Institution: University of Greenwich

Unit of Assessment: 3 - Allied Health Professions, Dentistry, Nursing and Pharmacy

Title of case study: Impact of research on "Super-Recognisers" on the establishment and staffing of specialist Police Units in the UK, Germany and Australia; improvements in suspect identification; the creation of new commercial opportunities; and improvement in public understanding.

Period when the underpinning research was undertaken: January 2011 – June 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Josh Davis	Professor in Applied Psychology	01/09/2008 - present
Trevor Thompson	Associate Professor of Clinical Research	18/08/2008 - present

Period when the claimed impact occurred: August 2013 – July 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

Through research, consultancy, training delivery, and the creation of tailored Super Recogniser tests, the University of Greenwich has played a critical role in the establishment and staffing of new **Super Recogniser Units** (SRU) at the **UK Metropolitan Police Service**, **Munich Police (Germany**), **Stuttgart Police**, and **Queensland Police Services (Australia),** ultimately increasing identifications and consequently conviction rates with corresponding impact on public safety. The research has also contributed to the creation and improvement of new businesses and services, such as **Super Recognisers International Ltd** (UK), **Yoti Ltd** (UK and India), and **VisionMetric Ltd** (UK). Public interest and awareness have also been impacted via large scale public engagement activities.

2. Underpinning research

Over £4 billion of public and private funds have been invested in millions of CCTV cameras in the UK, and similar initiatives have occurred in other countries, with the assumption that these will help to deter or solve crime and help with security and public order. However, the full public safety benefit can only be realised with effective identification of people in the images these cameras provide. Not all people have the same abilities to recognise others from faces and so it is important that police officers are selected who are highly accurate in recognising and identifying suspects to undertake this work. This is one of the ways in which research into so-called **Super-Recognisers (SR)** is important**.** Super-recognition is studied at the **Centre for Thinking and Learning** at the **Institute for Lifecourse Development**, which was created to support and further develop our long-standing expertise in applied aspects of cognitive research geared to improving health and wellbeing throughout society. High quality research has been undertaken here by **Davis** and a wider team including **Thompson** for a number of years in the area of super-recognition, which has had significant societal, commercial and public benefits.

Development of assessments of super-recognition abilities

Super-Recognisers (SR) are individuals exceptionally accurate at identifying faces of individuals not personally familiar to them, which can both increase identification of suspects and reduce false positives. **Davis** and colleagues have performed extensive research on super-recognisers, involving both fundamental studies of the cognitive and neurological basis of the abilities **[3.1, 3.2]** and, of most importance to the current case study, translational forensic work with the UK Metropolitan Police Service (MPS) and other international police and business partners **[3.3, 3.4, 3.5]**.

Research assessing potential super recognisers in the Metropolitan police force
In 2011**, Davis** was invited to investigate the facial recognition abilities of a small group of around 25 **Metropolitan Police Service** officers who had made a disproportionately large number of all suspect identifications from London's CCTV. Tests of familiar and unfamiliar face recognition and object memory ability were performed by **Davis**' team to compare high-performing officers to the general public. This testing identified face-specific super-recognition abilities in most high-performing officers. This research was initially described in **Davis**' first authored publication "I never forget a face!" in The Psychologist in 2013, and presented in full through a journal article in Applied Cognitive Psychology in 2016 **[3.3]**. The success of this work formed the foundation for future impact with the MPS.

Larger scale studies of super-recogniser abilities to identify previously unknown suspects
Davis' research subsequently played a key role in a project that aimed to improve police digital evidence use, with an applied research focus on CCTV footage search. This €8,500,000 European Commission research funded project, Large Scale Information Exploitation of Forensic Data (LASIE), which ran from 2014 to 2017, concerned large-scale behavioural studies measuring super-recognition skills required for policing. An essential contribution of the research involved tests of unfamiliar face recognition, which differed conceptually from the pre-2014 work, as the pre-LASIE changes made to MPS systems were primarily designed to tap into familiar face recognition of suspects (e.g., suspects known to the officer from arrests). The new tests also provided more detailed information on contextualised SR performance, such as SR accuracy in crowded settings, or after long delays (over 56 days). This resulted in the further refinement of tests by **Davis** for identifying SRs. These included a Spotting the Face in a Crowd Test **[3.4**, **3.5]** and a Long-Term Face Memory Test **[3.2]** to support existing unfamiliar simultaneous face matching and short-term face memory tests **[3.6]**. Officers identified as SRs using these tests performed very highly on suspect identification in their work, a key contributor to the impacts described below.

3. References to the research

1. Belanova, E., **Davis, J. P.**, & **Thompson, T.** (2018). Cognitive and neural markers of super-recognisers' face processing superiority and enhanced cross-age effect. Cortex, 108, 92-111. https://doi.org/10.1016/j.cortex.2018.07.008 ***[REF2 Submission – Identifier 21049]***
2. **Davis, J. P.**, Bretfelean, D., Belanova, E., & **Thompson, T.** (2020). Super-recognisers: face Recogniser performance after variable delay intervals. Applied Cognitive Psychology, 34(6), 1350-1368. https://doi.org/10.1002/acp.3712
3. **Davis, J. P.**, Lander, K., Evans, R., & Jansari, A. (2016). Investigating predictors of superior face Recogniser ability in police super-recognisers. Applied Cognitive Psychology, 30(6), 827–840. https://doi.org/10.1002/acp.3260
4. **Davis, J. P.**, Treml, F., Forrest, C., & Jansari, A (2018). Identification from CCTV: Assessing police super-recognisers ability to spot faces in a crowd and susceptibility to change blindness. Applied Cognitive Psychology, 32(3), 337-353. https://doi.org/10.1002/acp.3405
5. Durova, M. D., Dimou, A., Litos, G., Daras, P., & **Davis, J. P.** (2017). TooManyEyes: Super-recogniser directed identification of target individuals on CCTV. Proceedings of the 8th IET International Conference on Imaging for Crime Detection and Prevention (ICDP-17), IET Digital Library, 43-48. https://doi.org/10.5281/zenodo.1071986
6. **Davis, J.** (2019). The worldwide impact of identifying super-recognisers in police and business. The Cognitive Psychology Bulletin; Journal of the British Psychological Society: Cognitive Section, 4, 17-22. ISSN: 2397-2653. https://doi.org/10.31234/osf.io/2ybau

Indicators of research quality:
- The research has been published in peer-reviewed, international academic journals **[3.1**-**3.4**, **3.6]**, supporting international quality or above of the body of research.
- **Grant:** LASIE (May 2014 - Oct 2017). Large scale information exploitation of forensic data (LASIE). European Commission 7th Framework Programme. SEC-2013.1.6-1: 607480, UoG – Project Partner (Davis leading on development of face recognition tests, EUR8,406,523.35, http://www.lasie-project.eu/.

4. Details of the impact

Davis' research has had wide-ranging impact enhancing the delivery of police services, via improvements in their professional selection methods and policies and the creation of Super-Recogniser Units. **Davis'** research has also impacted on commerce, via contributions to the creation of new Super-Recogniser businesses, jobs, and services and improvements of performance; and in the area of public understanding, learning, and engagement, via public interest and awareness of Super-recognition. The primary pathway to impact fulfilled in the current REF2021 eligibility period was the collaborative research work by **Davis** and his team with the **Metropolitan Police Service** (MPS) on super-recognisers (SR) starting in 2011. Suspect identification using CCTV was already regarded by the MPS as a key policing tool for safer neighbourhoods, especially where such identifications led to successful convictions and crime prevention. Results, however, had been disappointing, in particular with regards to human cognitive factors in successful identification. The MPS therefore recognised the need for scientific research into individuals exceptionally proficient at facial recognition and ways to identify such individuals who would be most effective at using CCTV for suspect identification. This led to a close collaboration between **Davis**, the MPS and other international police and business partners in order to resolve this barrier to the potential that CCTV use offers for the identification of suspects.

Impact on the creation of Police Super-Recogniser units in the UK, Germany and Australia
In August 2014, **MPS Detective Chief Inspector Mick Neville** asked **Davis** to provide the names of officers scoring highly on super-recogniser tests for deployment in two high profile operations: to locate and trace a missing girl in the Alice Gross case (who was identified by one of the super-recognisers, as was her murderer); and to support the Greater Manchester Police investigation for a new Inquest into the Hillsborough Disaster in Sheffield which involved 96 deaths and has the highest death toll in British sporting history (in which victims were identified by super-recognisers). **Davis** provided an initial list of names of 20 officers he had assessed in his earlier research with the police. **Davis**' research and expert contributions were essential to the understanding that police operations would be more successful with a single department using scientifically identified super-recognisers for analysis: the **Super-Recogniser Unit** (SRU). This specialist unit was eventually established at New Scotland Yard in May 2015 **[5.1]**. The Unfamiliar Face Recognition Test Battery developed by **Davis** and team was subsequently used to identify more SRs for the MPS and other UK forces in the May 2015 - Oct 2017 period. In the period following the work with the MPS, from 2017 to 2019, **Davis** was asked to consult with police forces including **Munich Police, Stuttgart Police** and **Queensland Police Services**. Drawing on his work and expertise he administered testing to identify SRs, and provided training for them. This work has so far resulted in the creation of **Super-Recogniser Units (SRU) within Stuttgart** in 2018**, Munich** in 2019 and **Queensland Police Services** in 2019.

Impact on police identification of suspects in the UK, Germany and Australia
Use of identified specialist SR police officers vastly improved suspect identification rates in the UK, from around 50 per week prior to the creation of the MPS **Super-Recogniser Unit** (SRU) to around 250 per week in 2015/2016 **[5.1]**. The Unit made around 2,250 identifications between May 2015 and December 2017 **[5.1]**. It can be estimated that these identifications translate into a significant increase in convictions with around a 50% conversion rate **[5.1]**. Suspects and victims for a number of high-profile events have been identified by SRU members selected using the testing provided by the University of Greenwich including in the **Skripal Novichok poison murder case** in 2018 (https://www.nytimes.com/2018/09/05/world/europe/salisbury-novichok-poisoning.html) and the **Austin Caballero serial theft case** in 2016 **[5.1]**. In the **Munich Police**, over 4500 officers were tested between December 2017 and April 2018 and the SRU was established in October 2018 and fully operational by September 2019. The leads generated by the Unit were used to link different crimes together and provide a name of the suspect; most leads were deemed "helpful" by investigating teams **[5.2]**. Munich Police reported a large impact with 1800 suspects identified in the first four months of establishing their unit **[5.2]**. From mid-2018, and stemming from **Davis**' presentations and a University of Greenwich consultancy agreement with him, **Stuttgart Police**

started testing their staff for super-recognition abilities and including certification for those identified as such. Up to July 2019, over 2000 staff members have taken the tests, but more importantly, the skills of SRs found in this way were used to support police operations in the Stuttgart riots of June 2020 and are regularly used in football stadiums in Stuttgart to identify banned fans **[5.3]**. The results of this collaboration have led to the decision to provide all officers with the opportunity to be tested by the University of Greenwich in the future **[5.3]**. In **Queensland Police Services** (QPS), the SRU has identified over 300 suspects across the state, the highest number of identifications in their 160-year history. The partnership with **Davis** and the University of Greenwich has also enhanced awareness in the QPS of facial recognition and facial identification, and supported **the QPS Strategic plan** and its statement of purpose which is: 'In collaboration with community, government and non-government partners, provide effective, high quality and responsive policing services to make Queensland safer' **[5.4]**.

Impact on commercial Super-Recogniser services

Since 2017, the agency **Super Recognisers International (SRI) Ltd** has provided consultancy in SR-informed investigations, SR recruitment and contracting services, and training of SRs, for clients in **law enforcement, defence, the security sector, legal professions, and other businesses (including broadcasters, concert/festival hosts, football stadiums)**. SRI was established by Mick Neville after retiring from the MPS, extending the application of SR research into the commercial domain. **Davis** has supported SRI's core business offering from their beginnings through providing the most current SR expertise, testing methods tailored for the agency, advice and guidance. This has enabled them to better serve clients such as **SeeQuestor, Facewatch, O2 Arena, Camelot, SBS Broadcasting (Australia), NHK Broadcasting (Japan), Iridium Security, and police forces such as City Police, Thames Valley Police and States of Jersey Police [5.1]**.

Impact on the creation of internationally recognised professional standards certification process as a super-recogniser

The key to SRI's reputation has been in ensuring the international standard of their SRs, using the only globally recognised certification of SRs via licenses of the Association of Super-Recognisers (ASR). The SR testing used by the Association for this certification is that developed by **Davis** and is provided via the University of Greenwich **[5.1]**. This certification, mandated by SRI, also requires recruits to attend training courses on behavioural analysis/detection, gait analysis and facial mapping. **Davis** and his team provide expertise, and assist SRI with the training, on the latter. In doing so, they have actively supported the competitiveness of SRI Ltd, whilst also underpinning the Association of Super-Recogniser's mission to drive up standards via a members' Code of Conduct, and helping to realise their vision of establishing super-recognition as a forensic science in its own right. To date more than 100 people from a number of countries have completed the ASR certification process, including staff from the **City of London Police, Thames Valley Police, Queensland Police, US border control, MPS, Norwegian Police [5.1]**.

Impact on commercial identification-verification services

Yoti Ltd are an identity verification company started in 2014, which services individuals, government, and businesses who require identity verification, and are based in the UK and India. They also cover the US, Canada, Australia and New Zealand as distinct regions, with clients including the **NHS, Co-op, NSPCC, and Age UK**. The Government of Jersey is a client of Yoti and 10% of the Jersey adult population currently use their services (i.e., around 8500 individuals). The Yoti app has been downloaded to over nine million phones around the world. The company's valuation in 2019 was around £80 million (https://www.yoti.com/blog/yoti-raises-8m-equity-investment/). The company has been able to strongly benefit from **Davis'** work **[5.5]**: From 2015 to 2020, Yoti employed around 35 full time SRs to support their UK operations and over 115 for their India region, all of whom were selected during recruitment involving more than 10,000 applicants which used **Davis's** SR test batteries, and who subsequently underwent training informed by his team. The role of these SRs is essential to Yoti's business in that they check documents and facial photos as part of an identification verification process generated by client requests (around 6 million carried out to date). This research informed expertise was provided to Yoti via consultancy agreements with the university, and **Davis** continues to support staff

recruitment via expertise and training. In doing so, **Davis'** team has played a key role in supporting Yoti's core business offering, and in enhancing their brand in support of their stated mission 'to become the world's most trusted identity platform'.

Impact on the development of commercial facial composite software

VisionMetric Ltd are a UK-based facial composite software company who have created the program EFIT6 for creating facial composites through a process of selecting and rejecting complete faces (as opposed to individual features) ultimately geared to evolving the composite to represent the target face. A new algorithm – E2ID – is being developed via the collaboration, aiming to match facial composites against police databases of mugshots. Since February 2020, and incorporated into **Davis'** public engagement work described below, participants have so far made 1 million similarity ratings of pairs of images used as essential data to drive the machine learning algorithm of E2ID's artificial intelligence. In this way **Davis**' team are supporting product design and development at Visionmetric through their research and a unique application of citizen science **[5.6]**.

Public interest in, and awareness of, Super Recognition

The publicity generated by the SR research, particularly in terms of policing successes, has resulted in over 100 media articles, TV and radio appearances by **Davis**. A website, www.superrecognisers.com, has been created to support this engagement. It is clear that the public are fascinated by SRs, as over 6,000,000 worldwide participants have completed a fun "Could you be a super-recogniser?" test on the website in the 5 years since it was placed online in April 2015 **[3.6]**. On completion participants are offered opportunities to participate in future research and help pilot police tests - approximately 200,000 have participated in follow-up research, and 44,800 have left contact details to be invited to more (per April 2020). As part of an integrated citizen science project, 20,000 participants have contributed to the E2ID face matching algorithm development described in the VisionMetric collaboration above **[5.6]** This widespread media attention and active public participation reflects an intense interest in super-recognition that **Davis** has actively nurtured via awareness-raising and understanding enhancement. This has occurred at general public level, but also at a personal level whereby the curiosity of individuals as to their SR potential has been stimulated - participation spurred on by the latter is helping to identify ever more SRs and aid further research.

The research by **Davis** has inspired at least two authors to write novels in which SRs were protagonists: J.S. Monroe, *The Other You* (2020), which reached Amazon Kindle's Top 100 chart in 2020, and T. Darnton, *The Truth about Lies*, (2018), shortlisted in 2019 for the Waterstone's Children's Book Prize, the Centurion Book Award, and the Concorde Book Award. **Davis** consulted directly with these authors, and both acknowledge **Davis**' contribution, especially with regards to helping ensure scientific accuracy and plot development for their novels **[5.7]**.

5. Sources to corroborate the impact

1. Testimonial on MPS SR use and Super-Recogniser Units and on SRI.
2. Testimonial from Munich Police.
3. Testimonial from Stuttgart Police.
4. Testimonial from Queensland Police Services.
5. Testimonial from Yoti Ltd.
6. Testimonial from VisionMetric Ltd.
7. Testimonials from authors: J.S. Monroe and T. Darnton.