Michael Zock:
A Life of Interdisciplinary Research and International Engagement

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1. IN THE BEGINNING

Born 22 September 1948 in Rosenheim, Germany, Michael Zock entered the world just after the blockade of Berlin by Russia. On the day of his birth, the British Foreign Secretary stressed that western powers were not committed to going to war over the situation as they believed there would be a political solution in the short term. Perhaps prophetically, international engagement would become a hallmark of Michael's life. It was in the very city of Berlin that Michael graduated with his baccalaureate on the 13th of January 1970. After studying languages (French, English, Spanish, and Russian) at the University of Paris-VIII from 1971-1973, he was awarded a degree to become a trainer of language teachers from the École Normale Supérieure de Saint-Cloud, an elite French high school for male students near Paris. Michael received a Masters of Linguistics in 1974 and then in 1980 a Doctorate of Experimental Psychology with a specialization in Psycholinguistics from Paris-VIII. He completed his habilitation in Cognitive Science in April 1997.

2. DISSERTATION RESEARCH

After completing his doctorate in Experimental Psychology, Michael was appointed by the CNRS to work at LIMSI, an AI-lab close to Paris (Orsay). He stayed for 20 years before moving in 2006 to southern France (Marseille) to join TALEP, the NLP group of the LIF (Aix-Marseille Université).

The depth and completeness of Michael's work was evident early on. In the French report by Jury President and world reknown computational linguist Joseph Mariani, Michael's thesis work is called "clair et bien construit" (clear and well-constructed), "brillamment présenté", including nothing less than a 3000 title bibliography that would be "un outil très précieux", a most precious utility for the scientific community. His dissertation jury particularly noted the interdisciplinary character of Michael's research, spanning linguistics, computing, and psycho-linguistics.

3. WORK LIFE

The time line of Michael's life illustrated in Figure 1 reveals that Michael's passion for language and cognition was an early and constant focus of his career, starting from early education. An initial professional example was from 1971-1972 when he served as a translator for UNESCO. Quadralingual in German, English, French, Spanish, Michael also has knowledge of Russian and Japanese and (later of) Chinese. With a global perspective, Michael served naturally as a French scientific ambassador. The breadth and practicality of his interests were also apparent early on as he served as a German radio journalist and a free-lance photographic reporter before he commenced his research career (meeting and taking pictures of VIPs including Roman Polanski and Jacques Chirac). His international engagement was a persistent theme, starting with his reporting career in the late seventies in international affairs and then in the late eighties at LIMSI participating in diverse European Community projects.

Michael's principal domain of expertise is linguistics, psycholinguistics and automated generation of language. His research interests include language learning and cognitive simulation. Starting from user needs and empirical findings, he built tools to help people acquire speaking or writing skills and also advanced the simulation of cognitive process of language production (words, phrases, texts).
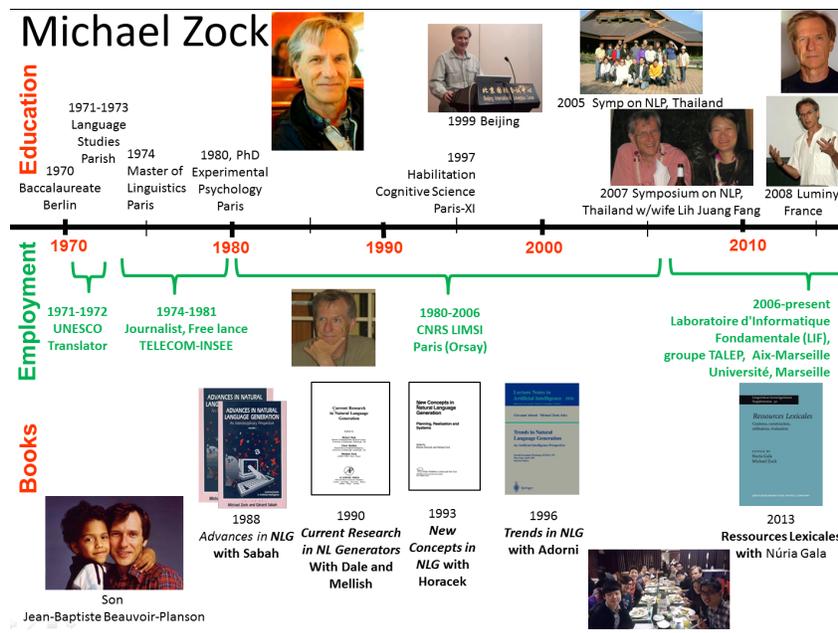

Figure 1. Michael Zock Time Line

A life-long investigator of human language production and machine generation of language, Michael was persistent in his pursuit of employing machines to augment the cognition through the development of language aids for humans. Michael's research foci included the areas of:

- *Message planning*: creation of a conceptual interface, (i.e. linguistically motivated ontology augmented with a graph generator) to help people compose their thoughts;

- *Outline planning*: helping authors to perceive possible links between their ideas or thoughts in order to produce coherent discourse;

- *Lexical access*: improving navigation in electronic dictionaries by taking peoples' search strategies and certain features of the mental lexicon into account, in particular, the words' organization and representation;

He also had a keen interested in the acquisition of basic syntactic structures, i.e. verbal skill / fluency in order to survive abroad, something which no doubt was motivated and informed at least in part through his many professional experiences abroad. His efforts included building a self-extending, multilingual phrasebook augmented with an exercise generator (Drill Tutor).

Statistics, like words, also have a story to tell about Michael's research contributions. Michael has been a most prolific author having authored/edited no less than 5 books, 3 special journal issues, and 14 workshop collections. He authored 21 book chapters, 13 journal articles, and 93 additional publications and participated in no less than 78 international workshop and conferences, including organizing 19 of them. He gave 16 tutorials and served his community on 56 program committees across Europe, America and Asia. His indefatigable international engagements have included in person research in Japan (Nara Institute of S&T, Tokyo Institute of Technology, National Institute of Technology, National Institute of Informatics), Korea (Korea Advanced Institute of S&T), Bangkok (University of Kasetsart), Canada (University of Montreal), Bulgaria (Academy of Sciences), Canada (McGill University), Togo (UNESCO Mission) and Ethiopia (Addis Ababa University School of Information Science). In Paris, he has given 13 technical courses and received 20 invitations to speak at conferences.

Michael collaborative research and publication is evident in the many text books he co-edited with colleagues from around the world. This is illustrated in Table 1 which also exemplifies his sustained contribution to the field of natural language generation.

Table 1. Michael Zock's Book Co-Editorship

Co-Editors	Title	Pub	Date
Núria Gala & Michael Zock	*Ressources Lexicales: Contenu, Construction, Utilisation,Évaluation (Lingvisticæ Investigationes Supplementa)*	John Benjamin Publishing Company	2013
Giovanni Adorni & Michael Zock	*Trends in Natural Language Generation - An Artificial Intelligence Perspective: Fourth European Workshop (EWNLG)*	Springer Verlag, New York	1996
Helmut Horacek & Michael Zock	*New Concepts in Natural Language Generation: Planning, Realization, Systems.*	Pinter Publishers, London	1993
Robert Dale, Chris Mellish & Michael Zock	*Current Research in Natural Language Generation*	Academic Press, Harcourt Brace & Jovanovich, New York	1990
Michael Zock,	*Advances in Natural Language Generation: an Interdisciplinary Perspective: Volume 2*	Pinter, London, Ablex, Norwood, N.J.	1988
Michael Zock, & Gerard Sabah	*Advances in Natural Language Generation: an Interdisciplinary Perspective: Volume 1*	Pinter, London, Ablex, Norwood, N.J.	1988

4. MICHAEL'S WORK THROUGH HIS COLLEAGUES EYES

A particularly insightful picture of Prof Zock's contributions comes into view from the eyes of his peers. For example, University of Exeter, Professor of French and Renaissance Studies Keith Cameron notes Zock's considerable influence both on French and international linguistic research directions. Professor Guy Lapalme from the University of Montreal describes Michael as an internationally known natural language generation expert with an original blended vision of computing and psycholinguistics. Noting his broad career spanning master of linguistics, journalism, psycholinguistics doctorate, French and international research, which enabled transdisciplinary and cross domain insights spanning theory and practice, providing an authoritative view of language production. Professor Lapalme notes Michael's establishment in 1987 of the European Language Generation Workshop, his service as a thesis examiner (Canada, Spain), invited speaker at international conferences (e.g., US, Bulgaria, Romania, Mexico, Japan, Australia), committee member of international conferences such as COLING and ECAI, and evaluator of NSF projects.

University of Paris Professor Laurence Danlos notes Michael's impressive publication record and research community contributions, and reports that Michael is not interested solely in creating a machine that will faithfully produce a coherent text from the input but rather an accurate computational model and simulation of the natural cognitive process of language production as well as a practical system for language learning.

University of Montreal Professor Alain Polguère, knowing Michael for more than 15 years, notes how Michael came to work on a range of American and Canadian contracts on text generation in the context of the R&D company, Odyssey Research Associates, making foundational contributions to both text generation and lexical knowledge. In 1991, they helped organize the First Natural Language Pacific Rim Symposium in Singapore. Michael's originality and clairvoyance provided him a grand capacity for analysis and synthesis which he applied to the systematic study not only of his own research but of the entire research community. Language learning system SWIM and his lexical multilingual lexical research in Papillon. Professor Polguère also notes Michael's important influence on his colleague Igor Mel'čuk Sense-Text linguistic theory and his contributions to the lexical database DiCo, adopted in Papillon. Reflecting on his scientific role, Professor Polguère called Michael the prototype researcher of the highest caliber, with exceptional domain knowledge and productivity, an impressive ability to collaborate with others and enhance their scientific capacity.

Christiane Fellbaum, Senior Research Scientist at Princeton, describes Michael as "an extraordinarily active, original, and productive member of the international scientific community". She notes his global involvement in France, Europe, Eastern Europe, and Asia. She cites his multidisciplinary (psychology and computer science) perspective noting his expertise in lexical access and tip-of-the-tongue phenomena and his (then) recent contributions on multilingual wordnets.

In his collaboration with Michael during the multilingual lexical Papillon project, Professor Christian Boitet from the Groupe d'Études pour la Traduction Automatique (GETA) recognized all that he had heard about Michael in the past: competent, original, creative, relevant, high quality, high impact, and communication excellence. His research was well though, very

ambitious, yet practical (e.g., his use of the semantic graph language UNL to facilitate lexical knowledge management). Christian was impressed by Michael's ability to rapidly discover, create practical solutions, publish and engage and influence external research community. For example, he introduced psycholinguistically naturalistic extensions to the Sense-Text models of Mel'čuk.

Dr. Dominique Estival, Head of the Natural Language Processing group at Syrinx Speech Systems in North Sydney Australia, in 2001 writes of Michael's long and fruitful research career. Describing Michael as enthusiastic and persevering, Dr. Estival used one of Michael's overview publications when teaching a course on natural language processing at University of Melbourne. Moreover, Dominique notes Michaels' devotion to students and researchers across the world – from Eastern Europe to Bulgaria or Romania. His research is of long term interest to industrial researchers at IBM, Apple-Europe, and Thomson-CSF.

Professor Dan Tufis, Director of the Research Institute for Artificial Intelligence of the Romanian Academy and Full Member of the Romanian Academy, recalls Michael as a "fascinating person, a broad-view scientist and man of culture, a gifted lecturer" and a "major influencer" of his career. Dan recounts in 1988 when Michael was a VIP invited lecturer at an international conference in Prague that in spite of suffering "assaults from participants" he exhibited "modesty and politeness". Dan was impressed by not only his clarity of ideas, but also his generosity, including gifting in early 1990 a MAC-Plus and an Apple printer where in Romania, personal computers didn't appeared until 1987 and only then in public institutions. He recounts this "real friend" who "fought for it more than one" to obtain a 1-year NATO scholarship at LIMSI for Dan. On the occasion of the Festschrift, Dan expresses "Thanks Mika! Be happy, surrounded by lots of friends, followers and peers who love you both as a scholar and a gentleman."

Gerard Sabah, Director of Research at the Centre National de la Recherche Scientifique/Laboratoire d'Informatique pour la Mécanique et les Sciences de l'Ingénieur (CNRS/LIMSI) notes the recognition global level, exemplified by his 2001 Generation Workshop in Toulouse or his invitation by Kathy McKeown to give a course at the University of Columbia in New York City, his invitation by James Pustejovsky to spend three months at Brandeis University, or his invitation to the Tokyo Institute of Technology. Noting his expertise in text generation, lexicography, and dictionaries, his multidisciplinary approach and foundation on valid cognitive theories yet with practical application, highlighting the strong connection with the Human Machine Communication department at LIMSI and its groups on Architecture and Models for Interaction and Language Information and Representation.

Professor Jean-Pierre Desclés at the University of Paris-Sorbonne notes how Michael Zock contributed greatly to the clarification of challenging research area focused on the relationship of language and thought. Professor Desclés describes the important application domains addressed by Michael's psycholinguistically motivated research in text generation including computer-based education assistants. His impressive international reputation has enabled him to bring his theoretical and practical insights to Romania, Bulgaria, and Mexico as well as facilitated the development of many junior researchers in France and beyond.

Joseph Mariani, Director of Research at CNRS and at that time Director of the ICT Department at the French Ministry for Research, recognized the quality of Michael's work and its impact on the international community, describing him as a "recognized pioneer" in text generation and dictionaries. Dr. Mariani notes his major role in organizing international workshops, conferences (e.g., COLING, ACL) as well as citations of his contributions in reviews in leading journals *Artificial Intelligence* and *Computational Linguistics*. In addition to a multiplicity of publications, Joseph notes this most interesting trilingual scientist has acted as a global scientist … called upon to serve as a reviewer in Washington at NSF and in Brussels by the European Commission, as well as being invited to research in Tokyo or give a tutorial in Beijing (COLING) or conference paper in Cuba or a psychology review in Mexico. These strengths are echoed by Michel Denis from the Human Cognition Group at CNRS/LIMSI.

Professor Pieter Seuren at the Max Planck Institute for Psycholinguistics in Nijmegen notes Michael's contributions are not only to deeper understanding of "the human ability to produce coherent speech" but also "important contributions to psycholinguistics and the theory of language in general". Characterizing his approach as "ambitious" and "developing theories that are computer-testable" resulting in his ability to "establish an impressive reputation". In a companion area of automated dictionary making, Dr. Zock's "expertise is recognized by formal lexicographers all over the world." "He is appreciated not only for the intellectual content of his contributions but also for the quality of his teaching." Notably, Pieter characterizes Michael as "a person of total integrity and great personal warmth, without any of the arrogance that too often grows in leading academic figures, of whom he is clearly one."

5. TECHNICAL LEADERSHIP AND RECOGNITION

Michael exhibited leadership throughout his career, notably not only in his unofficial role as an international scientific ambassador through sustained contributions and organization of scientific events. In addition to edited collections cited above, Dr. Zock helped organize at least 6 Workshops on Natural Language Processing and Cognitive Science (NLPCS 2013, 2012, 2011, 2010, 2009, 2008, 2007), four - European Workshops on Natural Language Generation (EWNLG 1995, 1993, 1991, 1989), four CogALex workshops (2012, 2010, 2008 and a forerunner 2004) in conjunction with COLING, Tools for Authoring Aids - (2008), and LREC, Marrakech) and the 7th International Conference on Cognitive Science (ICCS 2010). A sampling of some of his recent contributions illustrates his sense of humor and wit (e.g., "If all roads lead to Rome, they are not created equal. The problem of lexical access" (IA + TAL), "Wheels for the mind" (LREC '10), and "The mental lexicon, blueprint of the dictionaries of tomorrow? (ESSLI '09). I had the great fortunate of co-organizing two workshops with Michael (Jokinen et al 1996, 1997) and his leadership was natural but laser focused. Tireless worker, he is still organizing scientific workshops: one in COLING 2014 (Cognitive Aspects of the Lexicon, CogALex) and another one within the French NLP conference TALN 2014 (Réseaux Lexicaux et Traitement des Langues Naturelles, Lexical Networks and NLP).

Not surprisingly, Michael's work has been recognized across the world. For example, in Mexico (1995) he was recognized with the Unam *School of Psychology 20th Anniversary Award*, for his work on SWIM. In Santiago de Cuba in 2001 he received the best paper in the Computational Linguistics section of the 7th Symposium of Social Communication. He has received four grants

from the Japanese government (1995, 2003, 2004, 2009) and his research was twice supported by Apple Computer Europe.

6. NEXT GENERATION

Michael's passion for international technical leadership and progress, however, was complemented by his concern for the next generation of research talent. A persistent aspect of Michael's professional career has been his constant mentoring of the future science leaders. One example of this has been his service on doctoral thesis committees. Table 2 illustrates how graduate students from Australia, Italy, Spain, and Canada have benefited from Michael's sage technical counsel.

Table 2. Michael Zock's Doctoral Committee Service

Student	University	Topic	Date
Lars Yencken	Computer Science and Software engineering, University of Melbourne, Australia	Orthographic support for Japanese vocabulary acquisition	2009
Alberto G. Bramati	Catholic University of Milan, Italy	Linguistics	2008
Anastasis Daradoumis	Polytechnic University of Catalonia, Barcelona Spain	Intelligent Tutoring Systems & Human-Computer Interaction	1997
Nicole Tourigny	Université de Montréal, Canada	Computer Science	1994

And as yet another manifestation of his practicality and efficiency, Table 3 is a blended example of Michael's thesis oversight together with simultaneous collaboration with other researchers. His generous and collaborative approach has helped shape the landscape and futures of computing and linguistics researchers. He is currently supervising the PhD thesis of Valérie Clerc (2011-2015): Génération automatique d'exercices de formation en ligne pour l'apprentissage du japonais – niveau intermédiaire (automatic generation of on-line training exercices to learn Japanese – intermediate level).

Table 3. Michael Zock's Thesis Direction

Student	Discipline	Co Director	University
Nikolai Vazov	Linguistics Thesis	Jean-Pierre Desclés	Sorbonne
Laroui	Computing	Gérard Sabah	Paris Sud
Nicolas Nicolov	Computing	Chris Mellish	Edinburgh-Sofia

7. CONCLUSION

Multilingual translator, global researcher, and language generator, Michael's legacy is indicated by many scientific artifacts deposited along his journey, from novel concepts and interdisciplinary approaches to intriguing inventions and communications. However, his true contribution is to a better connected interdisciplinary science and, most important, the lasting influence he has left in the hearts and minds of those he taught, mentored, and collaborated with.

8. REFERENCES

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9. KEYWORDS

History, scientific contributions, language production, language learning, psycholinguistics, scientific leadership, translation, transdisciplinary, students, books

10. ABSTRACT

Language scientist, translator, German radio journalist, free-lance photographic reporter, and scientific ambassador are just some of the titles held by the multitalented Michael Zock. This opening chapter chronicles the professional milestones of this boundary spanning, cross cultural, psycholinguistic pioneer, while exposing his politeness, modesty and warmth.

Following a brief introduction of Michael's origins, this chapter accounts, in part through the words of his colleagues, Michael's life-long interest in computational modelling and simulation of the natural cognitive process of language production and his quest to create practical systems for language learning. The chapter summarizes his contributions to the literature, his scientific leadership, and transdisciplinary engagements across Europe, America and Asia. Cultured, creative, and communicative, Michael's cross domain insights spanning theory and practice and his passion for language and cognition continue to inspire students and colleagues alike.