James M. Yearsley

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Education

PhD. Theoretical Physics, Imperial College, 2011. Aspects of Time in Quantum Theory.

MSci. (1st Class Honours), Imperial College, 2007. Physics with Theoretical Physics.

Academic Experience

Vanderbilt University, Department of Psychology

Postdoctoral Scholar: November 2015-Present.

City University London, School of Arts and Social Sciences

Postdoctoral Research Assistant, Department of Psychology: October 2013-November 2015.

University of Cambridge, Department of Applied Maths and Theoretical Physics

Research Associate, Centre for Quantum Information and Foundations: October 2011-September 2013.

Awards

Faculty of Natural Sciences Award for Excellence in Teaching (2011). Awarded to individuals who have made a major contribution to learning and teaching within the Faculty of Natural Sciences at Imperial College London.

Tyndall Prize (2007). Awarded annually to a final year student in the Department of Physics for the most outstanding final year or Year in Europe non-computational project.

Research - Psychology

Current research directions

Quantum models of decision making, new predictions and tests.
Human similarity judgments (structural properties, context effects, psychological spaces).
Constructive processes/order effects in decision making.
Affective evaluation and its impact on decision making.
Bayesian networks, quantum networks and causal reasoning; relevant applications.

Journal articles

Published/In press

[1] Yearsley, JM & Pothos, EM. (2016). Zeno's paradox in decision-making. Proceedings of the Royal Society B **283:** 20160291.

[2] Yearsley, JM & Busemeyer, JR. (In press). Quantum cognition and decision theories: a tutorial. Journal of Mathematical Psychology.

[3] Barque-Duran, A, Pothos, EM, Yearsley, JM, & Hampton, JA. (2015). Patterns and evolution of moral behaviour: moral dynamics in everyday life, Thinking & Reasoning, DOI: 10.1080/13546783.2015.1051585.

[4] Pothos, EM, Barque-Duran, A, Yearsley, JM, Trueblood, JS, Busemeyer, J, & Hampton, JA. (2015). Progress and current challenges with the quantum similarity model. Frontiers in Psychology, **6**, 205.

[5] Yearsley, JM & Pothos, EM. (2014). Challenging the classical notion of time in cognition: a quantum perspective. Proceedings of the Royal Society B **281**, **1781**, 20133056.

In preparation/Under review

[1] Barque-Duran, A, Pothos, EM, Hampton JA & Yearsley, JM. (under review.) Contemporary morality: moral judgments in digital contexts

[2] Yearsley, JM. (under review.) Advanced tools and concepts for quantum cognition: a tutorial.

[3] Yearsley, JM, Barque-Duran, A, Scerrati, E, Hampton, JA & Pothos, EM. The triangle inequality constraint in similarity judgments.

[4] Pothos, EM, Busemeyer, JR, Shiffrin, RM, & Yearsley, JM. Rediscovering human rationality: quantum theory and the conjunction fallacy.

[5] Yearsley, JM, Hampton, JA, & Pothos, EM. Context effects in similarity judgments.

Refereed published conference proceedings

Published

[1] Yearsley, JM, Pothos, EM, Barque Duran, A & Hampton, JA. (2015). Diagnosticity: Some theoretical and empirical progress. In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings, & P. P. Maglio (Eds.), *Proceedings of the 37th Annual Conference of the Cognitive Science Society* (pp. 2739-2744). Austin, TX: Cognitive Science Society.

[2] Barque-Duran, A, Pothos, EM, Yearsley, JM, & Hampton, JA. (2015). Moral dynamics in everyday life: how morality evolves in time? In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings, & P. P. Maglio (Eds.), *Proceedings of the 37th Annual Conference of the Cognitive Science Society* (pp. 154-159). Austin, TX: Cognitive Science Society.

[3] Yearsley, JM & Pothos, EM. Towards an empirical test of realism in cognition. (2015). In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings, & P. P. Maglio (Eds.), *Proceedings of the 37th Annual Conference of the Cognitive Science Society* (pp. 2733-2738). Austin, TX: Cognitive Science Society.

[4] Yearsley, JM, Pothos, EM, Hampton JA & Barque Duran, A. (2015). Towards a quantum probability theory of similarity judgments. *Proceedings of the 8th international conference on quantum interaction.* Lecture Notes in Computer Science, 8951, 132.

[5] Yearsley, JM & Pothos, EM. (2015). Towards an empirical test of realism in cognition. *Proceedings of the 8th international conference on quantum interaction.* Lecture Notes in Computer Science, 8951, 271.

Other achievements

Together with J Trueblood, Z Wang and J.R. Busemeyer, I am ran a full day tutorial on quantum models of cognition and decision at the 37th Annual Conference of the Cognitive Science Society.

I was accepted to attend the 2015 Summer Institute on Bounded Rationality which took place at the Max Planck Institute for human development, Berlin, June 2015.

Research - Physics

Journal articles

[1] Halliwell, JJ & Yearsley, JM. (2013). Negative probabilities, Fine's theorem and linear positivity. Physical Review A **87**, 022114.

[2] Yearsley, JM, Halliwell, JJ, Hartshorn, R & Whitby, A (2012). Analytic examples, measurement models and classical limit of quantum backflow. Physical Review A **86**, 042116.

[3] Halliwell, JJ & Yearsley, JM (2012). Pitfalls of path integrals: Amplitudes for spacetime regions and the quantum Zeno effect. Physical Review D **86**, 024016.

[4] Yearsley, JM, Downs, DA, Halliwell, JJ & Hashagen, AK. (2011). Quantum arrival and dwell times via idealised clocks. Physical Review A **84**, 022109.

[5] Halliwell, JJ & Yearsley, JM (2010). On the relationship between complex potentials and strings of projection operators. Journal of Physics A **43**, 445303.

Selected by the Institute of Physics for inclusion in IOP select, `http://select.iop.org`. IOP select is a special collection of journal articles, chosen by IOP Editors based on one or more of the following criteria: 1) Substantial advances or significant breakthroughs, 2) A high degree of novelty or, 3) Significant impact on future research.

[6] Yearsley, JM (2010). Quantum arrival time for open systems. Physical Review A **82**, 012116.

[7] Halliwell, JJ & Yearsley, JM (2009). Arrival times, complex potentials and decoherent histories. Physical Review A **79**, 062101.

[8] Halliwell, JJ & Yearsley, JM (2009). Quantum arrival time formula from decoherent histories. Physics Letters A **374**, 154.

[9] Yearsley, JM (2008). The propagator for the step potential and the delta function potential using the path decomposition expansion. Journal of Physics A **41**, 285301.

Refereed published conference proceedings

[1] Yearsley, JM & Halliwell, JJ. (2013). An introduction to the quantum backflow effect. Journal of Physics.: Conference Series **442**, 012055.

[2] Halliwell, JJ & Yearsley, JM. Amplitudes for spacetime regions and the quantum Zeno effect: Pitfalls of standard path integral constructions. Journal of Physics: Conference Series **442**, 012018.

[3] Yearsley, JM (2011). A review of the decoherent histories approach to the arrival time problem in quantum theory. Journal of Physics: Conference Series **306**, 012056.

[4] Yearsley, JM (2009). The propagator for the step potential using the path decomposition expansion. Journal of Physics: Conference Series **174**, 012072.