

I16 Face Similarity Linkage: A Novel Biometric Approach to Sexually Motivated Serial Killer Victims

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Learning Overview: The goal of this presentation is to showcase another investigative tool for crime linkage by using facial biometrics of serial killer victims.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by introducing new techniques to investigators in serial killer cases when all other investigative tools are exhausted. This technique, using facial biometrics on victims, can be used as a building block to help toward a conviction.

Crime linkage can be difficult if there is no physical or genetic evidence left at a crime scene; therefore, other techniques need to be used to link crimes to an offender.¹ The type of offender committing these crimes can be ascertained by assessing the crime scene, the victims, and distinguishing features that link crimes and therefore the killer. This study focuses on the crimes of sexually motivated serial killers. Owing to the sexual motivation of attacks, some serial killers may have a particular “type” or appearance of prospective victims that they are drawn to. Therefore, similarities in facial biometrics of victims may be useful to help link multiple victims to a single offender. Being able to make the connection to a killer by linking the victim’s facial measurements stands as a useful investigative tool. Biometric approaches may be used as a means for crime linkage in the absence of physical evidence at a scene. The current study provides a background on crime linkage, typologies of serial killers, and victimology in order to set the scene for the application of biometric methods as a novel linkage measure.

The current research was undertaken to propose a technique, termed Face Similarity Linkage (FSL), to evaluate whether victims of a serial killer have statistically more similar facial measurements than a randomly chosen person of the same gender. To test this, three of Ted Bundy’s victims were randomly selected and anatomical landmarks were located and measured to produce proportionality indices of their faces. A random subject from an online database was used as a comparison. The results showed there were no statistically significant differences between the three of Bundy’s victims; however, there was significant difference between 11 of the 17 facial measurements of Bundy’s victims when compared to a random person. This research serves as a proof of concept that, with more advanced means of data collection, FSL may be a useful tool for law enforcement for linking serial homicides. The current method is relatively novel and in need of expert systems interfaces to improve speed and application, which is outlined in the current study.

The prospect that any investigator can use this method due its simplicity, low cost, and speed is a great benefit. There is no need for extensive training or equipment; this research may be replicated with printed images, a ruler, and pen. Clearly the proposed method is a tool, not a complete solution. Other factors including time and geography of potential victims should always be considered. However, as a relatively quick method of matching, this method has potential for application to many unsolved and future crimes. This potential may be further progressed by the adaption of the current manual procedure to an automated, *in silico* solution with the assistance of software engineers and experts.

Reference(s):

1. Porter, M.D. (2016). A Statistical Approach to Crime Linkage. *The American Statistician*, 70(2), 152- 165.
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Serial Killer, Biometric, Face Similarity Linkage