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EDITORIAL

A special issue in honor of the contributions of Professor Nicola S. Clayton FRS

Elias Garcia-Pelegrin[1] · Rachael Miller[2,3] · Joshua M. Plotnik[4] · Alexandra K. Schnell[2]

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Abstract

It has been an honor to edit this special issue of Learning & Behavior to recognize the exceptional contributions of Prof. Nicky S. Clayton FRS to the fields of comparative cognition and developmental and experimental psychology. Prof. Clayton has also provided supervision, mentorship, and support for many students, researchers, and colleagues throughout her career, including over 52 PhD candidates and postdoctoral researchers, helping to pave the way for a generation of future scientists in academia and industry. Indeed, all four of the co-editors on this special issue worked with Prof. Clayton in her Cambridge University Comparative Cognition Lab as PhD candidates and/or postdoctoral researchers (from 2011 to 2022), and we happily continue to collaborate together. Prof. Clayton was awarded the 2024 Comparative Cognition Society (CCS) Research Award and delivered the Master Lecture at the 31st International Conference on Comparative Cognition (CO3, April 2024). Dr. Rachael Miller and Prof. Joshua Plotnik (co-editors) co-organized a symposium at the CO3 conference dedicated to Prof. Clayton. The invited symposium speakers were Prof. Mike Beran (Georgia State University), Prof. Jon Crystal (Indiana University), Dr. Christelle Jozet-Alves (Université de Caen Normandie), and Prof. Thomas Bugnyar (University of Vienna). Dr Elias Garcia-Pelegrin (co-editor) served as Master of Ceremony for an evening CO3 banquet, which included a video compilation of "thank you" messages from many of Prof. Clayton's colleagues, students, and friends.

Keywords Episodic memory · Cognitive ethology · Comparative cognition · Behavior systems

Elias Garcia-Pelegrin, Rachael Miller, Joshua M. Plotnik, Alexandra K. Schnell contributed equally to this editorial piece, and are listed in alphabetical order.

Extended author information available on the last page of the article

Prof. Nicola Clayton (image credit to Nadi Paderi)

Biography

Nicky Clayton is Professor of Comparative Cognition in the Department of Psychology, University of Cambridge (since 2000), a Fellow of the Royal Society (FRS, since 2010), a Fellow of the Royal Society of the Arts (since 2024), and a Fellow of Clare College, Cambridge (since 2000). She is co-founder of The Captured Thought (2012) and Scientist in Residence at Rambert (since 2009). Prof. Clayton also holds visiting professorships at Nanjing University, Institute of Technology, China (since 2018) and the Beijing Language and Culture University, China (since 2019), and honorary professorships at Hangzhou Diangi University, China (since 2019) and Beijing Minzu University (since 2019).

She started her career with a BA Hons in Zoology from the University of Oxford in 1984 and a PhD from the University of St Andrews in 1987. Prof. Clayton has been recognized for her outstanding contributions, with high-profile awards received many times over the years, including the Jean-Marie Delwart Award in Comparative and Evolutionary Neurosciences, Belgian Royal Academy of Sciences (2010) and the Experimental Psychology Society Mid-Career Award in 2013. She is the first person to be awarded both the Association for the Study of Animal Behaviour (ASAB) Tinbergen Lecturer Award and the ASAB Medal in 2022.

Contributions

Prof. Clayton is renowned for her research on the mentality of corvids (members of the crow family), including investigations of memory, future planning, perspective-taking, causal reasoning, and mental time travel (e.g., Emery & Clayton, 2004). For example, in one of her highest-cited publications in *Nature* (2000 citations; Google Scholar, November 2024), she provided evidence for episodic-like memory, i.e., "what-where-when" memory in scrub-jays (*Aphelocoma coerulescens*; Clayton & Dickinson, 1998). This work considered the importance of using an ecologically valid paradigm in which birds cached their food and then had to remember, across several different experimental conditions, where, when, and what they cached (peanuts or wax worms). It was a pioneering study that, in part, led to the creation of an entire subfield within comparative cognition dedicated to the study of episodic-like memory and planning for the future in non-human animals. She and her team followed up on this research with several other important studies, including a seminal paper published in Nature showing that jays will plan for future needs by both storing a particular food in a place they do not expect to find it the following day, and in places they expect to later be hungry (Raby et al., 2007). Prof. Clayton has also studied the social side of caching (e.g., cache pilfering and cache protection from pilferers), and the potential socio-cognitive underpinnings of such behavior (e.g., showing that scrub-jays change their caching behavior based on the identity of observers – Dally et al., 2006; demonstrating that jays alter their caching behavior tactics according to their own previous experiences as cache pilferers if they had been observed by conspecifics – Emery & Clayton, 2001). She has also conducted extensive cognitive research in other corvid species, including New Caledonian crows (*Corvus moneduloides,* e.g., tool use – Gruber et al., 2019; Jelbert et al. 2019; Taylor et al., 2011). Prof. Clayton and her colleagues have conducted cognitive work with other taxa as well, including elephants (e.g., relative quantity judgment – Plotnik et al., 2019) and humans (e.g., cross-cultural comparisons of cognitive development in executive function in Chinese and British children – Ding et al., 2023). She creates significant bridges between science and the arts to, for example, choreograph dance pieces. *Comedy of Change* was inspired by natural and sexual selection in honor of the bicentenary of Charles Darwin and the 150th anniversary of his epic *On the Origin of the Species*, for which it won the Lawrence Olivier Award, and *Seven for a Secret Never to be Told* was inspired by Prof. Clayton's research on cognition in corvids and children.

Current interests

Prof. Clayton's current research explores the fascinating intersections of animal cognition, illusion, and behavior, with a particular focus on corvids and cuttlefish. Renowned for her groundbreaking work on cognitive abilities like memory, planning, and perspective-taking in various corvid species, Prof. Clayton and her colleagues have recently expanded this focus to explore how these birds use deception and problem-solving strategies reminiscent of sleight-of-hand techniques used in human magic (Garcia-Pelegrin et al., 2021, 2024). These recent studies reveal that jays are sensitive to cognitive illusions, uncovering perceptual blind spots and psychological constraints that shape the way the birds make decisions (Schnell et al., 2021a). Complementing this, her interest in cuttlefish cognition investigates parallels between avian and marine intelligence, particularly in areas such as self-control (Schnell et al., 2021b), memory (Schnell et al., 2021c), and curiosity (Ajuwon et al., 2024). By integrating insights from these distinct taxa, Prof. Clayton aims to uncover universal principles of cognition and challenge conventional assumptions about the boundaries of intelligence across species.

This issue

This issue contains nine articles (research articles, reviews, and opinions) spanning a range of topics, including animal curiosity, memory, object permanence, magic, and theory of mind. Ajuwon et al. (2024) review curiosity and the value of prospective information in animals. They explore the prevalence of preferences in information-seeking tasks with uncertain future outcomes and identify future research avenues to better characterize and understand animal curiosity. Cornero and Clayton (2024) tested object permanence in rooks (*Corvus frugilegus*), with one rook demonstrating the ability to track multiple invisible displacements, while some other individuals made typical "A-not-B" errors. Beran (2024) discusses the role of "magic" and the use of magician techniques in comparative cognition, referring, for example, to Garcia-Pelegrin et al.'s (2023) innovative study of manual action expectation and biomechanical ability in non-human primates. Sheridan et al. (2024) present evidence that rats can use episodic memory replay to solve olfactory memory tasks. Pham et al. (2024) explore the limitations of traditional "Spoon" tasks in measuring episodic future thinking, proposing "spontaneous" versions that reduce environmental cues and prompts to better align with Tulving's original conception. Boyle and Brown (2024) propose a philosophically grounded framework to explore multiple functions of episodic memory across species and suggested integrating artificial intelligence (AI)-based models to inform future behavioral research. Hope et al. (2024) review the empirical research on memory in elephants, exploring its potential links to cognitive and behavioral flexibility in navigating physical, social, and spatial environments. They highlight future directions for studying elephant memory and its implications for conservation and mitigating human–elephant conflict. Poncet et al. (2024) did not find evidence for future planning in cuttlefish, arguing that either a trade-off between present and future needs or a potential disconnect between the cognitive underpinnings of episodic memory (for which there is evidence in this species) and future planning may explain their results. Worsfold et al. (2024) replicated the seminal Clayton and Dickinson (1998) paper with additional controls and a richer analysis of the birds' behavior during the experiments, providing a deeper consideration of cache retrieval and episodic-like memory in birds and, as is suggested for future research, in other animals.

Conclusion

We are grateful for this opportunity to edit the exciting and diverse group of papers presented in this special issue in Prof. Clayton's honor. We wish to thank Prof. Clayton for her support of us and so many others over her illustrious career in science. Prof. Clayton's significant and pioneering research has contributed to advancing the understanding of the evolution and development of cognition in humans and other animals, from cephalopods to corvids.

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Data availability No new data were created or analyzed for this paper.

Code availability This paper has no associated code.

Declarations

Conflicts of interest All authors have been members of Professor Nicky Clayton's laboratory at the University of Cambridge. The authors have no other competing interests to declare that are relevant to the content of this article.

Ethics approval This editorial is not a research study.

Consent to participate Not applicable.

Consent for publication Not applicable.

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Authors and Affiliations

Elias Garcia-Pelegrin[1] · Rachael Miller[2,3] · Joshua M. Plotnik[4] · Alexandra K. Schnell[2]

✉ Elias Garcia-Pelegrin
egarpel@nus.edu.sg

✉ Rachael Miller
rmam3@cam.ac.uk

✉ Joshua M. Plotnik
joshua.plotnik@gmail.com

✉ Alexandra K. Schnell
alex.k.schnell@gmail.com

[1] Department of Psychology, National University of Singapore, Singapore, Singapore

[2] Department of Psychology, University of Cambridge, Cambridge, UK

[3] School of Life Sciences, Anglia Ruskin University, Cambridge, UK

[4] Hunter College and the Graduate Center, City University of New York, New York, NY, USA