

Luca Tummolini

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Personal

Born on March 6, 1975

Italian Citizen

Languages: Italian (native speaker); English (proficiency level)

Scientific profile

My interest is in social interaction and the cognitive mechanisms that enable humans to flexibly coordinate and collaborate with one another: from shared deliberation in small groups to conformity with population-wide regularities like conventions and social norms. Recently, I have worked on the interaction between high-level cognitive processes like reasoning and judgments of ownership over objects and low-level sensorimotor ones like objects affordances both in individual and in social contexts. I am interested to develop a common framework between the cognitive and the social sciences and I believe that game theory can provide the ideal toolbox. I am also interested in exploring how the most recent advancements in the cognitive and social sciences can support the design of the new digital infrastructures of contemporary societies. I have published in philosophy, psychology, economics and computer science journals. I am the author of more than thirty articles and co-editors of three volumes. I have published in several top journals in different disciplines (Synthese, Psychological Bulletin, Philosophical Transactions of the Royal Society, Behavioral and Brain Sciences among others) and top conferences in the field of AI and Multi-Agent Systems (the International Conference of Autonomous Agents and Multi-Agent Systems). I have been invited to give keynote lectures in several international conferences (CFS Conference on Collective Intentionality at the University of Copenhagen, Cognitive Foundations of Group Attitudes at IRIT in Toulouse, New Trends in the Philosophy of Social Sciences at UNED in Madrid, International conference on Conventions at the University of Paris X) and in international lecture series (Social Action Series at the University of Milan; Mind in Action at University of Palermo). I have also organized a series of international scientific conferences workshops and events (The Conditional Games Workshop in Ariccia (RM); the IV edition of the International Conference on Collective Intentionality in Siena; the II edition of the European Network of Social Ontology in Rome) specifically intended to build networks and bonds between scholars within cognitive and social sciences.

Education

Ph.D. Cognitive Science, *with honors*, University of Siena, 2010

M.A. Communication Studies, *summa cum laude*, University of Siena, 2001

Academic Appointments

Associate Researcher, Institute for Future Studies (Stockholm, SE), 2020–

Researcher, Institute of Cognitive Sciences and Technologies (CNR, IT), 2012–

Research Fellow, Researcher, Institute of Cognitive Sciences and Technologies (CNR, IT), 2004–2012
Research Assistant, University of Siena, 2002–2003

Grants & Fellowships

Visiting Scholar, Institute for Future Studies, Stockholm (SE), 2017–2020.
Visiting Fellow, Institute of Philosophy, School of Advanced Studies, London (UK), 2012.
Visiting Scholar, European University Institute (EUI), Fiesole, Italy, 2011.
Research Fellow, Istituto di Scienze e Tecnologie della Cognizione, Roma, Italy 2004–2011.
Summer Research Fellowship, University of Virginia, Charlottesville, USA, 2004.
Research Grant, University of Siena, Siena, Italy, 2002–2003.

Publications

Submitted

Przepiorka, W., Szekely, A., Andrighetto, G., Diekmann, A., Tummolini, L. How norms emerge from conventions (and change).

Journal Articles

Szekely, A., Lipari, F., Antonioni, A., Sanchez, A., Tummolini, L. Andrighetto, G. (2021) Evidence from a long-term experiment that collective risks change social norms and promote cooperation. *Nature Communications*. DOI: 10.1038/s41467-021-25734-w

Michalland, A., Falcinelli, I., Liuzza, M.T., Tummolini, L., Borghi, A. M (2021) Affordances in the Covid-19 pandemic: the the case of objects touched by unknown people. *Royal Society Open Science*. Registered Report - Stage 1 acceptance.

Mazzuca, C., Falcinelli, I., Michalland, A., Tummolini, L., Borghi A. (2021) Differences and similarities in the conceptualization of COVID-19 and other diseases in the first Italian lockdown. *Scientific Reports* 11, 18303. <https://doi.org/10.1038/s41598-021-97805-3>

Mazzuca, C., Fini, C., Michalland, A., Falcinelli, I., Da Rold, F., Tummolini, L., Borghi, A. M (2021). From affordances to abstract words: The flexibility of the sensorimotor grounding. *Brain Sciences*.

Fini, C., Tummolini, L., Borghi, A. (2021) Representing the distance from others during the Covid-19 pandemic in Italy. *Scientific Reports*.

Borghi A.M., Mazzuca C., Da Rold F., Falcinelli I., Fini C., Michalland A.H., Tummolini L. (2021) Abstract words as social tools: which necessary evidence? *Frontiers in Psychology* 11:613026. doi: 10.3389/fpsyg.2020.613026

Dove, G., Barca, L., Tummolini, L., Borghi, A. (2020). Words have a weight: Language as a source of inner grounding and flexibility in abstract concepts. *Psychological Research*. doi: 10.1007/s00426-020-01438-6

Szekely, A., Andrighetto, G., Payette, N., Tummolini, L. (2020) Aggression, conflict and the formation of intimidating group reputation. *Social Psychology Quarterly*, 83(1), 70-87. DOI: 10.1177/0190272519882389.

- Tummolini, L., Pezzulo, G. (2020) The epistemic value of conformity. *Physics of life reviews*. DOI: 10.1016/j.plrev.2020.06.010
- Borghi, A., Tummolini, L. (2020) Touch me if you can: the intangible but grounded nature of abstract concepts. *Behavioral and Brain Sciences*.
- Borghi, A.M., Barca, L., Binkofski, F., Castelfranchi, C., Pezzulo, G. and Tummolini, L., (2018) Words as social tools: Language, sociality and inner grounding in abstract concepts. *Physics of life reviews*. DOI:10.1016/j.plrev.2018.12.001.
- Tummolini, L., Stirling, W.C. (2018) Coordinated rational choice. *Topoi*. DOI: 10.1007/s11245-018-9589-6.
- Borghi, A., Barca, L., Binkofski, F., Tummolini, L. (2018) Abstract concepts, language and sociality: from acquisition to inner speech. *Phil. Trans. R. Soc. B*, 373(1752), 20170134; DOI: 10.1098/rstb.2017.0134.
- Borghi, A., Barca, L., Binkofski, F., Tummolini, L. (2018) Introduction: Varieties of abstract concepts: development, use and representation in the brain. *Phil. Trans. R. Soc. B*, 373(1752), 20170121; DOI: 10.1098/rstb.2017.0121.
- Stirling, W.C., Tummolini, L. (2018) Coordinated reasoning and augmented individualism. *Revue d'économie politique* 128 (3), 469-492.
- Scorolli, C., Borghi, A., Tummolini, L. (2017) Cues of control modulate the ascription of object ownership. *Psychological Research*. DOI 10.1007/s00426-017-0871-9
- Ricci, A., Tummolini, L., Castelfranchi, C. (2017) Augmenting societies with mirror-worlds. *AI and Society*; DOI: 10.1007/s00146-017-0788-2.
- Borghi, A. M., Binkofski, F., Castelfranchi, C., Cimatti, F., Scorolli, C., Tummolini, L. (2017). The challenge of abstract concepts. *Psychological Bulletin*, 143(3), 263-292.
- Faulkenberry, T.J., Tummolini, L. (2016) Commentary: Is there any influence of variations in context on object-affordance effects in schizophrenia? Perception of property and goals of action. *Frontiers in Psychology*, 7(1915). DOI: 10.3389/fpsyg.2016.01915
- Andrighetto, G., Grieco, D., Tummolini, L. (2015) Perceived legitimacy of normative expectations motivates compliance with social norms when nobody is watching, *Frontiers in Psychology*, 6(1413). doi: 10.3389/fpsyg.2015.01413.
- Ricci, A., Piunti, M., Tummolini, L., Castelfranchi, C. (2015) The mirror world: Preparing for mixed-reality living, *IEEE Pervasive Computing*, 2(14), 60 - 63.
- Scorolli, C., Borghi, A., Tummolini, L. (2015). Visual cues and implicit judgments of ownership: An experimental study, *Sistemi Intelligenti*, 27(1), 209 - 220, doi: 10.1422/79695.
- Tummolini, L. (2014) Making our ends meet: Shared intention, goal adoption and the third-person perspective, *Phenomenology and the Cognitive Sciences*, 13(1), 75 - 98.
- Roversi, C., Borghi, A., Tummolini, L. (2014) A marriage is an artefact and not a walk that we take together, *Review of Philosophy and Psychology*, 4(3), 527 - 542.
- Borghi A., Scorolli C., Caligiore D., Baldassarre G., Tummolini L. (2013) The embodied mind extended: Using words as social tools, *Frontiers in Psychology*, 4(214).
- Tummolini, L., Andrighetto G., Castelfranchi, C., Conte, R. (2013), A convention or (tacit) agreement betwixt us: on reliance and its normative consequences, *Synthese*, 190(4), 585 - 618

Tummolini, L., Borghi, A., Scorolli, G. (2013) Disentangling the sense of fairness from the sense of ownership, *Behavioral and Brain Sciences*, Commentary, 36(1), 101-102.

Tummolini, L., Castelfranchi, C. (2011) The embodiment of ownership, *Sistemi Intelligenti*, 2, 345 - 357.

Castelfranchi, C., Pezzulo, G., Tummolini, L. (2010) Behavioral Implicit Communication (BIC): Communicating with smart environments via our practical behaviors and its traces, *International Journal of Ambient Computing and Intelligence*, 2(1), 1-12.

Tummolini, L. (2008). Convention: an interdisciplinary study, *Topoi*, 27, 1-3.

Tummolini, L., Castelfranchi, C. (2007) Trace signals. The meanings of stigmergy, *Lecture Notes in Computer Science Series*, Vol. 4389,141-156.

Tummolini L., Castelfranchi C. (2006). The cognitive and behavioral mediation of institutions: Towards an account of institutional actions, *Cognitive Systems Research*, 7(2-3), 307-323.

Tummolini, L., Castelfranchi C., Ricci, A. Violi, M., Omicini, A. (2005) Exhibitionists and voyeurs do it better: A shared environment for flexible coordination with tacit messages, *Lecture Notes in Artificial Intelligence*, LNAI 3374, Springer-Verlag,215-231.

Editorial Activities

(with Borghi A., Barca, L., Binfkoski, F.) Varieties of abstract concepts: development, use, and representation in the brain, *Philosophical Transactions of the Royal Society: B*, 2017.

(with Salice, A.) Social Facts: Metaphysical and Empirical Perspectives, *Phenomenology and the Cognitive Sciences*, 2013.

(with Falcone, R., Miceli, M., Paglieri F.) *The Goals of Cognition: Essays in Honor of Cristiano Castelfranchi*, College Publications, 2013.

Convention: an Interdisciplinary Study, *Topoi: an International Review of Philosophy* 27, 1-2, 1-164, 2008.

(with Castelfranchi C.), Cognition, Joint Action and Collective Intentionality, *Cognitive Systems Research*, 7, 2-3, 97-323, 2006.

(with Castelfranchi, C., Balkenius, C., Butz, M., Ortony, A., Roy, D.), From Reactive to Anticipatory Cognitive Embodied Systems, *Technical Report Fs-05-05*, AAAI Fall Symposium (2005), AAAI Press, Menlo Park (CA).

Book Chapters

Ross, D., Stirling, W., Tummolini, L. (2020) Strategic theory of norms for empirical applications in political science and political economy. In H. Kincaid and J. van Bouwel (Eds.) *Oxford Handbook of Philosophy of Political Science*. Oxford University Press

Borghi, A.M., Fini, C., Tummolini, L. (2020) Abstract Concepts and Metacognition: Searching for Meaning in Self and Others. In Michael D. Robinson and Laura E. Thomas (Eds.) *Embodied Psychology: Thinking, Feeling, and Acting*. Springer.

Ricci, A. Tummolini, L., Piunti, M., Boissier, O., Castelfranchi, C. (2015). Mirror worlds as agent societies situated in mixed reality environments. In A. Ghose, N. Oren, P. Telang, and J. Thangarajah, editors, *Coordination, Organizations, Institutions, and Norms in Agent Systems X*, volume 9372 of LNAI, pages 197-212. Springer.

Grossi D., Tummolini L., Turrini P. (2013) Norms in Game Theory. In S. Ossowski (ed.): *Agreement Technologies*, Dordrecht: Springer, 191-197.

Tummolini, L. (2013) Social Convention. In B. Kaldis, Ed. *Encyclopedia of Philosophy and the Social Sciences*, SAGE, 900-902.

Castelfranchi, C., Piunti, M., Ricci, A., Tummolini, L. (2012) AmI Systems as Agent-Based Mirror Worlds: Bridging Humans and Agents through Stigmergy. In T. Bosse, Ed. *Agents and Ambient Intelligence*, IOS Press, 17-31.

Tummolini, L., Mirolli, M., Castelfranchi, C. (2009). Stigmergic Cues and their Uses in Coordination: An Evolutionary Approach. In A. Uhrmacher and D. Weyns (Eds.), *Multi-Agent Systems: Simulation and Applications*. Taylor and Francis, 243-265.

Tummolini, L. (2009) L'armonia del silenzio: verso una teoria degli accordi taciti. In Raffaele Caterina (Ed.) *La Dimensione Tacita del Diritto*, Napoli: Edizioni Scientifiche Italiane, 147-157.

Proceedings

De Bortoli Vizioli, A., Borghi, A.M., Tummolini, L. (2020). When me is mine: An embodied origin for psychological ownership? In S. Denison., M. Mack, Y. Xu, & B.C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp. 2473-2479). Cognitive Science Society.

Stirling, W.C, Tummolini, L. (2019) Coordinated distributed decision making on social influence networks. In *6th International Conference on Control, Decision and Information Technologies (CoDIT19)*, IEEE Xplore.

Stirling, W.C, Tummolini, L. (2017). Social influence diffusion and coordinated decision making on networks. In *Proceedings of the 2017 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining 2017 (ASONAM '17)*, Jana Diesner, Elena Ferrari, and Guandong Xu (Eds.). ACM, New York, NY, USA, 860-868. DOI: <https://doi.org/10.1145/31110025.3116194>

Gaudout, B., Longin, D., Lorini, E., Tummolini, L. (2008) Anchoring Insitutions in Agents' Attitudes. Towards a Formal Framework for Autonomous Multi-Agent Systems. In Lin Padgham and David Parkes (Eds.) *Proceedings of the International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2008)*, ACM Press, 728-735.

Lorini E., Tummolini L., Herzig A. (2005). Establishing Mutual Beliefs by Joint Attention: towards a Formal Model of Public Events. In Bruno G. Bara, Lawrence Barsalou, and Monica Bucciarelli, *Proceedings of the XXVII Annual Conference of the Cognitive Science Society*, July 21-23, Stresa, Italy.

Omicini, A. Ricci, A. Viroli, M., Castelfranchi C., Tummolini, L. (2004) Coordination Artifacts: Environment Based Coordination for Intelligent Agents. In Carles Sierra and Liz Sonenberg (Eds.) *Proceedings of the International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2004)*, ACM Press: 286-293.

Castelfranchi, C., Tummolini, L. (2003) Positive and Negative Expectations and the Deontic Nature of Social Conventions, in *Proceedings of the 9th International Conference of Artificial Intelligence and Law (ICAAIL 2003)*, ACM Press: 119-125.

Castelfranchi, C., Giardini, F., Lorini, E., Tummolini, L. (2003) The Prescriptive Destiny of Predictive Attitudes: from Expectations to Norms via Conventions. In R. Alterman, D. Kirsh (Eds) *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*, Boston.

Invited Talks

Social Action Seminar Series (University of Milan), 2014

CFS Workshop: Collective Intentionality: Its Features and Pre-conditions (University of Copenhagen, Denmark), 2014

Cognitive Foundations of Group Attitudes - International Workshop (IRIT, Toulouse, France), 2012

New Trends in the Philosophy of the Social Sciences - International Workshop (UNED, Madrid, Spain), 2010

Mind in Action - International Lectures Series (University of Palermo, Italy), 2010

Morals, Emotions and Cognition - National Conference (University of Bari, Italy), 2009

Normative Multi-Agent Systems - Dagstuhl Seminar Series (Germany), 2009

Conventions - International Workshop (University of Paris X, France), 2008

Formal Models of Norm Change - International Workshop (University of Luxembourg), 2007

Normative Concepts - International Conference (University of Zurich, Switzerland), 2007

Michael Bratman and The Structure of Agency - International Workshop (University of Berne, Switzerland), 2007

Organization of Scientific Events

Symposium on Abstract Concepts: Different kinds, Multiple Representations (with Anna Maria Borghi) at XXIII Congresso Nazionale della Sezione Sperimentale, Bari 20-22 Settembre 2017

Workshop on Conditional Games (with Glenn Harrison and Don Ross; Villino Volterra, Rome, Italy) September 2016

<http://cear.gsu.edu/event/conditional-games/>

Workshop on Language, Action and Space (with Anna Maria Borghi) at the the Sixth International Conference on Spatial Cognition (ICSC), September 2015

II Conference of the European Network on Social Ontology (with Alessandro Salice; Luiss University, Rome, Italy), September 2011

<http://www.enso2011.it>

Interdisciplinary Workshop on Moral Emotions (with Cristiano Castelfranchi, Francesco Mancini and Amelia Gangemi, ISTC-CNR, Rome, Italy), 2008

AAAI Fall Symposia Series - From Reactive to Anticipatory Cognitive Embodied Systems (Washington, DC, USA), 2005

IV International Conference on Collective Intentionality - Cognition and Collective Intentionality Mental Prerequisites and Attitudes for Collective Intentionality: Philosophical, Logical, Computational, Neural and Psychological Models (University of Siena, Italy), 2004

<http://www.istc.cnr.it/collintIV/index.htm>

International Research Projects

FET Coordinated Action - SINTELNET: European Network of Social Intelligence, Co-Chair of the Social Epistemology Working Group, 2011–2013.

International Laboratory in Interacting Knowledge Systems (ILIKS), 2005–2011

ESF Individual Project - The Cooperative Mind: Proximate Explanations of Human and Animal Cooperation, 2007–2010

6th FP European Project - MindRACES From Reactive to Anticipatory Cognitive Embodied Systems, 2004–2007

ESF Individual Project - EUROCORES OMLL Programme: The Origin of Man, Language and Languages, 2004

Participation in Scientific, Editorial Boards and Reviewing Activities

Associate Editor for *Frontiers in Psychology*, Specialty Section on Theoretical and Philosophical Psychology

Associate Editor for *Computational Intelligence*

Member of the Editorial Board of *Topoi: An International Review of Philosophy*

Membro eletto del Consiglio di Istituto dell'ISTC-CNR (dal 2009 al 2015)

Lettera di Encomio per il lavoro svolto (Atto del Direttore con prot 1880 del 19/05/2011)

Member of the CESS Ethics Committee of Oxford University (Centre for Experimental Social Science's External Ethical Review Committee; since 2016)

Professional Activities

Member, Italian Association of Psychology (AIP)

Member, American Association of Cognitive Science (COGSCI)

Member, European Network on Social Ontology (ENSO)

Reviewer for: *Adaptive Behavior*; *Cognition*; *Cognitive Semiotics*; *Cognitive Processing: International Quarterly of Cognitive Science*; *Connection Science*; *Mind*; *Philosophical Psychology*; *Psychological Research: An International Journal of Perception, Attention, Memory, and Action*; *PLoS ONE*; *Journal of Cognitive Systems Research*; *Review of Philosophy and Psychology*; *Topoi: An International Review of Philosophy*; *Topoi Library: Springer Book Series*.

Teaching

UniNettuno Università Telematica Internazionale, Rome, Italy

2016-2017

Area Professor in Cognitive Economics, Economic Department

Università degli Studi di Roma “Tor Vergata”, Rome, Italy

2016–2017

S.I.BIL Seminar Series

Luiss University, Rome, Italy

2010–2016

Logic and Assessment of Arguments

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