Face Recognition

The overview that follows is offered to help the trier of fact understand how people recognize faces — and, more to the point, how unreliably they recognize the faces of strangers. Almost every eyewitness identification, and much surveillance-image evidence, depends on recognizing a face that was unfamiliar when it was seen, which is precisely the task at which human face perception is weakest. Its purpose is to define the terms a court is likely to encounter, to summarize the research on face recognition, and to do so in plain language and without favoring any party. The cross-race effect, facial composites, and children's face recognition are treated in their own papers and are noted here only where they bear on the general principles.

Recognition, Recall, and the Specialness of Faces

Faces are processed differently from most other objects. People perceive a face holistically — as an integrated whole defined by the relations among its parts, not as a checklist of separate features. The clearest demonstration is the face-inversion effect: turning a face upside down disrupts recognition far more than turning other objects upside down, because inversion defeats the holistic processing on which face perception depends (Yin, 1969). It is also important to distinguish recognizing a face — deciding whether a face now in view has been seen before — from recalling one well enough to describe or reconstruct it. Recognition is much the easier task, and it is what an eyewitness is asked to do at a lineup.

Familiar and Unfamiliar Faces

The single most important finding for the law is that recognizing a familiar face and recognizing an unfamiliar one are, in effect, two different abilities, and they differ enormously in reliability (Hancock, Bruce, & Burton, 2000). We identify people we know easily and robustly, even from poor, distant, or degraded images. We are strikingly bad, by contrast, at recognizing — or even matching — faces that were unfamiliar to us when we first saw them. The leading explanation is that expertise with a particular face is built up through exposure to many different images of it, across changes in angle, lighting, expression, and age, which the mind effectively averages into a stable representation that tolerates variation (Burton, Jenkins, Hancock, & White, 2005). Familiarity, on this view, comes from the quantity of accumulated exposure rather than any special quality of processing — which is why a face becomes easy to recognize only after we have seen it many times in many forms. A telling illustration: people are relatively poor at recognizing a profile view of their own face, which they rarely see, even though they have no difficulty with profiles of other well-known faces (Troje & Kersten, 1999).

Matching Unfamiliar Faces Is Surprisingly Poor

Because an unfamiliar face is encoded in an image-specific way, memory and even perception of it do not generalize well from one image to another. This is not merely a memory problem: people are poor at matching unfamiliar faces even when they do not have to remember anything. Asked to decide whether two photographs, or a photograph and a live person, show the same unfamiliar individual — with both images in front of them — observers make frequent errors (Megreya & Burton, 2006; Bruce, Henderson, Newman, & Burton, 2001). Experienced supermarket cashiers checking photo credit cards accepted fraudulent cards bearing a similar-looking but different person's photo more than half the time (Kemp, Towell, & Pike, 1997), and even passport officers, for whom face matching is a daily professional task, make substantial numbers of errors (White, Kemp, Jenkins, Matheson, & Burton, 2014). The crucial practical lesson is that an apparent resemblance between two face images does not establish that they show the same person. Two different but similar-looking people can be taken for one another even in high-quality images, not only in grainy ones.

Individual and Group Differences

People vary widely in face-recognition ability. At one extreme are individuals with developmental prosopagnosia, or "face blindness," who struggle to recognize even close acquaintances; at the other are "super-recognizers," a small minority with exceptional ability to recognize and match faces (Russell, Duchaine, & Nakayama, 2009). This range means that no general statement about face-recognition accuracy applies equally to every witness or examiner. A further, well-established group pattern is the other-race effect: people tend to recognize faces of their own racial or ethnic group more accurately than faces of other groups (Meissner & Brigham, 2001), a phenomenon developed in its own paper but noted here because it is a basic feature of how face recognition works.

What This Means for Evidence

Two implications follow directly. First, ordinary eyewitness identification rests on the weak system: the witness is almost always trying to recognize someone who was a stranger at the time of the crime, under exactly the conditions — a single brief, image-specific exposure — that make unfamiliar face memory fragile. Second, surveillance evidence must be read with the familiar/unfamiliar distinction in mind. The most reliable use of a CCTV image is to prompt recognition by people who already know the person depicted, for whom even a poor image can suffice. By contrast, asking an unfamiliar viewer — an investigator, a juror, or a forensic examiner who did not know the suspect — to judge whether the person in a surveillance image is the defendant is the difficult, error-prone task of unfamiliar face matching, and an inference of identity from resemblance alone is exactly the inference the research counsels against.

Face Recognition and the Law

The law has partly tracked these distinctions. Many courts allow a lay witness who is genuinely familiar with the defendant to give an opinion identifying the defendant in a surveillance image under Federal Rule of Evidence 701, on the rationale that the witness is in a better position than the jury to make the identification — a rule that fits the science, since familiarity is what makes recognition reliable. The harder questions concern unfamiliar matching. Testimony by a forensic examiner offering a feature-by-feature comparison of a defendant's face with a surveillance image — sometimes called facial mapping or facial image comparison — is contested, and its reliability is tested under the rules on scientific and expert evidence: Daubert v. Merrell Dow Pharmaceuticals (1993), Kumho Tire Co. v. Carmichael (1999), and Federal Rule of Evidence 702 in federal court and the states that follow them, and the general-acceptance test of Frye v. United States (1923) elsewhere.

Where the evidence is an eyewitness identification of a formerly unfamiliar face, its reliability is for the jury to weigh through cross-examination and argument unless it was produced by unnecessarily suggestive police procedures (Perry v. New Hampshire, 2012), and courts have increasingly recognized the fallibility of such identifications (State v. Henderson, 2011). Across these settings the constructive role of the science is the same: to inform the trier of fact that recognizing strangers' faces is far less reliable than intuition assumes, and that resemblance between two images is not proof of identity — not to opine on whether a particular face is the defendant's, a judgment the law reserves to the fact-finder.

Special Issues in Legal Practice

The principles described above apply with equal force to every party in a legal proceeding. Memory operates the same way regardless of who is asking the questions, and the science

summarized here favors no side. What differs between the parties is not the science but the vantage point — the particular places where memory issues tend to surface, and the particular errors each party is best positioned to guard against. The two summaries below identify those recurring issues. They are offered for orientation, not as litigation strategy; in every case the controlling question is what the evidence in that case will, and will not, support, and the expert's role is to inform the trier of fact rather than to advocate for either side.

Special Issues for Prosecutors

For the State, face-recognition evidence is strongest when it rests on familiarity. An identification of a defendant in a surveillance image by a witness who genuinely knew the defendant beforehand draws on the reliable system and is well supported by the research, and such a witness is often better placed than the jury to make the identification. The errors the prosecution is best positioned to guard against arise from treating unfamiliar matching as if it were reliable: presenting an investigator's or examiner's impression that the person in a grainy image "looks like" the defendant as if it proved identity, and inviting the jury to infer identity from resemblance between two images of strangers. Because even high-quality images of different but similar-looking people are readily confused, the defensible course is to anchor identity in familiarity, in corroborating evidence, and in sound identification procedures rather than in resemblance judged by viewers who did not know the suspect.

Special Issues for Defense

For the defense, the recurring task is to expose reliance on the weak system — recognizing that a witness or examiner can be sincere and still be wrong. Ordinary eyewitness identification involves recognizing a face that was unfamiliar at the time of the crime, the very task at which human perception is poor, especially after a brief, single exposure and across changes of viewpoint and lighting. Surveillance evidence raises the same concern whenever the person judging the image — an officer, an examiner, or the jury — did not know the suspect beforehand, because matching unfamiliar faces is error-prone even with both images in hand, and resemblance is not identity. Individual differences and the other-race effect may further bear on a particular identification. The law contemplates that these matters be placed before the trier of fact through cross-examination, through challenge to identification procedures and to facial-comparison testimony, and, where the governing standard is met, through expert testimony (Daubert v. Merrell Dow Pharmaceuticals, 1993; Frye v. United States, 1923). The aim is not to deny that faces can be recognized — familiar faces reliably are — but to ensure that the difficulty of recognizing strangers is weighed.

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