

Alex Muhl-Richardson

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I am a behavioural scientist and psychologist interested in new approaches to solving real-world problems. I have interests in human performance optimisation and individual differences in behaviour. I have extensive experience leading and managing research, including developing data collection methodologies, working with large datasets, data analysis, developing actionable insights and report writing.

Experience

Psychologist

Human Performance Optimisation Centre, Beacon Red

- 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

Abu Dhabi, UAE

06/2024 - Present

Senior Lecturer in Behavioural Science

Department of Communication and Applied Behavioural Science, Royal Military Academy Sandhurst

Camberley, UK

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

Cognition and Motivated Behaviour Lab, Department of Psychology, University of Cambridge

Cambridge, UK

04/2021 - 11/2021

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

Research Associate

Visual Cognition Lab, Department of Psychology, University of Cambridge

Cambridge, UK

04/2018 - 04/2021

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

Research Associate

Department of Psychology, Nottingham Trent University

Nottingham, UK

11/2017 - 04/2018

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

Education

PhD Psychology

Centre for Vision and Cognition, School of Psychology, University of Southampton

Southampton, UK

2013 - 2018

- Main research project: Individual Differences in Dynamic Visual Search
- 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)

Department of Psychology, University of Sheffield

Sheffield, UK

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)

Department of Psychology, University of Sheffield

Sheffield, UK

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

Experiment, survey and interview design, data collection, report writing, behavioural insights

Research and Development

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

Statistics and Modelling

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

Programming Languages

R, Python, MATLAB, JavaScript, SQL

Projects

Human Performance Optimization 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
- Ongoing review and development of this capability to move towards a full product offering

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

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., 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>
3. 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>
4. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2021). How the Zebra got its Rump Stripes: Salience at Distance and in Motion. *bioRxiv*. <https://doi.org/10.1101/2021.04.16.440148>
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>

Selected Presentations

1. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2023). Visual Salience at Distance and in Motion: How the Zebra got its Rump Stripes. *Experimental Psychology Society London Meeting, University College London, UK*, Talk.
2. Muhl-Richardson, A., Parker, M. G., Tortosa-Molina, M., Recio, S. A., & Davis, G. (2020). The Attentional White Bear as a Failure of Proactive Suppression. *Object, Perception, Attention & Memory Conference, Austin, USA*, Talk.
3. Muhl-Richardson, A., Recio, S. A., & Davis, G. (2018). Distractor Suppression in Visual Search. *Applied Vision Association Christmas Meeting, Birkbeck, University of London, UK*, Poster.