

*ROBOTS – OUR FUTURE
PARTNERS?!*

A Sociologist's View
from a German and Japanese Perspective

von

Miriam J. S. Leis

Tectum Verlag
Marburg 2006

Tag der mündl. Prüfung: 14. Dezember 2005
Erstreferentin: Prof. Dr. Karin Knorr Cetina
Zweitreferent: PD. Dr. Kay Junge

Leis, Miriam J. S.:
Robots – Our Future Partners?!
A Sociologist's View from a German
and Japanese Perspective.
/ von Miriam J. S. Leis
- Marburg : Tectum Verlag, 2006
Zugl.: Konstanz, Univ. Diss. 2005
Umschlagabbildung: Autorin
ISBN -10: 3-8288-9134-9
ISBN -13: 978-3-8288-9134-0

© Tectum Verlag

Tectum Verlag
Marburg 2006

Contents

I.0 Preface: Fast Changing Times	i
I.1. Why Should a Sociologist Write about Robotics?	I
I.2 Personal Motivation for choosing a Topic about Robots and for doing a Comparison Study between Germany and Japan	II
I.3 Research Questions	IV

PART I

1.0 Visions	1
1.1 From Zoë to ASIMO– A Brief History of Robots	4
1.1.1 Ancient Myths	5
1.1.2 The Creation of Artificial Entities from a Christian Perspective	7
1.1.3 Non-humans and Artificial Entities from a Japanese Perspective	9
1.1.4 Religious Factors Overestimated?	12
1.1.5 Dolls and Puppets in Japanese Thought	15
1.1.6 The Flourishing Age of Early Automata	17
1.1.7 Frankenstein, Sandman and Philosophical Questions	19
1.1.8 Automata in Japan	22
1.2 Industrialization	27
1.2.1 Japan’s Modernization Process	28
1.3 The Robot	32
1.3.1 Robots in Japanese Fiction and Literature...	33
1.3.1.1 Happy Birthday “Astro Boy” !	35
1.3.1.2 Mecha-Animé and the Gundam Universe...	40
1.3.2 The Robots are Coming	42
1.3.3 Defining “Robot”	43
1.3.4 First Real Robots	52
1.3.4.a) Excursion: Killed by a Robot?	53
1.3.4.b) Excursion: Failsafe Laws?	53
1.3.4.c) Excursion: Robot Shows	56
1.3.5 Why do we want robots?	57
1.3.5 a) Excursion: Robot Economy	64

PART II

2. (MA)CHI(N)E	67
2.1 What is (Wo)man?	67
2.1.1 Man, Machine or (Ma)chi(n)e ?	70
2.1.2 La Mettrie, Minsky, Moravec and the End of Humanity?	70
2.1.2.a) Short Reflection: Losing Ground in Virtual Worlds	77
2.1.3 The shift towards a “mechanistic” view of humankind	80
2.1.3 a) Excursion: What a Difference a Chip makes	82
2.1.4 Downgrading and Upgrading: Restoring the Vanishing Borders	83
2.1.4.a) Short Reflection II: Was God just a mediocre engineer?	87
2.2 Res Cogitans and Res Extensa - The Mind enters the Machine.....	87
2.2.1 Ever Failed a Turing Test?	90
2.3 The (Un)limited Animal	93
2.3.1 The Evolution of a <i>Cyborg</i>	96
2.3.2 Reflections on Technology and Society	99
2.3.2 a) Reflection: Fast and Ubiquitous	99
2.3.2 b) Reflection: No Serviceable Parts Inside	101
2.3.2.c) Reflection: The <i>Techno</i> -Paradox	103
2.4 Where to Place Artifacts?	107
2.4.1 The “Blade Runner Complex” and the Elimination of “Quasi-Objects”	107
2.4.2 A Note on ”Actor Network Theory“	112
2.4.3 On Replacing Elements in a Network	121
2.4.4 The Placement of Subjects and Objects in Germany and Japan	123
2.4.4.1 Fuzzy Logic and Fuzzy Objects - A Short Introduction to the Concept	124
2.4.4.2 A Note on Statistics and “Fuzzy Set Theory	127
2.4.5 Survey & Results	129
2.4.5.1 Preliminary Results	131
2.4.5.2 Interpretation	133
2.4.6 A Note on Anthropomorphizing	136

PART III

3.1.1	Japan – The <i>Robot Kingdom</i> !?	143
3.1.2	Observations	149
3.1.2.1	Germany – The Robot Kingdom !?	149
3.1.2.2	Germany – The Robot Kingdom ??	155
3.1.2.3	Japan – The Robot Kingdom !	158
3.2	Robot-Related Interest Promotion	162
3.2.1	Public Events	163
3.2.2	Robodex 2003 (held from 03.04.2003 to 06.04.2003)	164
3.2.3	Kansai and Kyushu: Japan’s hubs for Robot development	166
3.2.4	Japan’s Robotic Celebrities	171
3.2.5	Japan – Inside the Robot-Toy-Kingdom	173
3.3	Robot Pets	180
3.3.1.1	AIBO	182
3.3.1.2	The History of AIBO	183
3.3.2	AIBO from a Sociologist’s View	189
3.3.2.1	AIBO-Community	189
3.3.2.2	AIBO Life Style Phenomenon	190
3.4	German and Japanese Robot-Research	194
3.4.1	Walking Humanoids	194
3.4.2	Comparison Study: Germany and Japan	198
3.4.2.1	“Form Follows Function” vs. “Function Follows Form”	198
3.4.2.1 a)	Short Reflection III: The Art of Robotics	203
3.4.2.2	Concept Comparison	204
3.4.3	Partner Robot	213
3.5	Explanations	218
3.5.1	Robotics and Demographic Factors	218
3.5.2	Explaining the “Robot Kingdom”	221
3.5.2.1	Attitude towards technology	221
3.5.2.2	From Ships, Cars and Consumer Electronics to Environmental Technology Robots and Animé	226
3.5.2.3	The “Cherry Blossom Effect”	229
3.5.2.3	From <i>Zen</i> to <i>ASIMO</i> and Back - In Search of Japan’s Self-Identity	231
3.5.2.5	Nihonjinron	232
3.5.2.6	“Nihonjinron-Effect” as Self-Fulfilling Prophecy	234
3.5.2.7	Nihonjinon – Or Why the Robot is Japanese	235
3.5.2.8	Reanalyzing “ <i>Tetsuwan Atomu</i> ”	236

3.5.3	Why the Robot fits into the Japanese Culture	243
3.5.3.1	The Group - “Closed Circuit”	244
3.5.3.2	Harmony	244
3.5.3.3	Conformity, Ritualism and the Group	244
3.5.3.4	Public Behavior and Observing Rank	247
3.5.3.4 a)	Excursion: A Note on accepting ones Position	249
3.5.4	Reflection: Robots as Role Models?	251
3.6	Personal Robots	253
3.6.1	Indications	254
3.6.2	Human-Robot Relations	257
3.6.3	A Further Note on Human-Object Relations as a Compensatory Resort	260
3.6.4	Shut-Ins and Loners	262
3.6.5	Robots to Care for - Robot Assisted Therapy	264
3.7	Reflection	266
PART IV		269
4.1	About Social Sciences and Robotics	269
4.1.2	Mind Without History	271
4.2	Natural and Artificial Intelligence	272
4.2.1	“Intelligent” Artifacts?	272
4.2.2	What is Intelligence?	274
4.2.3	Artificial Intelligence	277
4.2.4	Programmed for All (Im)practical Purposes	281
4.3	Phenomenology, Neuroscience and Robotics	284
4.3.1	Action Schemes	290
4.3.2	Towards a Robot-Phenomenology	296
4.3.2.1	Why do robots (still) fail at simple tasks Takamanya – Or Managing Without Understanding	297 298
4.3.3	“Cultural OS	301
4.3.3.1	Running on the Wrong Program	304
4.3.3.2	Excursion: The Phenomenology of Problem- Solving	309
4.4	The use of Robots for Social- and Psychological Studies	311
4.4.1	Communication	312
4.4.2	Language	321
4.4.3	E-Motions	324

Bonus: Excerpt from “Sayako “	337
References and Information	
References	340
German and Japanese Robot Projects in Brief	D- 1
List of Acronyms and Abbreviations	D-11
A.1 Work and Methodology	A 1
A.1.1 A note about using generalized expressions	A 1
A.1.2 A note about terms and definitions	A 2
A.2 A note about my methodological approaches	A 2
A.2.1 Goal of the study	A 2
A.2.2 Generating and testing hypothesis	A 3
A.2.3 Data and Observations	A 4
A.2.4 Interviews and discussions	A 8
A.3 German Summary	A15
A.4 Interview Summaries & Survey Data (The names of some interviewed persons (“Amerigo”, “Misenus”, “Arvalis” and “Aoki”) have been changed for this published version; pseudonyms have been computer generated)	S 1
A.4.1 Mr. Shinkawa (Robosquare Fukuoka, Robot Edutainment Center Japan)	S 1
A.4.2 Rev. Dr. <i>Amerigo</i> (Pastor, Protestant Church in Germany)	S 5
A.4.3 M. <i>Misenus</i> . (Former nursing-care worker in Germany)	S 8
A.4.4 Dipl.-Ing. Graf (Researcher at Fraunhofer IPA / Germany)	S17
A.4.5 Rev. <i>Arvalis</i> (Pastor, German Protestant Church in Japan)	S21
A.4.6 Prof. <i>Aoki</i> (Japanese Humanities Professor)	S26
A.4.7 Mr. J. Suzuku (Engineer at Mitsubishi Heavy Industries)	S30
AIBO Survey Data & Evaluation	S36