JAKUB SZYMANIK

CONTACT

Institute for Logic, Language and Computation
University of Amsterdam
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RESEARCH INTERESTS

Primary: logic, cognitive modeling, formal semantics
Secondary: formal epistemology, artificial intelligence, philosophy of language

EMPLOYMENT HISTORY

Associate Professor at the Institute for Logic, Language and Computation, University of Amsterdam **2013-**

Postdoc at the Institute of Artificial Intelligence, University of Groningen **2011-2012**

Postdoc at the Department of Philosophy, Stockholm University **2010**

Docent at the Philosophy Department, Utrecht University **2009**

Scientific consulting at the SpeechConcept **2009**

EDUCATION

Universiteit van Amsterdam, The Netherlands **2006-2009**

Ph.D., Institute for Logic, Language and Computation

Title: Quantifiers in TIME and SPACE.
Computational Complexity of Generalized Quantifiers in Natural Language
Advisors: Johan van Benthem, Marcin Mostowski, Theo Janssen
Committee: Robin Clark, Paul Dekker, Jouko Väänänen, Dag Westerståhl

Warsaw University, Poland **1999-2005**

Master of Arts in Philosophy (cum laude), Individual Studies in the Humanities

Studied: philosophy, psychology, linguistics and mathematics

Collegium Invisibile, Poland **2001-2005**

Individual research in the philosophy of language

AWARDS & GRANTS

The Netherlands Organization for Scientific Research VENI Grant, *What makes social interactions hard? A computational study of intentions, knowledge, and beliefs*, 250,000 EUR, 2012.

Swedish Research Council Postdoctoral Grant, *A Computational-Empirical Approach to Language Comprehension*, 1,404,000 SEK (∼155,000 EUR), 2009.

"Polityka" Prize for Best Polish Young Researchers, 2009

Foundation for Polish Science Award for Young Researchers, 2007, 2008

Marie Curie Research Fellowship in the GLoRiClass Project, 2006

Collegium Invisibile Fellowship, 2001

Ministry of Education Scholarship for Academic Excellence, 2000-05

Ministry of Education Award for High-School Students, 1999

Finalist in the International Philosophical Olympiad in Budapest, 1999

2nd place in the Polish Philosophical Olympiad in Warsaw, 1999

Teaching

Introduction to Generalized Quantifiers, Eastern Generative Grammar Summer School 2013 (invited course).

Logic, Computability and Cognition (with N. Gierasimczuk), Nordic Spring School in Logic 2013 (invited course).

Complexity of Epistemic Reasoning, 13th Logic Workshop 'Truth-Complexity-Language', Poland 2012.

Generalized Quantifier Theory Meets Cognition (10h), ESSLLI 2011, Ljubljana.

Capita Selecta AI and Cognitive Science: Game Theory (5 ECTS) (with S. Ghosh, R. Verbrugge), University of Groningen, 2011

Quantifiers & Cognition (10h), Stockholm University, 2010

Introduction to Modal Logic (6 ECTS), Utrecht University, 2009

Master of Logic project 'Interacting Agents Processing Information'(10 ECTS) (with C. Dégremont, L. Kurzen, N. Gierasimczuk) University of Amsterdam, 2009

Structures for Semantics (10 ECTS) (with R. van Rooij), University of Amsterdam, 2008

Teaching assistant for the Second Course in Logic (30h), University of Warsaw, 2006

Introduction to Computational Complexity (30h), Collegium Invisibile, 2006

Introduction to Mathematical Linguistics (30h), Collegium Invisibile, 2003

Introduction to the Philosophy of Language (60h), Collegium Invisibile, 2002

Academic Activities

Conference chair: ESSLLI 2012 Logic & Cognition Workshop, Opole, 2012; Formal Semantics Meets Computation and Cognition, Amsterdam, 2009; Paris Amsterdam Logic Meeting of Young Researchers, 2007–2008;

Conference Program Committees: Szklarska Poręba Workshops on the Roots of Pragmasemantics, 2007-2009; ESSLLI 2011-2013 Student Sessions; Logic & Cognition Poznań Conference 2012; The 5th Biennial Conference of Experimental Pragmatics;

Recent Organizational Activities: Grolog seminar, Groningen, 2011–; Reading Group on Social Cognition, Groningen 2011– ; Logic and Cognition Seminar, Amsterdam, 2007–2009; Fifty Years of Generalized Quantifiers, Warsaw, 2007; GloRiClass Seminar, Amsterdam, 2006–2009; Warsaw CogSci Forum, 2005-2008; Warsaw Group Logical Workshops, 2002–2007;

Reviewing: Lecture Notes on Artificial Intelligence; Neuropsychologia; Proceedings of Syntax and Semantics of Spatial P; Information and Computation; Linguistics and Philosophy; Annual Conference of the Cognitive Science Society; Journal of Logic, Language and Information; Conference on Theoretical Aspects of Rationality and Knowledge; Dialogue & Discourse; Synthese; Workshop 'Reasoning about other minds'; A book proposal for MIT Press; Computability in Europe 2012-13; Modeling Strategic Reasoning; Journal of Mathematical Psychology, Fifth Indian Conference on Logic and its Applications, Grant application for Czech Science Foundation, Journal of Applied Logic, Cognitive Science: A Multidisciplinary Journal, Journal of Semantics, PLOS ONE.

Professional Memberships: Association for Mathematics of Language; Cognitive Science Society; Polish Semiotic Society; Polish Association for Logic and Philosophy of Science; European Society for Philosophy and Psychology; The Association for Symbolic Logic; Association for Computability in Europe.

Editorial Job: Editorial assistant for Handbook of Logic and Language (2nd edition); Co-editor of webportal Filozofia.pl; co-editor of webportal Logic and Rational Interaction, Editor of Generalized Quantifiers category at PhilPapers.

Supervision: Gert-Jann Munneke, *Logical and cognitive modeling of moral decisions*, PhD, ILLC, in progress. Eva van Viegen, *Reading experiments on higher-order reasoning*, MSc, Groningen, in progress.

PhD Examination Committees: Lauri Keskinen 'Characterizing All Models in Infinite Cardinalities' (ILLC, UvA, 2011).

Committee Memberships: Education Committee for Research Master Brain and Cognitive Sciences; Chairman of the Search Committee for PhD in logic and cognitive modeling, Board of Examiners of the Mater's programme in Logic.

Work in progress

- J. Szymanik. *Computational Semantics for Quantifiers from a Cognitive Perspective*, book project for MIT Press.
- J. Szymanik. Towards descriptive complexity of backward induction, in preparation.
- Marcin Zajenkowski, Maria Garraffa, and Jakub Szymanik. Working memory mechanism in proportional quantifier verification, submitted.
- J. Szymanik. Ramsey properties as a source of intractability in natural language semantics, under revision.
- J. Szymanik and M. Zajenkowski. Computational approaches towards monotonicity in sentence-picture verification, submitted.
- L. Robaldo, J. Szymanik, B. Meijering. On the identification of quantifiers' witness sets, under revision.
- M. Zajenkowski, R. Styła, and J. Szymanik. Is the working memory overload associated with semantic processing impairments in schizophrenia?, submitted.

Journal Papers

1. M. Zajenkowski and J. Szymanik. Most intelligent people are accurate and some fast people are intelligent. Intelligence, working memory, and semantic processing of quantifiers from a computational perspective, *Intelligence. A Multidisciplinary Journal*, Vol. 41 (5), 2013, pp. 456Ð466.

2. J. Kontinen & J. Szymanik. A characterization of definability of second-order generalized quantifiers with applications to non-definability. *Journal of Computer and System Sciences*, forthcoming.

3. C. Dégremont, L. Kurzen and J. Szymanik. Exploring the tractability border in epistemic tasks, *Synthese*, (DOI) 10.1007/s11229-012-0215-7.

4. M. Mostowski & J. Szymanik. Semantic bounds for everyday language. *Semiotica*, Vol. 188, Iss. 1-4, pp. 363-372.

5. M. Zajenkowski, R. Styła, and J. Szymanik. A computational approach to quantifiers as an explanation for some language impairments in schizophrenia, *Journal of Communication Disorder*, Vol. 44, 2011, pp. 595-600.

6. J. Szymanik & M. Zajenkowski. Contribution of working memory in the parity and proportional judgments, *Belgian Journal of Linguistics*, Vol. 25, 2011, pp. 189-206.

7. I. van Rooij, J. Kwisthout, M. Blokpoel, J. Szymanik, T. Wareham, and I. Toni. Communicating intentions: Computationally easy or difficult?, *Frontiers in Human Neuroscience*, Vol. 5, 2011, pp. 1–18.

8. J. Szymanik. Computational complexity of polyadic lifts of generalized quantifiers in natural language, *Linguistics & Philosophy*, 33 (3), 2010, pp. 215-250.

9. A. Isaac & J. Szymanik. Logic in cognitive science: Bridging the gap between symbolic and connectionist paradigms, *Journal of the Indian Council of Philosophical Research*, XXVII (2), 2010, pp. 279-309.

10. J. Szymanik & M. Zajenkowski. Comprehension of simple quantifiers. Empirical evaluation of a computational model, *Cognitive Science: A Multidisciplinary Journal*, 34 (3), 2010, pp. 521-532.

11. N. Gierasimczuk & J. Szymanik. Branching quantification vs. two-way quantification, *Journal of Semantics*, 26 (4), 2009, pp. 329–366.

12. J. Szymanik & M. Zajenkowski. Improving methodology of quantifier comprehension experiments, *Neuropsychologia*, 47 (12), 2009, pp. 2682–2683.

13. J. Kontinen & J. Szymanik. A remark on collective quantification, *Journal of Logic, Language and Information*, 17 (2), 2008, pp. 131-140.

14. J. Szymanik. A note on some neuroimaging study of natural language quantifiers comprehension, *Neuropsychologia*, 45 (9), 2007, pp. 2158-2160.

15. M. Mostowski & J. Szymanik. Computational complexity of some Ramsey quantifiers in finite models, *The Bulletin of Symbolic Logic*, 13, 2007, pp. 281-282.

16. N. Gierasimczuk & J. Szymanik. Hintikka's thesis revisited, *The Bulletin of Symbolic Logic*, 13 (2007), p. 273.

17. J. Szymanik. Semantyka obliczeniowa dla kwantyfikatorów monadycznych w języku naturalnym, *Studia Semiotyczne*, 26, 2007, pp. 219-244.

18. T. Ciecierski & J. Szymanik. O hipotezie Bar-Hillela, *Studia Semiotyczne*, 25, 2004, pp. 201-212.

19. J. Szymanik. Problemy z formą logiczną, *Studia Semiotyczne* 25, 2004, pp. 187-200.

PROCEEDINGS PAPERS

20. J. Szymanik. Backward Induction is PTIME-complete, *Proceedings of the Fourth International Workshop on Logic, Rationality and Interaction*, D. Grossi,O. Roy (Eds.), Lecture Notes in Computer Science, 2013.

21. C. Thorne and J. Szymanik. Generalized Quantifier Distribution and Semantic Complexity, *Proceedings of the 10th International Tbilisi Symposium on Logic, Language, and Computation*, 2013.

22. J. Szymanik, B. Meijering, R. Verbrugge. Using intrinsic complexity of turn-taking games to predict participants' reaction times, *Proceedings of the 35th Annual Conference of the Cognitive Science Society*, M. Knauff, M. Pauen, N. Sebanz, and I. Wachsmuth (Eds.), Austin, TX: Cognitive Science Society, 2013, pp. 1426-1432.

23. J. Szymanik, S. Steinert-Threlkeld, M. Zajenkowski, and T. F. Icard III. Automata and Complexity in Multiple-Quantifier Sentence Verification, *Proceedings of the 12th International Conference on Cognitive Modeling*, R. West and T. Stewart (Eds.), Ottawa: Carleton University, 2013.

24. L. Robaldo & J. Szymanik. Pragmatic identification of the witness sets, *Proceeding of the 8th Conference on Language Resources and Evaluation*, N. Calzolari et al. (Eds.), European Language Resources Association, Istanbul, 2012.

25. N. Gierasimczuk & J. Szymanik. Invariance properties of quantifiers and multiagent information exchange, *Proceedings of the 12th Meeting on Mathematics of Language*, M. Kanazawa, A. Kornai, M. Kracht and H. Seki (Eds.), Lecture Notes in Artificial Intelligence 6878, Springer, Berlin, 2011, pp. 72-89.

26. C. Dégremont, L. Kurzen and J. Szymanik. On the tractability of comparing informational structures, *Proceedings of the Workshop 'Reasoning about Other Minds: Logical and Cognitive Perspectives'*, J. van Eijck, R. Verbrugge (Eds.) CEUR 751, 2011, pp. 50-64.

27. N. Gierasimczuk & J. Szymanik. A Note on a generalization of the muddy children puzzle, *Proceedings of the 13th Conference on Theoretical Aspects of Rationality and Knowledge*, K. Apt (Ed.), ACM Digital Library, pp. 257-264.

28. J. Kontinen & J. Szymanik. Characterizing definability of second-order generalized quantifiers, *Proceedings of the 18th Workshop on Logic, Language, Information and Computation*, L. Beklemishev and R. De Queiroz (Eds.), Lecture Notes in Artificial Intelligence 6642, Springer, Berlin, 2011, pp. 187-200.

29. O. Bott, F. Schlotterbeck, and J. Szymanik. Interpreting tractable versus intractable reciprocal sentences, *Proceedings of the International Conference on Computational Semantics*, J. Bos and S. Pulman (Eds.), SIGSEM, Oxford, 2011, pp. 75-83.

30. J. Szymanik & M. Zajenkowski. Quantifiers and working memory, *Proceedings of the 17th Amsterdam Colloquium*, M. Aloni and K. Schulz (Eds.), Lecture Notes in Artificial Intelligence 6042, 2010, Springer, Berlin, pp. 456-464.

31. J. Szymanik. Almost all complex quantifiers are simple, *Proceedings of the Mathematics of Language 2009*, C. Ebert, G. Jäger, M. Kracht, J. Michaelis (Eds.), Springer, Berlin, Lecture Notes in Computer Science 6149, 2010, pp. 272-280.

32. J. Szymanik & M. Zajenkowski. Understanding quantifiers in language, *Proceedings of the 31st Annual Conference of the Cognitive Science Society*, N. A. Taatgen and H. van Rijn (Eds.), 2009, pp. 1109-1115.

33. J. Szymanik. The computational complexity of quantified reciprocals, *Proceedings of the 7th International Tbilisi Symposium on Logic, Language, and Computation*, P. Bosh, D. Gabelaia, J. Lang (Eds.)n Lecture Notes in Artificial Intelligence 5422, Springer, Berlin, 2009, pp. 139-152.

34. J. Szymanik. Strong meaning hypothesis from a computational perspective, *Proceedings of the16th Amsterdam Colloquium*, M. Aloni, P. Dekker, F. Roelofsen (Eds.), 2007, Amsterdam, pp. 211-216.

Articles in Books

35. Communication and Cooperation, *Logic across the University: Foundations and Applications*. J. van Benthem, F. Liu (Eds.), Lecture Notes in Computer Science Series, Springer 2013.

36. A. Isaac, J. Szymanik, R. Verbrugge. Logic and complexity in cognitive science, *Johan van Benthem on Logical/Informational Dynamics*, A. Baltag, S. Smets (Eds.), Outstanding Contributions to Logic, Trends in Logic book series, Springer, 2013.

37. A. Isaac & J. Szymanik. Logic in cognitive science: Bridging the gap between symbolic and connectionist paradigms, *A New Survey of Active Directions in Modern Logic. Logic and Philosophy Today*, A. Gupta, J. van Benthem (Eds.), Studies in Logic, Volume 30, College Publications, London, 2011, pp. 275-300.

Thesis

Jakub Szymanik. *Quantifiers in TIME and SPACE. Computational Complexity of Generalized Quantifiers in Natural Language.* PhD thesis, University of Amsterdam, 2009.

Edited

Book *Kognitywistyka*. (with M. Zajenkowski), MISH, Warsaw, 2004.

Book *Filozofia i nauki szczegółowe*. (with: T. Ciecierski, L. Nijakowski), MISH, Warsaw, 2002.

Proceedings of the Logic & Cognition Workshop at ESSLLI 2012, Opole, Poland, 13-17 August, 2012. (with R. Verbrugge), CEUR Workshop Proceedings, Volume 883, CEUR-WS.org, 2012.

Special issue of *Journal of Logic, Language, and Information* on Logic and Cognition, in preparation.

Invited Conference Talks

Working memory in language. Complexity predictions in semantic processing, *Artificial Grammar Learning: Learnability, Complexity and Meaning*, Tübingen, 2013.

Using logic to predict behavior in turn-taking games, *Modality and Modalities*, Copenhagen 2013.

Playing Eleusis, *European Summer School in Logic, Language, and Information Student Session*, Opole 2012.

A Tractability Border in Natural Language Semantics, *International Conference on Cognitive Modeling 2012 Workshop 'Scaling Models of Cognition to the Real World'*, Berlin 2012.

Intentional Communication: Computationally Easy or Difficult. A Comment on Robin Clark's 'Face, Reputation, and Truth', Lorentz Center Workshop 'Modeling Strategic Reasoning', Leiden 2012.

Generalizing Muddy Children Puzzle, *Dagstuhl Seminar Computer Science & Problem Solving: New Foundations*, Dagstuhl 2011.

Logic & Cognition, *'Entia et Nomina'*, Gdańsk 2011.

Quantifier Verification. Between Computational and Algorithmic Level, *3rd Workshop on Semantic Processing, Logic and Cognition*, Tübingen 2011.

Logic & Cognition. The New Psychologism in Logic, *7th Conference on Argumentation 'Cognition and Argument: An Insight into Real-Life Practice'*, Warsaw 2011.

Logic and Cognition, *Logic and Philosophy Today*, Delhi 2011.

Complexity, Meaning, and Quantifiers, *Workshop on Vague Quantities and Vague Quantifiers*, Berlin 2010.

Muddy Children Playground, *Logic, Rationality and Intelligent Interaction*, ESSLLI workshop, Copenhagen 2010.

Generalized Quantifiers. From Logic to Cognitive Science, *Szklarska Poręba Workshop* 2010.

Comprehension of Simple Quantifiers. Empirical Evaluation of a Computational Model, *2nd Workshop on Semantic Processing, Logic and Cognition*, Tübingen 2009.

Are there Independent Combinations of Quantifiers in Natural Language?, *Paris-Amsterdam Meeting of Young Researchers 7*, Paris 2008.

Computational Dichotomy between Reciprocals, *Games in Logic, Language and Computation* $14\frac{1}{2}$, Amsterdam 2007.

Complexity of Quantifier Meaning, *Paris-Amsterdam Meeting of Young Researchers 5*, Paris 2007.

Conference Talks

Using intrinsic complexity of turn-taking games to predict participants' reaction times, 35th Annual Meeting of the Cognitive Science Society, Berlin 2013.

A Note on the Complexity of Backward Induction Games, *Reasoning and Interaction at NASSLLI*, Austin 2012.

Computational Approaches Towards Monotonicity in Sentence-Picture Verification, *Texas Linguistics Society Conference*, Austin 2012.

Invariance Properties of Quantifiers & Multi-agent Information Exchange, *12th Mathematics of Language*, Nara 2011.

A Generalization of the Muddy Children Puzzle, *13th Conference on Theoretical Aspects of Rationality and Knowledge*, Groningen 2011.

Characterizing Definability of Second-Order Generalized Quantifiers, *18th Workshop on Logic, Language, Information and Computation*, Philadelphia 2011.

Monotonicity in Quantifier Verification, *Sinn und Bedeutung 15*, Saarbrücken 2010.

Working Memory and Quantifiers, *Utterance Interpretation and Cognitive Models III*, Brussels 2010.

Quantifiers & Working Memory, *Amsterdam Colloquium*, 2009.

Almost All Complex Quantifiers are Simple, *11th Meeting on Mathematics of Language*, Bielefeld 2009.

Understanding Quantifiers in Language, *The Annual Meeting of the Cognitive Science Society*, Amsterdam 2009.

How Complex is Language?, *Szklarska Poręba Workshop*, 2009.

A Remark on Collective Quantification, *Szklarska Poręba Workshop*, 2008.

Computational Complexity and the Strong Meaning Hypothesis, *7th International Symposium on Language, Logic and Computation*, Tbilisi 2007.

Verifiable Fragments of Language: Everyday Language Quantifiers, *Szklarska Poręba Workshop*, 2007.

The Notion of Computational Complexity in Psycholinguistics. Empirical Evidence, *European Society for Philosophy and Psychology Annual Meeting*, Belfast 2006.

Computational Complexity of Some Ramsey Quantifiers in Finite Models, *Logic Colloquium*, Nijmegen 2006.

Hintikka's Thesis Revisited, *Szklarska Poręba Workshop*, 2006.

Computational Basis for Natural Language Quantifiers Comprehension, *European Society for Psychology and Philosophy Annual Meeting*, Lund 2005.

Defining the Meanings of Quantifiers, *Prague International Colloquium on Logic, Games and Philosophy*, Prague 2004.

Can Every Indexical Sentence be Translated into Standing Sentence?, *Epistemological Controversies*, Toruń 2003.

Invited Seminar Talks

Logic in cognitive modeling, *ILLC Midsummer Night Colloquium*, Amsterdam 2013.

Computational Complexity in Semantics, *Colloquium on Complexity in Language*, Amsterdam Center for Logic and Communication, Amsterdam 2013.

From Logic to Behavior. Modern semantics and complexity theory in cognitive modeling, *Munich Center for Mathematical Philosophy*, Munich 2013.

Quantifier Transformations, *Knowledge Representation and Data Base Research Center*, Bolzano 2012.

Complexity of Backward Induction Games, *Logic and Interactive Rationality Seminar*, Amsterdam 2012.

Agent-oriented Perspective on Epistemic Reasonings, *Theoretical Philosophy Seminar*, Lund 2012.

Multi-agent Information Exchange, *Artificial Intelligence Colloquium*, Groningen 2012.

Complexity Measures in Cognitive Science, *Psychological Research Methods Seminar*, Amsterdam 2012.

Model Transformations, *Logic and Interactive Rationality Seminar*, Groningen 2011.

The Complexity of the Sentence-picture Verification, *Multi-agent Systems Group Seminar*, Groningen 2011.

Characterizing Definability of Collective Quantifiers in Natural Language, *CogSci Forum*, Warsaw 2011.

Characterizing Definability of Second-order Generalized Quantifiers in Natural Language, *The Logic Seminar*, Gothenburg 2011.

An Alternative Story of Muddy Children, *Logic Seminar*, Helsinki 2010.

Monotonicity and Quantifiers, *Logic, Language, and Mind Seminar*, Stockholm 2010.

Monotonicity in Quantifier Verification, *Department of Linguistics Seminar*, Tübingen 2010.

MOST, *Seminar on Psycholinguistics and Processing of 'most'*, Tübingen 2010.

Quantifier Processing, *Research Seminar in Logic and Language*, Tilburg 2010.

Data Complexity of the Quantifier Fragments in Natural Language, *GLoRiClass Farewell Event*, Amsterdam 2010.

Collective Quantification, Type-shifting, and Complexity, *Leiden Utrecht Semantic Happening*, Utrecht 2009.

Understanding Quantifiers, *Theoretical Cognitive Science Group Meeting*, Nijmegen 2009.

Complexity of Quantifiers, *Computational Linguistics Seminar*, Amsterdam 2009.

Quantifiers, Automata and Language Comprehension, *Logic Tea*, Amsterdam 2008.

Computational Insights into Meaning, *GLoRiClass Halftime Event*, Amsterdam 2008.

Quantifiers Comprehension. A Comment on Existing Studies and Proposition of a New Experiment, *Logic, Language, and Reasoning Seminar*, Amsterdam 2007.

LANGUAGES Polish (native); English (fluent); Dutch (intermediate); Russian, German (basics)

HOBBY Climbing and Alpinism

August 2013