



B117 Ear Print Evidence: State of Washington vs. Kunze

Chesterene L. Cwiklik, BS, Cwiklik & Associates, 2400 6th Avenue, South, # 257, Seattle, WA; and Kay M. Sweeney, BS*, KMS Forensics, P.O. Box 8580, Kirkland, WA

The attendee will be able to understand the need for caution in reaching conclusions from comparisons of ear prints with exemplars, and the need for studies incorporating range of variation.

This paper has several objectives: 1) to stimulate thinking about the actual data constituting an ear print, and evaluating sources of error in comparisons of the print with exemplars; 2) to demonstrate the effects of technique on comparisons; 3) to propose criteria for studies to evaluate whether ear prints have the potential for unique attribution; and 4) to present preliminary experimental data about the formation of partial ear prints.

Ear print evidence came to the attention of the criminal justice system in the U.S. in *State of Washington v. Kunze*, a homicide case where an ear print was the only physical evidence offered as a link between a defendant and the crime. Although ear prints have been in use in European courts, and had previously been proffered in the U.S., *State v. Kunze* was the first case in the U.S. where the evidence was challenged in a *Frye* hearing. It survived the challenge, and was presented in trial.

The ear print was found on the outside of the door to the murder victim's bedroom, where he was found bound and bludgeoned. It was dusted, photographed, then lifted by the latent print examiner. The lift was sent to the crime laboratory, where a forensic scientist examined ear prints from 70 individuals, including elimination prints from individuals who might have been at the house under normal circumstances. He concluded that "David Kunze is a likely source for the earprint and cheekprint which were lifted from the outside of the bedroom door at the homicide scene." The prosecution then contacted a police evidence technician from the Netherlands with experience in ear prints, who compared the ear print from the door with exemplars from the defendant, as well as with a database of photographs of 600 ears. He concluded that "the unknown earprint . . . has been placed by the left ear of the suspect David W. Kunze." In trial testimony, he said, "I think it's probable that it's the defendant's ear is the one that was found on the scene." It should be noted that both examiners worked with the ear print that had been dusted and lifted, and did not report examining either the door itself, or photographs of the print on the door. The defendant was convicted and the conviction appealed. The Washington Court of Appeals, in reversing the trial court, stated: "We conclude that the trial court erred by allowing [the two experts for the prosecution] to testify that Kunze was the likely or probable maker of the latent, and that a new trial is therefore required."

The authors were retained by the defense to review the physical evidence, and independent examinations of the ear print were conducted. The door itself was examined, and it was concluded that a portion of the pattern on the lift was not from the ear, but from loose black powder. The surface of the door was a textured paint, so the print was a discontinuous pattern of dots where the ear touched the tiny "peaks" of the paint; the loose powder added extra dots. *In situ* photographs of the dusted print corroborated this conclusion, as the feature in question did not appear in photographs.

Comparisons using overlays were difficult because the print on the door was faint, and was overwhelmed by the exemplars. The two simple techniques used to compensate for this: 1) photocopying the exemplars in red and yellow onto transparencies, with the evidence print photocopied in darker colors; and 2) tracing each dot that constituted the evidence ear print onto a transparency, then overlaying the tracing onto exemplars. This allowed the authors to notice a curved portion of the print on the door that was entirely within that of the exemplars, but with different degree of curvature. If the defendant's ear produced the print, it would have skipped slightly during the deposit (a not unlikely occurrence), as one part of the print was slightly displaced from the other when compared with his exemplars. Despite the differences, the authors were not able to exclude the defendant as the source. The prints did not include all the parts of the ear, and there were no systematic studies to provide information about how a print could be expected to vary from other prints from the same person. It was known and documented that ear prints vary with pressure and when eyeglasses are worn, but there was no predictive information that would allow one to expect a specific type of variation from specific features.

In order to better evaluate the evidence print with respect to exemplars, whether to arrive at an exclusion or a strong association, additional information about ear print variation would be needed. Specifically, interest lay in the range of variation within the set of prints that can be produced from the same ear. The known and documented types of variation in ear prints (from pressure and wearing eyeglasses) are analogous to the variation of microscopic characteristics in hairs within a scalp. In the scalp hair of two individuals, there can be an overlap of characteristics even though most of the hairs between the two persons are distinguishable. Similarly, with ear prints, there may also be an overlap in the set of possible prints from the ears of one person, with the set of possible prints from the ears of another person. This subject was not found in the literature. Until the appropriate studies are done to find out, it is the opinion of the authors that strong conclusions about ear print comparisons are premature. The studies should include not only ears that are similar in outward appearance, but also those that may produce similar partial prints. Other factors that might influence variation include different angles of the head and ear to the surface, and the effect of earrings, hair ornaments, braids, hats, headscarves, etc.



Criminalistics Section – 2004

In preparing for the second trial, additional exemplars were examined, including one from the murder victim's ex-wife, and two exemplars of their young son who lived with his father. The son was eliminated as a source of the print on the door during the initial examination by the crime laboratory. He could not be eliminated conclusively, but differences between the son's exemplars and the evidence print were observed. The ex-wife had also been eliminated during the crime laboratory examination, based upon gross features of the ear: her exemplar exhibited a prominent earlobe, but the print on the door did not. Complete prints of the ears from this individual and from the defendant exhibited grossly different shapes, but when each was compared with the ear print from the door, neither could be eliminated. The exemplar print from the victim's ex-wife could explain almost all the features found in the print on the door, whereas the prints from the defendant did not. However, there was no evidence in the print on the door of the prominent earlobe of the ex-wife.

A limited study was performed demonstrating that some individuals with prominent earlobes could produce prints that did not include the earlobe. The prints were obtained by asking subjects to listen for sounds on the other side of a door in whatever stance felt natural to them. When subjects wore even small earrings, the earlobe was less likely to appear in the print than when they did not, even when structures directly above the earlobe did appear. This study, while small and far from definitive, does indicate that any study of ear print comparison with ears should be conducted using direct comparison of every ear, and that elimination not be based upon gross differences in shape. It also indicates that the same caution be applied in comparisons of evidence prints in casework. Lastly, it demonstrates that variation among ears, as studied from photographs, can answer only some questions about variation in ear prints.

Ear print comparisons, while showing promise as supporting evidence linking individuals with crime scenes, should be approached with caution. Although ears themselves may well be unique, there is no evidence as yet that ear prints can be uniquely attributed to specific ears. Studies of sets of prints from individual ears are needed to establish a range of variation and to ascertain whether there is an overlap of characteristics that would preclude unique attribution. Partial ear prints merit special attention, as ears that are grossly different in shape may yield partial prints that are not readily distinguishable, and that may not even be recognized as partial prints. Lastly, criteria must be developed for determining whether a given evidence print includes sufficient information to permit adequate comparison.

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