Alex **Muhl-Richardson**

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I am a behavioural scientist and psychologist who uses data to solve real-world problems. I have interests in human performance optimisation, individual differences in behaviour and sustainable behaviour change. I have extensive experience leading and managing programs of research and experimentation, including developing data collection methodologies, working with large datasets, statistics and data analysis, and developing and communicating actionable insights.

Experience

Psychologist and Researcher   *Abu Dhabi, UAE*

Human Performance Optimisation Centre, Beacon Red   *06/2024 - Present*

- Research and Development Lead for the Human Performance Optimisation Centre at Beacon Red
- Leading human performance research, data analysis and behavioural insight development
- Engaging with clients, vendors and research partners to market and develop new human performance capabilities

Senior Lecturer in Behavioural Science   *Camberley, UK*

Department of Communication and Applied Behavioural Science, Royal Military Academy Sandhurst   *11/2021 - 06/2024*

- Research Co-ordinator for behavioural science research, developed relationships with external research bodies
- Developing and delivering evidence-based courses for UK and international military audiences

Research and Teaching Associate   *Cambridge, UK*

Cognition and Motivated Behaviour Lab, Department of Psychology, University of Cambridge   *04/2021 - 11/2021*

- Developed behavioural tasks for research on learning and memory, designed and delivered undergraduate teaching

Research Associate   *Cambridge, UK*

Visual Cognition Lab, Department of Psychology, University of Cambridge   *04/2018 - 04/2021*

- Responsible for a series of projects on attention and cognition, including experimental design, data collection and writing papers

Research Associate   *Nottingham, UK*

Department of Psychology, Nottingham Trent University   *11/2017 - 04/2018*

- Supported multiple projects across the department, contributing to experimental design, data collection and analysis and writing papers

Education

Certificate in Management and Leadership   *CMI, UK*

Chartered Management Institute   *2025 - 2026*

- Level 5 certificate in managament and leadership, ongoing, expected award date January 2026

PhD Psychology   *Southampton, UK*

Centre for Vision and Cognition, School of Psychology, University of Southampton   *2013 - 2018*

- Led a four-year programme of research - developing research questions, experimental design, data collection, analysis and publishing papers
- Received PhD studentship (£85,502) from the Defence Science and Technology Laboratory, delivered outputs to government stakeholders

MSc Psychological Research Methods (Distinction)   *Sheffield, UK*

Department of Psychology, University of Sheffield   *2012 - 2013*

- Main research project: The effects of autistic traits on social attention during deception, awarded Michael Siegal prize for best research project

BA (Hons) Philosophy and Psychology (Upper Second Class)   *Sheffield, UK*

Department of Psychology, University of Sheffield   *2009 - 2012*

- Main research project: The effects of display medium on memory - a comparison of LCD and E Ink displays
- Carried out additional project to research and develop training for vibro-tactile sensory augmentation equipment for fire and rescue services

Skills

Behavioural Science

Experimental design, data collection, report writing, behavioural insights

Research and Development

Research strategy, managing client and partner relationships, sourcing technology, capability development

Statistics and Data

Significance testing, linear models, clustering, outlier detection, decision modelling, Bayesian inference

Programming Languages

R, Python, MATLAB, JavaScript, SQL

Projects

Human Performance Optimisation Proof of Concept

Human Performance Optimisation Centre, Beacon Red   *2024 –> 2025*

- This project involved the scoping, development and testing of a new human performance optimisation capability
- Identified appropriate technology to support project objectives, engaged suppliers of relevant hardware, software and services, including wearable technology, health data platforms and medical testing
- Analysed data from a diverse range of sources, designed data management and analysis pipelines, developed behavioural insights

Improving Human Performance in X-ray Baggage Screening

Visual Cognition Lab, Department of Psychology, University of Cambridge   *2018 –> 2021*

- This project focussed on developing novel training to improve human performance while using the next generation of computed tomography baggage screening technology in airports
- Collected behavioural data from approximately 400 human research participants with applied visual search tasks programmed in Python and online with the Gorilla platform; conducted statistical analysis and modelling of decision-making, null hypothesis significance testing, Bayesian model comparisons and linear mixed-effects models
- Won funding from the Defence and Security Accelerator (worth £266,359), worked closely with government and industry stakeholders (e.g., Dstl, QinetiQ), outputs included three published papers and a library of three-dimensional computerised tomography images for training and security research, materials available for parts of this work on GitHub (https://github.com/alexmuhl-r/3D-CT-Image-Enhancement) and Gorilla Open Materials (https://app.gorilla.sc/openmaterials/867312)

Individual Differences in Dynamic Visual Search

Centre for Vision and Cognition, School of Psychology, University of Southampton   *2013 –> 2017*

- This project examined the individual cognitive, affective and personality factors that can impact human attention and the relevance of this to complex real-world visual tasks, such as air traffic control
- I developed experimental tasks to collect behavioural responses, eye movements and physiological data from human participants, modelled human performance using Signal Detection Theory and conducted statistical analysis including linear mixed-effects models
- Outputs from this project included presentations at national and international conferences, two published papers and project pages available on Github (github.com/alexmuhl-r/Dynamic-Visual-Search) and the Open Science Framework (osf.io/ahufd)

Selected Publications

1. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2025). An evaluation of image enhancements in three-dimensional computed tomography baggage screening. *Applied Ergonomics*, *122*, 104394. https://doi.org/10.1016/j.apergo.2024.104394

2. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2025). Perceiving zebra rump stripes "through the eyes of" their predators: A study with human observers. *Perception*. https://doi.org/10.1177/03010066251389508

3. Muhl-Richardson, A., Tortosa-Molina, M., Recio, S. A., Parker, M. G., & Davis, G. J. (2022). Attenuating the "attentional white bear" effect enhances suppressive attention. *Attention, Perception, & Psychophysics*, *84*(8), 2444–2460. https://doi.org/10.3758/s13414-022-02560-w

4. Muhl-Richardson, A., Parker, M. G., Recio, S. A., Tortosa-Molina, M., Daffron, J. L., & Davis, G. J. (2021). Improved X-ray baggage screening sensitivity with "targetless" search training. *Cognitive Research: Principles and Implications*, *6*, 33. https://doi.org/10.1186/s41235-021-00295-0

5. Muhl-Richardson, A., Godwin, H. J., Garner, M., Hadwin, J. A., Liversedge, S. P., & Donnelly, N. (2018). Individual Differences in Search and Monitoring for Color Targets in Dynamic Visual Displays. *Journal of Experimental Psychology: Applied*, *24*(4), 564–577. https://doi.org/10.1037/xap0000155