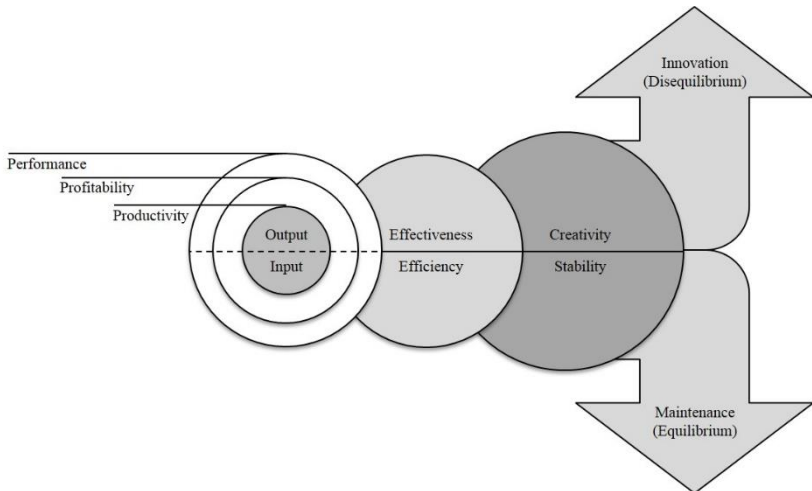
After all, in a way, the creation of new meanings and new values “is not a simple matter of processing objective information” about the environment (TAKEUCHI, 2006, p. 88). The environment in which the organization operates is often influenced by implicit factors that cannot be exactly or explicitly defined. For example, a market’s change of perception, although it did not change the underlying facts, may profoundly alter their meanings, defying quantification models. However, as puts Drucker (2002, p. 154), this is not an “exotic phenomenon” and it can be defined and tested. And one way to understand this process of defining the best tactical balance between stability and creativity can be made by comparing it with the *design* process. In fact, as suggested by Boland and Collopy (BOLAND; COLLOPY, 2004) in the chapter entitled “Design Matters for Management” (in the book “Managing as

designing”), managers of organizations can be considered both as decision makers “and as *designers*”.

The *design* process can be defined as a systemic approach to invention of possibilities (BUCHANAN, 1992). Although it cannot be defined as a predefined sequence of well-ordered steps, this process is consistent and produces results (BROWN, 2008). In a sense it can be defined as effective, but not necessarily efficient. It generates results in settings with high levels of indeterminacy, as characterized by weak-problems. This implies that there are no definitive conditions or limits to solve a problem from a design perspective (BUCHANAN, 1992). The solution generated by a process of *design* must be new and suitable. New to the extent that the solution must be unusual, at least to the minds that conceived it. And appropriately, it must comply with certain requirements for possible solutions (WARR; O’NEILL, 2005).

Based on Drucker (DRUCKER, 1985, p. 154) when he says that “new opportunities rarely fit the way the industry has always approached the market, defined it, or organized to serve it,” it can be inferred that the search for productivity may go through spaces of creativity and stability. In highly erratic environments, for example in the case of markets with rapid innovation cycles as in the mobile telecom, the variation in results is natural and, in a sense, perceived as a good thing by the customers (HALL; JOHNSON, 2009). And, also, the ability to enable and encourage “productive accident” is linked to the profitability of companies in a research reported by Florida and Goodnight (2005). Much of the creativity and intelligence of organizations are sprung from the interaction between people (WARR; O’NEILL, 2005). The more diverse the backgrounds of the people who make up the project teams, as in a dialectical process, the easier it will be the conversion of personal knowledge into organizational (TAKEUCHI, 2006).

Although a superficial analysis might suggest that the terms productivity and creativity are even self-excluding, the literature reviewed allows to present a perspective in which creativity is embedded into productivity. As illustrated in Figure 22, it was possible to infer, within the context of productivity and performance, a contextual place for the term “stability” and the relationships between efficiency and effectiveness, and between innovation and maintenance. Also that the drive for productivity can be understood as a proper balance between the concepts represented by the terms creativity and stability. And that the balance between the forces of disequilibrium and equilibrium – which defines productivity – could be conducted through a process of *management as design*.



**Figure 22 – Expanded Model of the Triple P**  
 Source: Author, based on (TANGEN, 2005)

This text aims to propose a sense making discourse placing creativity as a fundamental component of productivity. Much still needs to be improved so that we can obtain the desired conceptual articulation.



### **Section III**



### **3 CONVERGING DISCUSSION: WITHDRAWAL OF ALL THAT STILL REMAIN HIDDEN**

The story is a sufficiently plausible account of “what is happening out there?” that it can serve as a landscape within which they and others might be able to make commitments and to act in ways that serve to establish new meanings and new patterns of behavior. (COOPEY; KEEGAN; EMLER, 1997, p. 312)

The third section of this document, its 6<sup>th</sup> chapter, is characterized by a convergent discussion that, moved by the sensemaking purpose of enabling people to act (COOPEY; KEEGAN; EMLER, 1997; WEICK; SUTCLIFFE; OBSTFELD, 2005; WEICK, 1995), will try to offer some actionable insights towards fulfilling the underlying emancipatory interest (HABERMAS, 1971) of this research and researcher.

Like constructing a new vantage point from where myself and others will enjoy future landscapes, this section of the text aims at establishing a discourse that increases the potential to act of a certain social contexts (academic and corporative). This particular potential to act (knowledge) is intended by me to:

- a) enable groups to work on the creation of innovative proposals;
- b) commit groups to act in support of socio-cultural diversity.

The creation of this potential to act (knowledge) is focused on proposing a heuristic to make less puzzling, less ambiguous, that will give sense of what to expect and how to intellectually understand: (i) the assignment of individuals to groups and (ii) the governance of social groups. All aiming at to increase the potential of these same groups to generate innovative propositions of products (goods or services). Thus, the destiny of all organizational context research – that is to propose ways to increase the productivity of organizations – is fulfilled. Fulfillment that should be enabled by the results shown below.

This interdisciplinary approach to innovativeness efforts of groups can contribute to make sense of an important challenge facing a myriad of organizations: make sense of innovative efforts. At the same time that it maintains the innovativeness potential of teams – without relying on

control processes, it enables organizations to act by providing an academically supported discourse in the form of a heuristic.

Thus, this research aim became to propose a heuristic for designing the best set of participants, given a definite pool of possible candidates, as to obtain the highest innovative product's potential out of a group of people; i.e. a specific set of participants. Or, how to select participants to a group as to obtain the best composition to yield the highest innovative potential product from that same group.

The operationalization of the proposed heuristic is divided into simple steps like:

1. Assess the NFC levels of the potential individuals to be involved;
2. Design groups based on specific sets of diverse levels of NFC to lead the innovative effort and/or to evaluate it;
3. Adopt Allport's Four Key Conditions of intergroup contact through governance policies;
4. Define a time frame and available resources;
5. Provide organizational autonomy for the designed groups.

The above suggested steps should enable organizations to create *Bildung* prone groups where the imaginative productivity is richest because it will not be merely free. The specific horizons where those groups will stand, "as in the convolutions of the arabesque," should provide "a field of play where the understanding's desire of unity does not so much confine it as suggest incitements to play" (GADAMER, 2004, p. 41).

### Reflexive questioning

The somehow questionable preciseness of a "research question" was addressed by me in a reflexive way. Firstly, it became clear to me that the research question cannot be given upfront, at least its questioning cannot be fully understood upfront. It seems more like a hermeneutic outline, which conveys "a small degree of correctness" (GADAMER, 2004, p. 409) good enough to be usable. The research questioning and questions gave sense to my hermeneutic experience (FLEMING; GAIDYS; ROBB, 2003) during this entire research process.

The way I understand the hermeneutic process of understanding, even though the question phrase was given upfront, its meaning was constructed in an interplay between parts and wholes throughout the time



lapse in which the research was done. And, in my case, the research question was written in its final form only after some considerable amount of the research was already done.

As presented somewhere else on this text, the theme of my doctoral research started to gain some formal contours in October 2010. What appeared to me as a potentially interesting breakdown to study (ALVESSON; KARREMAN, 2007) was the fact that the majority of organizations that I knew seemed to be over-focused on efficiency. As if efficiency was equated to performance: better efficiency would lead to better performance. Then, after March 2011, I started a study done through several creativity-driven workshops which made me question the role of design into the creation of innovative opportunities.

It is from that historical vantage point that I designed the question, the general and specific objectives as follow.

#### Research Question

*What, if any, is the relation between the motivated cognitive tendencies of individuals in a group and the potential of that group to create products perceived as innovative?*

#### General Objective

*To study the relation between the motivated cognitive tendencies of individuals in a group and the potential of that group to create products perceived as innovative.*

#### Specific Objectives

- i. Identify an instrument capable to assess the motivated cognitive tendencies levels of individuals in a group;*
- ii. Identify an instrument capable to assess the perception of innovativeness of a product;*
- iii. Develop a study capable to depict the possible relations between the results of the two instruments listed above.*

#### Designing Research Answers

The present research did produce correlations at or above 0.6 point between the motivated cognitive tendencies of individuals in a group

(NFC Mean) and the potential of that group to create products perceived as innovative (OUP Mean).

The numbers that support this research are the result of data sets from four studies based on four different workshops with 84 participants (forming 18 valid groups from Germany, Brazil, India, Italy, Mexico and Poland), three independent panel of judges and one panel of judges (involving 36 judges coming from Brazil, Colombia, Germany, Italy, Sweden and United Kingdom). At the end, the total studies' participation was of 99 persons (55 women and 44 men) from eight different countries.

When considering OUP Mean as a dependent variable and W/M Ratio, NFC CoV and NFC Mean as independent variables (Predictors), a multiple linear regression can verify that the resulting model yields the following data: the predicted R value of 0.668, R square of 0.446, adjusted R square of 0.328 and a Durbin-Watson index of 1,294, with a 0,036 confidence level; which indicates that the  $F(3;14) = 3,762$  of the model is statistically significant (above the critical value of 3,34).

The results of this study confirm that the NFC Mean levels of groups (as a result of the historical standpoint of its members) impacts the results of their innovative efforts. In other words, these results enable to describe NFC Mean as a positive and significant predictor of OUP Mean. And, based on that, it is possible to design groups that “are much more innovative than the rest,” paraphrasing Jensen et al. (2007, p. 685). Therefore, it seems to me possible to design *Bildung* prone groups.

The predictors' variables indicate that the model can explain 32,8% of OUP ratings obtained by each group. The presented data and results answer positively the research question of this thesis by indicating that there is a relation between the motivated cognitive tendency of an individual in a group (NFC Mean) and the potential of that group to create products perceived as innovative (OUP Mean).

Therefore, the solution of the initial breakdown and mystery are presented as a proposition for a heuristic focusing on enabling action towards the (i) assignment of individuals to groups and (ii) the adoption of a governance policy for social groups in order to increase their potential to generate innovative propositions of products (goods or services).

### Considerations to Act

The analysis of the present studies seems to yield many more interesting interpretations than the ones directly related to the mathematical correlations. Nevertheless, I focus on the “magic” of numbers, due to my belief that *numbers* can consensually enable the

construction of a coordinated system of action (TAYLOR; VAN EVERY, 2000) for organizational social contexts.

Thus, as a sensemaking discourse supported by a technical interest in evidences and concerning the design of groups to create or assess innovative propositions, from the present studies it can be interpreted that:

- Groups with mid-to-high NFC Mean should have their products propositions perceived as more innovative;
- Groups predominantly composed by women should have their products propositions perceived as more innovative;
- Groups with mid-to-low NFC Mean should be more assertive in assessing the innovativeness of new product propositions;
- Groups predominantly composed by men should be more assertive in assessing the innovativeness of new product propositions.

The sensemaking discourse that supports this heuristic, named Prejudice Related Innovativeness Determinants Heuristic – PRIDHe<sup>110</sup> (MANHÃES; MAGER; VARVAKIS, 2013), can be summarized as: *organizations that are aware about their prejudices and the impacts of these are more likely to perform better*. Therefore, it follows that whenever people from a social context have to open themselves up to the new, they will need to do it in terms of the *fore-structures* of understanding that they already possess. And, if they are aware of their prejudices, their probability to have better performances increases.

### Facing the Triple Challenge of Innovativeness

Whenever we have looked at any job – no matter for how many thousands of years it has been performed – we have found that the traditional tools are wrong for the task. (DRUCKER, 1999, p. 80)

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<sup>110</sup> On the morning of the 28<sup>th</sup> of August 2012, after rumbling the words Prejudice, Innovativeness, Determinants and Heuristic in my head, I thought about the acronym PRIDE. At first it just seemed to me to be a bad idea, too obvious, too corny. And I commented that with Miriam Becker. To my surprise, she strikingly replied: “Mauricio, isn’t your research is about prejudice?!” Yes, I replied. “Don’t you think that it makes no sense that you have a prejudice about that word?” :-) Thanks Miriam.

Departing from the concept of the individual triple challenge<sup>111</sup>, to be innovative organizations should have to overcome the triple challenge of (i) understand the prejudices of its members, (ii) to understand its historical context and (iii) create innovative meaning propositions. These challenges can only be overcome by creating new knowledge: by finding new ways of augmenting the potential to act (KROGH et al., 2013, p. 4). And knowledge, by its turn, can only be created by building bridges between the different, as *arcs herméneutiques* (RICOEUR, 1986, p. 158) connecting seemingly incompatible concepts. Thus, organizations have to enable individuals to overcome the triple challenge mentioned above through a process of Socialization, Externalization, Combination and Internalization (NONAKA; TOYAMA; KONNO, 2000; NONAKA; TOYAMA, 2003).

Organizations can facilitate this process by providing for its members two enablers. The first one is the possibility of being aware of one's own closed mindedness<sup>112</sup>, which is "of key importance to the ways in which our thoughts, often inchoate and unwieldy, congeal to form clear-cut subjective knowledge" (KRUGLANSKI, 2004, p. 01). The second one is by adopting the Four Key Conditions for intergroup contact (ALLPORT, 1979). As presented by Pettigrew (1998), these conditions are: equal group status within the situation; common goals; intergroup cooperation; and the support of authorities, law, or custom.

One final important remark has to be made before detailing the proposed heuristic. At the beginning of this research, my interest was focused on studying organizations. At some point, I thought that "groups" would make the study about the impacts of prejudice on innovative efforts much easier. At this point in time, my intention with the proposed heuristic is to focus back at organizations. Which means, trying to extrapolate my understandings about groups' dynamics to the

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<sup>111</sup> The individual triple challenge of (i) a flickering self-awareness, (ii) to understand what is the Other and (iii) create innovative propositions, as detailed at page 162.

<sup>112</sup> "The phenomena of closed and open mindedness are at the heart of the interface between cognitive and social processes. Every intelligible judgment, decision, or action rests on a subjective knowledge base held with at least a minimal degree of confidence. Formation of such knowledge requires that we shut off our minds to further relevant information that we could always strive and often manage to acquire. The relation of closed mindedness processes and social cognition and behavior is twofold. First, other people or groups of people often are the targets of our judgments, impressions, or stereotypes. Second, they are often our sources of information, and their opinions, judgments, and attitudes exert an important influence on our own. Thus, closed mindedness phenomena impact on what we think of others as well as how we think, in terms of the sources of information we take into account when forming our own opinions." (KRUGLANSKI, 2004, p. 04)

organizational level in a way that can effectively commit people to act, establishing new meanings and new organizational patterns.

### **Prejudice Related Innovativeness Determinants Heuristic**

Based on the studies and data generated by this research, it is possible to support by quantitative arguments a qualitative sensemaking discourse that connects the notions of design, prejudice and innovativeness.

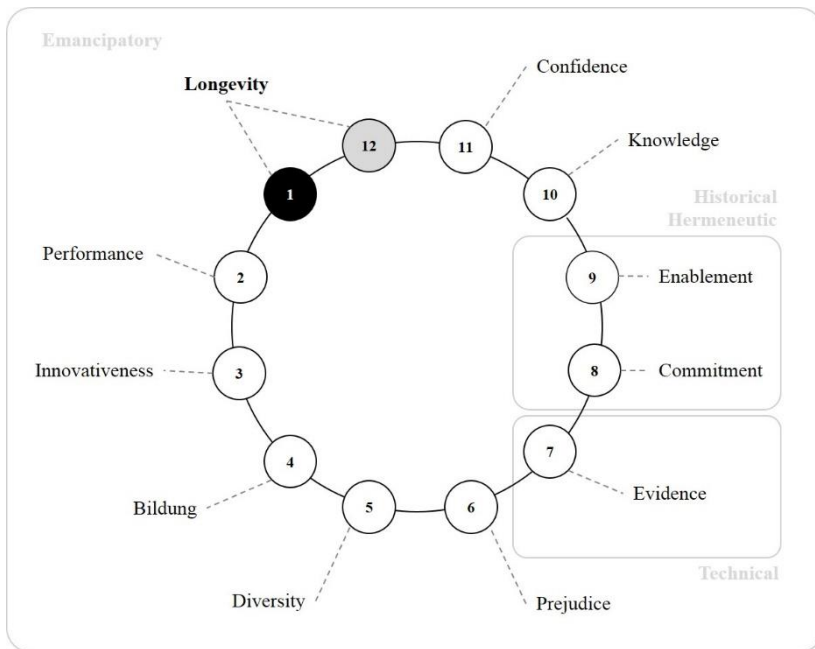
The sensemaking discourse that support this heuristic is structured as follows, based on twelve determinants:

1. When people feel confident in a group, they will want it to be **longevous**;
2. To be longevous, a group needs to have good **performance**;
3. To have good performance, a group needs to **innovate**;
4. To innovate, a group have to go through **Bildung** processes;
5. To go through a *Bildung* process, a group needs the benefits of socio-cultural **diversity**;
6. To have the benefits of socio-cultural diversity, a group has to be aware of the **prejudices** of its members;
7. To be aware of the prejudices of its members, a group needs to obtain **evidences**;
8. To obtain evidences, a group has to be **committed** to act;
9. To commit to act, a group has to be **enabled** to act;
10. To be enabled to act, a group has to create new **knowledge**;
11. To create new knowledge, group's members need to feel **confidant**;
12. Felling confident in a group, its members will want it to be **longevous**.

The proposed heuristic, based on Weick's sensemaking process (WEICK, 1995, p. 55), works by committing people to act towards generating tangible evidences in some social context. The generation of evidences helps them make sense in retrospect what is occurring, why it is occurring (plausibility), and what should be done next to enhance their identity as an innovative organization. The following figure illustrates the proposed heuristic.

The critical relation between prejudice and innovativeness, as a perspective on performance, permits to view the ability of organizations to create new products in the light of the totality-subjectivity combination.

At the same time, the PRIDHe heuristic tries to avoid both (a) the constraints of a “method” for innovation and (b) proposing “tyrannies of structurelessness” (ALVESSON; SKÖLDBERG, 2009, p. 160). This “middle way” takes into account the hermeneutic experience and invites the involved ones to play with the prejudices at stake. And, as a sense making discourse, a *play* is precisely what innovation is: there is a risk that it “will not ‘work,’ ‘succeed,’ or ‘succeed again,’ which is the attraction of the game” (GADAMER, 2004, p. 106).



**Figure 23 – Determinants of PRIDHe**

Although presented as separate, the twelve determinants from the heuristic are fundamentally intertwined. After all, emancipation is dependent upon the instrumental and practical knowledges (HABERMAS, 1971) to be able to understand the difference between what is given by nature and what is socially constructed (ALVESSON; SKÖLDBERG, 2009, p. 156).

The details for each one of the twelve determinants are presented in the following pages.

## 1. Longevity

*When people feel confident in a group, they will want it to be longevous.*

From a sensemaking perspective, organizations are collectivities whose participants have a common interest in its longevity (SCOTT, 1987; WEICK, 1995). Interest which arises in retrospect due to plausible explanations about what is occurring to them inside a particular group or organization.

One of the *plausible explanations* for its desired longevity is offered by several research on the theme of corporate social responsibility (SEBHATU, 2010). Therefore, to act into the future towards making the longevity of a group an interesting perspective, research indicate that efforts should be invested at reducing conflicts with stakeholders as a way to boost confidence in a group or organization. From a social categorization perspective, the higher member commitment, the higher will be group's cohesion (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009). And is also expected that group longevity to help cohesiveness (SCHIPPERS et al., 2003, p. 783). Cohesion which helps protect the group and, as studies show, explain the profit maximization effect that social responsibility produces at companies, "even in the absence of external pressures" (SEBHATU, 2010, p. 40).

In other words, groups' longevity and cohesion help boost performance.

## 2. Performance

*To be longevous, a group needs to have good performance*

A comprehensive review of research about group and performance<sup>113</sup> literature (VAN KNIPPENBERG; DE DREU; HOMAN, 2004, p. 1009), from a social categorization perspective, found that higher member commitment and group cohesion result in higher overall group performance. Performance is understood here as an umbrella term of excellence, which includes profitability and productivity, and which is

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<sup>113</sup> "Furthermore, performance can be described as an umbrella term for all concepts that considers the success of a company and its activities. Nevertheless, the types of performance that a particular company strives to fulfil are very case specific." (TANGEN, 2005, p. 40)

what many people who claim to be discussing about efficiency are actually talking about (TANGEN, 2005).

Building on Tangen's (2005) definition of performance it is possible to advocate that, through augmenting its innovation pipeline, any organization will ameliorate its performance. Performance which is fundamental in the continuous business cycles of creative destruction as described by Schumpeter (SCHUMPETER, 1927).

### 3. Innovativeness

*To have good performance, a group needs to innovate*

Although there are several factors that contributes to organizational performance, according to Drucker (DRUCKER, 1985, p. 149), successful entrepreneurs have one thing in common: "a commitment to the systematic practice of innovation." In other words, it can be seen – from Drucker's perspective – that the systematic and, therefore, productive practice of innovation leads to business success and longevity; i.e. improves organizational performance.

Therefore, one factor that could be considered as a major contributor to organizational performance is its capacity to play along with the *creative destruction* dynamics of capitalism, i.e. *innovation* (SCHUMPETER, 1943). Moreover, this last one cannot be considered as an efficient process in itself nor a direct result of an organizational focus on efficiency.

The possibility to make sense of what seems incomprehensible, the possibility to retrospectively create "innovations to manage complexity" (WEICK, 1995, p. 73) increases when tension between intersubjective meaning<sup>114</sup> and generic subjectivity (i.e., control) does not so much confine "as suggest incitements to play" (GADAMER, 2004, p. 41). Essentially, preservation is as much a freely chosen act of reason as are revolutions and innovations. Thus, revolutions are not extraneous acts to organizations, they are as much acts of reason as the control ones are.

Nevertheless, creating innovative products (goods and service), or doing "what has not yet stood the test of experience is no mere act of ordinary business practice" (SCHUMPETER, 1927, p. 293). And

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<sup>114</sup> "Intersubjective meaning becomes distinct from intrasubjective meaning when individual thoughts, feelings, and intentions are merged or synthesized into conversations during which the self gets transformed from "I" into "we"." (WEICK, 1995, p. 71)



unordinary business practice prompt for certain people with certain attitude and aptitude (SCHUMPETER, 1927).

#### 4. Bildung

*To innovate, a group have to go through a Bildung processes*

Several studies on innovation have focused on understanding “the new capabilities required to achieve a breakthrough” (VERGANTI; ÖBERG, 2013). In the present research, this “breakthrough” is considered a direct result from the capability of a group to “create value for an intended user, and the ease with which it can be implemented” (MAGNUSSON; NETZ; WÄSTLUND, 2014, p. 316). Based on the readings that support the present research, one of these possible new capabilities might be the creation of *Bildung*<sup>115</sup> prone social groups. A particular stream of research based on the concept of Need for Closure (NFC) suggests a possibility to enable the design of groups (KERR; TINDALE, 2004) with special characteristics that can emulate a kind of open-mindedness that relates to the concept of *Bildung*.

And the main goal of designerly ways of thinking is of creating connections, of meaning-making, of gaining awareness of different perspectives of reality, of making sense of things (KRIPPENDORFF, 1989, 2006). In other words, “making the familiar strange and the strange familiar” (AMABILE, 1996). That is to say that, to reap most of the potential offered by Design – in a broad sense and Design Thinking in particular, it is necessary that organizations’ members commit to *build bridges between the different*. Organizations characterized by dichotomization, definiteness, conflict, institutionalism and authoritarianism will most likely not have *Bildung* prone attitude and aptitude. Therefore, these organizations will most likely not benefit from Design to generate innovative propositions because they do not harness diversity.

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<sup>115</sup> In English this word corresponds to ‘formation’ and can be described as “keeping oneself open to what is other – to other, more universal points of view” (GADAMER, 2004, p. 15) which can be considered a fundamental condition for co-creation efforts, especially towards obtaining innovative propositions.

## 5. Diversity

*To go through a Bildung processes, a group needs the benefits of socio-cultural diversity*

Several studies of organizations, regions and nations indicate a connection between economic success and human capital diversity (FLORIDA, 2003). Østergaard, Timmermans and Kristinsson (2011) explain that, as social context becomes more diverse, “this creates possibilities for new combinations of knowledge.” And their research also indicates that there is a positive relationship between human diversity and the organization’s likelihood to innovate. More precisely, diversity of backgrounds should give “groups a larger pool of resources that may be helpful in dealing with nonroutine problems” (VAN KNIPPENBERG; SCHIPPERS, 2007).

Based on the results from this research, the creative group should be composed by 65% of women and have High NFC mean. For the best assessments’ group, it should be composed by 64,71% of men and have Low NFC mean. The present research indicates that, from the Ethics of Care perspective (GILLIGAN, 2014; TRONTO, 1999), women are better at working in groups and men are better at assessing disruption. Women are better at understanding and integrating the needs of group, i.e. at caring. Men are better at assessing and hierarchizing the needs of groups, i.e. at taking care.

Therefore, the *High NFC women of innovative potential* are any human with a kind of true solicitude (which seems to be identified as a *Woman* as in the Ethics of Care) and the drive to pursue what is feasible here and now (High NFC individuals), should have a greater potential for creating innovative propositions. At the men’s side, the *Low NFC men of innovative assessment*, is any human capable of a competitive independency (which seems to be identified as a *Man* as in the Ethics of Care) and to feel comfortable at ambiguous situations (Low NFC individuals), should have a greater potential for assessing innovative propositions.

As an encompassing thought, what this research is demonstrating is the fact that women and men that are aware of their prejudices are at a better position for building bridges between the different.

## 6. Prejudice

*To have the benefits of socio-cultural diversity, a group has to be aware of the prejudices of its members*

Based on the works of Arie W. Kruglanski (KRUGLANSKI, 2004), Gordon W. Allport (ALLPORT, 1979) and Hans-Georg Gadamer (GADAMER, 2004), I adopted the description of prejudice *as a historical vantage point where human finite understanding is situated, and which may result on judgments that are rendered before a fair amount of elements have been examined* (ALLPORT, 1979; DOBROSAVLJEV, 2002; GADAMER, 2004; KRUGLANSKI, 2004; ROETS; VAN HIEL, 2011b). It is also important to note that there are not only negative connotations in this description of prejudice.

Therefore, at the same time that groups' members prejudice can distort understandings, it also plays an important role in opening up what it is to be understood. Based on that proposed understanding, this heuristic advocates that by being aware of the impacts of prejudice, tradition and the interplays between pre-understandings and understandings, groups should have better possibilities to innovate, i.e. to create new propositions that will be retrospectively perceived as valuable by a determined social context.

Thus innovation, as a sensemaking process, only makes "plausible sense retrospectively" (WEICK; SUTCLIFFE; OBSTFELD, 2005, p. 409) as it was already described by Schumpeter in 1943 (SCHUMPETER, 1943, p. 83). In such a "space of Knightian uncertainty, goal ambiguity and environmental isotropy" (SARASVATHY et al., 2008, p. 338) it is of utmost importance the possibility of having cues and evidences for groups to construct plausible explanations of what needs to be done in order to act into the future.

## 7. Evidence

*To be aware of the prejudices of its members, a group needs to obtain evidences*

Contemporary organizational knowledge paradigms, like "Evidence" (KRISTENSSON UGGLA, 2010, p. 80), constitute beliefs embedded in frames and ideologies that influence what is noticed and how events unfold (WEICK, 1995, p. 133): "believing is seeing."

The evidences presented for the solution of the breakdown and mysteries are mainly geared by Jürgen Habermas' description of the technical cognitive interest (ALVESSON; SKÖLDBERG, 2009, p. 155) (HABERMAS, 1971, p. 308). Thus, its main intent is to present instrumental findings, embedded by causal explanations obtained by empirical-analytical methods (HABERMAS, 1971; TINNING, 1992).

The mentioned evidences are portrayed in two different sets. One depicts the indexes of reference for the Innovativeness Production Groups and the other, the indexes of reference for the Innovativeness Perception Judges.

### *Innovativeness Production Groups*

The 6 highest perceived innovativeness ratings (an average of 7,85 points at the OUP Mean, see Table 43) were attributed to products that were created by groups with an average NFC Mean of 56,16, an average NFC Coefficient of Variation of 0,217, and a Women/Men ratio composition of 0,650. The lowest perceived innovativeness ratings were obtained by groups with an average NFC Mean of 49,19, an average NFC Coefficient of Variation of 0,252, and an average Women/Men ratio of 0,60.

When considering OUP Mean as a dependent variable and W/M Ratio, NFC CoV and NFC Mean as independent variables (Predictors), a multiple linear regression can verify that the resulting model yields the following data: the predicted R value of 0.668, R square of 0.446, adjusted R square of 0.328 and a Durbin-Watson index of 1,294, with a 0,036 confidence level; which indicates that the  $F(3;14) = 3,762$  of the model is statistically significant (above the critical value of 3,34).

Therefore, the predictors' variables indicate that the model can explain 32,8% of OUP ratings obtained by each group. These results enable to describe NFC Mean as a positive and significant predictor of OUP Mean.

The differences between the 6 highest perceived innovativeness ratings and the lowest perceived ones suggest that an increase of 14,49% at NFC Mean level of groups relates to an increase of 47,57% at the innovativeness perception level of its products.

Base on that data, it is possible to inductively infer (see Table 69) ideal ranges of references for designing groups that are potentially better at creating innovative propositions. These groups, based on Analysis 2 should have a predominance of women (65% to 35%), and should follow the reference ranges as presented on the following table. If the participants

share a socio-historical context, as what occurs on longevous groups, the NFC Coefficient of Variation should be around 0,24. If they don't, which is the characteristic of groups with participants that do not know each other, it should be towards 0,14.

**Table 69 – Findings as indexes of reference for groups**

<b>Indexes</b>	<b>References</b>
NFC Mean	52 to 59
NFC Coefficient of Variation	Self-similar contexts: 0,24 Self-dissimilar contexts: 0,14
Women/Men Ratio	0,65

### *Innovativeness Perception Judges*

As can be inferred from the data available, judges with specific NFC levels seem to be more assertive in their assessment of innovative potentials. These findings have interesting implications for the design of committees responsible for evaluating innovative propositions.

Base on that data, it is possible to inductively infer ideal ranges of references for designing panel of judges that are potentially better at assessing innovative propositions. These groups, with a predominance of men (approximately 65% to 35%), should follow the reference ranges as presented on the following table.

**Table 70 – Findings as indexes of reference for judges**

<b>Indexes</b>	<b>References</b>
NFC	40 to 51

The evidences obtained by the statistical correlation between the levels of NFC Mean of groups and the perception of innovativeness (OUP) of the propositions created by those same groups are considered sufficient to commit groups to act towards adopting the proposed heuristic.

## 8. Commitment

*To obtain evidences, a group has to be committed to act.*

The commitment and enablement necessary for groups to act towards adopting the proposed heuristic is also geared by Jürgen Habermas' description of the historical-hermeneutic cognitive interest (ALVESSON; SKÖLDBERG, 2009; HABERMAS, 1971). So, its main intent is to present practical findings, which permits to understand meanings obtained through hermeneutic methods (HABERMAS, 1971; TINNING, 1992).

This research demonstrates that groups' innovative efforts will be concealed by the prejudices of its members. But, by being aware of its prejudices and horizons, groups will be able to create new knowledge, and to augment its members' capacity to act towards innovation.

In fact, innovation is a highly subjective process. Predictions about which ideas will be successful are difficult to do. Sutton (SUTTON, 2001) also agrees on the importance of the people's commitment to a new idea as a way to increase its chances of success. Also, in line with Simonton (SIMONTON, 1999), he suggests that if there is commitment of the people to the success of a group's effort, the ideas that will serve as basis for an innovation process can be selected "randomly."

Therefore, the proposed heuristic presents a discourse target at committing groups to act, by presenting the necessary use of evidence through numbers, i.e. quantitative methods. Thus, taming the prejudice issue through closed mindedness and the NFC concepts enables to produce facts and figures that can persuade groups to commit and to act towards assessing their prejudices, i.e. to be aware of the impact of them into innovative efforts.

Therefore, based on the cognitive paradigms of evidence, competence and innovation (KRISTENSSON UGGLA, 2010, p. 80), this heuristic aims precisely at collaborating to improve openness towards diversity in groups. In other words, to design *a discourse to compromise organizations to act towards assessing prejudice among its members as a way to create knowledge to support innovative opportunities.*

## 9. Enablement

*To commit to act, a group has to be enabled to act;*

What seems to be a necessary consideration of the proposed heuristic is the fact that, at the same time that it enables organizations to act based on a non-controlled solution for innovativeness efforts, it reinforces the argument for groups' diversity. At its core, this research reinforces, with studies and numbers, the importance of members' diversity into innovativeness-driven efforts.

It is from that particular standpoint that this heuristic works with the central aspect of prejudices' impact on innovative efforts; specifically on the design of effective groups that are composed of individuals who trust and communicate well with each other.

In that sense, beyond committing to the fact that groups must be aware of its prejudices in order to innovate, it is also necessary that groups' members be enabled to act towards assessing it. That enablement is supported by the evidences and by the procedures and instruments that were developed and tested during the present research. The application of these procedures and instruments will enable groups' members to create knowledge about what is "out there," what is "in here" and "who we must become" in order to deal with these questions (WEICK, 1995, p. 70).

## 10. Knowledge

*To be enabled to act, a group has to create new knowledge*

To create innovative propositions, it is expected that people find creative pathways to solve problems or conquer obstacles that seemed impossible based on previous perspectives. These goals can only be attained by creating new knowledge: by finding new ways to augmenting the potential to act (KROGH et al., 2013, p. 4). *Grosso modo*, it can be said that knowledge is created by building bridges between seemingly antithetical concepts (NONAKA; TOYAMA, 2003, p. 02).

Down that theoretical path, knowledge is created through connections done by individuals that have to overcome all sorts of conflicts in order to build trust amongst them (NONAKA; TOYAMA; KONNO, 2000; NONAKA; TOYAMA, 2003).

This is where, once more, the awareness of prejudices plays an important role by helping understand the knowledge creation process (KROGH et al., 2013) as collaborative process of augmenting the

potential to act of humans. And the different people involved must “feel entrusted and emboldened to express their ideas, share their knowledge, and be creative in general” (NONAKA; VON KROGH; VOELPEL, 2006, p. 1191–1192).

Thus, to create new knowledge, people need to feel confident.

## 11. Confidence

*To create new knowledge, group’s members need to feel confident*

But, at the same time that diversity presents possibilities of innovation, it strengthens the need for intergroup interaction and communication and “might lead to conflict and distrust” (ØSTERGAARD; TIMMERMANS; KRISTINSSON, 2011, p. 500). Other streams of research also indicate that cognitive diversity “may be detrimental to team satisfaction, affect, and members’ impressions of their own creative performance” (HENNESSEY; AMABILE, 2010). And that diversity can just as easily “lead to negative as to positive outcomes” (HENNESSEY; AMABILE, 2010, p. 580). Hong and Page (2004) also highlight the fact that “problem solvers with diverse perspectives may have trouble understanding solutions identified by other agents” (p. 16389). In other words, the ability “to actively bridge different knowledge traditions” (JAHNKE, 2013, p. 353), to hermeneutically *build bridges with the Other* is an important aspect of solving problems and creating meaning.

By being aware of the impact of the prejudices of its members into their innovative efforts, and how important it is to make people feel confident in a group to create knowledge, may commit also to adopt Allport’s four conditions of intergroup contact (PETTIGREW, 1998, p. 66–67).

The four key conditions defined by Allport to foster positive intergroup contact are described in several research works to have reduced the ignorance about the negative impacts of one’s own prejudice by augmenting self-awareness during situations of cultural diversity, i.e. intergroup contacts (BROWN; HEWSTONE, 2005; HODSON; BUSSERI, 2012; PETTIGREW, 1998; ROETS; VAN HIEL, 2011b). These key conditions, as consolidated by the present research based on Pettigrew (PETTIGREW, 1998, p. 66–67), are:

- a) EQUAL STATUS. This is the most important condition, and its main requisites are: different groups must expect and perceive



- equal status in any situation where they are acting along; and all groups must have come into the situation on equal status;
- b) **COMMON GOALS.** All groups share an active and common goal-oriented effort;
  - c) **INTERGROUP COOPERATION.** Attainment of common goals must be done by an inter-dependent effort, without intergroup competition and without specialization tasks by groups or individuals;
  - d) **SUPPORT OF AUTHORITIES, LAW, OR CUSTOM.** This condition concerns a governance policy that promotes and enforces the other three conditions. All individual or group that disobey that conditions will suffer explicit social sanction. The authority support establishes norms of acceptance, which assures the equal status condition.

In experiments where these conditions were tested, as described by the literature (PETTIGREW; TROPP, 2006; ROETS; VAN HIEL, 2011b), the level of attrition between the members of the groups were significantly reduced. This reduction is one of the necessary conditions for knowledge creation, such as “autonomy, creative chaos, redundancy, requisite variety, and love, care, trust and commitment” (NONAKA; TOYAMA; KONNO, 2000, p. 25). And, at innovative efforts, mutual understandings can only arise “if and only if, for all participants, there is a symmetrical distribution of chances to choose and to apply speech-acts” (Habermas, cited by Alvesson and Sköldbberg 2009, p. 152). In other words, groups where a few people dominate the conversation are less likely to attain a higher potential of collective intelligence “than those with a more equal distribution of conversational turn-taking” (WOOLLEY et al., 2010, p. 688).

Based on the numbers resulting from this research, the creative groups should be gender biased, predominantly composed by High NFC women (65%). It is interesting that, from the Ethics of Care perspective (GILLIGAN, 2014; TRONTO, 1999), a patriarchal society sustains that “empathy and caring” are feminine traits (GILLIGAN, 2014, p. 89). Traits that are necessary for establishing some sort of confidence between humans. But, instead of interpreting that an innovative group should be composed predominantly by women, the proposed heuristic sustains that the adoption of Allports’ conditions are necessary (although, not sufficient) for enacting empathy and caring among group members. So, fostering confidence should increase the longevity of the group.

## 12. Longevity

*Feeling confident in a group, its members will want it to be longevous*

At this point, the hermeneutic circle closes. Whereas the first Longevity determinant is focused into the future, this one is aimed at checking the past. It is a point of reflection. It is a historical point where the group retrospectively evaluates its past efforts towards building confidence, generating evidences and fostering innovativeness.

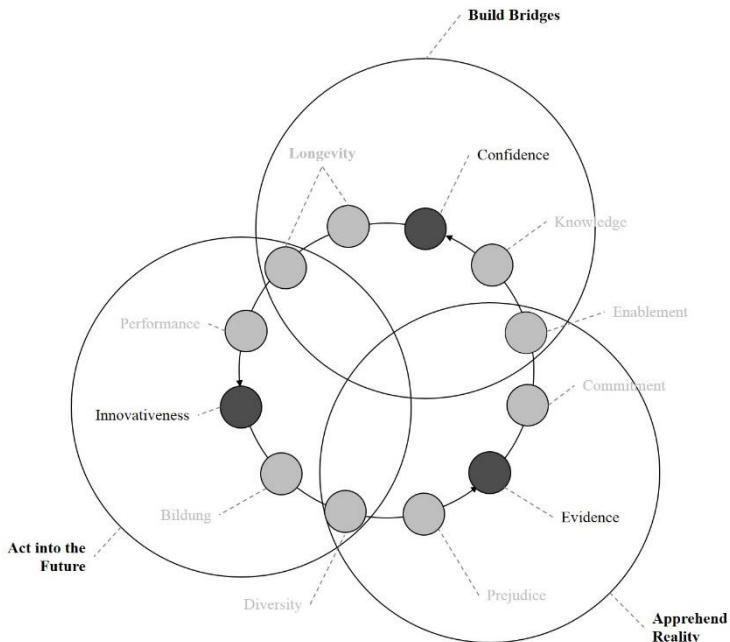
After all, the interest towards the longevity of a group arises in retrospect due to plausible explanations about what is occurring to them inside a particular group or organization.

Thus, this research shows that the adoption of practices that increase the awareness of the prejudices at play fosters the confidence towards groups by its members and the surrounding communities. Therefore, the adoption of a governance policy that supports the awareness of the prejudices at play can be considered as a longevity-maximizing strategy for a group.

## ENABLEMENT TO ACT

The whole interest of reason, speculative as well as practical, is centred in the three following questions: 1. What can I know? 2. What ought I to do? 3. What may I hope? (KANT, 1855, p. 488)

One of the goals of this research is to enable people to act. Which, after all, is the purpose of any heuristic. With that in mind, based on the research that I have done, the heuristic circle can be entered by any one of the determinants. Nevertheless, I prescribe three main entrances into the proposed heuristic. These three main entrances represent a simplified version of PRIDHe. Thus, permitting to focus initial efforts on three, rather than on the twelve determinants. This simplification was done in order to facilitate the commitment to act towards adopting the proposed heuristic. Following a one-way sequence, those three main entrance opportunities are: Innovativeness, Evidence and Confidence.



**Figure 24 – Circles of PRIDHe**

Inspired by Kant's proposed three questions that answer all interest of reason: "What can I know?," "What ought I to do?," and "What may I hope?," these three entrances opportunities can be contextualized into three nucleus of action named as: Act into the Future (What may I hope?), Apprehend Reality (What can I know?) and Building Bridges (What ought I to do?)<sup>116</sup>.

#### Act into the Future: Innovativeness

PRIDHe, in its most basic approach, serves to support the execution of *ad hoc* innovation projects. During preparation phase to "act into the future," which is understood as the development of a new product (good or service), organizations can use the determinants of this heuristic to support decision making for the upcoming steps of the project. In a sense, its determinants assure that project leaders are aware of the hermeneutic conditions necessary for innovative process. Hermeneutic awareness can be considered as a pre-condition for sensemaking and to create opportunities to comprehend the "new."

The proposed heuristic helps to assess if the intended innovation project takes into effective consideration PRIDHe's determinants such as the other two entrances: (i) generation of evidences *in concreto* about the intended project and about the project team and (ii) a governance policy that enforces respect among its members.

For instance, if the organization has already decided which "act into the future" it will make, the best next step is to seek evidence that its members form a highly innovative potential group (by means of NFC assessments) and then it must assure that the related group has the appropriate governance policy that will foster its innovative potential.

#### Apprehend Reality: Evidence

Mainly to assess the innovative potential of a group or an organization, PRIDHe heuristic enables people to act by providing a verifiable assessment tool. Based on the results of this research, it is possible to assess an actual existing group to verify its innovativeness potential and, if necessary, proceed to personnel selection or reassignment.

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<sup>116</sup> In a sense, these questions are very much close to the logic proposed by the Effectual Networks as a form of answering "What effects can I create, given who I am, what I know, and whom I know?" (DEW et al., 2008, p. 49).

Given the fact that innovativeness of groups were higher when NFC Mean was between 52 and 59, with NFC CoV between 0,14 (for self-dissimilar groups) and 0,24 (for self-similar groups), and presenting a Women/Men Ratio of 0,65, it is a straightforward process to assess possible candidates to design higher innovative potential groups or organizations.

If the organization has not a clear idea on how it will “act into the future,” the best place to start is to seek evidence that its members form a highly innovative potential group and then it must assure that this group has the appropriate governance policy that will foster its innovative potential. At the end of this short cycle, the organization asks for the identified group with the appropriate governance to define ways to “act into the future.”

### Building Bridges: Confidence

This research shows that the adoption of practices that increases the awareness of the prejudices at play fosters the confidence towards groups by its members and the surrounding communities. Therefore, the adoption of a governance policy that supports the awareness of the prejudices at play can be considered as a longevity-maximizing strategy for a group. A governance policy based at Four Allport Key Conditions would have to be (i) marked by conditions of equal individual or group status; (ii) necessarily direct all actions towards common goals; (iii) which could only be attained by obligatorily cooperation and interdependency; and (iv) supported by clear messages and actions from authorities reinforcing these conditions.

If the organization has not a clear idea on how it will “act into the future,” nor knows how/where is the best form to “apprehend reality,” its managers must assure to start with the appropriate governance policy that will foster its innovative potential. Governance which must build bridges to enable the organization to connect with others. As a second step, the organization must define an initial “act into the future.” By acting under a certain governance, i.e. by acting as it ought to do, the organization will be able to better understand what it may hope for. By understanding what to hope for, the organization will be at a better historical position to gather evidences based on what it can know.

## The Triple Challenge of Innovativeness

Therefore, the main goal of this document is to enable people to act towards creatively produce innovative propositions. Thus, permitting to focus initial efforts on facing the triple challenge of (i) understand the prejudices of its members, (ii) to understand its historical context and, finally, (iii) create innovative meaning propositions. In order to facilitate the commitment to act towards facing that challenge triplets, this interdisciplinary approach to innovativeness efforts of groups proposes a simplified version of PRIDHe. I do believe that, at the same time that this proposition maintains the innovativeness potential of teams – without relying on control processes, it enables organizations to act by providing an academically supported discourse in the form of a heuristic.

The operationalization of the proposed heuristic to overcome the triple challenge is divided into simple steps like:

1. Closed-mindedness assessment: Based on the results of the mentioned literature and research, it is possible to assess the participants of an existing group to verify the closed-mindedness of each individual and, if necessary, proceed to personnel selection or reassignment. This assessment is obtained with the Need for Closure (NFC) scale, which is an instrument to measure the level of closed mindedness of individuals. The NFC scale was developed by Professor Arie W. Kruglanski (2004) and has 41 questions. From which only 15 items (questions 3, 4, 6, 8, 9, 11, 12, 13, 15, 25, 30, 32, 33, 39 and 40) are taken into account for obtaining the NFC levels of each individual. Further information about how to assess closed-mindedness using NFC scale is available throughout this document;
2. Design of Innovativeness Groups: Design groups based on diverse levels of individuals' NFC. Thus, it is a straightforward process to assess possible candidates with the NFC scale and to design higher innovative potential groups based on the aggregate mean levels of NFC. According to this research, the innovativeness of groups were higher when portraying mean NFC levels between 52 and 59 (when considered the answers for the 15 questions referred above) and a Coefficient of Variation around 0,14 and 0,24. The differences between groups that are in that NFC range and those that don't suggest that the formers get rated almost 50% higher than the latters at the innovativeness perception level of its products;

3. **Governance Policies:** Adopt governance policies that enforce non-hierarchical intergroup contact. For instance, if the organization has already assessed its members as to design a highly innovative potential group; then it must assure that this group has the appropriate governance policy that will foster its innovative potential. Therefore, the adoption of a governance policy that supports the awareness of the prejudices at play can be considered as an innovativeness enhancing strategy for a group. The suggested governance policy should have to be based on Four Allport Key Conditions for intergroup contact as to (i) create conditions of equal individual or group status; (ii) necessarily direct all individual actions towards common goals; (iii) which could only be attained by obligatorily cooperation and interdependency; and (iv) supported by clear messages and actions from authorities reinforcing these conditions;
4. **Autonomy:** Provide organizational autonomy for the designed groups. The organization does not need obligatorily to have a clear idea on how it will “act into the future.” Therefore, the best place to start is to seek evidence that its members form a highly innovative potential group and then it must assure that this group has the appropriate governance policy that will foster its innovative potential. At the end, the organization provides autonomy for its innovativeness group and asks its members to define ways to “act into the future,” setting autonomously courses of action, milestones, goals and deliverables;
5. **Resources:** The organization has to define a time frame and available resources, supply these resources and verify continuously if the group obey the governance and is committed to the innovative process, its milestones and deliverables, both for the sake of the group itself and for the organization as a whole.

The above suggested steps should enable organizations to create *Bildung* prone groups where the imaginative productivity is richest because it will not be merely free. This research shows that the adoption of practices that increases the awareness of the prejudices at play fosters the confidence towards groups by its members and the surrounding communities. If the organization has not a clear idea on how it will “act into the future,” nor knows how/where is the best place to “understand reality,” its managers must assure to start with the appropriate governance policy that will foster its innovative potential. Governance which must

build bridges to enable the innovativeness group to connect with Others, with different discourses and realities.

### Innovativeness Potential Check

From the proposed heuristic, it is possible to suggest a Innovativeness Potential check for organizations. This check is designed to be used by managers in order to verify if the respective innovativeness group has the highest potential to act towards facing the triple challenge of innovativeness.

The proposed check process is based on five questions, to which managers have to answer by a Yes or a No. The questions are:

1. Do organizational members, as a whole, represent diverse types of mindedness (open and closed)?
2. Does the group directly responsible for the innovative effort is composed by the right mix of different mindedness (open and closed) individuals?
3. Does this group obey to a governance policy that enforces intergroup contact conditions: equal status within the situation; common goals and interdependence?
4. Does this group have complete autonomy to define courses of action, milestones, goals and deliverables?
5. Does this group was clearly informed about the resources (budget and time frame) that it is obliged to comply with?

Those questions are directly related to the five items described above. To augment the probability to overcome the triple challenge of innovativeness, based on the reasoning that supports the present heuristic, organizational managers have to respond positively (Yes) to all questions presented above. Each negative answer prompts managers to implement the directives suggested by the correspondent item from the five ones described upstream.



## ENABLEMENT TO REFLECT

One of the purposes of this thesis was to produce an invitation to others to think along about the impacts of prejudice on innovative efforts, or the impacts of prejudice in organizations' performance. After all, I learned that knowledge has this activist orientation in many degrees, and that the main goal of a research process is to enable people to reflect, to augment their potential to act; i.e. to create knowledge.

Based on my personal understanding of the literature review that I have done about reflexive research methodology, I tried to focus mainly on providing novel insights on the subject, with an emancipatory perspective. Besides proposing a framework as to assess the innovative potential of groups, my interest was to invite others to think along about the above mentioned issues.

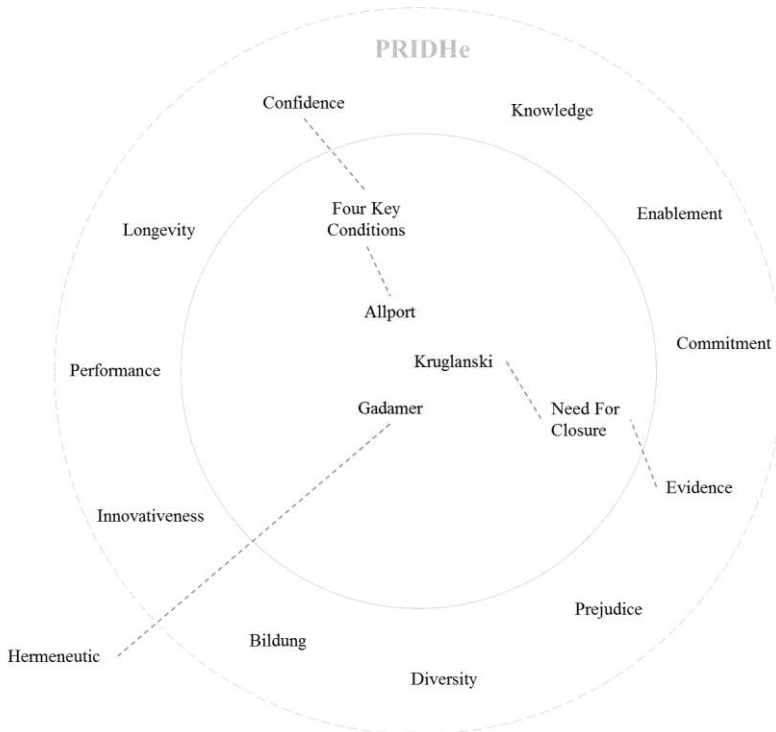
The challenge to act and/or reflect as a result of an interdisciplinary research requires a hermeneutically trained consciousness. Which does not mean to have some kind of "neutrality." Since this research deals with the concept of *prejudice*, I thought necessary to keep different voices as a certain guarantee from detracting other positions.

At the end, as a result of this effort of keeping a multiplicity of voices, my reflections gravitated towards three theoretical points of reference.

Thus, the proposed heuristic, as can be seen at the following figure, is based on the works of three notable voices. Without fearing of being unfair, I should say that in order of magnitude, these voices are from Hans-Georg Gadamer (1900-2002), Gordon Willard Allport (1897-1967) and Arie W. Kruglanski (1939).

At its core, PRIDHe rests – with pride – on the shoulders of these men. A first gravitational orbit is defined by the application on the lifeworld of organizational people of two sets of enablers:

- i. Four Key Conditions of Intergroup Contact: this sums to the design and adoption of a governance policy that embed the four key conditions into the everyday activities of a specific group or the whole organization;
- ii. Need for Closure Scale: this one is characterized by the application of NFC's assessment tools in personnel selection and assignment.



**Figure 25 – Orbits of PRIDHe**

Gravitating around that first orbit, there is a second one composed by an amalgam of not precisely sequential activities that, following the proposed heuristic, should be taken into consideration by managers or policymakers in order to design organizations or groups with a greater innovativeness potential.

At the edges of this gravitational system there is a Hermeneutic orbit. Thus, seeing as a whole, PRIDHe is a hermeneutic circle.

## FINAL REFLECTIONS

Although these studies focus on specific design frameworks and group creativity dynamics, the aim of the referred doctoral research is to support a discourse that enables social groups to commit to act towards fostering innovative opportunities. And, specifically, fostering innovative opportunities supported by social diversity.

The quantitative data generated by this research supports the adoption of an organizational governance policy that fosters the awareness of the impacts of prejudices on innovative efforts, as a particular perspective on the performance of organizations. Probably, as supported by these research findings, the institutionalization of Allport's Key Conditions, i.e. embedding them in governance policies, can enable organizations to be more innovative.

The NFC assessments of an organization's employees can help structure more effective innovation teams, in the sense that it helps to assign not only the open-minded individuals, but also to identify and add closed-minded ones to the innovative effort. Nevertheless, one issue of utmost importance to be addressed is related to ethical questions about the protection of the private data that might be collected during the assessment process.

It can be considered an "educated guess" to conclude that groups with certain levels of NFC Mean could improve the odds to create more and better propositions perceived as innovative. Levels which, counterintuitively, are not located towards the more open-mindedness percentile, but at the mid to high closed ones. This "finding" echoes Gadamer's assertion that humans cannot escape history, to reflexively understand ourselves is to cope with the fact that the old is somehow preserved in any supposed transformation. And it has to be combined with the new to create a new value. After all, as Gadamer writes, "preservation is as much a freely chosen action as are revolution and renewal."

Therefore, these final thoughts are also directed towards claiming that prejudices are really needed to achieve innovation, they are actually fundamental for innovative efforts. As described by Prof Arne Roets during the final jury (05<sup>th</sup> of March 2015), this work shows that innovative efforts need to have some anchors, some people deeply rooted into the lifeworld of contemporaneity.

At its core, the here proposed sensemaking discourse can be summarized as: to perform better, organizations have to be aware of their prejudices. Or, put it in another way: *organizations that are aware about their prejudices and the impacts of these are more likely to perform better.*

Although I had no illusion, from the very outset, that this research would produce objective, simplified, scientific concepts of truth, I firmly believe that it is a good interdisciplinary research and that it properly invites others to think along and to feel enabled to act. I also believe that the main goals of this research were attained. The initial breakdowns have been studied and further investigations are more than justified and necessary. Further and diverse perceptions could be developed through other texts and by future research.

As remembered by Prof Birgit Mager on the final jury (05<sup>th</sup> of March 2015), there is always the danger of moving from the disciplines to the interdisciplinarity to the “undisciplined.” I took the risk. As Nietzsche suggests when writing about knowledge as the result of when something strange is reduced to something familiar, I opted to work with unfamiliar methods. Nietzsche also states that the certainty of the natural sciences resides precisely in the fact that they choose for their object what is strange. And then, they use sound methods to find familiar things in, under or behind this object. But, what is familiar, “what we are used to is most difficult to ‘know’.” Although it might seem contradictory and absurd, I believe that the only valid approach to try to know such a familiar and almost transparent object such as prejudice, is through a unfamiliar reflexive methodology.

Above all, what I am most enthusiastic about this research is the structure itself of this resulting document. It seems to me an ideal one to serve as supporting structure for interdisciplinary research. At the end, I firmly believe that this is a relay race through time. These are my footsteps.

Now, the challenge is to the ones that will knock at this text and, perhaps, pass it onto the next walkers of future landscapes.

La théorie sociale globale serait dans le même rapport avec l'idéologie si elle pouvait satisfaire aux mêmes critères que ces sciences positives. Or la faiblesse épistémologique de la théorie sociale globale est à la mesure de la force avec laquelle elle dénonce l'idéologie.  
(RICOEUR, 1986, p. 315)



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## APPENDICES



## APPENDIX I

### PhD Survey – NFC

#### Free and Informed Consent

By responding to this survey I declare that I was informed that the questionnaire below is part of a study about the process of service innovation, object of research by the PhD student Mauricio Manhaes, with the goal of developing a monograph towards obtaining the title of Doctor of Engineering and Knowledge Management at the Federal University of Santa Catarina, Brazil. I know that I have the freedom not to accept participating, as well as give up the process at any time and, moreover, I was informed that the data supplied by me will be treated confidentially. I was also informed about the availability of the researcher to address questions that I may have now or in the future about my participation in this study, as well as with respect to the destination to be given to the knowledge that will result. To do this, if I may judge necessary, I can contact the researcher at the address: [mcmanhaes@gmail.com](mailto:mcmanhaes@gmail.com) (Please include *SUBJECT: PhD Survey*).

By submitting the responses of this survey, I agree to the terms presented above.

\* Required

Name: \*

---

Your birth-date:

---

*Please use this form: DD-MM-YYYY*

Your email \*

---

*Please inform your email. All data obtained for this research are protected under the Free and Informed Consent agreement.*

#### INSTRUCTIONS:

Read each of the following statements and decide how much you agree with each according to your beliefs and experiences. You are encouraged not to think too long about each question, just answer spontaneously. Please respond to the 41 items according to the following scale:

- 1.....strongly disagree
- 2....moderately disagree
- 3.....slightly disagree
- 4.....slightly agree
- 5.....moderately agree
- 6.....strongly agree

This survey can be found at:

**<http://www.....>**

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**PhD Survey**

1. I think that having clear rules and order at work is essential for success. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

2. Even after I've made up my mind about something, I am always eager to consider a different opinion. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

3. I don't like situations that are uncertain. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

4. I dislike questions which could be answered in many different ways. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

5. I like to have friends who are unpredictable. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

6. I find that a well ordered life with regular hours suits my temperament. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

7. When dining out, I like to go to places where I have been before so that I know what to expect. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

8. I feel uncomfortable when I don't understand the reason why an event occurred in my life. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

9. I feel irritated when one person disagrees with what everyone else in a group believes. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

10. I hate to change my plans at the last minute. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

11. I don't like to go into a situation without knowing what I can expect from it. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

12. When I have made a decision, I feel relieved. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

13. When I am confronted with a problem, I'm dying to reach a solution very quickly. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree



14. When I am confused about an important issue, I feel very upset. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

15. I would quickly become impatient and irritated if I would not find a solution to a problem immediately. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

16. I would rather make a decision quickly than sleep over it. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

17. Even if I get a lot of time to make a decision, I still feel compelled to decide quickly. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

18. I think it is fun to change my plans at the last moment. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

19. I enjoy the uncertainty of going into a new situation without knowing what might happen.\*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

20. My personal space is usually messy and disorganized.\*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

21. In most social conflicts, I can easily see which side is right and which is wrong.\*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

22. I almost always feel hurried to reach a decision, even when there is no reason to do so.\*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

23. I believe that orderliness and organization are among the most important characteristics of a good student.\*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

24. When considering most conflict situations, I can usually see how both sides could be right. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

25. I don't like to be with people who are capable of unexpected actions. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

26. I prefer to socialize with familiar friends because I know what to expect from them. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

27. I think that I would learn best in a class that lacks clearly stated objectives and requirements. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

28. When thinking about a problem, I consider as many different opinions on the issue as possible. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

29. I like to know what people are thinking all the time. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

30. I dislike it when a person's statement could mean many different things. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

31. It's annoying to listen to someone who cannot seem to make up his or her mind. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

32. I find that establishing a consistent routine enables me to enjoy life more. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

33. I enjoy having a clear and structured mode of life. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

34. I prefer interacting with people whose opinions are very different from my own. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

35. I like to have a place for everything and everything in its place. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

36. I feel uncomfortable when someone's meaning or intention is unclear to me. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

37. I always see many possible solutions to problems I face. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

38. I'd rather know bad news than stay in a state of uncertainty. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

39. I do not usually consult many different opinions before forming my own view. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

40. I dislike unpredictable situations. \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

41. I dislike the routine aspects of my work (studies). \*

*The rates are: strongly disagree, moderately disagree, slightly disagree, slightly agree, moderately agree and strongly agree*

	1	2	3	4	5	6	
Strongly disagree							Strongly agree

## APPENDIX II

### E-MAIL INSTRUCTIONS

----- Forwarded message -----

From: Mauricio Manhães <mcmanhaes@gmail.com>  
Date: 2013-05-29 11:28 GMT-03:00  
Subject: INSTRUCTIONS | Independent Panel of Judges  
To: \_\_\_\_\_

Dear Judge,

It is an honor to be able to count on your contribution for this research.  
At this time, all other judges should have also received this message.

To proceed for the evaluations of the ideas, I ask you to observe the following steps:

1. The deadline for submission of the evaluation is on the DD/MM/YYYY;
2. The evaluation consists of analyzing X service propositions that were created during a creativity workshop. To do that you will have to watch X videos (the image quality is low, which should not interfere with your understanding of the propositions);
3. You will have first to go through three pages before reaching the "Service Evaluation". It is important that you read very carefully each one of them before starting the evaluations. At the end of each of the three first pages there is a link (in this format: "Next ==>") to the next one;
4. At the beginning of the "Service Evaluation" page there is a link to a PDF (TEMPLATE). If you want, you can print this form to serve as a support for a first stage of the assessment;
5. At the end of the "Service Evaluation" page there is a text field. There you can write comments on specific aspects about the evaluated ideas and about your own experience throughout the process (since this is a study, any comments about it are welcomed);
6. To access the "Service Evaluation" page, you must inform the following password: XYXYXYXYXY

The link to the first page of this study is: <http://...>

I want to thank you for your participation and cooperation in this important stage of the research.

Best regards,

## WEBSITE INSTRUCTIONS

### 1. Free and Informed Consent

By responding to this survey I declare that I was informed that the questionnaire below is part of a study about the process of service innovation, object of research by the student Mauricio Manhaes, with the goal of developing a monography towards obtaining the title of Doctor of Engineering and Knowledge Management at the Federal University of Santa Catarina, Brazil. I know that I have the freedom not to accept participating, as well as give up the process at any time and, moreover, I was informed that the data supplied by me will be treated confidentially. I was also informed about the availability of the researcher to address questions that I may have now or in the future, about my participation in this study, as well as with respect to the destination to be given to the knowledge that will result. To do this, if I may judge necessary, I can contact the researcher at the address: mcmanhaes@gmail.com (Please include SUBJECT: PhD Survey).

By clicking on the link below, I agree to the terms presented above.

### 2. Independent Panel of Judges

Instructions for evaluating propositions for new services.

First, we would like to warmly thank you for kindly taking part as an evaluator in this research-project. The work that you do is of the utmost importance in scientifically being able to evaluate the creativity of the service ideas appearing in our study. In the current study, the test subjects have participated in a 2 days' workshop session, where they were divided in groups of 5-6 persons. In connection with this, the test subjects have been given an assignment to work with. The test subjects were given the following instruction, in summary:

#### ***Goal***

*Based on the given theme, create new value propositions for a specific social context.*

When the session concluded, the test subjects had to report their service ideas. It is these service descriptions that you will be evaluating.



You will be evaluating three aspects of each service description: Originality, User-Benefit and Producibility.

### **Originality**

One important factor during the development of new products and services is that they be perceived as creative/innovative, and thus “stand out” and gain attention. The concepts of creativity and innovativeness can, however, have many different definitions and interpretations. What we are interested in here, however, is originality, i.e. how unusual, unique and “new wave” the evaluated service can be considered to be.

Consequently, you will only be evaluating the Service Descriptions on the basis of their originality. How you will do this is described on the next page.

### **User-Benefit**

One fundamental consideration when involving customers in product and service development is getting the customer’s preferences, needs and requirements actively integrated into the process, thus capturing the often tacit knowledge that he or she possesses. The customer’s perspective lies at the centre of this approach, with the aim of bringing greater user benefit (value) to a product or service. You are to evaluate the Service Descriptions on the basis of the benefit (value) you judge them to create for their users.

### **Producibility**

In this research study, we are working on the fundamental assumption that customers can contribute interesting ideas and prototypes during a service development process. It is, however, seldom that a customer has the knowledge or resources to be able to evaluate whether or not an idea can be implemented. We would like you, with your knowledge of technical and administrative possibilities, to evaluate how good the services are from the perspective of producibility; in other words, questions such as whether the idea is realizable, can it be charged for, etc. You are to evaluate the Service Descriptions on the basis of their producibility.

## **3. Evaluation Manual – Judges**

Evaluation manual for the dimensions of Originality, User-Benefit and Producibility.

1. You are to evaluate three dimensions of the various service ideas: Originality, User-Benefit and Producibility.
2. We believe you have an intuitive feeling for what these dimensions are:

*Originality: For the dimension of Originality your starting point should, however, be how unusual, unique and “new wave” you consider the relevant service idea to be. At this juncture, you are not to think about whether the idea is realizable or not, this will be evaluated in another dimension (the ability to commercialize).*

*User-Benefit: We believe you have an intuitive feeling for what user benefit is. It can be, for instance, saving time, saving cost, an experience or something else that provides the user with added value. In order to evaluate the benefit of a product or service, it is important, for instance, that it meets the user requirements of the relevant target group and that this target group can really be expected to want to use the service.*

*Producibility: When you are doing the Producibility evaluation, it does not need to be realizable directly, but still within a ‘reasonable time’. Producibility concerns questions such as whether it is technically and administratively feasible to implement the service, can the use of the service be measured, etc.*

3. You do your evaluation by placing each Service Description on a scale of 1 to 10. Begin by defining the end points, i.e. 1 and 10 for each dimension. In concrete terms, this is done in such a way that you find the “worst” contribution and position it at 1 and then the “best” and position it at 10 for each dimension. Subsequently, you place all the other contributions at discretionary points on the scale. Thus when you have finished, you may well have several 1s, several 2s and so on.

#### 4. [...]

5. In order to be able to do the evaluation, you will thus have to read and watch all the Service Descriptions and Videos. By way of a suggestion, the evaluation can be done in two stages. In connection with watching through the Service Videos, you can do a primary sort into 5 lists, for instance, where the first list corresponds to the ideas you think will get a grade of 1-2, and the second list will get a grade of 3-4, and so on. When this has been done, go through the five lists and do your final evaluation. It might be the case here that an idea you evaluated as a 1 or a 2 might turn out to be a 5 upon second examination.

6. It is yourself who will, based on the brief description in point “2.“, create the definition of how you evaluate each dimension of the service ideas.

7. Once you have decided which grade you are going to give a service idea, find the respective question on the website and rate each Service Description on any number you like from 1 to 10.

8. When you are finished, click on the “Send” button.

===== <==== Previous ||| Next ====> =====

## SERVICE EVALUATIONS

To proceed to the Service Evaluation, please, click here.

## PRESENTATION

If you want to return to the presentation page, please click here.

## REFERENCE

Magnusson, P. (2003). Customer-oriented product development: experiments involving users in service innovation. STOCKHOLM SCHOOL OF ECONOMICS. Retrieved from here.

### **Protected: 4. Service Evaluation**

This content is password protected. To view it please enter your password below:

Password: \_\_\_\_\_

### **Protected: 4. Service Evaluation (After password)**

Please, follow the instructions presented by the Manual.

If you want to read them again, click here.

The main steps are:

1. On a paper, first rate the “worst” and the “best” ideas on each of the dimensions;
2. On a paper, rate the other ideas’ dimensions;
3. Transfer your notations to the on-line questionnaire on the botton of this page.

**TEMPLATE** -> As a support for your evaluation, you can find a PDF document template here. If you want, you can download and print it.

At the **botton** of this page you will find the on-line questionnaire for your evaluation.

## SERVICE VIDEOS AND LINKS

You are encouraged to watch the videos in **full-screen** and to follow the **links** to the original projects pages.

### GROUP G1 – PRODUCT P1

#### VIDEO

#### DETAILS

Text and links to product's information

### SERVICE EVALUATION SURVEY

Please, follow the instructions published at this URL: <http://...>

\* Required

Your name: \_\_\_\_\_\*

Please, identify yourself.

Your e-mail: \_\_\_\_\_\*

Please, inform the e-mail address that you prefer to be contacted for the purposes of this research.

### GROUP G1 – PRODUCT P1

#### GROUP G1 – PRODUCT P1 – Originality \*

Low	1	2	3	4	5	6	7	8	9	10	High
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#### GROUP G1 – PRODUCT P1 – User-Benefit \*

Low	1	2	3	4	5	6	7	8	9	10	High
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#### GROUP G1 – PRODUCT P1 – Producibility \*

Low	1	2	3	4	5	6	7	8	9	10	High
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## Comments

If you would you like to comment anything about the ideas that were presented or about the evaluation process, please, write it here.

### APPENDIX III

The NFC is an one-dimensional construct with five major aspects or facets distributed in the Need for Closure Scale as presented below (ROETS; VAN HIEL, 2011a, p. 92):

1. Preference for order;
2. Preference for predictability;
3. Decisiveness;
4. Discomfort with ambiguity;
5. Closed-mindedness.

Facets	Question Number	Question
1	1	I think that having clear rules and order at work is essential for success.
5	2	Even after I've made up my mind about something, I am always eager to consider a different opinion. R
4	3	I don't like situations that are uncertain.
5	4	I dislike questions which could be answered in many different ways.
2	5	I like to have friends who are unpredictable. R
1	6	I find that a well ordered life with regular hours suits my temperament.
2	7	When dining out, I like to go to places where I have been before so that I know what to expect.
4	8	I feel uncomfortable when I don't understand the reason why an event occurred in my life.
5	9	I feel irritated when one person disagrees with what everyone else in a group believes.
1	10	I hate to change my plans at the last minute.
2	11	I don't like to go into a situation without knowing what I can expect from it.
3	12	When I have made a decision, I feel relieved.

3	13	When I am confronted with a problem, I'm dying to reach a solution very quickly.
4	14	When I am confused about an important issue, I feel very upset.
3	15	I would quickly become impatient and irritated if I would not find a solution to a problem immediately.
3	16	I would rather make a decision quickly than sleep over it.
3	17	Even if I get a lot of time to make a decision, I still feel compelled to decide quickly.
2	18	I think it is fun to change my plans at the last moment. R
2	19	I enjoy the uncertainty of going into a new situation without knowing what might happen. R
1	20	My personal space is usually messy and disorganized. R
4	21	In most social conflicts, I can easily see which side is right and which is wrong.
3	22	I almost always feel hurried to reach a decision, even when there is no reason to do so.
1	23	I believe that orderliness and organization are among the most important characteristics of a good student.
5	24	When considering most conflict situations, I can usually see how both sides could be right. R
2	25	I don't like to be with people who are capable of unexpected actions.
2	26	I prefer to socialize with familiar friends because I know what to expect from them.
1	27	I think that I would learn best in a class that lacks clearly stated objectives and requirements. R
5	28	When thinking about a problem, I consider as many different opinions on the issue as possible. R
4	29	I like to know what people are thinking all the time.
4	30	I dislike it when a person's statement could mean many different things.

4	31	It's annoying to listen to someone who cannot seem to make up his or her mind.
1	32	I find that establishing a consistent routine enables me to enjoy life more.
1	33	I enjoy having a clear and structured mode of life.
5	34	I prefer interacting with people whose opinions are very different from my own. R
1	35	I like to have a place for everything and everything in its place.
4	36	I feel uncomfortable when someone's meaning or intention is unclear to me.
5	37	I always see many possible solutions to problems I face. R
4	38	I'd rather know bad news than stay in a state of uncertainty.
5	39	I do not usually consult many different opinions before forming my own view.
2	40	I dislike unpredictable situations.
1	41	I dislike the routine aspects of my work (studies). R

Items indicated with R are reverse scored.