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Lip Prints

Masters Thesis Committee:
Ismail M. Sebetan, Chairperson
Bert Ouderkirk, Supervisor
Marcy Worthington, Supervisor

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DEDICATION

This project is dedicated to my family, who provided an incredible amount of understanding while I completed my research and writing; to Doctor Ismail Sebetan, who displayed a tremendous amount of patience and compassion; to my father, who always believed in my effort to finish and for his endless amount of wisdom and ideas; and to my mother who showed me at a very young age the importance of a good education and more importantly, the steadfast commitment one needs to succeed.

Abstract

Lip prints deal with the characteristics found on ones lips. Identifying a specific person to those characteristics (lip prints) is referred to as Cheiloscopy. The form of identification is slowly gaining popularity throughout the world. Lip prints are based on physical properties of an individual and during the occasions when the person's lip prints are either smeared or smudged, it is possible to obtain biological evidence in the form of skin flakes or saliva. In this work I present case studies of biological families' lip prints for the purpose of determining whether characteristics of those prints are hereditary. During the research I utilized two methodologies in obtaining lip prints; the development of a latent lip print utilizing a magnetic black powder, and gathering actual record lip prints on paper from the use of lipstick. The results of both processes clearly show which method worked best. There are five types of characteristics of a lip print and a person can possess just one or, in very rare occasions, all five. The findings of the obtained lip prints clearly reflect the most common characteristic type as well as establishing whether the lip print can be considered as being categorized as individual characteristic, unique to each person. Research of other lip print studies reflected similar results as this project.

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CHAPTER I

INTRODUCTION

STATEMENT OF PROBLEM

With the ever-increasing demands placed upon law enforcement to provide sufficient physical evidence linking a perpetrator to a crime, it makes sense to utilize any type of physical characteristic to identify a suspect of an offense. Lip prints have unique markings that can be entered into a specific classification. In order for this to occur, we must answer the following question: Do the prints on lips constitute as individual characteristics? If they do, then the prerequisite for linking that particular evidence to a known person is accomplished. In order to answer this question, the subject of lip prints possibly being hereditary comes into play.

My curiosity in the field of Cheiloscopy is based from my earlier days as a Marine Corps Criminal Investigator. While assigned duties as a newly appointed apprentice investigator for the Criminal Investigation Division, one of the first crime scenes I responded to was a voyeur (Peeping Tom) offense. The seasoned investigator I was with instructed me to look around the crime scene area for any possible items of evidentiary value. While searching the exterior area adjacent the house, I was

hoping to find shoe impressions in the dirt so I could pour my first cast. No such luck and as I continued my examination of the exterior windowpane that the unidentified man had been using to peer inside, I noticed, on the exterior side of the windowpane, an unusual looking mark. Upon closer examination I discovered it to be similar in shape of a complete set of lips. After informing the senior and more experienced investigator that I had identified a possible latent lip print on the window, he informed me to disregard it because even if the mark was a lip print there was no known system for comparison to identify a suspect. I was thinking that it would be beneficial to at least dust and lift it in case a suspect was apprehended at a later date so his known lip prints could be compared with the lifted print; however, because I was new to the field with no significant amount of experience, I remained silent. Sure enough, a few weeks later a suspect was identified at another similar crime scene. Because he elected to remain silent and there was no substantial evidence to link him to either crime, he was not identified as a subject.

SIGNIFICANCE OF THE PROBLEM

Results of this project identified a legitimate need to actively pursue lip print analysis and comparison within the law enforcement arena and legal system. Because of the overwhelming evidence that supports the fact that lip prints are indeed individual characteristics that no two people share, it is important to implement a standard operating procedure similar to that of the fingerprint system. Currently there is no such system in place therefore when latent lip prints are discovered at the scene it is necessary to identify a suspect via alternate means to subsequently conduct a comparison examination to either substantiate or eliminate the person as a suspect of the crime. The Appellate Court of Illinois ruled in People v. Davis, No. 2-97-0725 that a lip print is sufficient physical evidence to prove a person guilty of a serious crime (Hansen, 2000, p. 18). Given this fact it is logical to utilize lip print services on a routine basis within the law enforcement field.

PURPOSE

Any process that possesses the possibility of assisting the forensic field in identifying a suspect should be pursued and, if discovered pertinent, utilized in the act of criminal investigations and legal proceedings. The use of lip prints falls into this category and because they have been proved reliable and trustworthy to link a suspect to a crime, more emphasis should be given to this field. Lip print analysis is a process that provides both qualitative and quantitative results thus its application in the forensic field should be widely accepted by both law enforcement and the legal professionals.

THE SCOPE OF THE RESEARCH

Findings identified in this research suggest the conclusive evidence that lip prints are suitable for the successful comparison, analysis and identification of a person to a crime. In fact there have been convictions of perpetrators who were positively identified via the analysis of their known lip prints to those found at the crime scene (Uma, 1994, p. 59). Studies also indicate lip prints are classified as individual characteristics and similar to fingerprints, no two people possess the same prints. Given this information, it is interesting to wonder whether lip prints are hereditary. The physical attributes regarding the shapes of family members' lips can clearly be identified as being hereditary; however, the actual prints on those lips are not as easily seen unless printed and analyzed.

HYPOTHESIS

As with most research dealing with a relatively new issue, it is quite expected that the results of this project will indicate the need for further research into the subject matter. With that in mind, the use of lip prints for law enforcement and judicial proceedings has been successful and documented in an Appellate Court hearing. This study will research the possibility that lip prints are hereditary, that lip prints are unique to each person and can be categorized as possessing individual characteristics and the fact that lip prints can be analyzed for the purpose of positively identifying an individual.

LIMITATIONS OF THE DATA AND RESEARCH STUDY

The main limitation of this study was the absence of research in the field of lip prints; specifically, the possibilities that lip prints are hereditary. An additional hindrance was the method in which I obtained lip prints from families in that the process was done away from a controlled environment relying solely on the individual to take his or her own prints following provided specific instructions. Although the method was successful, under a controlled, supervised setting, the quality of the obtained lip prints could have been better.

DEFINITIONS

CHEILOSCOPY: Cheiloscopy is a forensic investigation technique that deals with identification of humans based on lips traces (Kasprzak, 2000, p. 358).

BRANCHING GROOVES: Branching Grooves (Type II) is one of five basic types of lip prints wherein the characteristic patterns present both vertical and horizontal grooves that run across the lip (Suzuki and Tsuchihashi, 1970, p. 53).

DIAMOND GROOVES: Diamond Grooves (Type III) is one of five basic types of lip prints wherein the characteristic patterns present diamond-shaped grooves in the lip (Suzuki and Tsuchihashi, 1970, p. 53).

DEOXYRIBONUCLEIC ACID (DNA): Deoxyribonucleic Acid is the complex genetic material found in the cells of every organism that can be used to uniquely identify a person (O'hara and O'hara, 2003, p. 885).

LIP PRINT: Lip Print may be revealed as a stratified surface trace with visible elements of lines (furrows) (Kasprzak, 1990, p. 146).

LONG VERTICAL GROOVES: Long Vertical Grooves (Type I) is one of five basic types of lip prints wherein the characteristic patterns present long vertical grooves that run across the lip (Suzuki and Tsuchihashi, 1970, p. 53).

SHORT VERTICAL GROOVES: Short Vertical Grooves (Type I!) is one of five basic types of lip prints wherein the characteristic patterns present short vertical grooves that run across the lip (Suzuki and Tsuchihashi, 1970, p. 53).

RECTANGULAR GROOVES: Rectangular Grooves (Type IV) is one of five basic types of lip prints wherein the characteristic patterns present grooves on the lip resembling a net-like design (Suzuki and Tsuchihashi, 1970, p. 53).

OVERVIEW OF THE REMAINING CHAPTERS

The first chapter questions the possibilities of allowing lip print comparisons in the courtroom and identifies its methods of analysis to establish a positive identification. A brief history of the development of lip prints will be conducted to include extensive research regarding the fact that lip prints are individual characteristics wherein no two people have the same prints. The remaining chapters will present a review of available information relevant to the use of lip prints (Chapter II); a description of the methodology of the collections process of lip prints from twenty families (Chapter III); the analysis of the obtained lip prints (Chapter IV); and an explanation of the study and its findings to include recommendations for future lip print incorporation into the law enforcement arena (Chapter V).

CHAPTER II

HISTORY/LITERATURE REVIEW

Lip prints have been with us since the beginning of man. Similar to the prints on a person's finger, lips also possess furrows that can be classified into various types for identification purposes. Unlike fingerprints however, lip prints have not been as popular a study.

During the early 1900's, anthropologists merely mentioned the existence of lines on lips without providing any type of evidence or studies regarding their use in the forensic science field pertaining to identification. LeMoyne Snyder (Homicide Investigation, 1950) introduced the possibility of utilizing lip prints to identify individuals. In his studies, Snyder described an interesting case wherein a woman was struck by a vehicle. During the investigation, a lip print was discovered on the left front fender of the vehicle suspected to have hit her. After comparing the lifted lip print to the female's lips, investigators discovered a match thus placing the vehicle at the scene of the crime.

Perhaps the greatest research of Cheiloscopy completed has been from Japanese doctors Suzuki and Tsuchihashi in 1970 and 1974 wherein lip prints were obtained from 280 and 1,364 Japanese citizens (respectively). During the studies, lip prints were classified into five main types. Type I represents a lip possessing full vertical grooves. Type I! (pronounced "one-dash") has partial grooves running vertically on the lip. Type II represents branched grooves while type III represents intersected (diamond) grooves that look similar to crosses. Type IV represents the reticular (rectangular) pattern similar to wire mesh or boxes (Figure 1).



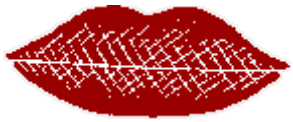
Type I (Full Vertical Grooves)



Type I! (Short Vertical Grooves)



Type II (Branched Grooves)



Type III (Diamond Grooves)



Type IV (Rectangular Grooves)

(Figure 1)

Because most lips contain more than one type of pattern, the lips are divided into four quadrants. Each quadrant is studied and the various types of lip prints are recorded. Each quadrant is read from the center of the lip outward toward the corner of the lip. The upper and lower lips are divided through the center by an imaginary vertical line, thus producing left and right upper and lower quadrants. See the example of recording lip prints (Fig. 2).

Depending on the manner of lifting material used, it is important to remember that the print may be opposite of the actual lip. For instance, when lifting a latent lip print utilizing a rubber lifter, the left upper quadrant of a lifted latent lip print is in actuality, the right upper quadrant of the person's lip. Obviously, when using a clear lifter (or tape) that is subsequently placed onto a backing, the print will be the same.

II I I II

III I I I!

Fig. 2. Recording Techniques for Lip Prints

The research concluded "no lip print showed the same pattern in the investigation of 1,364 Japanese subjects (757 males and 607 females)." The study further stated: "With regard to the dissimilarity of the lip print, as far as the 1,364 subjects used in this study are concerned, there were no two identical lip prints. This means that each human lip print has its own individual characteristics, and although the numbers so far studied are relatively small, it is noteworthy that the data indicate a strong possibility of the absolute dissimilarity of lip prints. Therefore, it may be concluded that the lip print can be used as one of the techniques for identification in the field of forensic odontology (Tsuchihashi, 1974, 233, 247).

Doctor Suzuki examined 18 pairs of uni-ovular twins discovering numerous similarities between the lip prints but no exact match. He reported "It was assumed that personal lip prints may show dissimilarity amongst individuals, and that this lip groove pattern could be influenced by hereditary factors, some of which were formed by the study of twins" (Suzuki and Tsuchihashi, 1970, 55). This finding was important information due to the fact both uni-ovular twins contain the

same DNA but not the same fingerprints. The discovery of two different forms of physical identification for such twins was exciting and pertinent for the forensic science field.

Other than the aforementioned collected lip prints from the twins, the only other analysis of lip prints connected with families I found was reported by Hirth, Gottsche and Goedde (1975). In this study, lip prints were obtained from 76 families for the purpose of determining whether there was a genetic basis of ridge-pattern in the lips. A branched pattern was prominent on the upper lips while simple patterns (long and short vertical grooves) were more frequent on the lower lips. The results of the study proved a genetic basis of lip prints.

While all this research was important for the introduction of Cheiloscopy, the newly discovered physical evidence needed to be recognized on a higher level to be truly effective within the forensic science field. The two major forms of strict scrutiny for any new scientific evidence are the general acceptance requirement (Frye v. United States) and the scientific soundness requirement (Federal Rules of Evidence in 1993 in Daubert v. Merrell Dow Pharmaceuticals). In Frye v. United States, the court stated the following: “Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while the courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.” In order to meet this standard the court must decide if the procedure is generally accepted throughout the scientific community. Relating to the admissibility of expert testimony, Rule 702 of the Federal Rules of Evidence states: “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case” (Saferstein 2004, pp. 12-14).

In 1993, during a crime scene examination of a homicide in Kane County, Illinois, a roll of duct tape was seized as evidence. Analysis of the tape discovered a lip print on the sticky side. Leanne Gray, an Illinois State Police lab forensic scientist specializing in latent print examination, obtained standards of the defendant’s (Davis) lips using the sticky side of duct tape and lipstick on paper. Using a side-by-side comparison of the standards and the photograph of the latent print from the evidence, she along with Steven McKasson of the Southern Illinois forensic science lab in Carbondale, Illinois, concluded that the defendant made the lip print. In fact 13 points of similarity between the standard and the photograph were found. Gray testified that lip print comparison is not a new form of identification but it is seldom used because lip prints are not readily available. Although this print is the only case of which she is aware in Illinois in the past ten years, the methodology of lip print comparison is a known and accepted form of scientific comparison. The methods used in her comparisons are accepted within the forensic science community, regardless of whether the comparison is a lip print or fingerprint. She opined, in accord with the Federal Bureau of Investigation (FBI) and Illinois State Police, that lip prints, like fingerprints, are unique and a positive means of identification. According to McKasson, the basis for identification of impression evidence is that everything is unique if looked at in sufficient detail, and if two things are sufficiently similar, they must have originated from the same source. He testified that lip print

comparison is an accepted method of scientific identification in the forensic science community because it appears in the field literature. He is unaware of any dissent in the field regarding the methodology used to make a positive identification of a lip print. Resulting from their testimony and the level of their expertise, the Illinois Appellate Court, on May 12, 1999, accepted the fact that: "lip print identification is generally acceptable within the forensic science community as a means of positive identification because it appears in the field literature; lip print identification methodology, although seldom used, is very similar to fingerprint comparison and is a known and accepted form of scientific comparison; there is no dissent in the forensic science community with regard to either the methodology used or the fact that lip prints provide a positive identification; the F.B.I. and the Illinois State Police consider that lip prints are unique like fingerprints and are a positive means of identification; and, that the fingerprint examiner, working her first lip print case, was able to verify and testify to these facts, and that the questioned document examiner found at least 13 points of similarity between a standard and the partially blurred questioned print and determined that they matched" (Moenssons, 2005).

Although limited research has been completed on the subject of Cheiloscopy and lip prints, I have discovered a common response within all the literature I have read that is positive for the utilization of lip prints for personal identification. Additionally, every author I have found to research this subject agrees that further research is necessary and even pertinent for the field of forensic science. Fingerprint technician Sergeant W. J. Pertson (1987) of the Yorkton RCMP Identification Section, Yorkton, Sask, agree to the importance of searching crime scenes for not only fingerprints but also for other identifying types of physical evidence such as lip prints. Pertson described the circumstances of his identifying a partial impression of a human lip print while conducting a crime scene examination in 1984.

In India, research in the field of Cheiloscopy has been increasing. Not only have the laboratories developed a new technique in identifying suspects or criminals from the description of their lips, the Forensic Sciences Laboratory in Bangalore has established a comprehensive classification system for the micro-structural (grooves and wrinkles found on lips) and macro-structural (shape and size of lips) patterns of lips (Uma, 1994, 59). In Korea, forensic personnel are using biometric systems (technology that use unique human physical characteristics to automatically identify a person) (Kim, Baik and Chung, 2003, 561).

While many of the authors agreed that more criminalists/crime scene examiners should search for lip prints at the crime scene due to the fact they are more prevalent to being there than originally thought, authors opined that if a smear from a lip print cannot be identifiable, there is a strong possibility it would contain DNA evidence to identify a suspect (Segui, Feucht, Ponce and Pascual, 2000, p. 392) and (Castello, Alvarez and Verdu, 2002, 118).

Ehara and Marumo (1998) earlier reported: "lipstick smears are frequently encountered in forensic science laboratories as one of the most important forms of transfer evidence. Lipstick smears on suspects' clothing can indirectly prove a link between the suspect and a female victim, and smears left on cigarette butts, glasses or cups can prove a link between a suspect and a crime scene."

Another study demonstrated an attempt to obtain DNA from porous surfaces. "The developing of latent lip prints on porous surfaces is more recent than that for fingerprints. The first research showed that traditional reagents used for fingerprints are not successful. It has recently been determined that lysochromes (Sudan Black) are quite effective in developing recent latent lip

prints, as well as older ones, on porous surfaces. Once the print has been detected, a trace is available from which to procure cell remains that can supply enough DNA to be analyzed by the polymerase chain reaction technique. The results of this study indicate that latent prints on paper and developed with Sudan Black can be used as a potential DNA source for forensic identification" (Castello, Alvarez and Verdu, 2004, 615-616).

If DNA cannot be extracted from the smear, the laboratory should at least be able to determine what substance created the smear such as the oils and waxes from lipstick. During the occasions when there is a smeared lip print wherein the lip characteristics are unable to be recognizable due to a heavy application of lipstick, evidence can still be obtained. The lipstick itself can be analyzed for various oils and waxes and an identification of the lipstick type may be obtained (Russell and Welch, 1984, 105).

Prior to obtaining lip prints utilizing lipstick, proper research was completed to ensure the best quality product was obtained. The individual providing the lip prints should clean the lips ensuring they are dry. A thin layer of lipstick should be applied rather than a thick layer which would fill in the groove patterns. Upon transferring the lip prints onto the paper, it is extremely important the individual does not move either the paper or his/her lips once contact is made (Utsuno, Kanoh, Tadokoro and Inoue, 2005, 130). Latent print examiner Robert W. Burns (1981) provides helpful information regarding the methods of recording lip prints and obtaining record lip prints. Burns suggested using a paper roller with an 8 x 10 piece of bond paper. After the person applies one thin coat of lipstick, the roller would be used to obtain three impressions across the paper. Burns also provides causes for unsatisfactory prints. The procedure for obtaining lip prints for this type of research is different than that of collecting record type lip prints from a suspect, especially when the amount of lipstick or lip rouge is in question. Many times females will wear heavy amounts of lipstick; therefore, when obtaining record lip prints, "A good system to remember is to allow the person to apply as much lip rouge as they desire, then have them make as many record lip prints as possible, until the lip rouge fails to transfer to the paper. In this manner you will have record prints with varying amounts of pressure and lip rouge which will greatly aid your examination and comparison" (Hoag, 1978, 6).

CHAPTER III

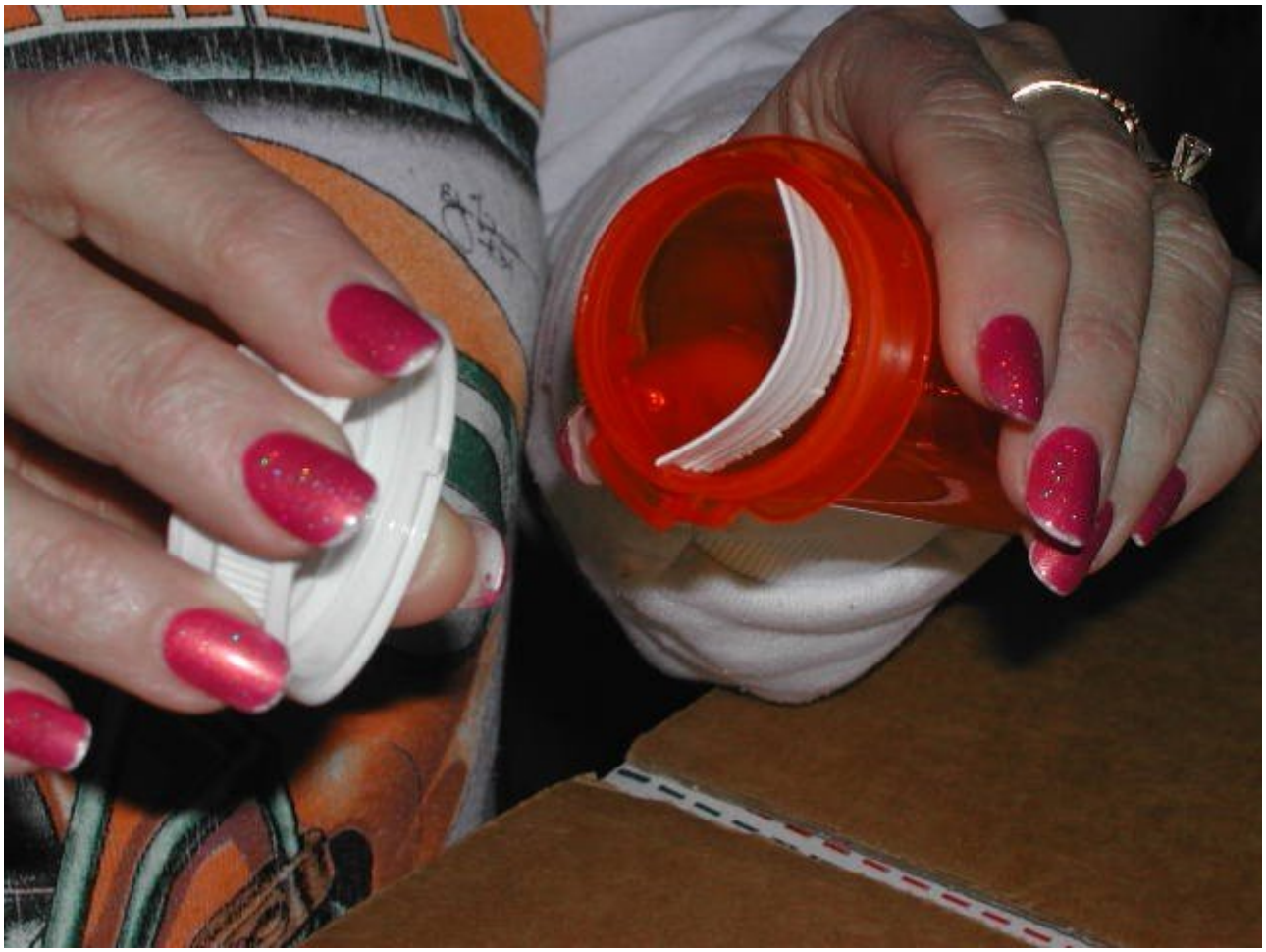
METHODOLOGY

Although Doctor Suzuki's extensive research in Cheiloscopy indicated human lip prints have individual characteristics, his study did not primarily focus on the biological family to determine whether lip prints are formed genetically. Because of that and due to the fact I was able to locate only one other corroborating study, I opted to seek out families comprised of blood-related members. Extensive families comprised of grandparents, parents and their children were desired for this research; however, complete families residing together or in close proximity are not as common in today's society. Therefore many of my participants consisted of a two-generational family. The collection data stemmed from an approximate yearlong time frame. The names of the families were not used in the study; instead they were identified with a systematic letter from the English alphabet.

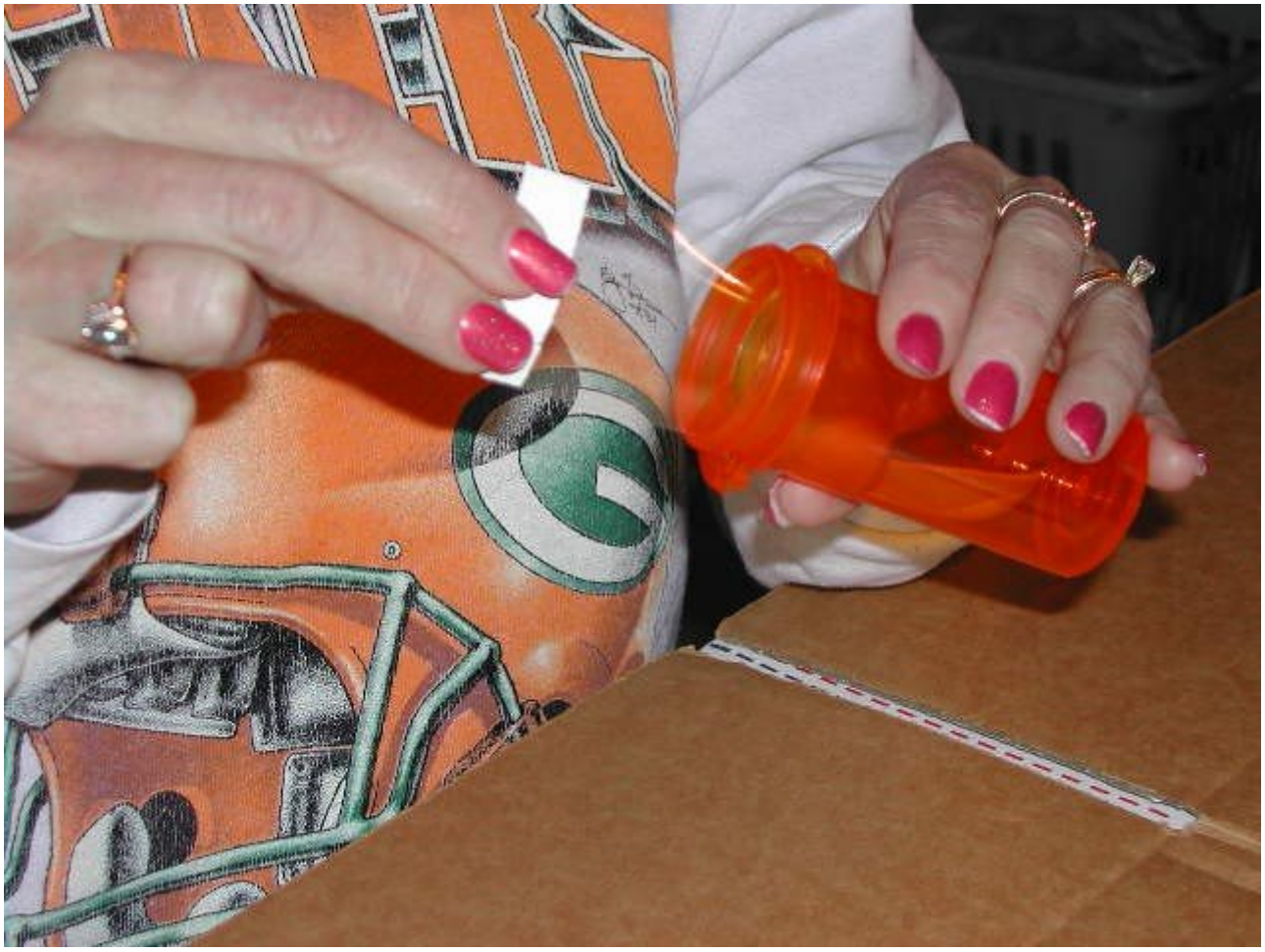
Two types of methods were utilized as an example for forensic research. The first method of obtaining lip prints of a three-generation family was that of utilizing a cut piece of clear plastic on

which each family member would place their lip prints. Utilizing a black magnetic detection powder, the latent lip prints were then developed. This method served as a twofold experiment. The first being a positive way to develop a latent lip print such as the way one would be discovered at an actual crime scene. The second positive result was the fact that the latent lip prints could be successfully developed after five months. As with any experiment, this procedure was accomplished by adhering to extremely specific directions. Each family member received the following guidelines regarding the capture of their lip prints:

“Here is the package with the containers possessing one plastic slide. The exterior of each container is marked with the individual’s name. Because there wasn’t enough room on the slide to mark your name, please ensure the slide you place your lip prints on goes back into the container marked with your name. When you open the container, you’ll see one end with white tape.”



“Please use this end to pick up and remove from the container. Please avoid touching any of the exposed plastic. If by chance you do get a fingerprint or a partial palm print on the plastic surface you can use a clean soft cotton towel to wipe it. Please do not use an abrasive fabric as this will scratch the surface.”

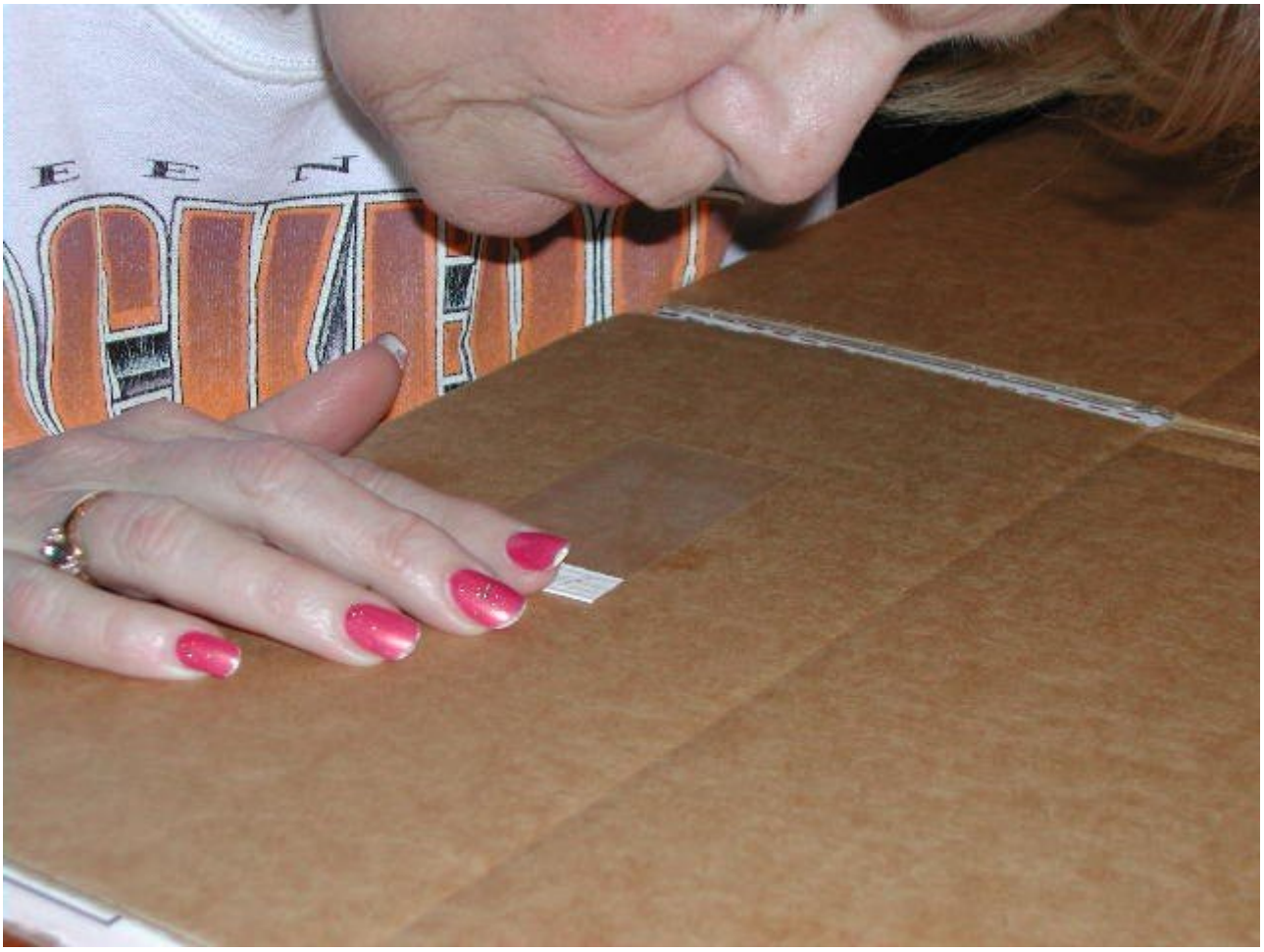


“Once removed from the container, place the slide on a clean, flat, smooth and solid surface so that the side with the plus (+) sign (located on the end with the white tape) is facing up.”



“Ok, now you’re almost ready to make the print. Hopefully, you have no cold sores and the lips are void of being dry or chapped. Some people can leave a print without any assistance from creams, ointments etc. You can make a test print on a piece of glass. If you have dry lips, apply one light layer of chap stick on the upper lip that you will then use to rub with the lower lip. One application will probably be too much and the lines on the print will be filled in. I suggest you make your first print on the piece of glass. When I experimented with this (one application with chap stick on the upper lip), the second print I made was perfect.

When you are ready to make the print, don’t smash your lips down too hard or you’ll get smudges. Gently place both slightly parted lips onto the surface of the slide (preferably centered). Remember to keep a finger on the tape so the slide doesn’t adhere to the lips when you rise up.



Once completed, examine the print to ensure you can visibly see two distinguishable lips and lines that move both vertically and horizontally. If you can you've successfully made a "readable" lip print. If however they are smudged, please clean off and try again. Remember this slide is plastic and it will only take so much rubbing before it gets scratched, which will make it extremely difficult (if not impossible) to identify between part of the print or a scratch. When you have the print on the slide, place the slide back into the container, ensuring the print portion is not pressed up against the wall, otherwise the print will be wiped away or smudged. Replace the container(s) back into the box and use the self-addressed label and pre-paid postage to mail off."

The second method in obtaining lip prints was the use of lipstick and blank index cards. Two lip prints were obtained on one index card for two reasons; the first was the possibility that one print may contain clearer lines over the other. Secondly, it goes to reason that the applied lipstick may be extremely heavy (depending on how forceful the participant was). By rolling the lips on the card the second time using the same applied lipstick, some may be clearer as the first sample removed the thicker layer of lipstick. The same thought process applies when lifting a latent print at a crime scene that was developed with powder. The first lift is often dirty in appearance due to excessive powder while the second lift obtains a cleaner looking print. The process was extremely helpful in analyzing, as two prints were available on one card. For comparison purposes the same three-generation family that provided latent lip prints on plastic pieces that were subsequently developed utilizing a black magnetic detection powder, were willing participants in providing their lip prints via the lipstick method. This method proved to work better, providing clearer prints of the

person(s) lips. Like the latent lip prints developed by powder, this method had its own guidelines each person had to follow:

“I have been collecting lip prints from parents and their biological children for the purpose of determining whether they are hereditary. The easiest method of doing this is by using a dry red in color lipstick. One coat on both upper and lower lip will provide two separate prints on a regular size white blank index card. The best method is parting the lips slightly so there is a recognized separation. No need to pucker the lips as this will cause distortion to the prints. They can remain normal.



I found placing the card on a raised thick book (such as a dictionary) while on a desk works well. This way your nose won’t get in the way.



The lips need to start from one corner of the mouth and “rolled” to the other corner of the mouth all the while maintaining contact with the paper.



The first print will be on the top portion of the index card (vertically positioned) while the second print (don't reapply lipstick) is positioned on the lower half of the card. In the center of the card, the first name of the person will appear. If grandparents can be included, please write (G'pa or G'ma next to the name).



For successful prints, the lines on the lips need to be recognizable, not smudged, too light or too dark and the entire upper and lower lip must be visible. Once the prints are on the card, place a blank card against it and tape them together to prevent the prints from smudging.



When all prints are complete and taped to a card, place them in the self-addressed, postage paid envelope and send back to me.

If you should feel strange or funny about this or if you would prefer not to do this, I completely understand. Let me assure you that no names will be used in my research. The families will only be labeled as “A”, “B”, “C”, etc…”

CHAPTER IV

RESULTS

Through extensive studies by Doctors Suzuki and Tsuchihashi of Japan, human lip prints were proven to be classified as individual characteristics. With this information it can be safely implied that no two persons obtain the same lip print. Similar to fingerprints, lip prints are unique to each person, to include identical twins. Although my research was not as extensive as Doctor Suzuki’s, it still reflected the same results in that no two people possessed the same lip prints. While the analysis of the characteristics of the lip prints of the family members suggests no two prints are the same, it was indicative that children do receive the same type of lip print characteristics as their parents; although, the placement of these lines are in different locations, thus creating a completely different, unique individual lip print.

During the course of this study, direct research was conducted with men, women and children ranging in ages between seven and eighty-three. All eighty-one participants comprised a total of twenty biological families. Within these families, three were third-generation possessing one set of grandparents, either paternal or maternal. The remaining seventeen families were two-generation consisting of parents and their twenty-seven biological children. All participants were willing volunteers in this project. They all understood their names would not be documented; rather, classified as “A”, “B”, “C”, etc.

As reflected in Chapter III, two different methods were utilized during this research in obtaining lip prints. During the first method, the person simply pressed his or her lips onto a piece of plastic that was subsequently processed with black magnetic detection powder. While the latent print was successful in being developed, the characteristics were somewhat difficult to analyze utilizing a common, household magnifying glass. It would stand to reason that these prints would be greatly enhanced using more advanced technological instruments found in a forensic laboratory. These processed lip prints can be viewed within Appendix A.

The second method for obtaining lip prints was accomplished using the lipstick method. As reflected in Chapter III, prints were obtained from the same third-generation family along with nineteen other biological families. As shown in Appendix B, the lip prints are much clearer and easier to analyze for classification purposes.

Type I (Long Vertical Groove) proved to be the most common of the five lip print characteristics as there were a total of 253 within all four quadrants of the eighty-one lip prints. Type I! (Short Vertical Groove) was second most popular with a total of 131, next being Type II (Branching Groove) with 114, then Type III (Diamond Groove) with 67 and lastly, Type IV (Rectangular Groove) with 42.

All grandchildren within the three third-generation families possessed the same characteristics of the parents with the exception of one grandson (Family B). He and the grandmother were the only two who possessed Type II (Branching Groove) characteristics.

All children from the second-generation families, with the exception of four, possessed the same characteristics as their parents. Both daughters of Family L, the daughter of Family N and one daughter of Family P contained one type that neither parent possessed. Unfortunately lip prints of the grandparents of these particular families were unable to be obtained; however, it is possible that they (grandparents) possessed the questioned characteristic type, as we observed in the third-generation Family B.

From the research gathered in this study it is indicative that lip print characteristics are indeed hereditary, either directly from the parents or from the grandparents. It is also important to note that while the children possessed the same characteristics as their parents and/or grandparents, it should be stressed that the characteristics located on the lips were not in the exact location as their parents, suggesting each person possessed his/her own individually unique lip prints.

CHAPTER V

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

DISCUSSION

As a prior law enforcement official, forensic science instructor and a crime scene examiner, I have found this research to be fascinating and very educational. As mentioned earlier in this project, my curiosity in the field of lip prints began at the onset of my career as a criminal investigator. Unfortunately, until this project, the opportunity to explore in this endeavor had not materialized.

Through this research it was evident that lip prints at crime scenes are rarely mentioned simply due to the fact most investigators and/or crime scene examiners do not look for them. On the numerous occasions when a smear or a smudge is discovered, most crime scene personnel disregard it as being a fingerprint that is unidentifiable. It is important to note though, lip prints left at scenes of a crime are more prevalent than one thinks. Articles such as drinking glasses, letters, cigarette butts, clothing, napkins and even skin may possess lip prints that could eventually lead to the identity of a suspect, victim or a witness of a crime.

CONCLUSIONS

The conclusion most noted during this research is the fact that lip prints are hereditary yet considered to be individualistic, each possessing their own unique characteristics. For this reason it is safe to suggest lip prints can and should be included in the forensic sciences arena as a legitimate means of identifying persons of interest connected with criminal activity.

Of course lip prints may never be on the same level as fingerprints when it comes to identification; however, it is interesting to know that certain countries around the world are creating databases and programs centered around the characteristics and appearances of lips specifically for the purpose of solving crimes.

RECOMMENDATIONS

It goes to reason that additional research is needed and required in this not-so-popular field. An interesting aspect of lip prints is the aging of a person and whether it has any influence on changing or altering the appearance and/or the characteristics of the lips. Stemming from my research, lip print characteristics would be like fingerprints in that the aging process would not change them.

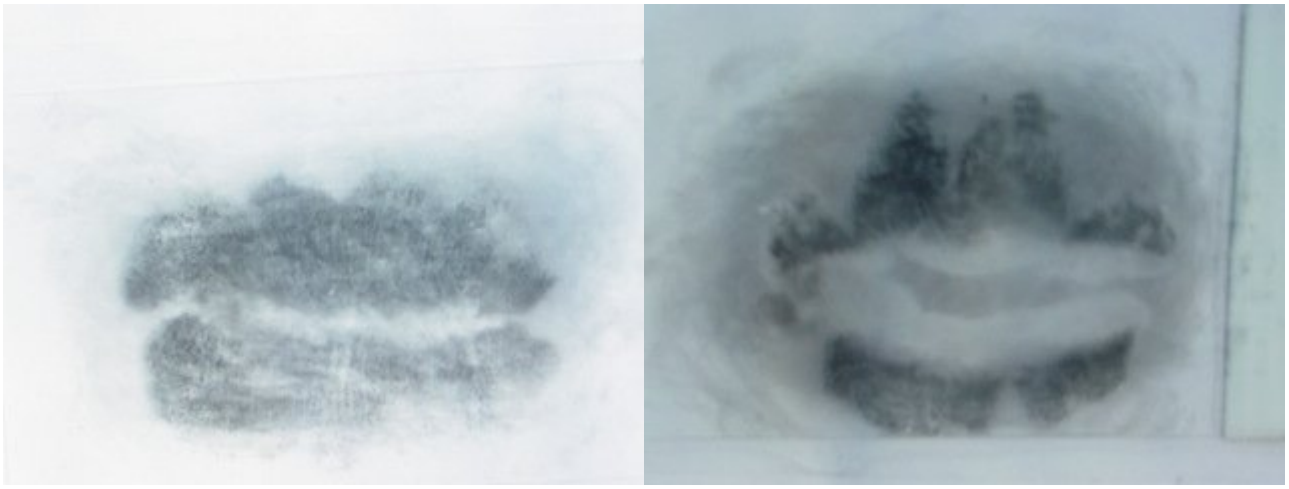
With the clear indication of the importance of lip prints I would strongly suggest this topic be introduced during periods of law enforcement training, not only for crime scene examiners but also for first responders to crime scenes.

APPENDIX A

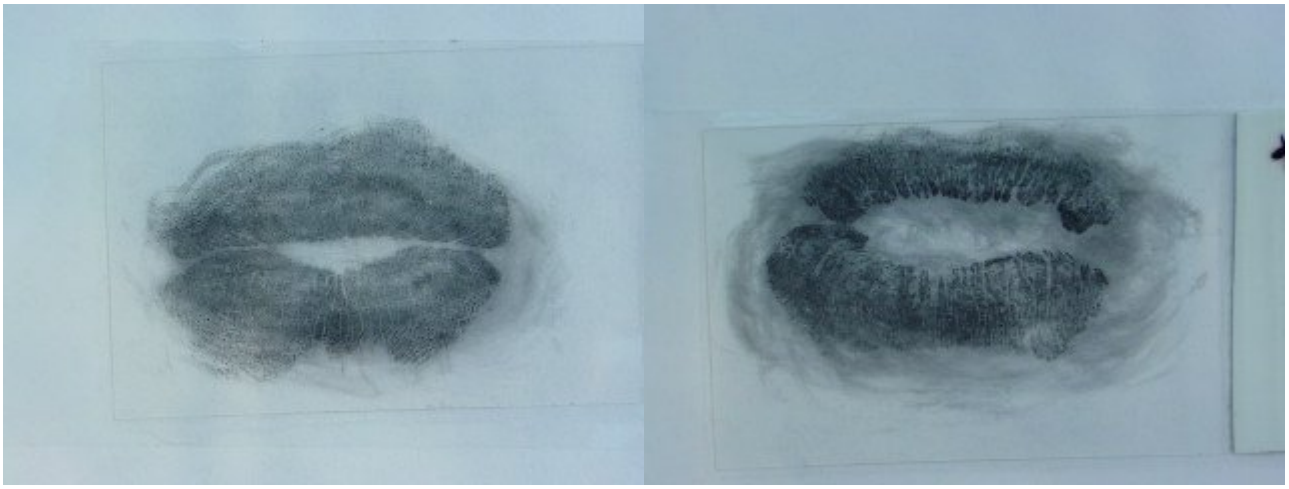
CHART OF LIP PRINTS (Utilizing the Magnetic Powder Dust Print Method)

Family A: (3rd Generation–Grandparents, Daughter/Son-in-law/granddaughters.)

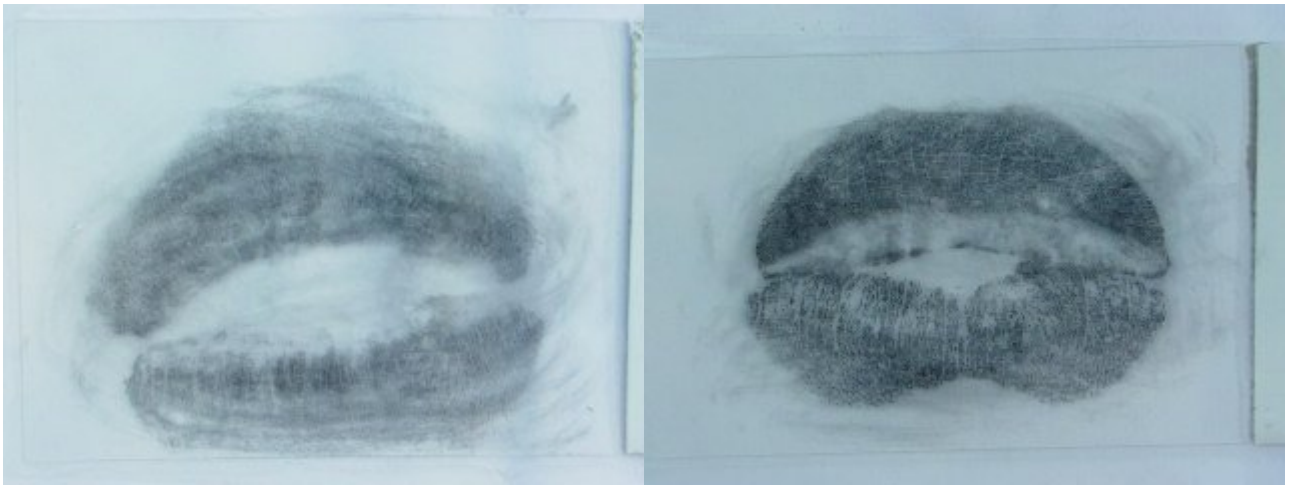
GRANDFATHER (MATERNAL) GRANDMOTHER (MATERNAL)



DAUGHTER (MOTHER) HUSBAND (FATHER)



DAUGHTER (GRANDDAUGHTER) DAUGHTER (GRANDDAUGHTER)



APPENDIX B

CHART OF LIP PRINTS (Utilizing the Lipstick Method)

Family A: (3rd Generation–Grandparents, Daughter/Son-in-law/granddaughters.)

GRANDFATHER (MATERNAL) GRANDMOTHER (MATERNAL)

III II III IV II II

I II I I! II I!



DAUGHTER (MOTHER) HUSBAND (FATHER)

II II I IV II II

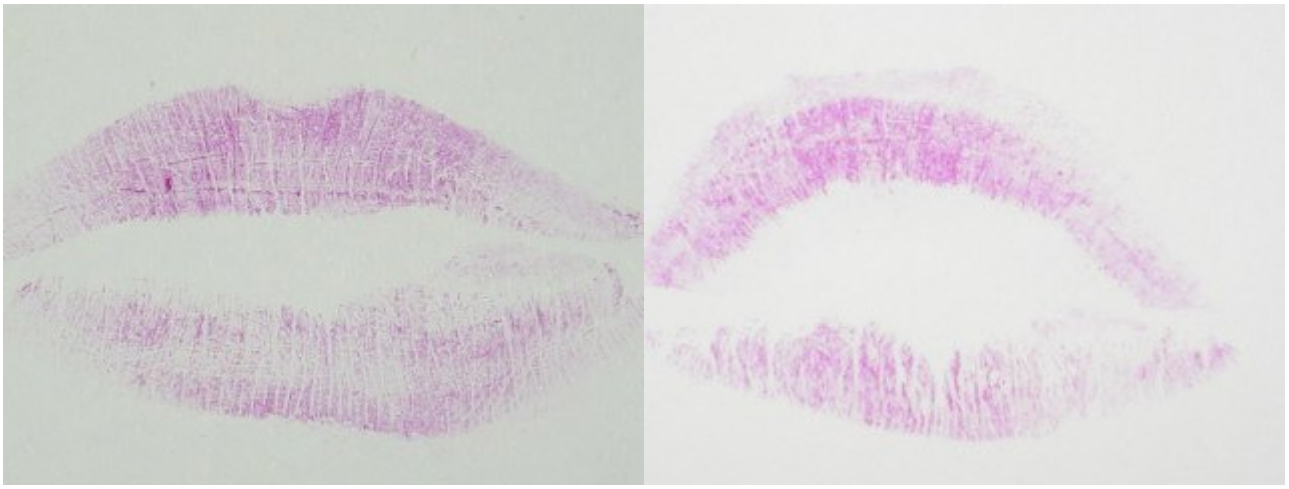
III I I! I II I! I



DAUGHTER (GRANDDAUGHTER) DAUGHTER (GRANDDAUGHTER)

IV I IV II I! IV II I!

I III I II III I II II I



Family B: (3rd Generation–Grandparents, Son/Daughter-in-law/grandsons.)

GRANDFATHER (PATERNAL) GRANDMOTHER (PATERNAL)

I I I! I! II III

I I I! I!



SON (FATHER) WIFE (MOTHER)

III I I I! III I I! I I!

I! III I! III I I! I



SON (GRANDSON) SON (GRANDSON)

I II I II I I

I III I III I III I III

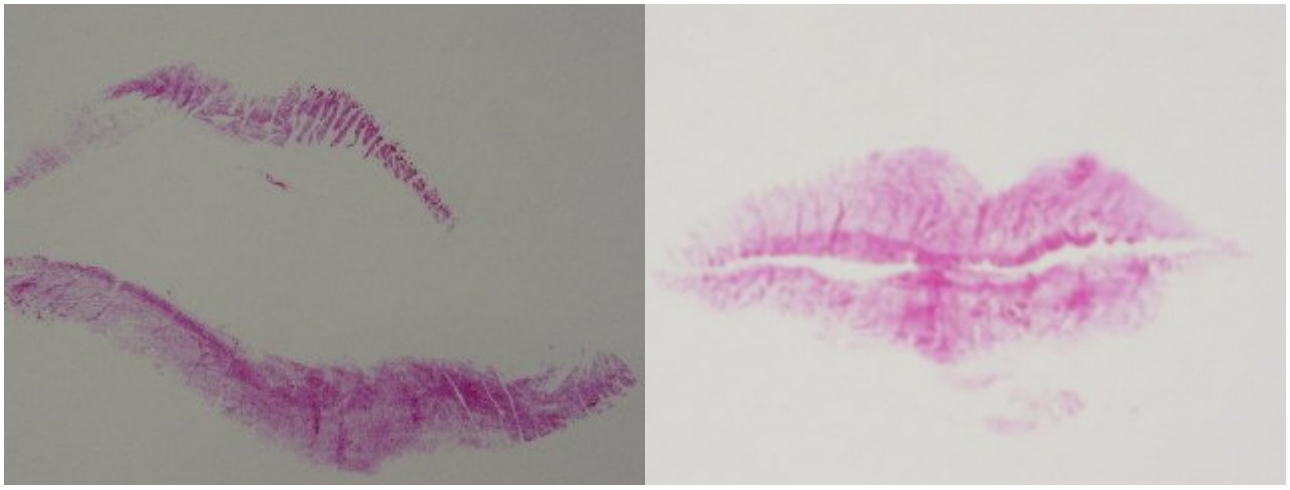


Family C: (3rd Generation–Grandparents, Daughters/Son/Daughter-in-law/grandsons.)

GRANDFATHER (PATERNAL) GRANDMOTHER (PATERNAL)

I II I I III IV I

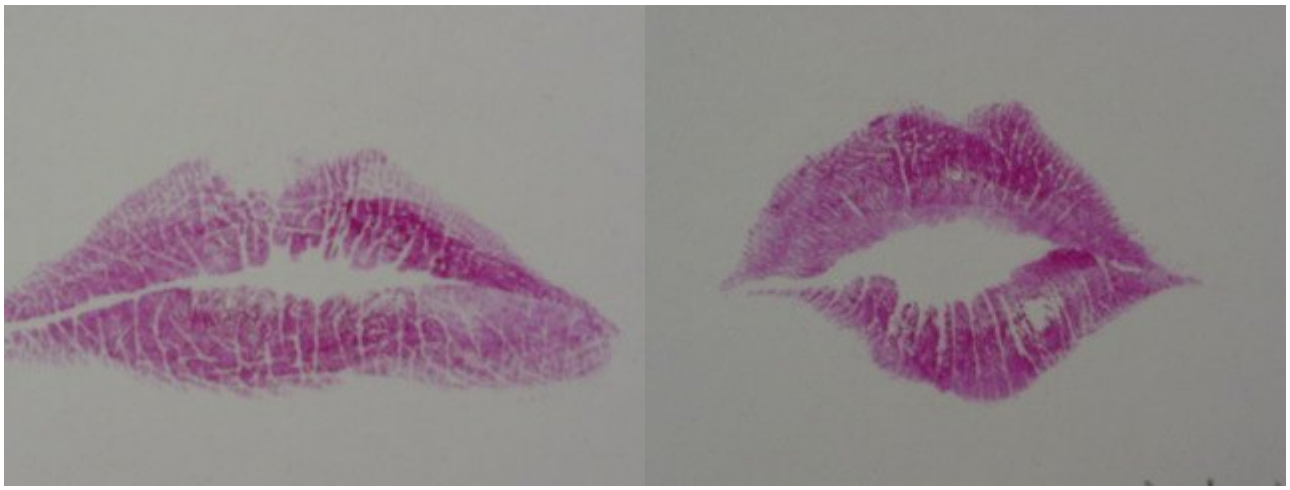
III I II I II I!



DAUGHTER DAUGHTER

II IV IV III I I! IV IV III

II I II I II I II



SON (FATHER) WIFE (MOTHER)

I II III I I! II IV II





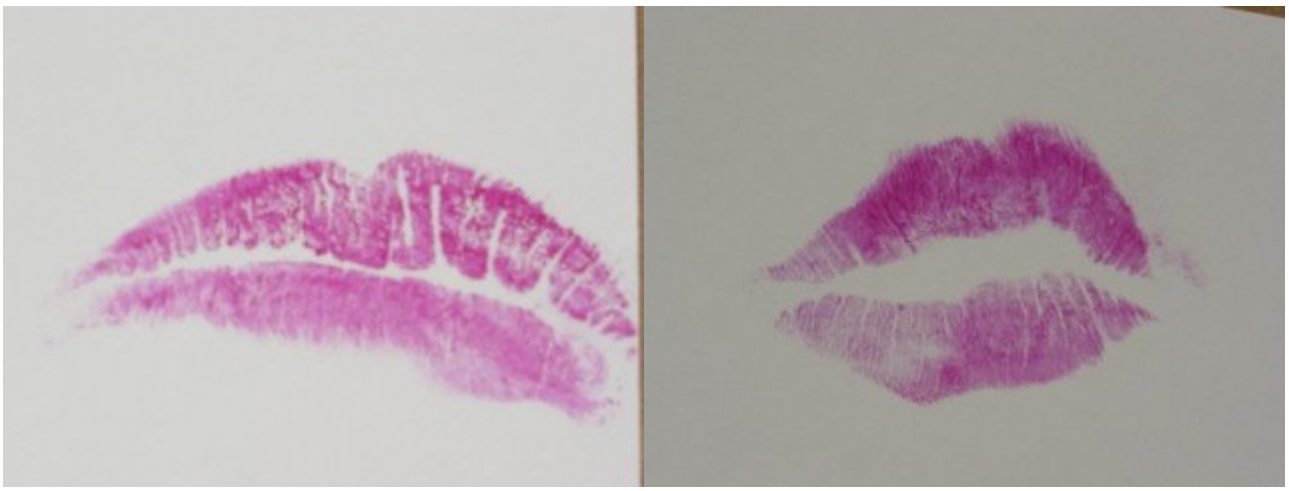
I II I! I! II I I! I I! II

Family C: (3rd Generation–Grandparents, Daughters/Son/Daughter-in-law/grandsons.) CONTINUED WITH GRANDSONS

SON (GRANDSON) SON (GRANDSON)

I I! I I I I!

I I I II I

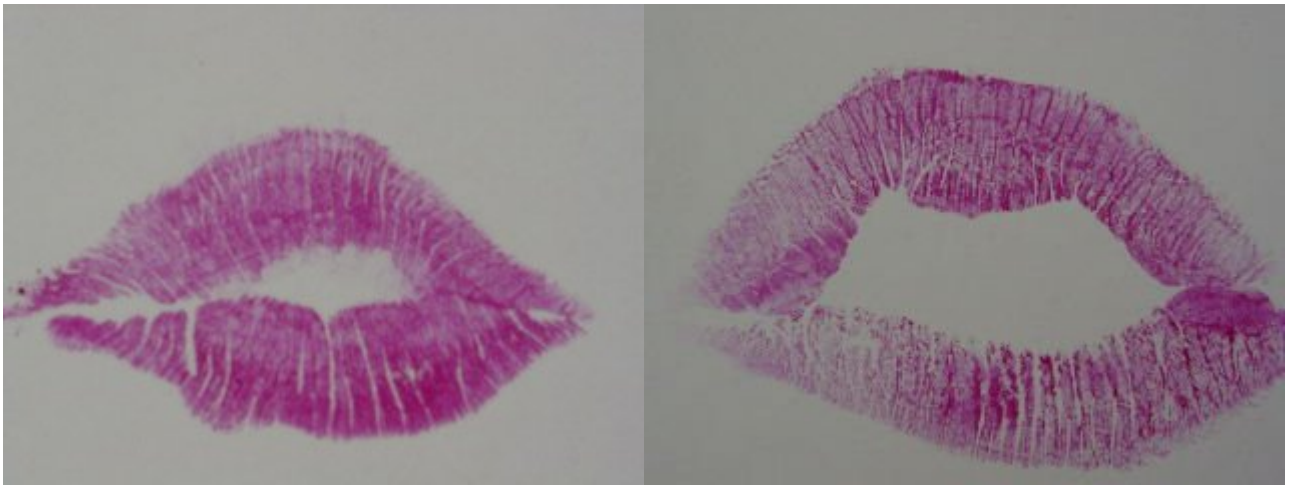


Family D: (2ND Generation – Father/Mother/Son.)

FATHER MOTHER

I II I! I III I IV I III

I I! I II III I I I! II



SON

I! I II I!

I II I! III

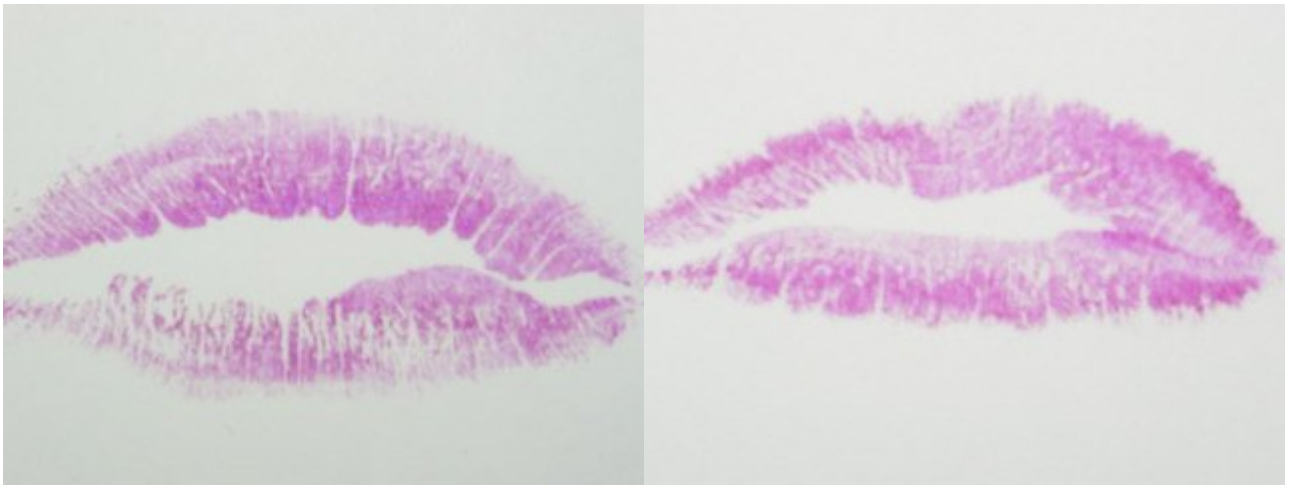


Family E: (2ND Generation – Father/Mother/Daughter.)

FATHER MOTHER

II I II I II III I! III I!

I I! I! II I! I! I



DAUGHTER

II I II

I I! I

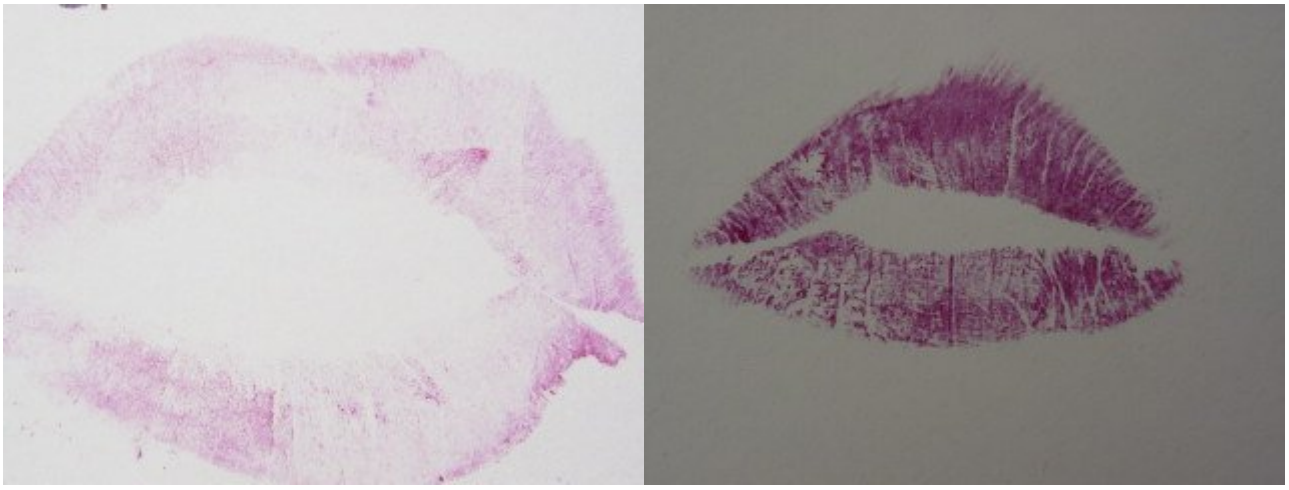


Family F: (2ND Generation – Father/Mother/Daughter.)

FATHER MOTHER

I III III I I!

I! I I I IV IV I



DAUGHTER

I! I I

I I



Family G: (2ND Generation – Father/Mother/Son.)

FATHER MOTHER

IV II I IV III II IV IV

I III I II I I! I II



SON

I I

I IV III I I!



Family H: (2ND Generation – Father/Mother/Daughter.)

FATHER MOTHER

I III II I! I II I I!

I III I III II I I II



DAUGHTER

I II I I!

I I II

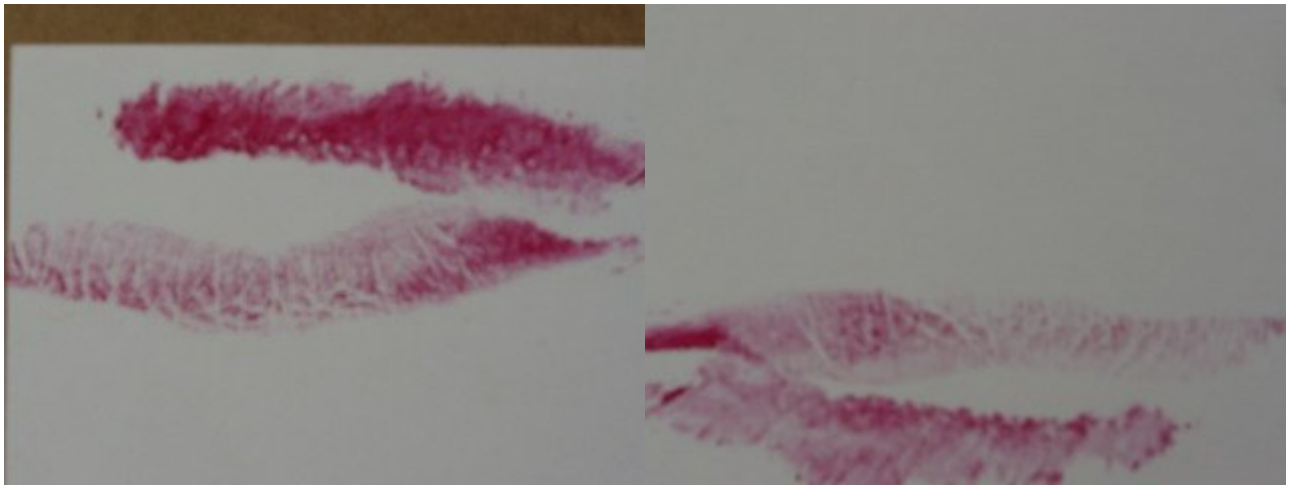


Family I: (2ND Generation – Father/Mother/Daughter.)

FATHER MOTHER

I II I III I I! I I!

I III III I I I





(LOWER LIP) (UPPER LIP)

DAUGHTER

III I! I I I! II

I I! I I! III



Family J: (2ND Generation – Father/Mother/Daughter.)

FATHER MOTHER

I I! II I III I! III I! III

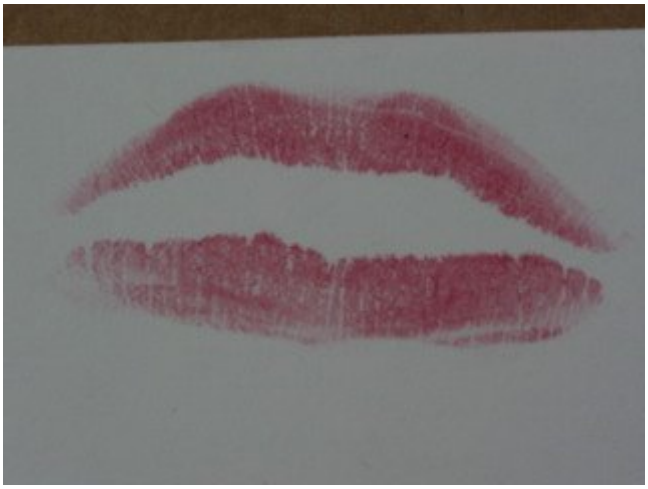
I II I II I I! II I I! II



DAUGHTER

I II I! II

I I! II I I! II

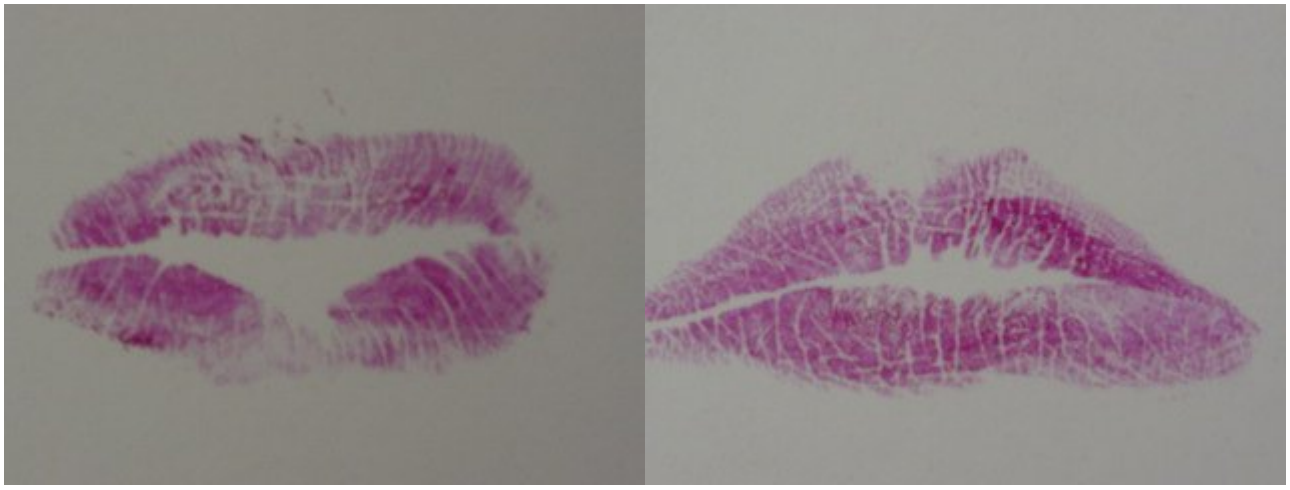


Family K: (2ND Generation – Father/Mother/Son/Daughter.)

FATHER MOTHER

IV I II IV II I I! IV III I! IV I

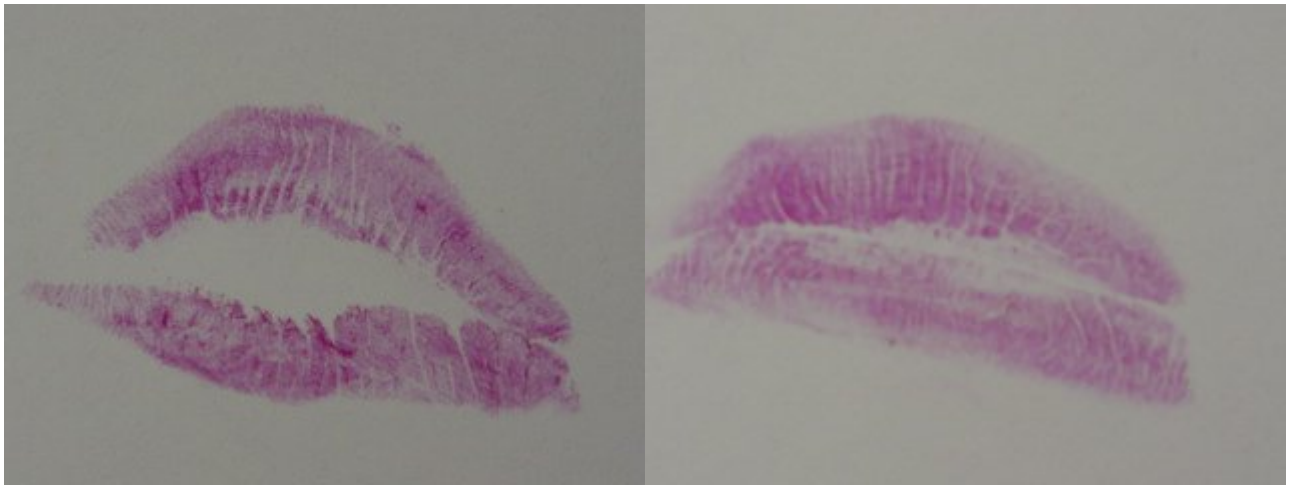
I II I I! II III I I II III



SON DAUGHTER

I I! I I! I II I III

I I I! I II I I! II

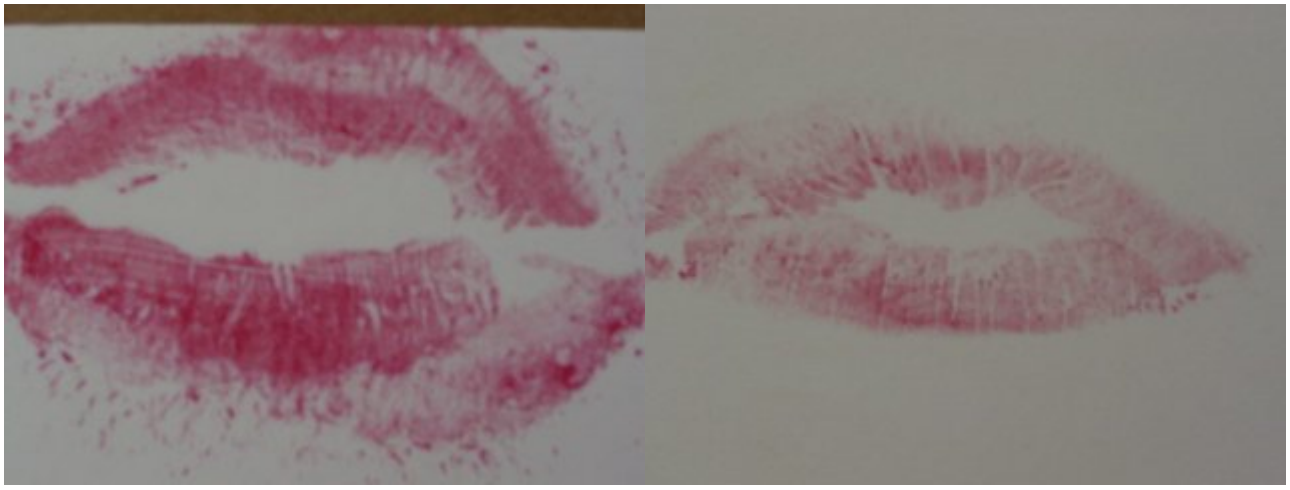


Family L: (2ND Generation – Father/Mother/Daughters.)

FATHER MOTHER

I! III III II I I III

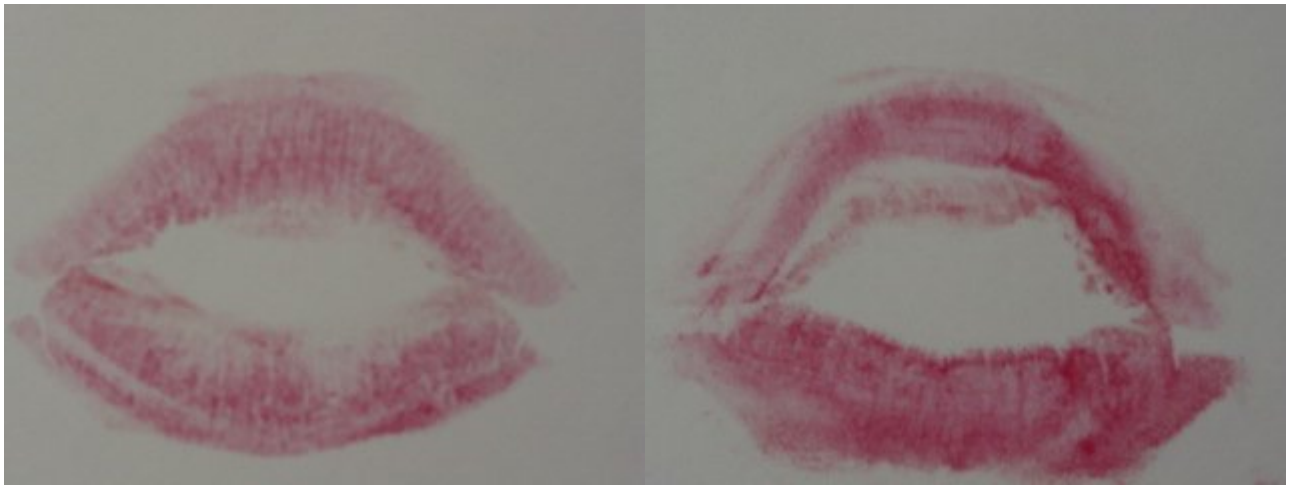
I I! I I! I I I! II



DAUGHTER DAUGHTER

IV II III IV I IV I! IV I

I I! III I I! III I I! III I! I



Family M: (2ND Generation – Father/Mother/Son/Daughter.)

FATHER MOTHER

I I! III I IV I! IV III III I! I

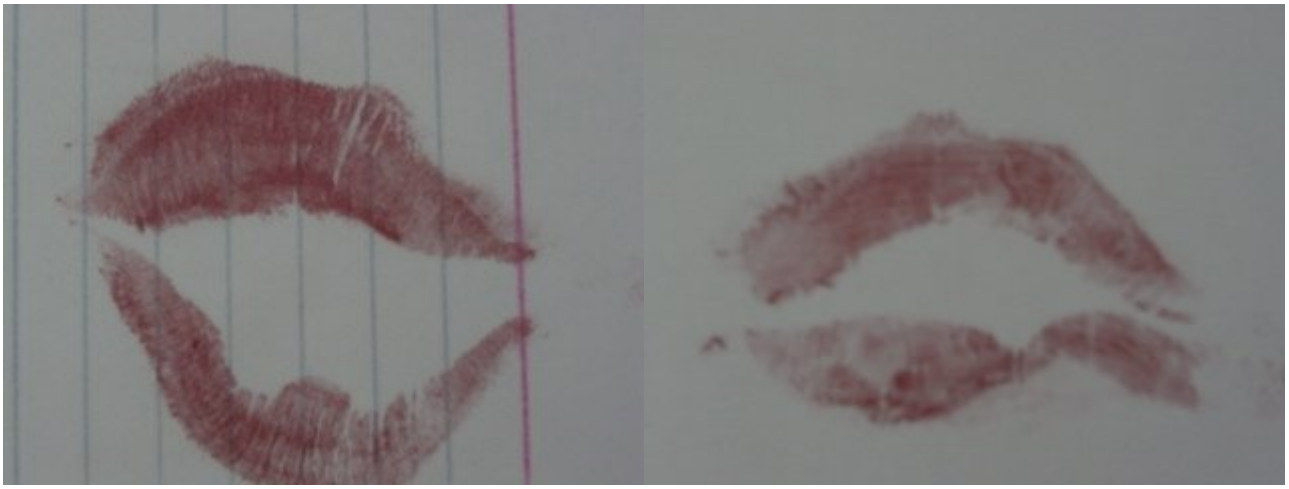
I I! I I! I II I I!



DAUGHTER SON

I I! I I! I! IV I

I I! I I! I! II I



Family N: (2ND Generation – Father/Mother/Son/Daughter.)

FATHER MOTHER

I! I I I! II

I! I I II I



SON DAUGHTER

II I II I! II I

I II I IV I! I I!



Family O: (2ND Generation – Father/Mother/Sons.)

FATHER MOTHER

I I! I II I II I III

I II I II I I! I II



SON SON

I I! I II I I! I! II

I I! I II I! I I! I I!

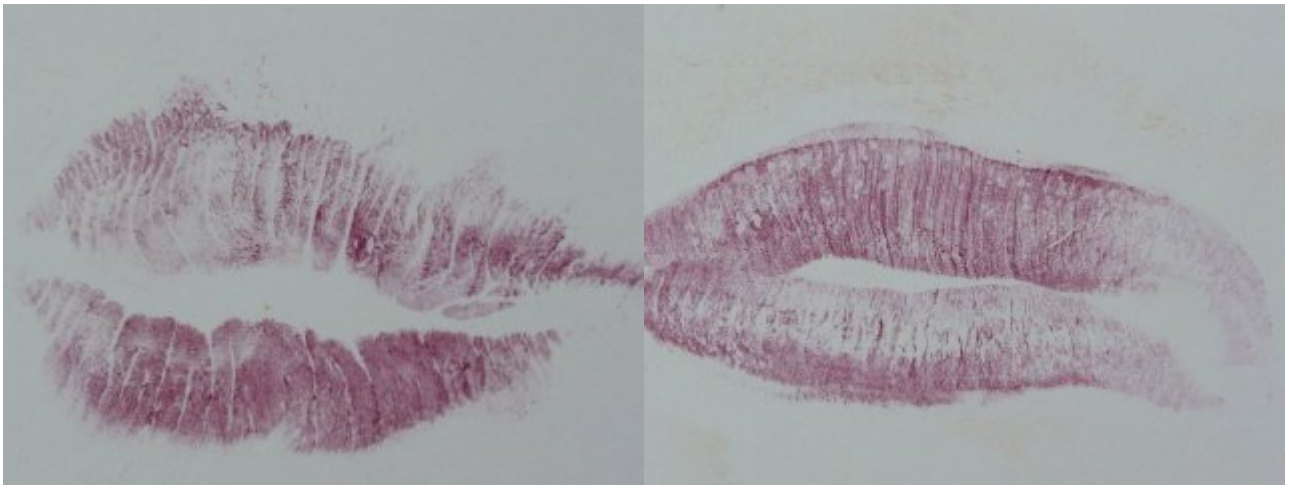


Family P: (2ND Generation – Father/Mother/Daughters.)

FATHER MOTHER

II I I I! I I

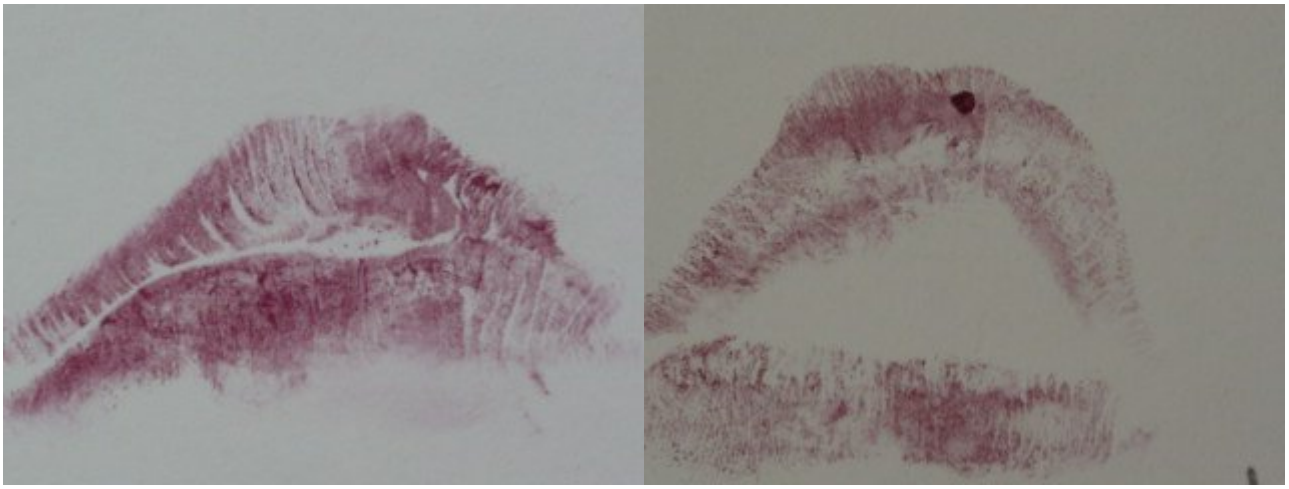
I! I I I! I I



DAUGHTER DAUGHTER

I! I I I! IV I I

I! I I I! I I



Family Q: (2ND Generation – Father/Mother/Sons/Daughter.)

FATHER MOTHER

IV IV II II I I

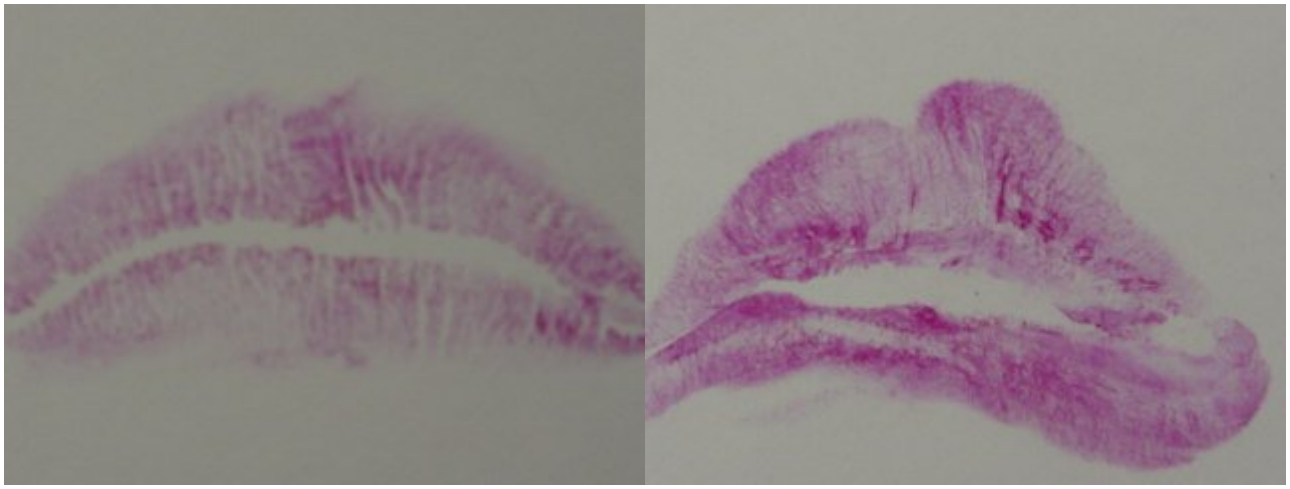
I I II I! I I I!



SON SON DAUGHTER

I IV I IV I II I I I!

I! I IV I II I I I! I I I!



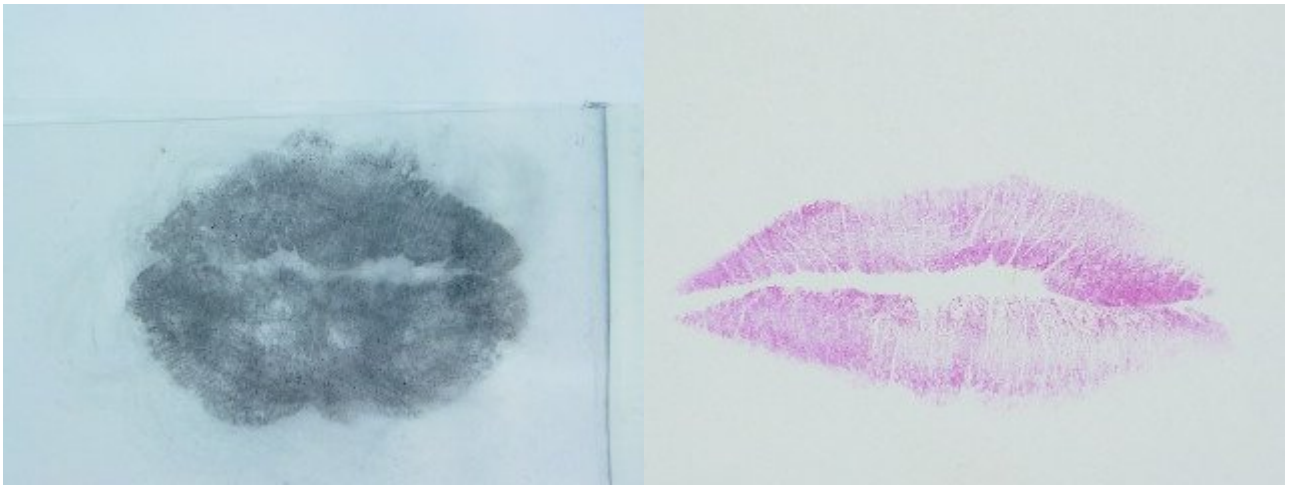


Family R: (2ND Generation – Father/Mother/Daughter/Son.)

FATHER MOTHER

II III II I! I! II I II I

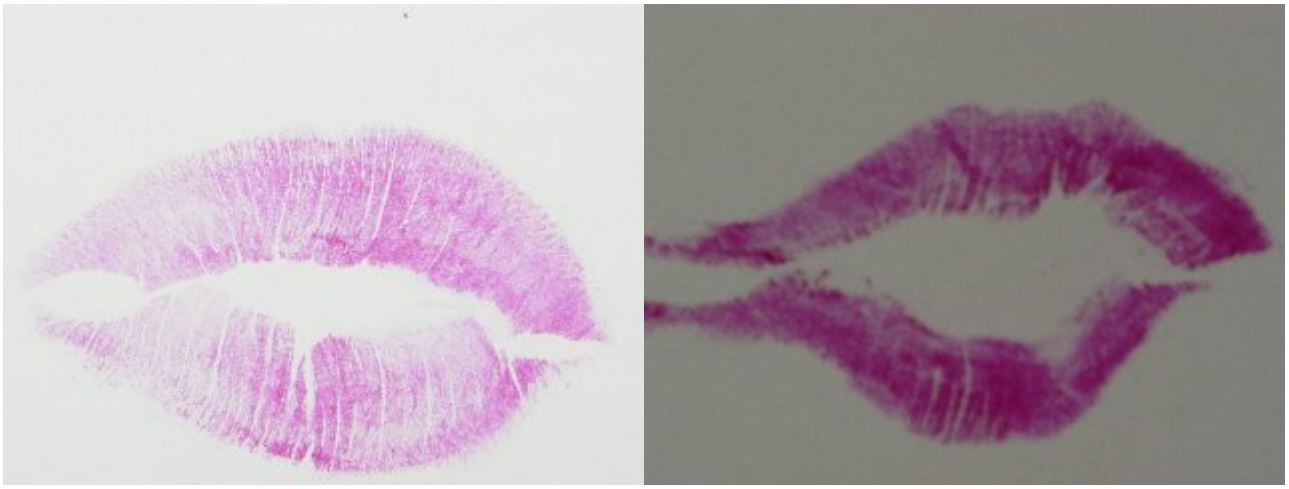
III I! I! I I



DAUGHTER SON

I I! I II I I! II

I I I! I I

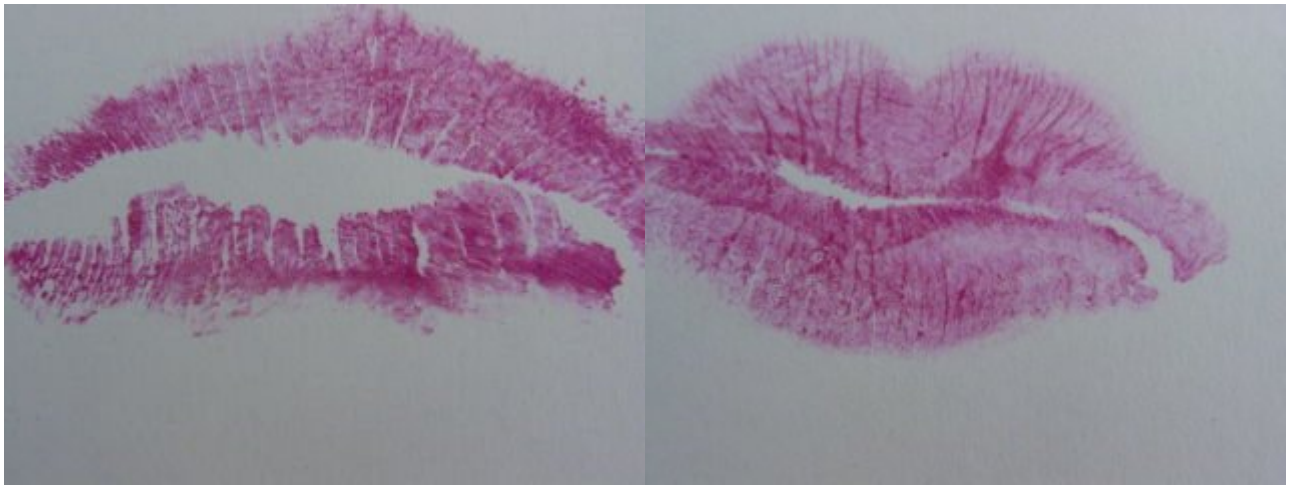


Family S: (2ND Generation – Father/Mother/Daughter/Son.)

FATHER MOTHER

I I II I III I! III

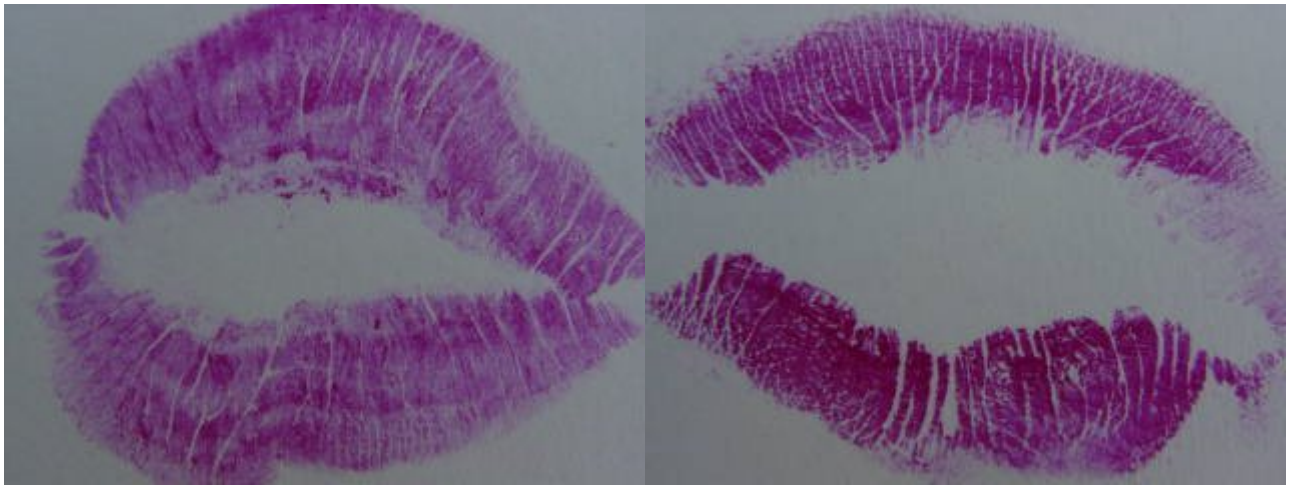
I I II I I



DAUGHTER SON

I I! I II II I I II

I I I! II I I II

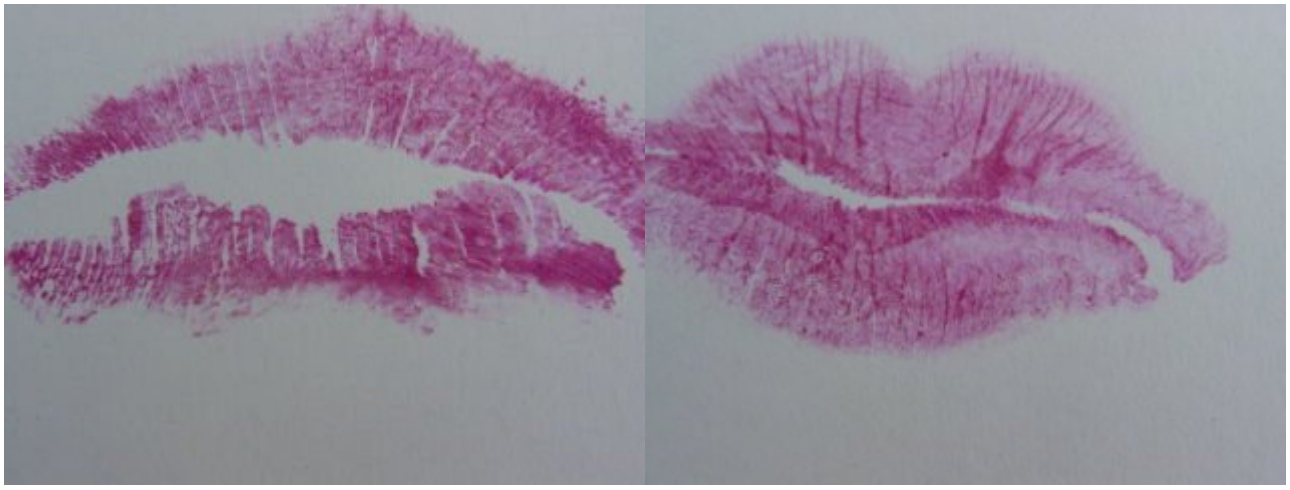


Family T: (2ND Generation – Father/Mother/Daughter.)

FATHER MOTHER

III I IV I! II III I II

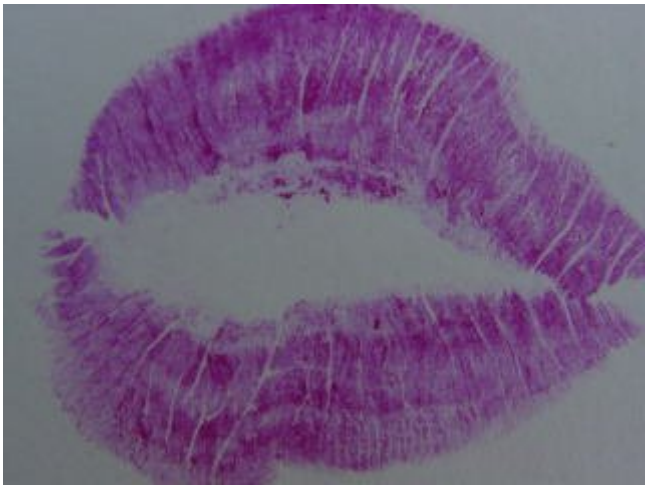
I IV III I I I!



DAUGHTER

III I I II IV

IV I! I I IV



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