

Institution: University of Greenwich
Unit of Assessment: (UoA 4) - Psychology, Psychiatry and Neuroscience
Title of case study: Enhancing Suspect Identification Rates from Facial Composites and CCTV
<p>1. Summary of the impact</p> <p>This research, which examines police investigatory methods to identify police suspects has directly increased suspect identification rates by the Metropolitan Police Service (MPS). It led to the MPS establishing a register of ‘super-recognisers’ – officers particularly skilled at identifying faces from CCTV footage – and changed practices. Dissemination of the research, also well-publicised in the media, has influenced national policy makers. There is worldwide interest and secured European funding for a test to identify super-recognisers amongst police cohorts. The research is also improving recognition of EFIT-V images, the facial composite system used by most UK police forces. Dr Davis is disseminating his findings through the training course that operators have to complete to be certified to produce composites in real police investigations. He is also contributing to economic impact by enhancing the EFIT-V product.</p>
<p>2. Underpinning research</p> <p>Research conducted by Dr Josh Davis, Senior Lecturer since September 2008 at the University of Greenwich has examined methods to enhance suspect identification rates by the police.</p> <p>Facial composites: If there is no suspect the police may ask a witness to create a facial composite. Davis collected important data at the University of Greenwich (2008/2009) for a final experiment providing theoretical information on how morphing multiple facial composites improves recognition of EFIT-V images, a system used by most UK police forces [3.1]. Subsequent research supported by a competitive internal University of Greenwich grant (<i>Morphing of composite images produced by trained police artists</i>, £3,540, July 2009), was the first to compare un-manipulated and morphed composites produced by E-FIT and EFIT-V, additionally finding that morphing can improve image recognition of E-FITs as well [3.2]. This research strand (2010-) has also found that the EFIT-V system is suitable for use with child witnesses [5.2]. Indeed, some of the youngest children produced composites of adult quality. Associated research (2010-) demonstrated that, in direct contrast to the results found when composites are created using older <i>feature-based</i> facial composite systems, producing a composite using the EFIT-V system which draws on <i>holistic</i> processing known to drive human face recognition more efficiently, may help to embed an accurate memory of a suspect’s face in a witnesses’ memory. This means that adult witnesses, but not necessarily child witnesses, are more likely to accurately identify that suspect from a subsequent video lineup [5.2].</p> <p>Suspect identification from CCTV: Identifying suspects from CCTV is vital for the detection of some crimes. As a consequence of his ESRC-funded PhD: <i>The Forensic Identification of Unfamiliar Faces in CCTV Images</i> (2007) and his highly cited research on CCTV identification [3.4] and on techniques used by expert witnesses to match crime scene facial images with those of defendants [3.5, 3.6], Dr Davis was invited (2011) to investigate the face recognition abilities of a small number of MPS officers who make a disproportionately large number of all suspect identifications from CCTV. A contract for the release of police staff to attend testing sessions was agreed with the Commissioner of the MPS: <i>Facial Identification from CCTV: Investigating Predictors of Exceptional Performance amongst Police Officers</i> [5.1].</p> <p>In research partly supported by a competitive internal grant (<i>Theoretical and applied markers to</i></p>

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measure holistic face recognition ability, £5,000, July 2011), Davis tested 21 officers who had identified over 600 suspects in 2011-2012 on their familiar and unfamiliar facial recognition and visual memory ability [3.3]. The officers' performance in these tests was compared to 104 controls drawn from the general public. Some officers performed within the top two percentiles at face recognition, meeting the criteria of a 'super-recogniser' established by researchers at Harvard University, USA. These super-recognisers were also better at recognising moving images than controls, suggesting that it would be advantageous for CCTV video footage to be displayed on 'wanted' websites. However, the super-recogniser sample did not possess exceptional visual memory ability as measured by other tests, suggesting that their enhanced skills are face-specific.

There are over 30,000 officers in the Metropolitan Police and at least another 100,000 across the UK. The research data supports proposals that face recognition ability is normally distributed and if so, there may be up to 600 super-recogniser police officers in London alone, with another 2,000 distributed across the country. There are many other security roles in the country that might benefit from such individuals, eg passport control. This research is ongoing with another group of potential super-recogniser officers from the Metropolitan Police due to be tested in November 2013 [5.1].

3. References to the research (REF1 submitted staff in **bold**, **REF2 Output)

- **3.1 Valentine, T., **Davis, J. P.**, Thorner, K., Solomon, C., & Gibson, S. (2010). Evolving and combining facial composites: Between-witness and within-witness morphs compared. *Journal of Experimental Psychology: Applied*, 16(1), 72–86. <http://dx.doi.org/10.1037/a0018801>. (<http://www.ncbi.nlm.nih.gov/pubmed/20350045>)
- 3.2 **Davis, J.P.**, Sulley, L. Solomon, C. & Gibson, S. (2010). A Comparison of Individual and Morphed Facial Composites Created Using Different Systems. In G. Howells, K. Sirlantzis, A. Stoica, T. Huntsberger and A.T. Arslan (Eds.), *2010 IEEE International Conference on Emerging Security Technologies* (p. 56 – 60). <http://dx.doi.org/10.1109/EST.2010.29> (<http://www.computer.org/csdl/proceedings/est/2010/4175/00/4175a056-abs.html>)
- 3.3 **Davis, J.P.**, Lander, K., & Jansari, A. (2013). I never forget a face. *The Psychologist*, 26(10), 726-729. (http://www.thepsychologist.org.uk/archive/archive_home.cfm?volumeID=26&editionID=231&ArticleID=2347)
- **3.4 **Davis, J.** & Valentine, T. (2009). CCTV on trial: Matching video images with the defendant in the dock. *Applied Cognitive Psychology*, 23, 482-505. <http://dx.doi.org/10.1002/acp.1490>
- 3.5 **Davis, J.P.**, Valentine, T., & Davis, R.E. (2010). Facial comparison of photographic images taken from full-face and profile viewpoints. *Forensic Science International*, 200, 165-176. <http://dx.doi.org/10.1016/j.forsciint.2010.04.012>
- 3.6 **Davis, J.P.**, Valentine, T., & Wilkinson, C. (2012). Facial Image Comparison. In C. Wilkinson, & C. Rynn (Eds.), *Craniofacial Identification* (pp. 136-153). Cambridge: Cambridge University Press. (<http://www.cambridge.org/us/academic/subjects/life-sciences/biological-anthropology-and-primatology/craniofacial-identification>)

4. Details of the impact

Suspect identification from CCTV research

Dr Davis's research on the super-recogniser abilities of some police officers has had a direct impact on police practices in the Metropolitan Police Service (MPS), and this has increased the number of suspects identified from CCTV from 50 to 150 per week [5.1].

The MPS established a register of officers with high levels of face recognition ability in 2012, once Dr Davis had empirically confirmed the abilities of the super-recognisers. The officers were

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geographically distributed across all boroughs. As of October 2013 this register contained over 200 officers [5.1].

A secondary factor driving these changes was the high media profile of the research, as many of the officers tested by Davis had also identified a substantial proportion of the London rioters in August 2011. Indeed, CCTV evidence was the primary evidence in many of the investigations. Some of the super-recogniser police officers who participated in the research were featured in the same media pieces as Davis [5.5-5.10]. These included television interviews on ITN's *London News* (28 February 2012), BBC1's *Crimewatch Roadshow* (29 June 2012), *Planetopia* (Germany; 23 July 2012 [5.10]), BBC1's prime time magazine programme - *The One Show* (9 April 2013 [5.9]), and ITV's *This Morning* (26 September 2013), on radio (*Radio Slovenija*, 12 January 2013), as well as for articles in *The Sunday Times* (20 November 2011), *New Scientist* (18 September 2012), *The Sunday Telegraph* (26 March 2013), *Science News* (USA; 7 September 2013 [5.5]), the *Associated Press* (Worldwide; 27 September 2013) and *CBS News* (USA; 27 September 2013).

As a result of the changes in practice, MPS super-recognisers on the register are the first to be provided with CCTV images of all serious crimes; of offenders in their locality or from areas of previous deployment; and of specific crime types if they match the officer's speciality. As over 70% of suspects confess in police interview when confronted by CCTV images [3.3], the research has also indirectly improved crime detection and sentencing rates.

As well as at international academic conferences, Davis has disseminated the research at training workshops for police officers specialising in identification, and lawyers, as part of their continuing professional practice (*National Identity Conference, London, May 2012* [5.1]) and to the National Video and Voice Identification Strategy group (NVVIS, March 2013 [5.3]). This working party consists of representatives from the Home Office, the Association of Chief Police Officers (ACPO), the Crown Prosecution Service (CPS) and other scientific branches of the police and Home Office. Their remit is to decide on identification procedure policy in England and Wales. At the NVVIS meeting, Chief Inspector Mick Neville of the Metropolitan Police confirmed that the service was investigating the practicalities of displaying moving images on their 'Caught on Camera' wanted website, as Davis's research demonstrated that this would further improve the likelihood a suspect is identified [5.1]. Furthermore, the group, chaired by the Police Deputy Chief Constable of Warwickshire as the representative of ACPO, agreed that similar pilot schemes should be implemented in other England and Wales forces [5.3]. It was also agreed that the Home Office Centre for Applied Science and Technology (CAST) would assist Davis in his endeavours [5.3].

Dr Davis is currently in negotiations with the MPS to develop a super-recogniser **test** that could be used with all police officers, in particular recruits so that their abilities can be used as soon as they commence service. The funding for this test is coming from a successful grant application to the European Commission by the MPS and a number of European partners (*LASIE: Large Scale Information Exploitation of Forensic Data: LASIE; SEC-2013.1.6-1 no: 607480*) [5.1].

If these negotiations are successful there is likely to be a direct positive financial impact from offering such a test to police forces in these European countries. The work with the MPS has been highly internationally publicised [5.7-5.10] and some foreign police forces have contacted the MPS and Davis as to how they can identify and utilise super-recognisers in their own organisations (eg, in Australia, Abu Dhabi, Canada) [5.1].

Facial composite research

The facial composite research has been submitted for publication and disseminated at international academic conferences and national practitioner **conferences** for police facial composite operators: *Identifying the Suspect: Improving Facial Composites Workshop*, Leeds, January 2013; and *E-FIT*

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Users Group Annual Conference, Bedfordshire, October, 2009 [5.4]. He also disseminates the research at police **training courses**: *Visionmetric Ltd*, the agents of E-FIT and EFIT-V, stated: “Dr Davis is the UK’s leading academic authority on the psychology of facial identification in the context of the industry standard systems (E-FIT & EFIT-V [5.4]). He is the primary instructor for the cognitive psychology component of composite training courses for UK police officers.” At these residential courses, Davis also discusses his research on facial composites, leading to impact through the trainees’ practice thereafter. Successful completion of the course certifies the operators to produce composites in real police investigations. There were seven courses between 2009 and June 2013.

EFIT-V has now become the favoured composite system of many police forces in the UK and worldwide. Additional forces worldwide are also interested in using the system. Indeed, Dr Davis’s research strand contributed to an official report to the Queensland Police, Australia, recommending that EFIT-V is adopted by the force (confidential report due November 2013) [5.2]. A primary reason was Dr Davis’s finding that the system is suitable for children. The authors quote Davis directly in the report: “I believe that due to there being no necessity to produce a detailed verbal description, EFIT-V is actually a far more versatile system and is easier for witnesses of all ages to work with.” [5.2] As EFIT-V is owned by the UK company *Visionmetric Ltd*, there would also be a direct positive financial impact to this country if the system was to be adopted by Queensland Police.

5. Sources to corroborate the impact**Corroboration testimonial statements**

- 5.1 Detective Chief Inspector (Metropolitan Police Service)
- 5.2 Forensic Artist (Queensland Police, Australia)
- 5.3 Inspector (Warwickshire Police Service)
- 5.4 Director (Visionmetric Ltd)

Sample of written media interviews

- 5.5 Gaidos, S. (2013). Familiar Faces. *Science News* (USA), 184(5), 16-21.
http://www.sciencenews.org/view/feature/id/352687/description/Familiar_faces
- 5.6 The Sunday Telegraph (26 March 2013):
www.telegraph.co.uk/news/uknews/crime/9942759/Human-image-banks-meet-the-Mets-Super-recognisers.html#mm_hash
- 5.7 Reeve, T. (2013). Conference report: Police embracing CCTV as a forensic discipline. *Security News Desk*, 24 September 2013:
<http://www.securitynewsdesk.com/2013/09/24/conference-report-police-embracing-cctv-as-a-forensic-discipline/>
- 5.8 Aslow, R. (27 September 2013). London police using 200 super-recognizers: What makes them "super"? *CBS News* (USA), 27 September 2013: http://www.cbsnews.com/8301-204_162-57605067/london-police-using-200-super-recognizers-what-makes-them-super/

Sample of television media appearances

- 5.9 *The One Show* (BBC1; 9 April 2013) <http://www.youtube.com/watch?v=PuPfq8UZTGQ>
- 5.10 *Planetopia* (Germany; 27 June 2012) <http://www.youtube.com/watch?v=7KxqnaTZCOo>