

Relative Doubt: Partial Match or “Familial” Searches of DNA Databases

In 2005, Denver District Attorney Mitchell Morrissey had DNA samples from three unsolved rape cases, but a search in the national DNA database had failed to turn up any matches.¹ Typically, such a search looks for perfect identity between a crime-scene sample and a known offender using thirteen genetic markers. However, the software used for matching returns can return not only perfect matches, but also near or “partial” matches of fewer markers. Because genetic information is inherited, such partial matches may point toward a relative of the source, which in turn could lead to the perpetrator of the offense. In Morrissey’s cases, the search revealed several of these near-matches -- one in each case, in fact. The only problem was that the matches came from the Oregon, Arizona, and California databases, and the national database stores entries anonymously, allowing each state to keep the identifying information of its offenders. Accordingly, Morrissey had to request the matching persons’ names from the federal government. And while federal rules did not prohibit a state from accessing information about its own offenders in such partial-match cases, they did not authorize the sharing of such information across jurisdictions. Thus, the head of the federal DNA database refused to disclose the names of the potential relatives.

Frustrated by his inability to pursue the partial matches, Morrissey wrote to the director of the FBI laboratories, complaining that the policy “protects murderers and rapists.” Several days later, FBI Director Robert Mueller called Morrissey to discuss the issue. Shortly after that, Mueller ordered the adoption of an interim policy, which permitted states to decide for themselves whether to share the identities of persons in the database revealed in partial match searches. Arizona and Oregon then complied with Morrissey’s request, but California resisted. After a campaign by the state’s sheriff and district attorneys’ organizations, however, Attorney General Jerry Brown radically changed course. In April of 2008, Brown announced that California would not only share such information, but also laid out the first policy in the nation

¹ Maura Dolan & Jason Felch, *Tracing a Crime Suspect Through a Relative*, L.A. TIMES, Nov. 25, 2008.

that explicitly authorizes searches for “partial matches” -- known as “familial” or “kinship” searches -- in the DNA databank.²

Given the rising law enforcement and public interest in this investigative technique, more states are likely to follow California’s lead. But notably, often lost in the excited telling of the tale of Morrissey’s crusade is one revealing fact: his “familial searches” did not work. None of the three matches turned out to point toward a relative, much less the source, of the actual crime-scene sample. Also absent from the tale is the story of the follow-up. What if the investigation had turned up some names? What kind of investigation might have taken place before those three wrongly identified potential relatives -- not to mention any of their equally innocent family members -- were ruled out as suspects? Could they be ordered to submit DNA samples? Could those DNA samples then be stored and kept in the national database, to which the law currently mandates only convicted felons and occasionally arrestees must submit?

Advocates of “familial searching” liken the practice to following up on any ordinary investigative lead. A popular analogy is often drawn between a partial license plate search and a partial DNA search,³ the implication being that it would be as unconscionable to ignore a lead in the latter case as it would be in the former. But such analogies are deceptive. Justifying partial DNA matches by likening them to partial license plate matches is like claiming that reading has not changed because there were books in the fourteenth century and there are books now: it ignores the transformative impact, and social meaning, of technology.

For starters, license plates are static, one-dimensional pieces of information. At best, a partial license plate tells you what state the vehicle is registered in, and perhaps the names and addresses of those who have registered vehicles that match. DNA, in contrast, is a dynamic system of information. Partial DNA fragments provide a wealth of information that can be mined according to law enforcement’s needs. Generate a list of possible matching profiles, and you may in turn gain access to the individual’s likely surname, potential relatives, and possibly a sample containing their entire genetic code. Some claim that the only law enforcement use of

² Maura Dolan & Jason Felch, *California Takes Lead on DNA Crime-Fighting Technique*, L.A. TIMES, Apr. 26, 2008; *see also* CALIFORNIA DEP’T OF JUSTICE, DIVISION OF LAW ENFORCEMENT, INFORMATION BULLETIN NO. 2008-BFS-01, DNA PARTIAL MATCH (CRIME SCENE DNA PROFILE TO OFFENDER) POLICY (2008) [hereinafter CALIFORNIA POLICY].

³ Robin Williams & Paul Johnson, *Inclusiveness, Effectiveness and Intrusiveness: Issues in the Developing Uses of DNA Profiling in Support of Criminal Investigations*, 33 J. L. MED. & ETHICS 235 (2006); Jaclyn O’Malley, *Police Consider Familial DNA*, RENO GAZETTE-JOURNAL, Jan. 18, 2009; *see also* 60 Minutes: *Not So Perfect Match* (CBS television broadcast, Mar. 23, 2007).

genetic information is of “junk DNA” -- noncoding regions that disclose no private information. Yet familial search practices, by their very nature, contradict this claim. Establishing familial connections through genetic testing exposes personal, private information -- the identity of your biological father is simply not “junk.” Moreover, most governments’ insistence retaining the biological sample provided for typing, and not just the typed DNA profile itself, underscores DNA’s dynamism: as typing technologies evolve, additional testing occurs. Already samples collected for one form of testing (STR) have been subjected to newer variations, such as SNP or Y-STR analysis without undergoing any judicial review of the propriety of these new tests.

Perhaps most importantly, the “partial plate” analogy is also technically inaccurate. DMV databases contain a registry of *all* license plates; the search for any partial matches thus inquires into the entire universe of suspects. By contrast, DNA databases collect material selectively -- typically from convicted offenders and arrestees -- and therefore replicate the skewed racial, ethnic, and socio-economic demographics of the criminal justice system. A search in a DNA database, then, does not include the entire universe of suspects. The proper comparison would be to say that familial searching is like looking for partial matches to a license plate, but in a DMV database that primarily contains plates registered to the poor, or to people of color.

This Article probes the practice of familial DNA searching. It aims to lay out the fundamental issues at stake in such searches, survey the current legal and practical landscape governing their deployment, and then ask normative questions intended to examine both its overall desirability and, if merited, optimal means of implementation.

I. A BRIEF INTRODUCTION TO FAMILIAL SEARCHING.

A. Background and Basics of Forensic DNA Typing.

A person’s genome is made up of 3.2 billion nucleotides (one of G, T, C, or A) inherited equally from one’s mother and father and stored in full in divided bunches on twenty-three paired chromosomes that are found in the nuclei of each of the roughly 100 trillion cells that

make up a human being.⁴ Genome “sequencing,” or the process of unpacking the genetic strand to uncover the letters and put them in order, has revealed that the vast majority of the DNA strand -- over 99.7% -- is identical between two people.⁵ However, certain stretches of the DNA strand, called “microsatellites,” contain a finite quantity of variability that can serve to distinguish one individual from another.⁶

The most common form of forensic DNA typing in the United States, known as STR or “single-tandem repeat” typing, looks to thirteen places (or loci, the plural of locus) on the genomic strand where there exists high variability, and counts the number of times certain known sequences repeat themselves.⁷ These are referred to as the “autosomal” loci, because the genes are spread across the twenty-two chromosomes that are identical in both sexes, as opposed to the two sex chromosomes.⁸ Autosomal typing stands most commonly in contrast to Y-STR typing, which examines genetic material found on the Y sex chromosome and thus only is available for testing males.⁹ At each location there are two repeat lengths, otherwise known as “alleles,” to measure -- one on the chromosome inherited from the mother and one from the chromosome inherited from the father.¹⁰ By counting the repeats at thirteen loci, an analyst can obtain twenty-six discrete measurements that aid in individuating one person from another.¹¹

Because these twenty-six alleles are directly inherited from one’s biological parents, there is a significant probability that two people who share biological ties will also share a large number of alleles in common. At minimum, a child and a parent will match at thirteen alleles, for instance. Due to the unpredictability of inheritance (since, of course, it is possible for one sibling to inherit one-half of a parent’s twenty-six alleles while the other inherits the other half), it is not possible to state definitively how many alleles two siblings will share in common.¹²

⁴ JOHN M. BUTLER, FORENSIC DNA TYPING: BIOLOGY, TECHNOLOGY, AND GENETICS OF STR MARKERS 17-20 (2d. ed. 2005); *see generally*, Erin Murphy, *The Art in the Science of DNA: A Layperson’s Guide to the Subjectivity Inherent in Forensic DNA Typing*, 58 EMORY L.J. 489, 495 (2008). The twenty-third chromosome pair is the sex chromosome -- either XX for girls or XY for boys. *Id.*

⁵ BUTLER, *supra* note 4, at 26.

⁶ BUTLER, *supra* note 4, at 86.

⁷ Murphy, *supra* note 4, at 494.

⁸ BUTLER, *supra* note 4, at 20.

⁹ BUTLER, *supra* note 4, at 20.

¹⁰ BUTLER, *supra* note 4, at 23.

¹¹ BUTLER, *supra* note 4, at 23.

¹² Identical twins will of course share all alleles in common. BUTLER, *supra* note 4, at 26.

However, one estimate suggests that siblings on average share roughly 16.7 alleles in common.¹³ Interestingly, the probability of overlap turns on several factors: most significantly on common inheritance, but also on the likelihood that the parents themselves shared a particular allele, as well as the commonness of the allele in the population at large.¹⁴ Suffice it to say, however, that it is possible to draw inferences of relatedness based upon a particular pattern or distribution of overlap in the genetic profiles of two individuals.

In the United States, the fifty states as well as the federal government have long collected biological samples from certain designated persons for typing and storage in a DNA databank. Initially, such collections focused solely on those convicted of serious felonies, but lately many jurisdictions have begun to mandate sample contributions from all convicted persons, and even some arrestees.¹⁵ Once collected, the genetic material is typed at the thirteen different nationally standardized autosomal loci, which are commonly referred to as the CODIS loci in reference to the Combined DNA Index System (CODIS).

CODIS is the name of software developed by the Federal Bureau of Investigation to conduct searches of genetic profiles, but it has come to stand for the idea of the national database itself -- a central repository into which all states can "load" their profiles and in turn can search the profiles deposited by other jurisdictions.¹⁶ The uploaded profiles are just the numbers pertaining to the alleles, as well as identifying information that allows the record to be traced back to the uploading entity. The jurisdiction that enters the record retains all of the personal information (such as the name and address) of the individual to whom it belongs.¹⁷ Originally, there were separate rules for what kinds of material could be uploaded nationally versus kept within a state's own borders¹⁸ -- for instance, arrestee profiles were initially prohibited from

¹³ Hank T. Greely, Daniel P. Riordan, Nanibaa' A. Garrison, & Joanna L. Mountain, *Family Ties: The Use of DNA Offender Databases to Catch Offenders' Kin*, 34 J. L. MED. & ETHICS 248, 253 (2006).

¹⁴ Greely et al., *supra* note 11, at 253.

¹⁵ Erin Murphy, *The New Forensics: Criminal Justice, False Certainty, and the Second Generation of Forensic Evidence*, 95 Cal. L. Rev. 721, 738 (2007).

¹⁶ Murphy, *supra* note 13, at 739 & nn. 74 & 79.

¹⁷ BUTLER, *supra* note 4, at 440.

¹⁸ Murphy, *supra* note 13, at 739 & nn.75 & 76.

being placed in CODIS.¹⁹ However, the FBI later changed its rules to allow states to upload any profile collected in a manner consistent with its own laws.²⁰

The national database has grown impressively in size since its authorization by Congress in 1994.²¹ It contains two types of profiles -- those belonging to known persons (often called “offender profiles”) and samples of unknown origin gathered from crime scenes (often called “crime scene” or “forensic” profiles).²² As of January 2009, the national database contained over 6.6 million offender profiles and over 250,000 forensic profiles.²³ Links can be made between a crime-scene sample and a known offender (often called a “cold hit”), as well as between two samples from the same or different crime scenes. There have already been numerous instances of individuals convicted on the basis of a cold hit alone.²⁴

A law enforcement officer wishing to search a database has several options. First, the officer must choose which level of database to search.²⁵ The national database (NDIS) is the most comprehensive, in that it contains the greatest number of profiles from the widest array of jurisdictions. But the officer might also search her own state-level database (SDIS) or even a locally maintained database (LDIS). Databases within a jurisdiction might contain more material than the national database, because the rules about the submission’s quality or its connectedness to a crime scene might be relaxed within a state or locality.²⁶ If a search conducted in the national database reveals a match, then the FBI facilitates the disclosure of information between the jurisdictions according to the FBI policy. In contrast, a search within a jurisdiction or locality that turns up a match can be dealt with according to that jurisdiction’s own rules.

In addition to choosing which database to search, the officer also has a second decision to make: how strictly to construe the match parameters of the search. The CODIS software allows

¹⁹ 42 U.S.C. § 14132 (2000).

²⁰ 42 U.S.C. § 14132 (2009) (adding to “persons convicted of crimes” also those “charged in an indictment or information with a crime” as well as “other persons whose DNA samples are collected under applicable legal authorities”); Justice for All Act of 2004, Pub. Law 108-405, § 203(a)(1) (2004) (altering enabling legislation).

²¹ 42 U.S.C. § 14131 et seq.

²² Murphy, *supra* note 13, at 738.

²³ FBI, CODIS Statistics Clickable Map, <http://www.fbi.gov/hq/lab/codis/clickmap.htm>.

²⁴ Yun S. Song, Anand Patil, Erin E. Murphy & Montgomery Slatkin, *Average Probability that a “Cold Hit” in a DNA Database Search Results in an Erroneous Attribution*, 54 J. FORENSIC SCI. 22 (2007) (citing cases).

²⁵ Murphy, *supra* note 13, at 739 (describing levels).

²⁶ Murphy, *supra* note 13, at 739 n.75; Butler, *supra* note 4, at 441. This benefit subsided slightly when the federal rules adapted to allow uploading of any material collected in compliance with state regulations.

three levels of inquiry, termed high, moderate, and low stringency.²⁷ A high stringency search requires identity both in number and kind of all 26 of the alleles in the two samples.²⁸ A moderate stringency search returns profiles in which the profile has all twenty-six alleles of the submission, but the submission contains additional material as well. Such a search could be useful in the case of mixtures, where investigators wish to pull up all profiles that contain all of the submitted sample's alleles, while also allowing the submission to have the extra information pertaining to another person.²⁹ Lastly, a low stringency search returns profiles in which at least one allele is present, even though the profile has additional alleles that the sample does not or vice versa.³⁰

Normally, a search in a DNA database is conducted on high or moderate stringency, and the goal is to return an exact match to the person leaving the sample. However, because lower stringency searches are allowed, it is possible that a search (either intentionally or inadvertently) returns near misses or "partial matches." It is such "partial matches" that create the possibility for the kind of searching which is the subject of this paper, namely "familial searching."

B. *Familial Searching: Mechanics.*

Familial searching refers generally to the idea of looking in a DNA database not for the person who left the crime scene sample, but rather for a relative of that individual. For purposes of clarity, it may be helpful to establish a vocabulary regarding such searches. The "source" is the actual individual who left the unknown crime-scene sample, typically considered the perpetrator of the offense.

When the source is not contained in the database, but a moderate or low stringency search is conducted, the result may be "partial matches" -- profiles that match at some, but not all, of the sample's alleles. Studies show that, if the database does indeed contain a relative, it is 80 to 90% likely that a partial match search will include that relative in its results.³¹ But studies also show

²⁷ Eva Steinberger & Gary Sims, *Finding Criminals Through the DNA of their Relatives -- Familial Searching of the California Offender DNA Database*, 31 PROSECUTOR'S BRIEF 28, 30.

²⁸ Steinberger & Sims, *supra* note 25.

²⁹ Steinberger & Sims, *supra* note 25.

³⁰ *Id.*

³¹ Yun S. Song, Erin E. Murphy & Montgomery Slatkin, *Statistical Implications of the California Familial DNA Search Policy: Number and Ethnic Distribution of False Leads* (unpublished manuscript, on file with author); see also Bieber et al., *supra* note X (estimating that roughly 80% of siblings might be identified).

that such a search is also likely to return a number of persons that are not in fact related to the source.³² The exact number of such persons depends dramatically on the kind of search that is conducted, which will be explored in greater depths in Part III, but for now suffice it to say that searches structured with reasonable tailoring may uncover somewhere in the range of five to twenty-five persons.³³

The persons turned up in such searches are often called “pivots” because they forge the link between the sample and its possible source. Pivots are typically in the database as a result of qualifying for inclusion as convicted or arrested offenders, but they may also be present because they voluntarily submitted their samples to aid in a different investigation or even were the victims of a crime. This category may be further divided according to the pivots ultimate utility. That is, a search will turn up a list of potential pivots -- persons who may or may not be related to the source. Eventually, some of those potential pivots will turn out to be useless -- that is, “false pivots” or “false leads.” But others may prove related to the source, and thus be “true pivots.”

In order to find a true pivot from among potential pivots, investigators will of necessity engage in further investigation to determine whether the pivot leads to a source -- i.e., whether the lead is true or false. We might then imagine two classes of persons affected at this next step by the investigation: the “source” (the person who did leave the sample), as well as “innocent relatives.” Note that the “innocent relative” category can be composed both of persons wholly unrelated to the source, as well as those who turn out to be related to, but are not themselves, the source. In other words, some persons will be the innocent relatives of a false lead (meaning neither they nor any of their relatives turned out to be the source), whereas others will be innocent relatives of a true pivot (meaning that while they were not the source, one of their relatives did turn out to be the source). We might call them respectively “random innocents” and “source-related innocents.”

By means of illustration, imagine a homicide in which scrapings from beneath the victim’s fingernails turn up the profile of the likely perpetrator. Detectives first run the sample in the database to find the source, but no matches are forthcoming. Detectives then run the sample at lower stringency, and turn up twenty-five potential pivots, which they narrow down to

³² Song et al., *supra* note 30.

³³ Song et al., *supra* note 30.

a list of five based on other factors (say, proximity to the crime scene). Detectives then investigate the relatives of the five potential pivots, to determine if any may be the source. Say four turn out to be false leads -- investigation of their relatives reveals that none are the source. Those relatives, then, are random innocents -- they were implicated in the crime through the presence in the database of their relative, the false pivot, but neither they nor their relatives nor the false pivot in fact have anything to do with the crime. Imagine one pivot has two siblings, one of which proves to be the source. Investigation of the true pivot's two siblings thus implicates the source (one sibling), as well as a source-related innocent (the other sibling).

Lastly, it is important to note that familial searches can come about two ways -- one, often called "inadvertent partial matches," occurs when investigators search the database intending to find an exact match, but because they use a lower stringency search, it turns up matches that are so closely approximate that the investigator cannot help but wonder whether it is a relative of the source. At that point, the analyst has two choices: she can report the partial matches to law enforcement, or return a report that states that no matches were found. Which of those choices the analyst takes often depends on the policy or laws of the particular jurisdiction. The second method, or "intentional familial searching," is to conduct a search intending to locate relatives. In that case, the very purpose of the search is to identify and convey the names of any potential relatives.

The next section explores the landscape of such searches in greater depth, but it is worth observing that most experts acknowledge that the current iteration of the CODIS software does a poor job at identifying true pivots for a number of reasons.³⁴ Most importantly, because the software was not designed for this purpose, it fails to take into account the wide variation in the popularity of certain allelic combinations as opposed to others. By simplistic analogy, it is akin to running a computer program designed to ferret out names, but that makes no difference between names that have an "X" in them versus those that start with an "X." It thus considers "Alexander" as equally probable a match as "Xenia." To that end, advocates of intentional

³⁴ Steinberger & Sims, *supra* note 25, at 28 ("Research conducted at the DOJ Richmond DNA laboratory has shown that CODIS, in its current configuration, is a very poor tool for finding familial relationships."). That's because "CODIS looks for allele-sharing patterns based on the level of stringency specified in a search, and does not take into account the rarity in the population of a shared allele." *Id.*; see also Dolan & Felch, *supra* note 2; Dolan & Felch, *supra* note 1 (reporting that "[t]he FBI software was not designed to find relatives, and a standard search accidentally eliminates 99.9% of relatives while often fingering people whose profiles are similar by pure chance.").

familial searches have moved toward the development and deployment of more sensitive search tools.³⁵

C. *Familial Searching: Practical and Legal Landscapes.*

Perhaps ironically, the first uses of DNA typing in a forensic context was in fact in a familial context: an immigration case in the United Kingdom used genetic typing to “test of the truthfulness of a claim to family connectedness.”³⁶ The first familial searching, however, did not occur until 2002 in a serial rape case from the 1970s, in which genetic testing led investigators to what turned out to be the son of the perpetrator.³⁷ It proceeded in a somewhat unorthodox fashion: investigators had narrowed a list of potential suspects based on various conventional means, and one of the members of the list was a man by the name of Joseph Kappen. Further investigation revealed that Kappen had since died, but a familial search of the national database produced his son as a possible relative. Based on this information, investigators received permission to exhume Joseph Kappen’s body, and subsequent testing revealed a match.³⁸

After a period of time in which investigators and policymakers contemplated the wisdom of permitting such searches,³⁹ the UK seems to have settled on a policy permitting such searches “only for serious crimes when a full suspect DNA profile is available and where no other match is found in the database.”⁴⁰ There are conflicting reports of the technique’s success. The first conviction based on a familial search occurred in 2004 in a spectacular case in which investigators used the method to find, via his databanked brother, a youth who threw a brick off an overpass, causing a driver to die of a heart attack.⁴¹ One report suggests that as of April 2008,

³⁵ One of the most vocal champions of familial searching, District Attorney Mitch Morrissey, has sated that he is testing software explicitly designed for such searches. <http://projects.nfstc.org/postconviction/presentations/morrissey.pdf>. It seems that he is using a program known as “DNA-View,” <http://dna-view.com/dnaview.htm>, which was developed by a researcher and which Morrissey claims will eliminate 90% of unrelated people.

³⁶ Williams & Johnson, *supra* note 3, at 242.

³⁷ Williams & Johnson, *supra* note 3, at 243.

³⁸ Williams & Johnson, *supra* note 3, at 243.

³⁹ Williams & Johnson, *supra* note 3, at 243.

⁴⁰ *Finding Criminals Through DNA Testing of Their Relatives*, TECHNICAL BULLETIN 40-014 (Chromosomal Laboratories, Inc., Phoenix, AZ).

⁴¹ James M. Curran & John S. Buckleton, *Effectiveness of Familial Searches*, 84 SCI. & JUST. 164, 164 (2008).

eight cases had been solved in this way.⁴² According to another report, of twenty familial searches conducted in 2004, roughly five led to “useful intelligence information.”⁴³ One recent article cited seventy searches since 2004, eighteen of which led to matches and thirteen to convictions.⁴⁴

The picture of familial searching in the United States is considerably less clear. Given diffuse nature of law enforcement in the U.S. and the difference between intentional and inadvertent familial searching, there are numerous dimensions upon which the question might be answered. At a most general level, the practice of familial searching might be divided into formal and informal categories -- the “formal” category comprising jurisdictions that have laws, rules, or policies that expressly authorize or forbid such practices, and the “informal” category comprising those in which no such restraints exist and thus law enforcement local custom or preference prevails. There is also a decided jurisdictional element to assessing the U.S. situation: for the most part, states are guided primarily by their own rules and laws as regards searches done of their own state-level databases, whereas the FBI rules and federal law governs those done of the national database or that cross state borders.

One fundamental starting point, then, is to ask what is permitted nationally. As the introduction relates, until quite recently the FBI forbid states from conducting intentional familial searches in its database.⁴⁵ However, because FBI rules allowed less-than-high stringency searches,⁴⁶ a state might occasionally turn up matches that were strikingly similar, but not identical, to the submitted profile. Because a state may still set its own policies for searches or data disclosure within its borders,⁴⁷ such searches could turn up leads within the state. However, if the partial match was to a profile entered by another jurisdiction, then pursuant to its policy, the FBI refused to disclose the identifying information.

⁴² Ellen Nakashima, *From DNA of Family, a Tool to Make Arrests*, WASH. POST, Apr. 21, 2008, at A01; see also Richard Willing, *Suspects Get Snared by Relative's DNA*, USA TODAY, June 7, 2005 (citing 9 solved cases) [hereinafter Willing, *Suspects Get Snared*]; Richard Willing, *DNA 'Near Matches' Spur Privacy Fight*, USA TODAY, Aug. 2, 2007 (citing 15 cases) [hereinafter Willing, *DNA Near Matches*]; National Policing Improvement Agency, National DNA Database Annual Report, Part III, available at <http://www.npia.police.uk/en/11403.htm>.

⁴³ Williams & Johnson, *supra* note 3, at 243.

⁴⁴ Jeffrey Rosen, *Genetic Surveillance for All*, SLATE, Mar. 17, 2009, <http://www.slate.com/id/2213958/>.

⁴⁵ Rosen, *supra* note 43.

⁴⁶ Normally, at least 10 loci (20 alleles) are needed to search. Seth Axelrad, *State Regulations on Low Stringency/Familial Searches of DNA Databases*, American Society of Law, Medicine & Ethics, available at http://www.aslme.org/dna_04/reports/axelrad1.pdf.

⁴⁷ http://www.nfstc.org/pdi/Subject10/pdi_s10_m02_03.htm.

This conflict led to the situation in Colorado that was described in the opening section; when partial matches turned up in District Attorney Morrissey's cases, he sought and was refused the names of the individuals from the states with their records -- Oregon, California, and Arizona. Thomas Callaghan, the head of the FBI's national DNA database, explained to the media that he denied access due concerns about privacy and fairness,⁴⁸ and worried that it might represent a slippery slope that could discredit the entire CODIS project for a technique of limited utility.⁴⁹ Moreover, he felt that the decision to allow such searches should be made more democratically, commenting that he "would be more comfortable with congressional authorization to conduct familial searches."⁵⁰

As a result of lobbying by D.A. Morrissey, FBI Director Robert Mueller reconsidered. First, in 2006, he implemented an interim policy that permitted states to follow up when they uncovered partial matches by chance, but that still refused to allow intentional familial searching in the national database.⁵¹ At that time, Oregon and Arizona both agreed to cooperate with the Colorado D.A., and turned over the information, but California initially refused.⁵² Ultimately, California also complied, but despite the District Attorney's claims that the three individuals were "likely" related to the perpetrators,⁵³ none of the three leads panned out.⁵⁴ Meanwhile, the FBI undertook a formal reconsideration of its policy,⁵⁵ and although it decided not to reconfigure the CODIS software to enable familial searches,⁵⁶ the present rules remain. Each state may decide whether to conduct a partial match search on its own, and in turn whether to disclose information to outside jurisdictions requesting identifying data as a result of such searches.⁵⁷

Accordingly, the major determinant of the future of familial searching seems to be the practices of the states. For the most part, states seem to have proceeded as usual. Some have

⁴⁸ Nakashima, *supra* note 41.

⁴⁹ Rosen, *supra* note 43.

⁵⁰ Nakashima, *supra* note 41.

⁵¹ Nakashima, *supra* note 41; Rosen, *supra* note 43.

⁵² Dolan & Felch, *supra* note 1.

⁵³ *FBI Shares Near-match DNA With Police*, UPI, Aug. 23, 2006.

⁵⁴ Nakashima, *supra* note 41.

⁵⁵ The CODIS unit of the FBI's Laboratory Services held a symposium on Familial Searching & Genetic Privacy in March of 2008. Rosen, *supra* note 43.

⁵⁶ Rosen, *supra* note 43 (reporting that the working group "provided scientific recommendations about partial matches" to the FBI in July of 2008 but "was silent about whether CODIS should adopt familial searches.")

⁵⁷ Willing, *DNA Near Matches*, *supra* note 41; http://www.nfstc.org/pdi/Subject10/pdi_s10_m02_03.htm ("Each state is responsible for determining its own policies...."). The standards are promulgated by the NDIS Procedures Board, but only the government approved laboratories have access. *See* http://www.nfstc.org/pdi/Subject10/pdi_s10_m02_wc.htm.

always allowed, either through explicit statutory authorization or informal practice, such searches within their own databases. Virginia and Florida, for instance, both allowed state database administrators to disclose information to investigators in the event of partial matches that are “very, very close” or 21 of 26 possible alleles.⁵⁸ Massachusetts and New York both have express statutory approval to conduct partial match searches, although do not regularly do so as a matter of practice.⁵⁹ Other states have provisions that do not expressly permit or forbid such searches.⁶⁰ Denver, the home of D.A. Morrissey, began testing software designed specifically for familial searches in September of 2007, and Massachusetts is reportedly doing the same.⁶¹ North Carolina conducted a familial search as a much-celebrated means of exonerating an inmate wrongfully convicted and sentenced to death.⁶² At present, it appears that only Maryland expressly prohibits intentional familial searching.⁶³

In fact, many states have proved reluctant to engage in regular partial match searching for pragmatic, rather than policy, reasons. Most lack the software necessary to make such searches fruitful, particularly in light of the decision by CODIS administrators not to add such a functionality. In addition, resource constraints operate as a disincentive to pursuing links without greater assurance of a likelihood of success, and the legally ambivalent status of familial searching no doubt causes some investigators to proceed cautiously.⁶⁴ Instead, the more common approach appears to be a less formal, more flexible one in which investigators do not actively pursue partial matches, but may follow up on them should a particularly close matching profile turn up in a moderate stringency search.⁶⁵

However, some of this informality may soon change. In response to the Colorado inquiry, and as a result of intensive lobbying from prosecutors, California radically changed its

⁵⁸ Daniel J. Grimm, Note, *The Demographics of Genetic Surveillance: Familial DNA Testing and the Hispanic Community*, 107 COLUM. L. REV. 1164, 1171 n. 47 (2007); David R. Paoletti, Travis E. Doom, Michael L. Raymer, & Dan E. Krane, *Assessing the Implications for Close Relatives in the Event of Similar But NonMatching DNA Profiles*, 46 JURIMETRICS 161, 163 (Winter 2006).

⁵⁹ Duncan Carling, Note, *Less Privacy Please, We're British: Investigating Crime with DNA in the U.K. and the U.S.*, 31 HASTINGS INT'L & COMP. L. REV. 487 (2008).

⁶⁰ See, e.g., Minn. Stat. §§ 609.117, 299C.155 (neither prohibiting familial searches nor expressly providing for them).

⁶¹ Nakashima, *supra* note 41.

⁶² Carling, *supra* note 58, at 497.

⁶³ Nakashima, *supra* note 41.

⁶⁴ Carling, *supra* note 58, at 497-98.

⁶⁵ Willing, *DNA Near Matches supra* note 41 (citing Virginia “very, very close” standard and Florida example if 21 of 26 alleles match).

position.⁶⁶ California became the first state in the nation to adopt an explicit policy that authorizes and outlines the procedures for intentional familial searches.⁶⁷

Specifically, the policy outlines provisions to govern both the disclosure of information in the case of an inadvertent match of 15 or greater loci, as well as the procedures that must be met in order to engage in an intentional search.⁶⁸ The two procedures are largely overlapping, and in essence provide 1) for such searches only where “all other investigative leads have been exhausted” and the agency is committed to following-up on any new leads; 2) the crime-scene profile is single source (as opposed to a mixture); 3) the crime-scene profile has undergone Y-STR typing, an additional form of typing for male samples;⁶⁹ 4) the search yields a “manageable” number of candidates; 5) the candidates are prioritized according to statistical principles of likely relatedness; 6) the potential pivot persons samples are Y-STR typed and 7) found to be “consistent,” whereupon any additional information of potential relatedness shall be considered; and 8) a committee discusses the case and the decision to disclose, with the Attorney General making a final decision in the event of lack of unanimity.⁷⁰ Since adoption of the policy in April of 2008, the attorney general’s office has authorized two intentional familial search samples; in both cases, subsequent Y-STR typing ruled out the potential pivot.⁷¹

California’s policy is interesting not only because it is the first such policy in the nation, but also in light of its particular contours. First, its legal form is significant: a policy statement crafted by a member of the executive branch, as opposed to a legislative enactment or judicial decision. Second, it is an express policy, which arguably carries with it legally enforceable entitlements, as opposed to informal practices or piecemeal directives. Third, it covers both inadvertent and intentional partial matches. Fourth, it endeavors to limit the cases to which testing applies, for example, that they must be single-source samples where all leads are exhausted. Interestingly, state officials have declared that disclosure is permitted only for “major violent crime where there is a serious risk to public safety,” but that limitation appears to apply

⁶⁶ Dolan & Felch, *supra* note 1.

⁶⁷ Nakashima, *supra* note 41; Steinberger & Sims, *supra* note 33, at 28.

⁶⁸ CALIFORNIA POLICY, *supra* note 2.

⁶⁹ Butler, *supra* note 4, at 206-07.

⁷⁰ Butler, *supra* note 4, at 206-07. In cases of inadvertent matching, the policy specifies that the Y-STR profiles need be “concordant” rather than “consistent,” but it is unclear whether this difference in language was intended to have any significance.

⁷¹ Rosen, *supra* note 43. Y-STR typing apparently also ruled out Morrissey’s initial three suspects. E-mail exchange with Jason Felch (on file with author).

as an express provision of the policy itself only with reference to intentional, as opposed to inadvertent, searches.⁷² The state has also indicated that searches may only be done in convicted offender databases, but since the state began collecting DNA from arrestees pursuant to a proposition passed in 2008 it is unclear whether that line will hold.⁷³

Fifth, the policy endeavors to winnow the number of false matches returned by imposing a requirement of additional testing -- the Y-STR component -- as well as investigative duties should the Y-STR haplotype match. Significantly, this means that the databanked samples -- not the profiles, but the original biological material -- will be subjected to an additional form of testing not expressly contemplated at the time of its approval by courts. Sixth, it provides a final safeguard in the form of committee review before disclosure, which may serve as an indirect means of limiting the volume of such searches. Lastly, Gary Sims, the manager and technical leader of the California Bureau of Justice Services' DNA laboratory casework section, has explained that the state has developed a statistical software application, affectionately known as the "Ratiometer," that accounts for the possibility of "allele sharing" and "the rareness of each shared allele."⁷⁴ This compensates for the deficiencies in the CODIS software as regards familial searching.⁷⁵

The adoption of the California policy, and the determination by the FBI to alter its regulations regarding familial searching, no doubt prefigure an important debate about the desirability of familial search methods. The next two Parts attempt to probe this question in two ways. First, Part Two sets forth normative arguments against the practice of familial searching, some of which turn on empirical assumptions about its fairness and likely utility but most of which rely on purely deontological claims about its justifiability. Part Three then assumes that such searches will be permitted, and probes questions pertaining to the legal framework necessary to safeguard both the integrity of the search process itself, as well as any subsequent investigation or actions undertaken as a result.

II. SHOULD WE ALLOW FAMILY SEARCHES?

⁷² Compare Steinberger & Sims, *supra* note 33, at 28, with CALIFORNIA POLICY, *supra* note 2 (referring only to "violent crime" in describing the values kept in mind during development of the policy, but providing limit only as regards intentional searches).

⁷³ Rosen, *supra* note 43.

⁷⁴ Steinberger & Sims, *supra* note 33, at 31.

⁷⁵ Steinberger & Sims, *supra* note 33, at 31.

Given that familial searching only began in earnest in 2002 in the United Kingdom, it is perhaps not altogether surprising that there remains relatively little discussion of the practice in the academic literature both as a matter of empirical inquiry and legal study. A few treatments examine the British experience,⁷⁶ as have a series of student notes in American legal journals.⁷⁷ More recently, some more substantive pieces about the American experience have been published.⁷⁸ Focusing particularly on the United States, however, there are effectively two cornerstone treatments of the issue, each published in 2006.

The first is a short piece in *Science* magazine that was written by Frederick Bieber (a doctor and medical geneticist at Harvard who has consulted regular with law enforcement on issues related to forensic DNA typing), Charles H. Brenner (a mathematics Ph.D. and visiting scholar in Public Health at UC Berkeley who wrote and licenses software used for familial searching), and David Lazer (a professor at Harvard's Kennedy school of public policy). That article sets forth data that indirectly makes the case for familial search methods, arguing for instance that "kinship analysis ... could increase a 10% cold hit rate to 14% -- that is, by 40%."⁷⁹

The second is a much lengthier and more comprehensive analysis by Stanford professors Henry T. Greely and Joanna L. Mountain (in law and anthropological science and genetics, respectively) and two doctoral candidates at Stanford (in genetics).⁸⁰ That piece similarly marshals probability theory to demonstrate that familial searching could potentially turn up fruitful leads, and then goes on to quickly consider some of the legal and political consequences of such practices. After contemplating the major legal and policy objections previously raised, the article "does not find any persuasive constitutional or policy arguments for prohibiting or

⁷⁶ Carole McCartney, *The DNA Expansion Programme and Criminal Investigation*, 46 BRIT. J. CRIMIN. 175 (2006); Curran & Buckleton, *supra* note 40, at 164; Williams & Johnson, *supra* note 3, at 244.

⁷⁷ Grimm, *supra* note 57, at 1164; Lina Alexandra Hogan, Note, *Fourth Amendment -- Guilt By Relation: If Your Brother is Convicted of a Crime, You Too May Do Time*, 30 W. NEW ENG. L. REV 543 (2008); Kimberly A. Wah, Note, *A New Investigative Lead: Familial Searching as an Effective Crime-Fighting Tool*, 29 WHITTIER L. REV 909 (2008).

⁷⁸ Jules Epstein, *Genetic Surveillance: The Bogeyman Response to Familial DNA Investigation*, J. L. TECH. & POL'Y (forthcoming), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1129306; Henry F. Fradella, *From the Legal Literature: DNA Databases & Familial Searching*, 43 CRIM. L. BULLETIN 7 (2007).

⁷⁹ Frederick H. Bieber, Charles H. Brenner & David Lazer, *Finding Criminals Through DNA of Their Relatives*, 312 SCIENCE 1315-16 (June 2006).

⁸⁰ Greely et al., *supra* note 11, at 248. This article notes that "[t]here appear to be only two ...detailed published discussions" of familial search issues beyond a report issued by the American Society of Law, Medicine and Ethics. *Id.* at 255 (citing a short discussion by David Lazer and Michelle N. Meyer in their book on DNA in the criminal justice system, and a small section of an article by Robin Williams and Paul Johnson about the UK experience with forensic DNA).

greatly limiting the use of this technique as a general matter.”⁸¹ Ultimately, the authors conclude that “family forensic DNA has substantial potential to extend the usefulness of DNA databases in generating investigational leads from crime scene DNA.”⁸²

This Part attempts to enhance this scant edifice of scholarship, largely in support of familial searching, by addressing the major arguments against familial searching. To some extent, arguments about its likely utility or discriminatory potential rest upon empirically testable and alterable facts and thus sit awkwardly among deontological claims about its justifiability. But even though the former concerns could be ameliorated through improved processes (for instance, a scientific technique that could identify a relative and *only* a relative with 90% confidence) or fairer databases (for instance, a universal database or a randomly composed database), I include the full range of issues here in light of the unlikelihood either of a radical change in the state of the science or in the rules regarding database composition. Moreover, to the extent that some such changes might be possible -- such as a law mandating universal collection of DNA -- then the need for familial searching would be eliminated altogether.

Thus, to be clear, this Part explores the legitimacy of familial search practices from a position that assumes that, in essence, familial searches to some degree work. That is, it assumes that it is both theoretically and practically possible to establish the source of genetic material by association to a relative.⁸³ It accordingly assumes, as a scientific and statistical matter, that near-miss matches can point directly enough toward potential perpetrators to be useful, although it will also occasionally generate a limited number of false leads. Part III explores the particular features and characteristics that a familial search policy might possess to ensure its optimal accuracy and efficiency,⁸⁴ but this Part imagines an ideally configured policy that has the potential to identify a limited range of potential pivots that might, in fact, point to the source of the crime-scene sample.

A. Accuracy.

⁸¹ Greely et al., *supra* note 11, at 255.

⁸² Greely et al., *supra* note 11, at 259.

⁸³ I realize this assumption is not non-controversial, *see* Murphy, *supra* note 13 (detailing problems with DNA evidence), but I make it here in order to isolate the problems with familial DNA searches in particular as opposed to DNA typing more generally.

⁸⁴ *See infra* Part III.

Perhaps the first place to begin a critique of familial searching is with the most important question: will it work? Given the just stated premise that this Part assumes, at the most general level, the answer to that question is yes, it may seem odd to pose this question again here. But the question as meant now is not ‘does familial searching have the capacity to accurately identify the source?’ but rather ‘does this capacity have the potential to harm police investigations more than help them?’ That is, the introduction of any new technology creates the possibility of negative externalities. A transit system might install an electronic subway turnstile in order to eliminate human error in toll collection, only to discover that it loses revenue as a result in the rise in fare-jumping absent an employee’s watchful eye. As even advocates of familial searching have observed, “[i]t is certainly possible that family forensic DNA, as a new technological ‘toy,’ [will] be overused at first, potentially at the expense of more effective, but less exciting, investigative techniques.”⁸⁵

The use of effective familial search methods to identify crime suspects likewise has the potential to harm, rather than aid, police investigations. The fear is essentially twofold. First, that familial searching will cause investigators to rely on genetic leads at the expense of more traditional lines of investigation – essentially a fear of over-reliance. This is of gravest consequences in cases -- of which there will be many -- in which the familial lead does not pan out and no source is identified, particularly if critical investigative information is lost in the interim. But it can also be an issue when a source is in fact found, which leads to another concern, which is that second, even in those cases in which the familial lead does end up locating a source, the genetic evidence may have the potential to so dominate and shape the course of any subsequent investigation that it inevitably taints its results.

Indeed, together these two fears can operate in a pernicious fashion: imagine investigators choose to pursue genetic leads at the expense of tracking down eyewitnesses, a far more laborious task with an uncertain payoff. As a result, those witnesses are lost. Even assuming that, say, one of the five familial leads pans out and appears to be a match, the earlier decision is not necessarily vindicated. That source could turn out to be a true source, but not the offense perpetrator (i.e., the DNA matches the worker who was at the home a day earlier installing cable). Even worse, it could be a true source who is not a perpetrator, but who does not have a solid alibi or other clear proof of innocence. Suddenly, every otherwise innocuous

⁸⁵ Greely et al., *supra* note 11, at 258.

fact of the person's life becomes clouded by suspicion. The former concern – over-reliance – thus exacerbates the latter concern -- the well-documented (especially as regards forensic evidence) psychological phenomenon of “confirmation bias,” or the tendency of individuals to view new information in a manner tilted toward their prior expectations.⁸⁶

The scandalous wrongful identification of Oregon attorney Brandon Mayfield as a perpetrator of the Madrid subway bombings provides a helpful illustrative example. When asked by Spanish authorities to help identify the source of prints left near the scene, the FBI erroneously declared a “match” to Mayfield's fingerprints.⁸⁷ As a result, the FBI first placed Mayfield under surveillance and then, lacking sufficient evidence to charge him, held him in prison as a material witness for two weeks.⁸⁸ He was cleared only when foreign authorities disputed the FBI's finding, and the FBI ultimately apologized for its error.⁸⁹ In the interim, however, a damning case against him arose based on otherwise unremarkable facts, such as his conversion to Islam, his advertising his legal services in a magazine owned by a suspected terrorist sympathizer, and his representation as a lawyer of a man who later pleaded guilty to terrorist conspiracy.⁹⁰ Agents appeared untroubled by the fact that a man who allegedly left a fingerprint on a bag in Madrid had never, in fact, been to Spain.⁹¹ In short, investigators could see what evidence confirmed their biases, and ignored that which did not.

The availability of familial search methods may likewise lead to sloppier investigative work. As one police officer in the United Kingdom candidly revealed, “You can slip into this lazy approach that ‘we've got DNA we needn't bother doing the rest of the work.’”⁹² The availability of genetic leads can end up skewing the investigation -- officers may focus upon the suspect identified genetically, as opposed to ferreting out and following up on leads from more traditional sources. The potential to allow the DNA to “lead the way” at early critical stages of

⁸⁶ David Faigman, *Anecdotal Forensics, Phrenology, and Other Abject Lessons from the History of Science*, 59 HASTINGS L.J. 979, 989 (2008) (noting that “anecdotal forensics may be particularly susceptible to confirmation bias”); Paul C. Giannelli, *Wrongful Convictions and Forensic Science: The Need to Regulate Crime Labs*, 86 N.C. L. REV. 163 (2007); D. Michael Risinger, Michael J. Saks, William C. Thompson & Robert Rosenthal, *The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 CALIF. L. REV. 1 (2002); see also McCartney, *supra* note 76. *The DNA Expansion Programme and Criminal Investigation*, 46 BRIT. J. CRIMIN. 175 (2006).

⁸⁷ Ronald L. Carlson, *Distorting Due Process for Noble Purposes: The Emasculation of America's Material Witness Laws*, 42 GA. L. REV. 941, 969 (2008).

⁸⁸ Carlson, *supra* note 87.

⁸⁹ Carlson, *supra* note 87, at 969.

⁹⁰ Carlson, *supra* note 87, at 969.

⁹¹ Carlson, *supra* note 87, at 969.

⁹² McCartney, *supra* note 76, at 185.

an investigation may result in the loss of investigative leads with a greater likelihood of leading to an actual perpetrator in cases where familial searching fails. As one commentator remarked, “[t]here tends to be a reliance on forensic evidence in terms of once you have it, other avenues aren’t followed up.”⁹³

Such tainting can happen either intentionally or unintentionally, as in the case of confirmation bias. Given a genetic clue, or even a true source, investigators may overemphasize ambiguous evidence, or fail to pursue lines of investigation that seem inconsistent with that lead.⁹⁴ Or investigators may actively ignore contrary evidence. Again, the harm can occur either when officers fail to pursue viable leads as a result of the availability of genetic ones (and then, once the familial leads fail, such evidence is lost), or when officers locate a source and jump to the conclusion that the source must be the perpetrator. Indeed, officers may rely on the evidence so much that they inadvertently create false supporting evidence. As one commentator observed, “[p]olice officers can rest on their laurels if they get a forensic hit Anecdotally, they will put it to the offender and hope to get an admission out of it.”⁹⁵ If the familial search turns up a source, and officials credit coincidentally incriminating circumstantial evidence, then they might apply pressure to extract a confession or secure a plea bargain.

Apart from the possibility of erroneous targeting or, even worse, conviction of innocent individuals,⁹⁶ the overreliance and bias effects of genetic evidence may on their own contribute to the diminution of other, more traditional policing skills. That is, it is not just a matter of *wanting* to investigate without technology; it is an issue of an officer’s capability to do so. Good interviewing skills, creative problem-solving, and other softer forms of investigative technique are not as easy to come by as a simple radio call to the crime scene technician. Without robust exercise and training, such expertise may diminish. Scholars of policing already lament the loss of the “beat officer” who pounded the pavement and knew the neighborhood; now even the patrol cop could be replaced by the laboratory analyst. As one commentator has observed, “there is a risk that faith in forensic science has been too easily used to shore up falling confidence in

⁹³ McCartney, *supra* note 76, at 185.

⁹⁴ This may be particularly true as DNA typing increasingly is done at the scene of the offense itself, and results and database-searching are contemporaneous to scene processing. Murphy, *supra* note 13, at 733 (discussing miniaturization processes).

⁹⁵ McCartney, *supra* note 76, at 185.

⁹⁶ McCartney, *supra* note 76, at 185 (“Erroneous police conclusions at the early stages of an investigation can lead to wrongful prosecutions and convictions....”).

police investigative competence without questioning the fallibility and shortcomings of applying the technique.”⁹⁷

But of course, this particular criticism could be said to apply equally as well to exact forensic DNA searches as it does to familial searching, and I do not mean to suggest that we should wholly discontinue the use of DNA evidence. But it is one thing to say that the probative value of DNA typing in cases in which it returns a exact hit, with a high probability that the person identified is the source, is so strong that it justifies the attendant risks of bias or overreliance. It is another to say that familial searches that can only gesture toward a range of possible suspects should be routinely allowed, especially in cases where it may shape the course of an investigation. Familial searches can create the false appearance of a finite pool of suspects, which in turn offers the opportunity to cherry pick suspects according to potentially dubious criteria.⁹⁸

Of course, this can happen in any investigation based on partial information. Some might even say that the very uncertainty will cause officers to act with circumspection in conducting additional investigation, whereas such biases might be more pronounced where there is only one suspect. But in this regard it is important to note the particular salience of the fact that the delivery mechanism is technology. An officer intuitively knows just how valuable a suspect description of “brown hair, brown eyes” is, and how far to push the envelope in investigating persons matching that description. When a computer churns out a list of names based on genetic ties, however, the officer might not know exactly how far such information ought to be taken.

Similarly, the very cumbersomeness, and unclear benefit, of pursuing partial leads -- because it is unclear how useful the results will be -- serve as an inherent safeguard against excessive reliance on them. The officer met with the “brown hair, brown eyes” description goes out and looks for more witnesses, or the cop with only two digits of a partial plate spends time

⁹⁷ McCartney, *supra* note 76, at 189.

⁹⁸ It does not matter that, eventually, officers might be able to definitively ensure that the relative is in fact the source. Think about the Supreme Court’s treatment of a less sophisticated technology: the dog sniff cases. Suppose a dog improperly alerts to the presence of narcotics in a trunk 5% of the time. We might nevertheless permit the practice, because the intrusion that follows (say, seizure and arrest) seems a reasonable exchange for the law enforcement benefit. It is not relevant that through chemical testing we will be able to ensure post hoc sorting of the 100% of the false identifications; the question is not the post hoc sorting method, but the ex ante authorization of the intrusion. On the other hand, if the dog alerted incorrectly 50% of the time, then even the same level of intrusion would be untenable. Again, it is simply not relevant that post hoc there would be effective means of ensuring that those wrongfully suspected were fully exonerated; the question is whether the initial intrusions should be encouraged at all.

gathering more useful information before turning to that as a last resort. But the ease at which a familial lead can be extracted, and the clear and easy path of investigation it sets out, is the very essence of the danger. Familial searching effectively offers little more than does a drunken, unreliable informant who spits out ten names and says one of them has a brother who did it. It may be the case that in one in ten instances a name pans out to be correct, but that doesn't mean that following up on that information, at the expense of more difficult but also more reliable routes, should be the top priority for law enforcement. The problem with familial DNA typing is that the drunk comes dressed up in the omnipotent robes of technology, and so investigators may find it difficult to relegate it to the rear reserves.

B. *Privacy.*

Of course, some police officers might respond that in a case that is significant enough, and cold enough, even the names spewed by a drunken and unreliable snitch will be something to go on. Even so, accuracy is not the only potential problem raised by familial searching. Perhaps even more significant to most people is the concerns surrounding privacy. Specifically, the most affected interests will be those of 1) individuals in the databases, distinguishing between true pivots and false pivots; 2) innocent relatives, who become suspects as a result of the pivot; and 3) the source.

1. *Databased persons.*

With regard to the individuals in the database, it is clear that familial searching represents an additional intrusion on their interests. When courts ruled upon the constitutionality of collecting DNA samples from convicted offenders, they almost uniformly specifically noted that the information collected was "junk" that revealed no information beyond the offender's identity.⁹⁹ The use of familial searching techniques upsets that assumption in two fundamental ways.

⁹⁹ See e.g., *United States v. Kincade*, 379 F.3d 813, 818 (9th Cir. 2004) ("The Bureau analyzes the presence of various alleles located ... on DNA present in the specimen. These STR loci are each found on so-called 'junk DNA'-that is, non-genic stretches of DNA not presently recognized as being responsible for trait coding-and 'were purposely selected because they are not associated with any known physical or medical characteristics.' H.R.Rep.

First, the state has effectively changed its technique of identifying persons from using social security number to using a family tree. Some may say that such relationships are easily uncovered regardless, and it may be that in many cases this would be true. Identifying an individual certainly is the first step in finding out the identities of that person's blood relatives. But in many instances, knowledge of one person's identity does not in fact reveal biological ties. Officers may out of the blue come knocking on Pivot's wife's door to collect samples from Pivots two sons, only to discover that Pivot's son is not in fact his own. Maybe officers will tell Pivot; maybe they won't. Maybe officers will tease Pivot subtly, or make insinuations; maybe they will forget they ever learned any information. The bottom line is that DNA will have been used, and generated, information far beyond simple identification. And, of course, when the son of Pivot's Old Flame is ultimately arrested for the crime, Pivot's wife may start to wonder.

Secondly, in order for DNA familial searching to be even remotely useful, a second round of genetic testing must be conducted upon samples to help winnow the number of false pivots. For instance, using only the thirteen core CODIS loci, familial searches for fifteen allele matches are apt to turn up anywhere from 1600-4200 potential pivots in a database the size of California's.¹⁰⁰ In order to reduce that to a plausible number for investigative purposes, such as 25 or fewer, then a second kind of genetic testing must be used.¹⁰¹ Most commonly, this secondary round looks at additional loci that descend patrilineally, called Y-STR testing,¹⁰² but other forms are also available.¹⁰³ But again, the state did not win approval for the forcible collection of genetic material from individuals with a carte blanche to thereafter subject that

No. 106-900(I) at *27.”); *United States v. Reynard*, 473 F.3d 1008, 1016 (9th Cir. 2007) (internal citations and quotations omitted) (“DNA samples in CODIS are composed of genetic markers (known as ‘junk sites’) which are purposely selected because they are not associated with any known genetic trait.”); *Nicholas v. Goord*, 430 F.3d 652, 670 (2d Cir. 2005) (“The junk DNA that is extracted has, at present, no known function, except to accurately and uniquely establish identity.”); *United States v. Amerson*, 483 F.3d 73, 85 (2d Cir. 2007) (“The so-called ‘junk-DNA’ sequences stored in CODIS are not currently associated with any known physical or medical characteristics.”); *United States v. Weikert*, 504 F.3d 1, 3 (1st Cir. 2007) (internal citations and quotations omitted) (“Profiling is performed using only so-called ‘junk DNA’-DNA that differs from one individual to the next and thus can be used for purposes of identification but which was purposely selected because [it is] not associated with any known physical or medical characteristics.”).

¹⁰⁰ Yun S. Song, Erin E. Murphy & Montgomery Slatkin, *Statistical Implications of the California Familial DNA Search Policy: Number and Ethnic Distribution of False Leads* (unpublished manuscript, on file with author); Greely et al., *supra* note X, at 252 (noting that “the chance that two unrelated people match at thirteen or more sites with every marker having at least one match ... is about one in two thousand,” which in a database of 2.75 million profiles, generates “roughly 2,000 to 3,000” spurious matches for a genotype of average frequency).

¹⁰¹ *Id.*; see also Bieber, *supra* note X (estimating that a “seven-locus Y-STR haplotype analysis on the crime scene and the list of database leads would eliminate 99% of those not related by male lineage”).

¹⁰² Song, et al., *supra* note 100.

¹⁰³ For instance, single-nucleotide polymorphisms, or SNPs, might also be examined. Bieber, *supra* note X.

material to whatever genetic tests it should develop. Indeed, again, the narrowness and substantive uselessness of the specific type of test approved -- STR typing of the 13 CODIS loci -- was a critical component in the reasoning of courts upholding collection statutes against constitutional challenge.¹⁰⁴ Yet Y-STR testing indisputably reveals biological relationships, and has been shown to have strong probative value even for identifying possible surnames.¹⁰⁵ The “junk,” then, is no longer as junky as the government initially contended.

But the state should not be allowed to acquire approval for potentially intrusive genetic testing practices by resting on the premise that it is no more than “junk” at issue, only to then begin down the slippery slope of manipulating the genetic material to uncover -- both via additional testing of samples and expansive searches in databases -- additional personal information. Such “function creep” risks in technology, especially as regards the government, have been well-documented.¹⁰⁶ Simply because the government may easily conduct the intrusive measure without public fanfare does not constitute authorization to do so. For instance, it would be improper for the government to represent to a court that the use of a technology did not violate the Fourth Amendment (say, a body-scanner that revealed only the presence of illicit narcotics) because it revealed no sensitive information, and then continue to use that technology to garner protected information (say, body-scanner 2.0, which also renders a naked visual image of the individual) claiming that it had already been constitutionally approved.

Indeed, the director of the FBI’s database seemed to acknowledge as much when he determined to leave to legislative judgment (and presumably, then, to more open constitutional challenge) the question whether familial searching should be allowed. Most states and the federal government are presently permitted to store the DNA samples, and thus entire genomic code, for certain individuals. But what they may do with that sample should be lawfully and rigidly circumscribed, and at the very least the background assumption should be that it is not permissible to begin forms of testing that are neither statutorily nor judicially authorized.

¹⁰⁴ Williams & Johnson, *supra* note 3, at 551 (noting that sample retention arguments were based on “quality assurance purposes, to resolve any subsequent disputes about the processing of samples in particular cases, and to facilitate any re-profiling that may become necessary if the current methodologies change....”)

¹⁰⁵ Uta-Dorothee Immel, Michael Krawczak, Jürgen Udolph, Angela Richter, Heike Rodig, Manfred Kleiber & Michael Klintschar, *Y-chromosomal STR Haplotype Analysis Reveals Surname-associated Strata in the East-German population*, 14 EUROPEAN JOURNAL OF HUMAN GENETICS 577 (2006).

¹⁰⁶ Carling, *supra* note 58, at 501; Tania Simoncelli & Barry Steinhardt, *California's Proposition 69: A Dangerous Precedent for Criminal DNA Databases*, 34 J. L. MED. ETHICS 199, 203 (Summer 2006)(detailing how “databases created for one discrete purpose, despite the initial promises of their creators, eventually take on new functions and purposes”).

Lastly, it should be added that the DNA databases are not entirely composed of convicted offenders. Many states now include arrestee profiles, for instance. However, even setting aside all of those once suspected or convicted of a crime, there remain individuals who either submitted DNA samples voluntarily for some reason (for instance, in a DNA dragnet or other investigation designed to catch an offender), or even as victims of crime. In one notable case, a familial search identified the brother of a victim as the perpetrator of other crimes.¹⁰⁷ In such instances, the privacy intrusion is particularly profound, and risks compromising any good will between the individual and the state, since as a result of either prior victimization or voluntary cooperation, the individual has in turn exposed a relative to suspicion or apprehension.

2. *Innocent relatives.*

Of course, even if the use of convicted offenders' stored DNA to conduct tests determined to identify their relatives should be deemed constitutional as a matter of privacy as regards those offenders, it is not at all clear that it should be so as regards the innocent relatives. In a sense, familial searching amounts to a law that says "Any convicted offender can be compelled to disclose a portion of the genetic identifiers of that offender's biological relatives, along with their identities, for purposes of entry into a national database." While we might not worry about the offender's privacy, we certainly might be concerned for his father, mother, brothers, sisters, and children.

Naturally, convicted offenders routinely disclose the identities of their relatives for purposes of supervision and monitoring. But it should be noted that several important practical limitations circumscribe the nature of such disclosures. First, just because the probation office may have the name of the offenders' family does not mean that the sheriff's department does. As a matter of institutional design, the entities of law enforcement that come into contact with such personal information may be significantly limited. Secondly, such information will inevitably be disclosed as a matter of social, as opposed to biological, construction of families.¹⁰⁸ That is, an offender is unlikely (and in fact, may be unable) to give the name of the father he

¹⁰⁷ Nakashima, *supra* note 41.

¹⁰⁸ Williams & Johnson, *supra* note 3, at 554; Erica Haimes, *Social and Ethical Issues in the Use of Familial Searching in Forensic Investigations: Insights from Family and Kinship Studies*, 34 J.L. MED. & ETHICS 263, 269 (2006)..

never met, or the sons he doesn't raise, or even the sister who refuses to talk to him. Law enforcement is unlikely on its own, even, to come across that information. But the genome will speak for itself. It will tell the police not only that the missing father is, as it turns out, probably the neighbor who has been in prison since a year after the offender was born, but also that he may very well have another brother who lives across the country, whom he did not even know about.

In addition, even if criminal justice entities have other means of acquiring information about biological relatedness, they rarely if ever use such information as a means of making a suspect out of those individuals. A person never before in jail is rarely identified as a possible suspect solely by virtue of his brother's criminal record, and law enforcement does not typically look to genealogy as a means of solving the typical case (certainly not non-domestic cases, in any event). Simply as a practical matter, the use of genetic databases to conduct familial searching takes information otherwise collected for innocuous reasons (the names of relatives) and renders it explosively intrusive. The purpose of acquiring the information changes from who is this random offender's brother (in case I need to find the offender) to who is this random offender's brother (because maybe he committed my unsolved crime!).

And, of course, in order for investigators to determine if the brother is in fact the source, they will inevitably need to subject many wholly innocent relatives to the kinds of investigative intrusions that every citizen fears. Simply put, investigative policing is not a cost-free exercise. It creates a stigma to live under a cloud of suspicion, even if that cloud is ultimately definitively lifted. Just ask Richard Jewell (the wrongly identified Atlanta bomber) or Stephen Hatfill (the wrongly identified anthrax mailer) or the members of the Duke lacrosse team (falsely accused of rape). Even mere suspicion, quickly dispelled, has the potential to disrupt a career, destroy a marriage, or ruin a life. That is why we rely upon the laws -- both those made by humans and those made by nature -- to circumscribe the capacity of police officers to intrude upon individuals. We trust that as a matter of efficiency, for instance, law enforcement will focus their attention where the most credible suspicion lies. And as a function of reality, we anticipate that they will not have the time, resources, or inclination to look much more broadly than that. DNA databasing upsets those assumptions, and renders fairly intrusive search methods easy and readily available. While that might be acceptable where the result is highly likely to be probative (such as in the case of a exact match search), it is less obviously desirable in the case where the

results will be significantly less probative because they are certain to include false starts (such as familial searches).

Of course there are laws and limits upon what officers may demand, but some of those limits are not yet fully clear. Certainly nothing stops investigators from showing up at one's home or place of work asking for a DNA sample and where you were last week. Moreover, it is an open secret that we do not truly expect our constitutional procedural entitlements to operate in full opposition to ordinary policing. Indeed, as some advocates of familial searches have written, "[b]eing compelled to assist in the criminal justice system, in this or any other way, may be annoying, but it is common."¹⁰⁹ But it is one thing to know that your cooperation is likely to be sought should you be so unlucky as to witness a crime or fall under suspicion in some way; it is another thing to say that, by virtue of your brother's criminal record, you will be an automatic candidate for the position of perpetrator and asked to hand over your genetic code.

It is in this respect that identification as a suspect via a familial search differs most materially from identification through some other means. Witnesses typically do not name twenty or twenty-five potential perpetrators, and if they do, police officers certainly would raise an eyebrow before following-up on all of them with anything more than the most rudimentary of checks. But the first and easiest resort when the genetic finger is pointed is to get a DNA sample from any possible suspects. That alone constitutes a level of intrusion -- particularly when the government is retaining those samples and constantly shifting its story about what it will do with them -- to generate reasonable alarm. And, to the extent that the alternative may be to let some crime go unsolved, it should be observed that innocent relatives should stand on entirely equal footing to innocent victims of crime. Both have equal moral claims to the interest of security and liberty, whether from the perpetrators of crime or from the state itself.

3. *The source.*

Of all the affected interests, perhaps the least sympathetic is that of the source. After all, the source -- the person who actually left the crime-scene sample identified through a familial search -- may be the criminal offender. It is certainly difficult to get too worked up about

¹⁰⁹ Greely et al, *supra* note 11, at 256.

anyone's privacy rights when they have seemingly broken or disregarded the laws safeguarding the security of society.

But if it is hard to muster much empathy for the source who turns out to have perpetrated the offense, then imagine instead the source who did not. That is, in many cases, it may be that the source of the genetic material is not, in fact, the perpetrator of the crime. Some times that may be obvious -- maybe the source has an innocent explanation or a rock solid alibi, such as the case of the woman identified by DNA evidence who later turned out to have been in jail in another state at the time of the crime. Maybe the source will be facially implausible -- such as the case of the man whose DNA was found on a rape-murder victim in a city to which he had never traveled, and who it was revealed was four years old at the time of the offense. Maybe even the source will simply not seem to match up in any plausible way, such that investigators determine that the lead is simply no good.

But surely in a not insignificant number of cases, identification of the source may start the process of police collection of corroborating evidence. And this, of course, simply returns to the dangerous specter of excessive reliance and confirmation bias discussed in the previous section.

C. Circumvents and Eliminates Democratic Accountability Over Proper Scope of Database.

Closely related to individual liberty concerns about the privacy interests of those persons affected by allowing familial searches are democratic accountability concerns about the quality of public debate concerning the scope of the databases. DNA databases are, for the most part, a creature of legislative enactment. The federal government and each of the fifty states have laws that set out exactly who should be required to submit genetic material for testing.

The significance of this debate is underscored by the seeming pervasive and profound resistance to population-wide databases. The definitive call for a population-wide database was sounded first by Professors David Kaye and Michael Smith, when they argued in 2003 that "settling for a DNA identification database restricted to convicts, or to convicts and arrestees, is sure to aggravate racial polarization in society, undermine the legitimacy of law and law enforcement, and further compromise public safety by halting far short of the deterrent and

investigative capability that a population-wide database would afford.”¹¹⁰ At the same time, however, they acknowledged that public opposition to mandatory DNA collection would be strong.¹¹¹

In fact, there is something to be learned from the fact that DNA collection has been a steadily expanding category over the past few years. Initially, DNA databases mandated sample collection from only those convicted of serious felonies.¹¹² Then it expanded to include all felons, then all those convicted, and now in some places, arrestees.¹¹³ Yet throughout those expansions, there has remained a strong firewall between general population coverage. This suggests that strong sentiment exists against a database that includes those who have never been accused or convicted of criminal activity in any fashion.¹¹⁴

But, of course, familial searching effectively creates a database of just (some of) those individuals. As the American Society of Law, Medicine, and Ethics wrote in a report it prepared on the issue, “[l]ow stringency searches are an implicit database expansion that should be open to public debate.”¹¹⁵ Familial search policies represent an end run around database inclusion statutes in multiple ways -- they widen the size of the database by effectively including relatives within it; they widen the ways in which the government may use mandatory DNA samples by authorizing additional forms of identity testing on already-tested samples; and they widen the nature of the information exposed by the “junk” the government collects.

The lack of public debate is not just troubling because it represents an end run around societal expectations of the scope of the database. It is also a concern because the differences in the repercussions of familial searches conducted pursuant to various parameters can be extreme. As previously noted, a search conducted using only the core CODIS loci tends to generate a large number of potential pivots, whereas an additional layer of testing narrows that number down significantly. Similarly, policies might vary dramatically in terms of the conditions

¹¹⁰ D.H. Kaye & Michael E. Smith, *DNA Identification Databases: Legality, Legitimacy, and the Case for Population-Wide Coverage*, 2003 WISC. L. REV. 413, 459 (2003).

¹¹¹ Kaye & Smith, *supra* note 108 at 437.

¹¹² Simoncelli & Steinhardt, *supra* note 104, at 202-03

¹¹³ Simoncelli & Steinhardt, *supra* note 104, at 202-03.; see Erin Murphy, *Paradigms of Restraint*, 57 DUKE L.J. 1321, 1329-30 (2008).

¹¹⁴ In fact, the European Court of Human Rights ruled recently that even inclusion of arrestees in the United Kingdom’s database violated its privacy protections. *S. & Marper v. United Kingdom*, Eur. Ct. H.R. 1581 (2008), available at <http://www.bailii.org/eu/cases/ECHR/2008/1581.html>.

¹¹⁵ Greely et al., *supra* note 11, at 255 (DNA Fingerprinting and Civil Liberties Project, *Report of Workshop 2*, available at http://www.aslme.org/dna_04/work2/report.php).

imposed prior to authorization of such searches or the release of potential pivot names (relating, for instance, to the seriousness of the offense or the existing of alternative routes of investigation). Lastly, and perhaps most significantly, the fact that familial searches replicate ethnic and racial biases in the criminal justice system -- as explained in the next sub-part -- raises serious concerns about actual and apparent fairness. Given the wide range of choices entailed even for those jurisdictions that choose to allow familial searches, it is only appropriate that such decisions be made with public notice and assent.

D. *Concerns Related to Actual and Apparent Ethnic and Racial Discrimination.*

Perhaps loudest among the chorus of concerns raised by familial search testing is the fear of real or apparent ethnic or racial bias. As Jennifer Mnookin eloquently observed in an op-ed against familial searches, familial searches are already “discriminatory” in that they make becoming a suspect of a crime turn on no more than the “bad luck [of having] a close relative who has been convicted,” but that effect is “exacerbated because African Americans and Latinos make up an outsized portion of the DNA database compared with their proportion in the public at large.”¹¹⁶ Even advocates of familial searching have agreed that “[f]amilial searching potentially amplifies . . . existing disparities” in the criminal justice system.¹¹⁷

Efforts to quantify the exact racial or ethnic impact of familial searching have until recently proved elusive.¹¹⁸ Most commonly cited is a figure arrived at by making a series of assumptions that combine the ethnic make-up of the databases along with assumptions regarding family structure, which concludes that “more than four times as much of the African-American population as the U.S. Caucasian population would be ‘under surveillance.’”¹¹⁹

In fact, new research reveals a slightly more complicated picture. Again, the precise nature and degree of the bias depends in large part upon the demographics of the locality, along with the specific contours of the familial search policy. Our recent study of the California familial search policy, for instance, shows that the measurement of the discriminatory effect on average turns in significant part upon the use of the Y-STR winnowing test in addition to the

¹¹⁶ Jennifer Mnookin, *The Perils of Expanding DNA Searches to Relatives*, UCLA TODAY, July 5, 2008.

¹¹⁷ Bieber, *supra* note 79.

¹¹⁸ One student note even argued that the impact was likely to be greatest for Hispanics, because they tend to have larger family structures. Grimm, *supra* note 57.

¹¹⁹ See Greely et al., *supra* note 11, at 259.

ordinary thirteen CODIS loci partial match search.¹²⁰ Specifically, we demonstrate that “[i]n California, a familial search of a convicted offender database will on average generate leads that skew attention away from Asian-Americans, and towards Hispanic Americans,” while also creating “important, although less dramatic, increases ... in the fraction of European and African Americans that will be falsely identified.”¹²¹ Importantly, these biases can operate even when, as a matter of probabilities, the genetic profile suggests that the perpetrator belongs to an ethnic group different than the one for whom the most possible pivots will be returned.¹²²

Clearly quantified evidence of racial and ethnic bias in the results of familial searching should alone be enough to disqualify it as an acceptable tool of investigation. As even advocates acknowledge, such concerns “may make the use of this approach unacceptable.”¹²³ While some have argued that a strict scrutiny race-based Equal Protection Claim may be difficult to make in light of the jurisprudence distinguishing disparate impact from intentional discrimination,¹²⁴ the fact that officers deliberately rely without reason on a skewed database might alone be enough to infer intentional discrimination. After all, it is as though the police acknowledged that a blind witness said the suspect was named Jim Jones, but officers intentionally used only the database for African-Americans to follow-up. Moreover, even if a race-based claim failed, it may still offend rational basis review, and also violate due process, to rely upon a database that will affirmatively lead investigators away from suspects belonging to the ethnic group most statistically likely to have committed the offense.¹²⁵ What could be more arbitrary and capricious than an officer pursuing investigative leads based only on a database that it knows will likely point them in the wrong direction?

Moreover, it is not just the demonstrated likelihood of actual ethnic discrimination that argues against familial searching, it is also the dangerous inscription of apparent biases. Beyond the substantiated notion that such searches would create suspects along ethnic lines in deceptively disproportionate ways, they also risk bolstering criminogenic views of racial or familial associations.¹²⁶ It may well be the case that “[s]tudies clearly indicate a strong

¹²⁰ Song, et al, *supra* note 100.

¹²¹ Song, et al, *supra* note 100.

¹²² Song, et al *supra* note 100

¹²³ Greely et al., *supra* note 11, at 255.

¹²⁴ See Greely et al, *supra* note 11, at 259.

¹²⁵ Gerald Gunther, *In Search of Evolving Doctrine on a Changing Court: A Model for A Newer Equal Protection*, 86 HARV. L. REV. 1 (1972).

¹²⁶ Haines, *supra* note 106.

probabilistic dependency between the chances of conviction of parents and their children, as well as among siblings.”¹²⁷ Yet it is one thing to acknowledge that reality with an appreciation of the “complex role of genetics, environment, and society in criminal behavior,”¹²⁸ and quite another to capitalize upon it formally as a means of setting investigatory priorities. Certainly a police department should draw criticism if it announced a policy of focusing primary attention in all cold cases upon minority males, even if it is true statistically that their rate of offending is disproportionately higher. Similarly, a policy that in essence says it will draw its suspects from a tainted pool should not be excused simply because it laments that there is not cleaner water.

E. *Undermines State’s Collateral Interest in Intact Families.*

Even apart from the state’s interest in both actual and apparent even-handedness in enforcing the law, the state also has an interest in maintaining and promoting intact, healthy family units. Family integrity and privacy are cornerstone constitutional values. Statutorily, many jurisdictions honor those interests by protecting those in certain familial relationships from having to testify against one another.¹²⁹ Yet as one commentator has acknowledged, “[s]imply implicating family members in an investigation where a relative (genetic or social) might be involved is likely to have profound social, cultural and physical impacts on that family.”¹³⁰

Many families may have already suffered tremendously as a result of their related convicted offender’s actions. Perhaps they incurred financial losses as a result of legal costs or thefts, or emotional losses due to incarceration or abandonment or betrayal. Perhaps members of the family themselves were victims of the offender -- in 2005, for instance, roughly half of violent crime occurred between non-strangers, and roughly 26% of female victims were victimized by someone intimate or related to them.¹³¹ Imagine the molested child of a sex offender confronted with a knock on the door because the DNA of the father he has no desire ever to remember has a genetic profile that suggests that he may have committed some offense. Or the parents of a family torn apart by their youngest son’s drug habit, that now must deal with

¹²⁷ Bieber, *supra* note 79.

¹²⁸ Bieber, *supra* note 79.

¹²⁹ Georgetown Law Journal Annual Review of Criminal Procedure, *Grand Jury*, 37 GEO. L.J. 233, 250 & nn. 806 & 810 (2008) (listing privileges).

¹³⁰ Haines, *supra* note 106, at 269.

¹³¹ U.S. DEPARTMENT OF JUSTICE, BUREAU OF JUSTICE STATISTICS, CRIMINAL VICTIMIZATION, 2005, BULLETIN NCJ 214644, p. 9, Table 9 (2006).

an intrusion by investigators asking for genetic samples from his three straight-A siblings. These scenarios may seem fantastic, but in all likelihood they are not. Criminality can tear families apart, and if the state conducts familial searches as a means of finding possible suspects, it does so with a strong likelihood of inflicting further damage.

Even in families in which the offender's position is reconciled, familial searching effectively turns convicted offenders into involuntary genetic informants. Of course, in cases in which the pivot turns out to point to the source, and the source is in fact the perpetrator, our sympathies may be hard won. But the nature of familial searching means that many potential pivots will prove to be false leads -- *after* a measure of investigation has occurred. Surely it will negatively effect the relationship between innocent relatives and the convicted offender when the relatives, by virtue of nothing other than the biological connection, find themselves suspected of a crime they did not commit. In those cases in which the relatives all prove entirely innocent, familial searches thus have the potential to sow tremendous rifts within families for no reason whatsoever. Moreover, although family relationships may serve as a basis of investigation in other contexts, they typically are not the *sole* basis (i.e., absent motive, opportunity, etc.) for suspecting an individual of an offense.¹³²

Lastly, it is worth noting that even in cases in which the pivot turns out to point to the source, there may nevertheless be innocent familial victims. For instance, take the first successful familial search in the United Kingdom, described in Part I.C. There, the crime had occurred thirty years earlier, but a familial search in the database turned up the pivot as a potential biological link. When the pivot turned out to have a father on the original list of 500 suspects, but who had since died, investigators first asked his widow and siblings for DNA samples. Based on that, they then received permission to exhume the body.¹³³ Testing revealed a match. On the one hand, this story marks a powerful tale of persistent investigation and undoubtedly provided a great sense of achievement for law enforcement and peace and closure for the victims' families.

But what about the widow, or the children of the deceased man? It would of course be lamentable if the exhumation had revealed that the father was not in fact the source. It might

¹³² *But see* Greely et al., *supra* note 11, at 256-57 ("We have found no general rules, or even any discussion, of whether family relationships may be considered in criminal investigation. It seems assumed that the fact of a family relationship may sometimes be a relevant, and useable, fact for police or other investigation.").

¹³³ Williams & Johnson, *supra* note 3, at 554.

even be the case that, in fact, there is an innocent explanation for the genetic link -- but with the accused long gone, he will be hard pressed to defend himself in a court of law. But even assuming the deceased man was the true perpetrator, what about the family members' own experiences of the incident. What if they were utterly unaware that their father had committed such a horrible offense? Are not the innocent children and the widow of a perpetrator also victims as sympathetic as others more directly harmed? Is it definitely clear that there are not meaningful costs to them of having their entire understanding of their family, and the public perception of it, upset long after there is any need for incapacitation or deterrence? Shouldn't their interests at least enter the calculus for consideration, even if in some cases it might not prevail? This is not to trivialize the victim's interest in finality and closure, but merely to acknowledge that it can come at the expense of inflicting trauma on other innocents.

F. *Concerns Related to Human Dignity.*

Lastly, and perhaps most elusively, is the question of dignitary interests. Much effort has been expended to capture the precise nature of the harm caused by the reduction of complex human relationships and contextual environments into cold, mechanical facts.¹³⁴ There may be incredible utility in deploying a range of technological methods for optimizing criminal enforcement. We are already moving toward a society in which the watchful eyes of cameras and radio frequency ID tags capture our every movement,¹³⁵ and we can easily imagine a brave new world in which the lab coated technician becomes more important than the street-walking beat officer.

But while the arguments for deploying technologies may be strongest when done either universally or exceedingly targeted, they are weakest when done in a piecemeal, incomplete fashion. That is, it is one thing to put cameras on every corner, or perhaps even to put cameras on every high-crime corner. It is another thing to put cameras aimed only at the family door of every home in which lives a previously-convicted offender. There is something demeaning to individuality to turn something as grave as being suspected of a crime on nothing more than

¹³⁴ Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1376 (1971); see also Christina M. Mulligan, *Perfect Enforcement of Law: When to Limit and When to Use Technology*, 14 RICH. J.L. & TECH. 13 (2008).

¹³⁵ Murphy, *supra* note 111 at 1325-26.

relatedness probabilities. Again, to put it in simple terms, we might feel vaguely comfortable allowing police to knock on brother's door if the eyewitness reported that the perpetrator "wasn't Guy, but looked like him." But would we want officers to haul him down to the precinct for a line-up based on that? And yet isn't that precisely what a genetic test would be -- a line-up not just in that case, but in every case thereafter (in the likely event that the profile then went into the database). To brand someone a suspect on so little, simply because it is dressed up as technology and biology, and then allow them to remain that way, seems to affront the fundamental dignity of targeted suspicion.

G. *Conclusion.*

Thus far, I have outlined six arguments against familial searching, even assuming that it can successfully identify the source (and thus perpetrator) of an offense. For any particular reader, perhaps one stands alone as particularly convincing; perhaps it is only when considered together that the balance of harms seems to tip against such methods. Certainly it is safe to say that effectiveness is not the only criteria for implementation of a law enforcement technique, and so there may be reasons why even a useful tool should not be employed in investigations. Some readers, however, may be sympathetic to these concerns, yet reluctant to altogether reject familial search practices altogether. The next part considers the permissibility of familial searching according to the current legal framework.

III. THE LEGALITY OF FAMILIAL SEARCHING.

The preceding Part explored numerous reasons why familial searches should not be allowed as a matter of policy. Already, however, one state (California) has expressly authorized familial searches of its database, and many other states permit information sharing between analysts and law enforcement in the case of close partial matches. Accordingly, this Part assumes that some degree of partial match reporting may be authorized, and asks whether such methods are constitutional.

In thinking about doctrinal implementation of familial search methods, two questions arise. The first is what policies should govern the actual search. Specifically, what form should

such policies take? What specifically ought to be authorized? What legal frameworks may serve as impediments? Second is the question of what should happen in the aftermath of a search. How should search results be treated? What should be considered permissible lines of investigation? How might familial search methods fit into the current frameworks governing police investigation? This Part considers these questions in turn.

A. *Familial searches versus inadvertent partial matches.*

As a preliminary matter, any jurisdiction that wishes to use partial match results must distinguish between adventitious partial matches, or “inadvertent partial matches,” and deliberate searches for partial matches. As explained in Part I.B, analysts occasionally come across partial matches as a byproduct of conducting searches intended to locate exact matches. Familial searches, in contrast, are deliberate attempts to locate relatives.

As both a practical and political matter, the distinction between the two kinds of searches should be considered largely artificial. The relevant question should be whether or not the search returns matches for fewer than all loci, not whether it was the analyst’s subjective intention to do so. Permitting inadvertent matches while prohibiting intentional partial matches only invites strategic behavior, and ignores the more important issue of what the parameters of a partial match -- however it is uncovered -- should be. Whether or not partial match searching occurs should not turn on whether or not the sample is a mixture, and thus a lower stringency search occurred, or not.

Indeed, treating inadvertent partial matches as equivalent to intentional partial matches serves to ensure that fortuitous matches receive the same scrutiny and legal protections that deliberate matches should. To be sure, this may mean that some inadvertent partial match results will be forfeited. For instance, we can imagine a policy that permits familial searching only in serious felonies, and sets a minimum of fifteen matching alleles. That means that an analyst conducting a search for a non-serious felony cannot report a fortuitous near-match even if it matches at far greater alleles, or that an analyst in a serious felony cannot report the match even if it happens to match at only fourteen alleles. But although imposing parity between the rules of intentional and inadvertent partial matching may occasionally preclude the reporting of information, it ensures that partial match searches are not abused and that all partial matching is

done with a manner of transparency and informality. Leaving inadvertent partial matching to the full discretion of analysts or law enforcement agents, while strictly regulating intentional partial matching, simply manufactures an artificial and unworkable divide.

B. *Appropriate legal instruments.*

The next question to consider is what legal form such search procedures might take. In many areas of criminal justice the constraints on the police power are not always clear. More importantly, there is often ambiguity -- and as a result, great diversity -- in the necessary source of legal authority before law enforcement may undertake a particular action.¹³⁶ The dispute about the national database affords an illustrative example: whereas the database director felt that congressional authorization was desirable, if not also legally necessary, before changing the policy to permit information sharing between jurisdictions, the FBI director ended up implementing the change without any public process or legislative approval.

At present there exists wide variation in the forms in which legal regulation of DNA searches occurs. The national database is governed at the most general level by the statutory provisions creating it, but they contain very little by way of strict instructions on how searches should be conducted. Additional guidance is provided by the National DNA Index System Procedures Board, which is responsible for crafting the procedures and regulations governing both the acceptance and search of DNA profiles in the database.¹³⁷ Both a working group (SWGDM) convened by the FBI¹³⁸ as well as members of the National Institute of Standards and Technology, a non-regulatory federal agency within the Department of Commerce, also promulgates reference materials that set quality standards for various DNA methods and technologies.¹³⁹ Lastly both the DNA database administrator and other FBI officials regulate the use and maintenance of the national DNA database.

On a state level, each state must have a designated CODIS State Administrator, who is responsible for the databases and the “primary point of contact for CODIS issues” in the state;

¹³⁶ Murphy, *supra* note 111, at 1445-46.

¹³⁷ <http://www.dna.gov/dna-databases/ndis>.

¹³⁸ See, e.g., Scientific Working Group on DNA Analysis Methods (SWGDM), *Training Guidelines*, FORENSIC SCI. COMMUNICATIONS, Vol. 3, No. 4 (2001), available at <http://www.fbi.gov/hq/lab/fsc/backissu/oct2001/kzinski.htm>

¹³⁹ See, e.g., Peter E. Barker, Michael S. Watson, John R. Ticehurst, Jennifer C. Colbert, Catherine D. O’Connell, *NIST Physical Standards for DNA-based Medical Testing*, 16 J. CLINICAL LAB. ANALYSIS 5 (2002).

each contributing laboratory must also have a designated administrator.¹⁴⁰ That person is the liaison to the federal government regarding any rules or regulations, and is a conduit of information to each qualified laboratory in the state. In terms of legal regulation, experiences among states vary widely. Some jurisdictions prescribe the scope of permissible searches by statute, others by administrative rule, and others by both formal and informal executive policy. In the absence of state or federal proscriptions, it may be the case that one laboratory permits one kind of searches, while in the next county over they do not.

Although this level of flexibility and local variety may be desirable in certain respects, it provides too little oversight as regards partial match searches. As detailed in Part II, partial match searches are effectively *de facto* expansions of the DNA database, and transform the storage of “junk” genetic identifiers into valuable familial genealogical charts. As such, they should not be conducted without explicit legislative approval (both at the state and federal level). Legislative process will help offset the concerns about lack of transparency and accountability in such searches, and also ensure that appropriate safeguards are put in place to ensure that the accuracy, privacy, and ethnic discrimination issues outlined earlier are properly considered. Allowing executive branch officials -- whether a governor, attorney general, or state laboratory administrator -- to unilaterally authorize such a wide-sweeping and politically contentious form of searching is in effect to grant the executive full authority to fundamentally alter the nature and character of the DNA database.

Of course, legislators may elect to include stricter or looser contours in any enabling statutes, and defer some of the details to executive implementation. Although ideally any statute would condition partial match searches on specific criteria in order to provide optimal safeguards, it is conceivable that legislators would wish to defer some policymaking to outside experts. In such a case, enabling statutes ought to repose that decisionmaking in an independent commission of experts -- ideally composed of a balance of technical, law enforcement, and criminal defense interests -- that will conduct open and public proceedings (including, perhaps, notice and comment) before laying out specific rules. Moreover, these rules would constitute the exhaustive catalog of what is permissible, rather than represent the mere floor upon which additional creative search methods might be constructed.

¹⁴⁰ <http://www.dna.gov/dna-databases/ndis>

C. *Legal frameworks.*

As of yet, we have not addressed whether familial search methods withstand general constitutional scrutiny, setting aside the question of racial and ethnic neutrality. The Fourth Amendment states that “The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.”¹⁴¹

The constitutionality of searches of DNA databases rests at the uncertain border of several legal frontiers. Formally, a familial search is made up of several independent steps, each of which could be analyzed independently. DNA must be physically collected in a biological sample from an individual; it must then be typed and analyzed in a laboratory; that entry must be uploaded into a database, and the physical sample placed in storage; a search must be conducted of the database using a search of particular stringency; the search must return a list of potential relatives; and then that list must be winnowed down, possibly by additional forms of testing (such as Y-STR typing).

Functionally, a search could be analyzed more abstractly -- namely, as a de facto expansion of the database both in that the state now effectively acquires genetic information from those never before convicted or accused of a crime, and also in that the state now effectively gleans from genetic samples more than just the “junk” identifiers.

As it stands, courts have not addressed either the functional or the formal implications of DNA searching in any particularly nuanced manner. The spate of legal rulings as regards forensic DNA typing have almost all addressed only the question of sample collection from particular offenders.¹⁴² Most of those have found the collection of DNA from convicted offenders constitutional under either the “special needs” or “reasonableness” strands of Fourth Amendment jurisprudence, emphasizing in particular that convicted persons have diminished

¹⁴¹ U.S. CONST. Amend. IV.

¹⁴² Murphy, *supra* note 111, at 1331-32. There are also a series of cases ruling on various evidentiary questions related to the technology’s general acceptance. See, e.g., *United States v. Jenkins*, 887 A.2d 1013 (D.C. 2005).

expectations of privacy under the Constitution.¹⁴³ Almost every ruling, in reaching its conclusion, noted that the thirteen loci revealed only “junk” identifiers, and nothing more.¹⁴⁴

None of those treatments have pieced apart the stages of forensic DNA typing and discussed their independent legitimacy. Indeed, most courts have framed the primary interest of the offender as against the physical bodily intrusion of sample collection, rather than a more subtle privacy or dignitary right to keep the government from databasing one’s genetic profile.¹⁴⁵ To the extent that challengers have raised the question of the potential for greater intrusion, the courts have uniformly relied upon the inutility of the CODIS loci -- the fact that they are mere “junk” that reveal no additional information -- as a basis for finding no violation of the Fourth Amendment.

Few of the opinions addressing the collection of DNA from convicted offenders have distinguished constitutionally between the collection and typing of the DNA sample and its ultimate retention, and instead tend to treat the government’s retention of the sample (which contains the entire genomic code) as akin to its retention of the profile (the 13 CODIS identifiers).¹⁴⁶ And few have paused to treat separately the limits on the number or kinds of searches might be done in the database once the profile is uploaded, or whether additional information might be permissibly extracted from either the profile or stored samples. And even in those limited instances in which courts have glossed these issues, they have never found them

¹⁴³ *Goord*, 430 F.3d at 658-59 (cataloging cases); *United States v. Sczubelek*, 402 F.3d 175, (3d Cir. 2005) (cataloging cases); *but see* *Murphy*, *supra* note 111, at n.39 (citing Vermont case holding DNA collection impermissible under state constitution). Critics and some dissenters have pointed out that, in relying on the diminished rights of conditional releasees, the courts have failed to provide a principled reason for mandating collection or retention of samples from those persons no longer under any form of supervision. Few courts have ruled on the collection of DNA from arrestees, but at least one has found it unconstitutional. *Compare* *Anderson v. Com*, Virginia Supreme Court, No. 062051, 9/14/07 (finding it constitutional in Virginia), *with* *In the Matter of the Welfare of: C.T.L.*, Minnesota. Court of Appeals, A06-874, File No. J4-05-52203, 10/10/06 (finding arrestee collection unconstitutional); *Gorman v. Minnesota*, 52-CV-05-684, 5th Judicial Dist. Court (Dec. 15, 2005) (finding pre-conviction collection of DNA a constitutional violation).

¹⁴⁴ *See, e.g., Goord*, 430 F.3d at 653 (“Although DNA indexing has the *potential* to be broadly revealing, the New York statute as written does not provide for sensitive information to be analyzed or kept in its database. Rather, it provides only for the analysis of identifying markers... The junk DNA that is extracted has, at present, no known function, except to accurately and uniquely establish identity. Although science may someday be able to unearth much more information about us through our junk DNA, that capability does not yet exist, and, more importantly, the New York statute prohibits such analysis.”). Significantly, New York is one state that authorizes low stringency searches. *See supra* note 99.

¹⁴⁵ *Murphy*, *supra* note 111, at 1355-56, 1359-60.

¹⁴⁶ *Murphy*, *supra* note 111, at 1355-56 & n.188.

prohibitive of the practice of DNA collection, typing, and searching.¹⁴⁷ In short, the current treatment of the constitutionality of DNA typing is woefully threadbare, and wholly inadequate to the task of contemplating the subtleties entailed in familial searching.

1. Legitimate Expectation of Privacy.

As an initial matter, then, the first order of inquiry is to establish a legitimate expectation of privacy -- the trigger for constitutional searches -- in the familial associative information. This can be framed in two different ways. First, imagine for a moment that new research revealed that one of the standard 13 “junk” loci in fact revealed the individual’s likely sexual orientation. Alternatively, imagine that the government developed a genetic test that could uncover a person’s inclination toward violence, and went back to re-test all its collected samples in order to flag offenders accordingly. Surely the courts should not turn a blind eye, and state refuse to conduct any additional constitutional analysis on the grounds that no additional Fourth Amendment intrusion has occurred.¹⁴⁸

Familial searching is akin to a change in technology that amounts, in substance, to a change in the nature of the government’s intrusive act. It is as though the court gave constitutional approval to a listening device analyzed according to its capacity to pick up voices from a distance, but then government uploaded new software that enabled the device to read voices from behind multiple closed doors. Here, the technology was approved on the understanding that it offered nothing more than a glorified fingerprint. Now, it is a fingerprint that points out a person’s family. Such a change requires independent judicial scrutiny. Assuming a legitimate expectation of privacy in the family relationships implied by one’s genetic code, what would such scrutiny look like, then? Again, the current legal frameworks prove difficult and imperfect.

¹⁴⁷ See, e.g., *Goord*, 430 F.3d at 670 (noting that the “second intrusion to which offenders are subject is the analysis and maintenance of their DNA information in New York’s database,” but finding it second to the government interest because DNA is not in fact “broadly revealing”).

¹⁴⁸ Judge Reinhardt, dissenting from the Ninth Circuit case upholding mandatory collection of DNA from felons, foreshadowed precisely this issue: “CODIS’s potential to expand is not confined to its likely future inclusion of more and more categories of persons to be subjected to DNA profiling. The system also has the ability to identify an increasing amount of information about each of its profiled subjects as our understanding of DNA continues to develop at lightning speed.” *Kincade*, 379 F.3d at 849-50.

2. Familial Searches as per se unreasonable.

At the highest level, we might find that such searches flatly violate the “reasonableness” provision of the Fourth Amendment, and perhaps even substantive due process under the Fifth and Fourteenth Amendments.¹⁴⁹ Trolling the DNA databases seems to constitute just the kind of warrantless, suspicionless activity that the Court has found impermissible when done for law enforcement purposes. In cases such as *Michigan Department of Police v. Sitz*,¹⁵⁰ *United States v. Martinez-Fuerte*,¹⁵¹ and *City of Indianapolis v. Edmond*,¹⁵² the Court has drawn a line between random searches conducted pursuant to specific, nondiscretionary policies with a primary purpose of apprehending law breakers and those searches done for other reasons, such as public safety.¹⁵³ In the case of familial searching, courts would be hard-pressed to cite any purpose for the search other than law enforcement. Indeed, the circuit courts even struggled to work their way around that problem in authorizing DNA databanking of felons; courts tried to argue that -- even though the DNA stayed in the database long after any term of supervision was over -- such searches were justified as a means of protecting the public.¹⁵⁴

Moreover, “special needs” or administrative searches tend not to invoke intense constitutional opprobrium because they are applied universally and indiscriminately. At least in theory, their very randomness protects against abuse. Yet familial searches obviously visit their intrusions only upon felons and the relatives of felons, rather than a random subset of the population. In this sense, they more closely resemble the kind of dragnets that the Court ruled unconstitutional in *Davis v. Mississippi*.¹⁵⁵ There, the court rounded up a group of African Americans for questioning and fingerprinting, based on nothing more than the description given

¹⁴⁹ Similarly, in *Rochin v. California*, the Court reversed the conviction of a man that rested in part on the forcible pumping of his stomach for drugs. 342 U.S. 165 (1952). Finding that “the proceedings by which this conviction was obtained do more than offend some fastidious squeamishness or private sentimentalism about combatting crime too energetically,” the Court found the state’s action to “shock the conscience.” Admittedly, the Court did explicitly “put to one side cases which have arisen in the State courts through use of modern methods and devices for discovering wrongdoers and bringing them to book.” *Id.* at 174.

¹⁵⁰ 496 U.S. 444 (1990).

¹⁵¹ 428 U.S. 543 (1976).

¹⁵² 531 U.S. 32 (2000) (striking down narcotics checkpoint with primary purpose of law enforcement). *But see id.* at 44 (acknowledging that there might be emergency exceptions).

¹⁵³ *See Edmond*, 531 U.S. at 41 (“We have never approved a checkpoint program whose primary purpose was to detect evidence of ordinary criminal wrongdoing.”).

¹⁵⁴ *Samson*, 547 U.S. at n.4.

¹⁵⁵ 394 U.S. 721 (1969).

by the rape complainant had reported that the perpetrator.¹⁵⁶ Noting that “no attempt was made” to minimize the intrusiveness to the suspects -- in the form of obtaining a court order, for example, the Court found the suspicionless dragnet to violate the Fourth Amendment. By analogy, it might be argued that a policy that the government’s use of genetic databases to cast even the barest light of suspicion on otherwise wholly innocent persons constitutes as crude a technological “dragnet” that it is akin to using race alone, as in *Davis*, as a reason for suspecting potential criminality.

In addition, there is some support for the notion that certain kinds of police investigative activity is per se unreasonable because it conflicts with extrinsic values, no matter how probative or effective it might be in identifying a guilty party. In *Winston v. Lee*, for instance, the Court held that the surgical removal of a bullet from the body of a robbery suspect constituted a per se “unreasonable” search that violated the Fourth Amendment.¹⁵⁷ Conducting a case-specific balancing of the individual’s interest as opposed to the state, the Court weighed the significant interests of the individual against the state’s claim of a compelling need for the bullet in order to enhance its case against the accused. Finding the individual interest to dominate, the Court found the intrusion impermissible, observing that “[t]he overriding function of the Fourth Amendment is to protect personal privacy and dignity against unwarranted intrusion by the State.”¹⁵⁸

To be sure, it may not be the case that familial searching places an individual in physical jeopardy or entail such actual violence as does the forcible removal of bullets (or stomach contents) might. However mining genetic material for information certainly raises an equally daunting specter of dangerous abuse of government power. The family is one of the most private and privileged sanctuaries of ordinary existence, and the identity of one’s relatives, and one’s relationships to them, form a critical part of the construction and security of the self. It already strains credibility to claim that lifelong genetic surveillance of once-convicted persons no longer under any form of legal supervision is justified as a matter of compelling state interest,¹⁵⁹ but to single out their relatives for the same treatment offends Fourth Amendment first principles.¹⁶⁰

¹⁵⁶ 394 U.S. at 728.

¹⁵⁷ 470 U.S. 753 (1985).

¹⁵⁸ 470 U.S. at 760 (citing *Schmerber v. California*, 384 U.S. 757, 767 (1966)).

¹⁵⁹ *United States v. Kincade*, 379 F.3d 813, 872 (9th Cir. 2004) (en banc) (Kozinski, J., dissenting).

¹⁶⁰ It might also be construed as violating the Equal Protection Clause, in that it irrationally distinguishes between possible perpetrators related to convicted offenders and possible perpetrators that are unrelated to offenders.

This is particularly true when one considers the nature of the interest affected not from the perspective of the offender whose sample is databased, but from the entirely innocent relatives. It may be bad enough that the innocent relative, as a matter of factual reality, must have a portion of their genetic code exposed to the state by mere fact of their biological relationship to a convicted offender. But the state should not be permitted to capitalize upon that simply because it can. By analogy, we might find that a state's warrantless, suspicionless search of the home in which lives a probationer alone does not violate the Fourth Amendment;¹⁶¹ and we might even uphold the same search if the probationer resides with family members, because they have in effect consented to such intrusions by virtue of their living arrangement. But surely we would not find no violation for the same search conducted in the home of the probationer's brother, sister, mother and father, simply by virtue of their blood relationship.

3. Familial searches as reasonable under certain conditions or circumstances.

Should the courts determine that familial searches are not per se unreasonable, then they will be left to determine the procedural conditions under which such searches may take place. At minimum, this should entail a policy-specific inquiry that examines the exact nature and scope of the policy and its likely efficacy. Implementing familial search methods in a manner sensitive to the liberty interests of all those involved requires a two-fold inquiry: first, into the nature of the search itself, and second, into the nature of the investigation that may follow a fruitful search.

At the outset, the most obvious and familiar route would be to find such searches permissible only upon issuance of a warrant and probable cause. But such a standard seems oddly inappropriate. In the case of DNA searching, the search conducted is of the government's own database -- an odd place to be requiring the government to obtain a warrant to look. Moreover, warrants are typically issued on a showing of particularity -- a requirement that states the exact thing(s) to be searched and seized. It would be difficult to meet a showing of particularity where the government is searching for fifteen alleles that could potentially match thousands of persons. Similarly, in the case of sampling, the government may be able to narrow the field slightly, but presumably the primary evidence against an individual is likely to be the resemblance to the genetic profile of the perpetrator, and nothing more.

¹⁶¹ Samson v. California, 547 U.S. 843 (2006).

In addition, judicially determined probable cause is a standard best applied to situations in which the factual scenarios may vary infinitely -- especially when there may exist a difficult ex post in determining the exact nature of the information held ex ante. But that will not be the case for most familial searches. In a familial search case, we can conjure the relatively finite range of variables, and make policy decisions in advance about whether the intrusion of familial searching is warranted. Moreover, as a matter of public accountability, it is preferable to encourage formal development of guidelines and policies for family searches, rather than rely upon ad hoc decisionmaking by members of the executive branch.

Instead, if familial searches are to proceed, they should do so folding into the analysis the contours of when such searches are authorized, as a matter of policy, along with what kinds of safeguards are in place to prevent abuse. The benefits of applying such a standard to analyzing familial searches are two-fold. First, it requires that such searches be conducted pursuant to particular policies that prohibit the exercise of “standardless and unconstrained discretion.”¹⁶² Thus, the state must craft particular rules and guidelines that govern the exercise of their power, which in turn are reviewable by courts. Second, review of such programs includes within it a measure of the effectiveness of the government’s stated practice.¹⁶³ In the Court’s words, “[t]he constitutionality ... depends on a balancing of the competing interests at stake and the effectiveness of the program.”¹⁶⁴

The notion that some investigative methods may require extensive regulation in order to pass constitutional muster, in light of their potential collateral harms, is not wholly novel. For instance, after the Supreme Court decided *Berger v. New York*¹⁶⁵ and *Katz v. United States*,¹⁶⁶ which suggested constitutional limits on the manner in which law enforcement could lawfully engage in wiretapping, Congress responded by passing “Title III,” a comprehensive regime regulating wiretap investigations.¹⁶⁷ As others have observed, a “super-statute” such as Title III has the capacity to not only shape the actions that it directly regulates, but also to embody and

¹⁶² 531 U.S. at 39 (citing *Prouse*).

¹⁶³ 531 U.S. at 47.

¹⁶⁴ 531 U.S. at 47.

¹⁶⁵ 388 U.S. 41 (1967).

¹⁶⁶ 389 U.S. 347 (1967).

¹⁶⁷ Pub. L. No. 90-351, tit. III, 82 Stat. 212 (codified as amended at 18 U.S.C. §§ 2510-22 (1996)); see also Anuj Desai, *Wiretapping Before the Wires: The Post Office and the Birth of Communications Privacy*, 60 STAN. L. REV. 553, 588-89 (2007) (recounting history of communications privacy before *Olmstead*, *Berger*, and *Katz*).

impart fundamental principles of society.¹⁶⁸ That such investigative methods may be permitted even upon a showing lesser than a warrant and probable cause also has precedential support. As the previous subpart explained, the Court has upheld warrantless, suspicionless search programs where the primary purpose was other than law enforcement.¹⁶⁹ And, as the Court's Fourth Amendment jurisprudence increasingly tacks in favor of a general "reasonableness" review,¹⁷⁰ as opposed to a strict textual commitment to warrants and probable cause, even a law-enforcement geared warrantless, suspicionless search may withstand review.

In the case of familial searching, such policies should be spelled out in as specific terms as possible. Moreover, courts should demand evidence of their effectiveness in the form of clearly quantified data and statistics. The likely number of hits under various search conditions is information that can be readily predicted in advance, and recorded after the fact. Moreover, as jurisdictions experiment with different policy contours, greater evidence will be available -- if the courts create the incentive to collect it -- about the efficacy of different approaches. In short, if familial search methods are to withstand Fourth Amendment scrutiny, then courts should be sure to ask tailored questions as to the exact nature and operation of such methods, and demand clear evidence of the likelihood of their success. Only highly tailored, successful approaches should be permitted to offset the significant liberty interests affected by such techniques.

4. Aftermath of familial searches.

Of course, the execution of a familial search typically marks only the beginning, not the end, of an investigation. The search will return a list of names, which can vary dramatically in size according to how exactly the search was conducted. It may have as few as one potential relative, or as great as thousands. Assuming that investigators wish to pursue those leads, what may they do?

Presumably, we can start from the assumption that the normal constitutional and statutory rules for conducting investigative searches apply. We can imagine two general scenarios: one in

¹⁶⁸ WILLIAM N. ESKRIDGE, JR. & JOHN FEREJOHN, *SUPER-STATUTES: THE NEW AMERICAN CONSTITUTIONALISM, IN THE LEAST EXAMINED BRANCH: THE ROLE OF LEGISLATURES IN THE CONSTITUTIONAL STATE* 321 (Richard W. Bauman & Tsvi Kahana eds., 2006).

¹⁶⁹ *See supra* Part III.C.3.

¹⁷⁰ *See, e.g.,* *Samson v. California*, 547 U.S. 843 (2006) (upholding suspicionless search of parolee under "totality of the circumstances" test of "reasonableness").

which the match is very close to that of the perpetrator, and one in which the match is only moderately close. Although precise line-drawing exercises would be largely arbitrary, imagine for a moment that one search returns a match at 22 of 26 alleles, while another returns a match at 15 of 26 alleles. As a matter of probabilities, the former case is more likely to be a relative than in the latter case, for the simple reason that the greater the number of matching alleles, the greater the likelihood of relatedness.¹⁷¹

However, given the possibility that partial matches may in fact be coincidental, it seems unprincipled to distinguish between the two cases. Moreover, drawing a line -- the precise number of alleles to mark the cutoff -- would be both difficult and arbitrary. It would require courts to enter into complicated and still-evolving understandings of genetic inheritance, for instance, because it turns out that all 15-allele matches are not created equal. That is, some alleles are more common than others. Thus, one 15-allelic match may be of alleles that occur frequently in the population, and thus not signify as much as another 15-allele match of alleles that occur less frequently. To hinge the permissible legal intrusions that the government may undertake on the number and frequency of allele types will invite courts into complex scientific and mathematic calculations for which they are ill-equipped to undertake.

Instead, all partial matches should be treated equally, and as mere leads to pursue further investigation. On its own, a partial match should not constitute probable cause to arrest or conduct a search. Probable cause is an elusive standard that has been defined as “a reasonable ground for belief of guilt”¹⁷² Numerous courts have rejected a definition of probable cause that sweeps too broadly and fails to concentration suspicion.¹⁷³ A partial match search, without additional evidence, seems clearly inadequate to meet this standard. As a result, imposing a warrant standard will in effect prevent the acquisition of confirmatory genetic material in the absence of additional, non-genetic evidence establishing the relative’s guilt.

Of course, under established rubrics, such a match may rise to reasonable, articulable suspicion to conduct further investigation.¹⁷⁴ If so, a partial match search might therefore give

¹⁷¹ Song, et al, *supra* note 100.

¹⁷² Ronald J. Bacigal, *Making the Right Gamble: The Odds on Probable Cause*, 74 *MISS. L.J.* 279, 289 (2004); *see also id.* at 279-80 “[T]he Supreme Court has said very little about computing the odds--the degree of certainty--that determines when probable cause exists. The case law on probable cause harbors a central ambiguity because the Court has told us that probable cause lies between bare suspicion and proof beyond a reasonable doubt.”).

¹⁷³ *Florida v. J.L.*, 529 U.S. 266 (2000); *State v. Detroy*, 102 Hawaii 13, 72 P.3d 485 (Hawaii 2003); *State v. Huft*, 106 Wash.2d 206, 720 P.2d 838 (Wash. 1986).

¹⁷⁴ *Terry v. Ohio*, 392 U.S. 1 (1968).

an officer grounds to effectuate a temporary detention of a pivot's relative, presumably to acquire more information or even a genetic sample. But of course, this analysis is fraught with the artifice of its premises. Temporary detentions under *Terry* are designed for street encounters, not deliberate attempts by the police to acquire a person's genetic material. The notion of the *Terry* stop is one borne in the exigencies of the moment -- a situation that does not comport with the relaxed pace of an investigation conducted largely by laboratory analysts.

The most natural course would be to view such evidence as meeting only the reasonable suspicion and relevance standards necessary to obtain a court order for a sample or issue a subpoena from a grand jury investigation. In the case of grand jury subpoenas, it is fairly clear that a grand jury may lawfully summons an individual to provide "non-testimonial" evidence,¹⁷⁵ which most courts have found a person's DNA type to be.¹⁷⁶ As the Supreme Court noted in *Hayes v. Florida*, the lower courts are divided on the use of non-testimonial court orders that authorize the seizure of a person to then provide (be searched, essentially) some piece of non-testimonial evidence (whether handwriting, DNA, or physical attributes).¹⁷⁷ Moreover, many jurisdictions have express statutes authorizing such orders.¹⁷⁸ Although some courts have refused to issue such orders absent compelling evidence,¹⁷⁹ as Professor Paul Giannelli concluded in his thoughtful review of the issue, "[s]uch orders satisfy the Fourth Amendment reasonableness requirements if they are based on a carefully drawn statute or rule that provides certain safeguards."¹⁸⁰

Accordingly, the preferable route may be to fold the permissible range of follow-up on a familial search into the inquiry of the search's constitutionality, and thus find that statutory authorizations of familial search methods that include specific provisions for the actions taken in the aftermath of a match receive greater constitutional approbation. That is, given the panoply of concerns to both the profiled individual as well as the relatives, courts could impose upon the

¹⁷⁵ *United States v. Dionisio*, 410 U.S. 1 (1973).

¹⁷⁶ Roberto Iraola, *DNA Dragnets -- A Constitutional Catch?*, 54 *DRAKE L. REV.* 15, 45 n. 146 ("[L]ower courts consistently have ruled that the DNA Act's requirement that prisoners provide samples does not violate ... Self-Incrimination...").

¹⁷⁷ 470 U.S. 811, 817 (1985); *see also Kaupp v. Texas*, 538 U.S. 626 (2003) (leaving "open the possibility that, 'under circumscribed procedures,' a court might validly authorize a seizure on less than probable cause when the object is fingerprinting").

¹⁷⁸ Paul Giannelli, *Nontestimonial Identification Orders for DNA Testing*, 44 *CRIMINAL LAW BULLETIN* 6 (2008) (citing statutes).

¹⁷⁹ Tom Jackman, *No Court Order Issued for DNA in Rape Case*, *WASH. POST*, Jan. 18, 2002.

¹⁸⁰ Giannelli, *supra* note 170, at 6.

states -- in the course of their determination about the reasonableness of the policy -- a requirement to circumscribe the nature of the investigation inspired by the familial search. For example, we can readily imagine provisions that require additional forms of investigative follow-up before a family member may be asked to provide a sample, or a rule providing for the destruction of any samples or profiles collected from relatives that prove unrelated, as necessary components of a “reasonable” familial search policy. The next Part provides more specific examples along these lines.

IV. RECOMMENDED LINES OF INQUIRY AND LIMITATIONS.

The potential intrusiveness of familial searches, and their essentially limited probative value, strongly supports (as a matter of policy, if not constitutional compliance) efforts to narrow their prospective reach. This Part catalogs some of the concerns that might be addressed by a statutory regime or policy, and proffers specific thoughts as to possible parameters in light of the current state of the scientific evidence. In essence, this section combines the concerns raised in Part II with the legal frameworks identified in Part III to provide a template for the implementation of familial search methods in an optimally efficient and adequately safeguarded manner.

A. Should there exist different standards for deliberate versus fortuitous partial match searches?

As a preliminary matter, a jurisdiction might distinguish between cases in which fortuitous partial matches may be reported to the investigative agents from cases in which the investigative agent actively seeks a partial match. As explained previously, analysts might come across near-misses in the course of searching for exact matches, and thus have to determine whether or not to report that information to the investigating officer. This is most likely to occur in cases in which the crime scene sample is a mixture, and thus the analyst is already running a moderate or low stringency search. California’s policy essentially recognizes as much, and makes virtually no distinction between the conditions under which an analyst may release the

names of a fortuitous partial match and those in which the investigating officer may file an official request for a partial match search.¹⁸¹

B. *When may familial searches occur?*

Any authorization for familial search methods must specify when such searches will be permitted. Of course, at the other end of the spectrum from wholly forbidding such searches might be to wholly approve them, and grant blanket permission to conduct them. Such an approach has the advantage of not requiring any administration, and the availability of more discriminating investigative methods might naturally limit the number of familial searches undertaken.

Part II identified six concerns raised by familial searches: 1) accuracy, in that they may be too readily relied upon or susceptible to confirmation bias, and thus mis-direct investigations at the expense of identifying a true perpetrator; 2) privacy, mainly as regards both the person in the database and any innocent family members (including innocent family members of the source); 3) democratic accountability, in the sense that such searches work an end-run around debates about the proper scope of DNA databases; 4) discrimination, in that empirical evidence shows that databases will, on average, skew investigations away from certain populations and toward others; 5) disruptiveness, in that searches have the capacity to potentially undermine or corrupt familial relationships; and 6) dignity, in that it arguably offends notions of individual dignity to suspect a person of a crime based on no more than a genetic resemblance to the perpetrator.

These concerns point toward a variety of dimensions upon which limitations on familial searches might be imposed. First, to offset almost all of the concerns, policymakers might strictly circumscribe the number of cases in which such searches can occur. Logically, this is best effectuated by identifying the cases in which familial searches are likely to be both the most socially beneficial, necessary, and likely to be effective. In terms of social benefit, policymakers might allow such searches only in cases involving the most serious charges – say, homicide, sexual assault, and violent robberies. In terms of necessity, policymakers might only permit

¹⁸¹ CALIFORNIA POLICY, *supra* note X. The only apparent difference appears to be the use of “concordant” and “consistent” to describe the Y-STR results. *Id.*

familial searches as a matter of last resort, for instance, only in those cases in which all other leads have been pursued and no suspect has been identified. And in terms of effectiveness, such searches might be limited to those cases in which the question of identity is dispositive or strongly indicative of guilt, investigators commit to following up on any leads. Limiting such searches to cases in which the crime scene sample is single-source, for example, will help ensure that a positive result will actually lead to a perpetrator, as opposed to forming a sort of arbitrary genetic dragnet.

Of course, the imposition of such limitations implies an oversight structure of safeguard their implementation. Conceivably, such oversight could be done by various entities: a court, a member of the executive such as prosecutors or the Attorney General, or within either the police or investigative departments. The California policy lodges this responsibility with the Attorney General, who must review all determinations to release information.¹⁸² However, the danger of such an approach is that the Attorney General arguably shares the same zeal for the “competitive enterprise of ferreting out crime” as do investigative officers. Placing authority with the courts, in contrast, introduces an impartial decisionmaker that would have both a deterrent effect on volume – to prevent such requests from becoming simple bureaucratic rubber stamps – as well as a neutralizing impact. Such a model most closely resembles the traditional warrant requirement, albeit with a different set of procedural safeguards and standards. Alternatively, a statutory regime could set up a committee or commission charged with reviewing such requests, perhaps composed of an interdisciplinary team of scientists and statisticians, executive officers, and lawyers. The downside, of course, would be that there might not be sufficient volume to keep such an entity fully occupied. Nevertheless, because family searches ought to be a last resort rather than the first line of inquiry, they may be less time sensitive generally and thus monthly or intermittent review periods would suffice.

C. What are the technical parameters delimiting the scope of the search?

Perhaps the most important part of setting a familial search policy is to determine the technical parameters of a familial search policy. This raises some of the most difficult and dynamic of issues: difficult because they hinge on empirical questions that have not yet been

¹⁸² CALIFORNIA POLICY, *supra* note X.

fully answered, and dynamic because those answers may change as the technology continues to develop and evolve. Nevertheless, it is possible to identify some parameters in light of the current state of the research and the technology.

First, empirical evidence suggests that there are significant diminishing returns as a partial match stringency levels decrease. That is, a match of 20 of 26 possible alleles is far more probative, in the sense that the database profile likely belongs to a relative of the perpetrator (a true pivot), than does a match of 10 of 26 possible alleles. But there are other ways of limiting the number of potential false matches. For example, one study shows that Y-STR typing is a critical component to winnow the potential matches, and thus constitutes a necessary part of any policy that allows partial matches under a particular threshold.¹⁸³ That is, there is a relationship between the minimum matching loci requirement and the Y-STR confirmatory typing requirement; if the partial matches are allowed only at a high threshold (say, over 22), then that stringency will do a great deal to limit the number of false pivots; the lower the match number, however, the more important it becomes to limit the number in other ways.

Thus, for example, this study shows that under California's current policy, which allows for as few as 15 alleles to match, a familial search is likely to turn up roughly 1600 to 4200 false leads within each ethnic group.¹⁸⁴ But when the Y-STR confirmation is introduced, as required by California, that number reduces to an average of under 25. As a general rule, however, the number of false matches using just the autosomal alleles decreases as the number of matching alleles increase. Thus, for example, the likelihood of a match at 22 loci for a full sibling, already rare (1.37×10^{-2}), is several orders of magnitude less likely for a random person (6.53×10^{-9}).¹⁸⁵ Thus, some might argue that, so long as these preliminary matches are then followed up by Y-STR confirmatory typing, it is not as important to set a high initial requirement for the allelic match. That is because the Y-STR typing demonstrably eliminates a large percentage of the false pivots, and thus the size of the initial pool may not matter.

But that contention is fair only under two conditions. First, it should be noted that, because Y-STR typing is available only for male samples, such an approach would require setting a separate threshold for potential female perpetrators. Second, and more importantly, it assumes the prior existence of Y-STR typing and databasing, such that it constitutes no

¹⁸³ Song, et al, *supra* note 100.

¹⁸⁴ Song, et al, *supra* note 100.

¹⁸⁵ Unpublished data on file with author.

additional intrusion to subject the database profile to additional testing. But this is not the case; in most instances, the profile in the database has only undergone typing at the 13 CODIS loci. As a result, acquiring the Y-STR profile requires recovery of the original sample and retesting, which raises precisely the kinds of grave concerns about privacy and accountability (in that profiles are being subjected to genetic tests that courts did not approve) outlined above. A higher number of initial alleles to match both diminishes the number of samples that would be exposed to greater intrusion in Y-STR testing, and also increases the probability that a potential pivot is in fact a relative.¹⁸⁶

Instead, it is preferable to set a minimum allelic threshold and then require Y-STR typing as additional protection. Further research should be done to identify the optimal number of alleles, in terms of yielding positive results but minimizing the likelihood of high numbers of false leads. Moreover, because research suggests that it is not just the number of alleles that matters, but also their specific character, such policies should take that information into account as well.¹⁸⁷ That is, some alleles are more common in the population than others, and thus a fifteen allelic match of one set of alleles can be more or less discriminating than a fifteen allelic match of a different constellation of alleles. In order to avoid dragnets and sweeps, a familial search policy ought to take the quality of the match, and not just the quantity of alleles, into consideration.

D. Which databases may be searched?

Another possible way to minimize the intrusiveness of familial search policies is to limit the databases that may be trolled for potential pivots. As the number and kind of samples collected increases, DNA databases include not only genetic material from convicted offenders, but also a wider array of voluntarily contribute samples. As noted earlier, for instance, one DNA database contained the profile of a victim, whose brother was later arrested after a familial search revealed the potential match. To the extent that partial matches stand on shaky constitutional

¹⁸⁶ Song, et al, *supra* note 100.; Curran & Buckleton, *supra* note 40, at 164 (noting that the “most straightforward way that genetics can contribute to lowering the impact on wrongly investigated families is by increasing the power of the technique by either adding further autosomal loci or by the use of mitochondrial DNA or the Y chromosome”).

¹⁸⁷ Yun Song, data on file with author.

ground, limiting the range of permissible databases to only convicted offenders – excluding arrestees, voluntary contributions, and victims, for instance, may help to minimize the harm.

Of course, such limitations may be difficult to enforce, especially if a database is kept in a way that does not distinguish clearly among these different populations. More importantly, there is an undoubted artifice in permitting such searches of convicted offenders but not victims, say, when the ultimate affected party – the pivot’s relatives – are equally innocent. In other words, why should the brother of a convicted offender be treated any differently than the brother of a crime victim? Although some limitations on the permissible databases to search might help diminish the potential intrusiveness of familial search methods, they have the indefensible effect of concentrating that intrusion on one population that is no less deserving of constitutional protection than any other. Indeed, to the extent that society chooses to engage in familial searching at all, it seems far more advisable simply to implement a universal database that would treat all innocent persons as potential suspects, rather than just those innocent persons who happen to be related to a convicted offender. In short, it seems that legally, logically, and morally unsustainable to limit the search to particular databases.

E. What regulation is there of the follow-up after a potential familial match?

Among the most important questions to be answered by familial search regimes are those regarding the aftermath of the search. Once investigators have identified a list of potential pivots, there will be a range of possible ways to continue the investigation. The most obvious course would be to let current constitutional law govern the aftermath of such searches -- to treat, in essence, the genetic tip as the equivalent of a tip from a human being. But such an approach blushes at the reality of the significance of the genetic information. Technology affects not only the nature but also the scope of a potential intrusion. It also invites a sense of false certainty and laziness that the rules around familial searches should strive to counteract. Accordingly, the preferred approach would be to regulate statutorily the manner in which the leads from a familial search may be pursued as a means of minimizing the intrusiveness of the practice.

For instance, a statutory regime might impose a maximum number of potential pivots allowable before investigation may begin. That is, part of the problem with partial match searches is that they may return a very large number of persons. One approach would be to

simply allow investigators to make their own judgments about whether or not such volume is useful. However, the preferable course is to specify *ex ante* whether the number of potential leads is so great that any additional intrusive forms of investigation should not be allowed. California's policy in some respects recognizes this, by allowing the release of a name only if the results were "manageable."¹⁸⁸

Although such limits seem artificial, they are necessary restrictions to offset the ease with which technology operates. Restrictions on when leads may be pursued counteract the tendency to overly rely on marginally useful but easily obtained information, as well as provide necessary protections for individual liberty. Thus, either some qualitative statement or quantitative number should impose boundaries upon when the results of a familial search may be pursued.

Jurisdictions might also consider imposing threshold investigative requirements before any genetic samples are sought from the relatives of pivots (i.e., the potential sources). That is, obviously the most convenient and easiest way of determining whether a relative is a source would be to simply test every relative that investigators can find. Given that genetic testing typically requires no more than a painless mouth swab, there is obviously great appeal in such an approach. Again, however, simply bestowing blanket authority to sweep families for genetic samples, based on the possibility that one is a source, serves only to exacerbate the privacy, accountability, and discriminatory concerns raised above. Moreover, to the extent that mere suspicion may raise questions within a family -- about either uncertain biological associations or potential guilt of the alleged offense -- the taking of samples should be the state's last, not first, resort.

Instead, statutes could require some threshold level of conventional investigation before any voluntary or court-ordered swabbing occurs. For instance, officers might be required to establish by conventional methods that a potential suspect had the means and opportunity to commit the offense, or attempt to secure other forms of evidentiary support of the person's guilt. Only after pursuing all lines of investigation with regard to that person, then, could officer's request the genetic sample. This might also have the salutary effect of reinforcing numerical limits on the numbers of persons that might be pursued. The goal is to make the genetic testing a form of last-resort, confirmatory information rather than a blanket, find-the-suspect-quick tool.

¹⁸⁸ CALIFORNIA POLICY, *supra* note X.

Lastly, statutes ought to clearly supervise the collection, testing, and retention of samples from potential relatives. This aspect of regulation is perhaps the most essential to offset the accountability concerns discussed earlier, because it ensures that those suspected solely for biological associations do not then, in turn, become permanent suspects. For instance, a statutory regime might impose a court order or subpoena requirement in order to collect a biological sample from a suspected relative, based on something like “reasonable grounds.” This safeguard would serve as a check against blanket suspect sample collection, and also serve as a point of review for procedural compliance. Some jurisdictions might even mandate that all relative samples be collected this way, and forbid the collection of “voluntary” samples, as a means of preventing low level harassment or coercion of suspects. Alternatively, a jurisdiction might require a heightened form of consent to sample submission -- perhaps a written waiver or the recitation of mandatory warnings.

Significantly, this kind of regulation is open to potential evasion, which also needs addressing. Under current constitutional law, police investigators can collect “abandoned” DNA freely -- and all it takes is one shed cell to “abandon” DNA. Courts have approved the harvesting of spit from the sidewalk and even deliberate acts of deception in order to acquire DNA from suspects.¹⁸⁹ Investigators can also avoid constitutional problems by obtaining DNA from third parties, such as a suspect’s doctor.¹⁹⁰ Even collections of genetic material that cannot be uploaded into the national database can in turn be stored in “rogue” databases maintained by states and localities according to their own norms or customs.¹⁹¹ Without regulation of these sources of collection, any procedural protections implemented to protect innocent relatives will be easily evaded.

Regardless of how the sample is obtained, a statutory regime also ought to provide for the destruction of both the genetic profile as well as the physical sample after testing is complete, assuming the suspected relative turns out not have in fact been the source. Again, as it stands, it is all too easy for the government to essentially collect large quantities of relatives’ genetic material, on the grounds that they are suspected as a source after a partial match, and then simply enter that material into the database and store the sample indefinitely. But if the sole basis for

¹⁸⁹ See, e.g., *Commonwealth v. Cabral*, 866 N.E.2d 429 (Ct App. Mass 2007). But see Tom Jackman, *No Court Order Issued for DNA in Rape Case*, WASH. POST, Jan. 18, 2002.

¹⁹⁰ Nakashima, *supra* note 41 (describing apprehension of BTK killer through genetic tests from daughter’s pap smear).

¹⁹¹ *Id.*

suspicion is that the person has a genetic profile similar to crime scene evidence, but is proven not to be the source, then absolutely no reason exists to maintain that profile or records. At the very least, the default assumption should be that all records and material is destroyed, and allow for retention only upon express permission.

F. What structural safeguards are in place.

Lastly, any concerted effort to regulate this form of investigation should also embed structures for general oversight. The benefit of technology, and to leads based on quantitative as opposed to qualitative information, is that it is more easily measured, monitored, and assessed. By building into any statutory regime a parallel requirement of data collection, interested parties will be able to review -- and improve upon -- the efficacy of such programs over time.

Thus, for example, the statutory regime could require tracking of the number of "hits" returned at various stages of the inquiry. Analysts could record the parameters of the search (in terms of stringency), the number and character of profiles returned based on autosomal loci (e.g., how many matched at each number of alleles), and then the number remaining after the Y-STR typing. Investigators might also record additional steps taken to winnow the suspect pool, such as additional investigation. Most importantly, investigators could record the number of potential sources contacted, and the results of any genetic tests. Naturally, a record of arrests or convictions that result from familial search investigations would also prove immensely beneficial.

With such information, investigators might learn how better to refine and narrow such searches to yield optimal results. There might also be a clear pattern establishing the utility or disutility of familial searching as an investigative method. This kind of information dramatically enhance the state's ability to measure the scope of familial search efforts, as well as its capacity to tailor future programs to optimize efficacy.

V. CLOSING

Sophisticated technological methods of investigation call for sophisticated legislative methods of coordination and control. This is true whether such searches are used to apprehend

or exonerate suspected individuals. For instance, advocates of familial searching often point to the case of Daryl Hunt, a wrongfully convicted inmate exonerated after postconviction DNA testing showed him not to have perpetrated the offense.¹⁹² A near-match search of the state database revealed a profile to a felon; investigators tracked down the felon's brother, offered him a cigarette, and tested its butt to find a match to the perpetrator.¹⁹³

Such a story raises questions both about the availability of defense-initiated familial searches of databases, as well as the power of the defendant to compel samples from possible alternative suspects. One Massachusetts appellate court has upheld an order to a third party to provide a DNA swab to the defense team, for instance.¹⁹⁴ Another court recently ordered the FBI, over its objection, to conduct a search of its DNA database for a profile that the defense alleged belonged to the true perpetrator.¹⁹⁵ Nevertheless, the ability at present for the defendant to conduct even direct-match searches in government databases, much less to compel sample collection from third parties, is far from clear.

Familial search methods show promise for aiding in investigations, but they also raise serious concerns of equity, civil liberties, and governmental accountability. As states and the federal government contemplate the advantages and disadvantages of implementing familial search policies, it is imperative that careful and nuanced attention be given to the subtle issues that such methods raise. Technology all too often enters the criminal justice system haphazardly and with enthusiasm out of proportion to its true promise and limitations. By cataloging both the possible concerns raised by familial search methods, and proposing policy limitations that might mitigate the effects of some of those concerns, this Article aims to enrich the public debate about the proper scope of such searches.

¹⁹² Rosen, *supra* note X.

¹⁹³ *Id.*

¹⁹⁴ Jansen, 444 Mass. 112 (2005). In *Jansen*, the defendant was charged with rape but maintained his innocence, alleging that unknown incriminating genetic material that did not definitively exclude him in fact belonged to another person. His request for a court ordered sample of the other person was originally denied, but when his private investigator collected and tested items "abandoned" by the suspect, which were found to match, the court ordered a confirmatory swab. The appellate court upheld the order. *Id.*

¹⁹⁵ Martha Neil, *FBI ordered to do DNA search to help suspect in Rape-Murder case*, ABA JOURNAL (Feb. 3, 2009).