Websleuths are private citizens who spend their spare time using publicly available information usually found online in pursuit of finding the identity of previously unidentified bodies (UIBs). Typically, they seek to find matches between UIB and missing persons profiles found at online databases administered by government agencies and interested groups. However, in many cases the data listed on these databases are missing or incorrect. For this study, I interviewed seven websleuths who have successfully identified UIBs. The purpose of this study is to examine the information seeking behavior of this previously unstudied group as well as to understand how they successfully navigate unreliable information systems for an important purpose. The study results indicate that these cases are solved through dogged persistence and unique heuristics developed as a result of years of experience.

Headings:

Information Seeking Behavior

Heuristics

Websleuths

Anomalous State of Knowledge
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Websites mentioned in this study:

The Charley Project: http://charleyproject.org An online database for cold case missing persons from the United States

The Doe Project: http://www.doenetwork.org The International Center for Unidentified and Missing


The National Center for Missing and Exploited Children:
http://www.missingkids.com/home US national clearinghouse & comprehensive reporting center for all issues related to the prevention of and recovery from child victimization

Newsbank: http://www.newsbank.com Online newspaper archive

Newspapers.com: https://www.newspapers.com Online newspaper archive

North American Missing Persons Network https://www.nampn.org An online database for missing persons from the United States

Websleuths.com: https://www.websleuths.com Online Crime Sleuthing Community
Introduction

“What’s in a name? That which we call a rose by any other name would smell as sweet” argues Juliet in Shakespeare’s “Romeo and Juliet”. But as people in love are known to do, Juliet didn’t fully grasp the issues that kept the lovers apart. It was not Romeo’s name that was at the core of the couple’s troubles but rather, his identity. Identity is the aggregation of experiences and connections that we have built as we have lived our lives, both within our family and without. The accumulation of days lived and roads travelled forms the essence of our personal narrative. This narrative is our identity, the fundamental unique truth about who we are.

So what, really, is in a name? While a name is not an identity, it serves as a convenient label for the complicated and untidy truth of our identity. Just as the label on a can of food does not fully describe the tastes within that can, a name provides a point of reference for all of us, a tether between the public reality of our body and the private identity that is intrinsic to each of us. We are usually glad that others know our name. When others know our name we sense that we play a role in their lives, no matter how minor, and that we have not been forgotten. Our name is not our identity, but it is nevertheless an important aspect of our identity, one that we are typically most willing to share.

To provide proof to others that we are who we say we are, we usually carry one or more forms of identification with us. This library card or drivers’ license or social
security card also indicates that our name, and consequently our identity, is acknowledged by some agency and that some aspects of our fundamental identity are almost certainly recorded in a database somewhere.

So with all of this formal and informal infrastructure in place, each of us feels comfortable that our name is securely linked to our identity and our identity is immutably, it would seem, linked to our body. However, in a surprisingly large number of instances, the seemingly durable link between our body and our name has become broken. NAMus estimates that there are currently over 40,000 bodies or remains of bodies in the United States that are unnamed and unidentified. All the safeguards and systems that would typically ensure that our name and our body cannot become separated have broken down. This tragic disconnect disturbs our positivist sense of the world. Our sense of identity is not as ironclad as we had intuitively felt. The connections with the world that we experience on a daily basis have, in the case of an unidentified body (UIB), evaporated into nothing and no one is there to say “I knew that person”.

But, at one time, connections did exist, and in many cases there is a lack of closure on the part of friends and family. The information regarding the fate of a loved one is a mystery, and may have been so for decades. While the police may have been actively working on the case years ago, there may have been no resolution to the mystery. While police are trained in the art and science of re-linking names with unidentified bodies, the case may not have been solved for any number of legitimate reasons, such as staffing and funding and workload.

The root cause of UIBs remaining unidentified is squarely within the realm of Information Science and its research goals. As Belkin would frame it, the problem is an
“anomalous state of knowledge”, a scarcity of information that needs to be resolved (Belkin, 1980). In the instance of “cold cases”, cases that have not been solved after a lengthy police investigation, the anomalous state of knowledge becomes extreme; all discovered information (evidence) has been collected, evaluated, aggregated, and analyzed. All information sources have seemingly been exhausted. Yet no satisfactory conclusion or solution has been reached. There is no name for the body.

Our culture seems to have an insatiable appetite for these cold cases, both fictionalized and real. Popular television shows such as, of course, “Cold Case” as well as “Bones” and “CSI” have fed that appetite, all the while making the work of such investigations appear all too easy.

Networked information structures, primarily the internet, have provided amateur detectives new opportunities for the purpose of information gathering in hopes of solving such cold cases on their own and in collaboration with others. Websites such as Websleuths, the Doe Network (“Doe” being the default name for UIBs) and NAMus have provided a resource for discovering cases to study and forums for interactive discussions with other sleuths.

The work of these hobbyist sleuths provides interesting avenues for Information Science research. While the internet has increasingly democratized the process of identifying the unidentified, a number of questions have arisen regarding the information seeking behavior of those would-be Sherlock Holmes who are successful in solving cold cases. Several of the questions are addressed in this study. Broadly stated, I hope to understand the ways that websleuths search for information that could lead to case resolution. If they have access to no additional sources beyond those available to the
professional investigators, how have they been successful where professionals have fallen short? My research will examine the information seeking behaviors and methods of a number of websleuths following qualitative, semi-structured interviews. I will concentrate on websleuths that have a successful record of accomplishment at their avocation. I am interested not only in their information seeking behaviors, but also in how they evaluate the veracity of the information gathered on the Web and particularly on collaborative forums. Finally, I will consider the process by which each individual assembles the information “pieces” into a coherent, satisfactory narrative that can be presented to the authorities.

It is my hope that this research will yield insights into new ways of seeking information and new ways of organizing that information that will prove helpful to information seekers in general, but especially to professional investigators and their amateur counterparts. It would be very rewarding if the discussion of new ways of thinking about information seeking processes could lead to the solution of other cold cases and providing closure to friends and family of the deceased.
**Literature Review**

The specific area of interest in this study, websleuths, has been largely unexplored in scholarly literature, perhaps because the purview of websleuths is somewhat differentiated from most instances of information seeking behavior. That is, most information seeking behaviors that have been studied are implicitly situated within the sphere of information that, while possibly difficult to find, is generally understood to be available. The information sought is assumed to be extant and findable, and the researchers are interested in studying how a given group or individual comes to be in possession of that information. By contrast, websleuths have no assurance that the information that will play a part in identifying a body can actually be found. Metaphorically, they are working to complete a jigsaw puzzle that may not have all the necessary pieces. Moreover, they are aware that many efforts, on the part of police and others, have been unsuccessful. They have no guarantee of reaching a satisfactory conclusion and a near certainty of frustration. Yet a small number of these individuals have found success in an endeavor that would, on its face, appear impossible. So how do they do it? What methods and processes of information retrieval and discovery have they devised and refined that have allowed them to find that needle in the haystack? The differentiating factor of success where success seems to be a practical impossibility makes the study of this group worthwhile. This research aims to discover the details of these behaviors and discuss ways in which these investigators' work may be generalizable to a broader range of information seekers.
Despite the gap in the literature, several areas of information science inquiry address conceptual aspects of websleuth behavior.

- Information Seeking Theory
- Serious Leisure
- Information Quality and Evaluation
- Knowledge Construction

These areas of study will be covered in this literature review.

**Information Seeking Behavior Theories**

Information seeking behavior is a much-studied area of library and information science, and two of the well-established models for information seeking behavior are particularly relevant to the specific behaviors of websleuths. These are Belkin’s conceptualization of Anomalous States of Knowledge (ASK) and Dervin’s Sense-Making Theory.

Nicholas Belkin’s concept of Anomalous States of Knowledge (Belkin, 1980) seems to fit the conundrum that faces websleuths as they search for clues. He calls these situations ‘anomalous’ because “inadequacies in a state of knowledge can be of many sorts, such as gaps or lacks, uncertainty, or incoherence, whose only common trait is perceived as ‘wrongness’” (137). The notion of “inadequacies” and “wrongness” seems to capture not only an intellectual aspect to investigators’ work, but hint at an emotional side as well. The investigators’ drive to seek information in hopes of identifying a body are driven by a sense of “wrongness” not only in an informational sense, but in a humanitarian sense as well. When a person remains unidentified, the world seems somehow out of balance, opaque. Further, Belkin’s conceptualization of ASK “allows
one to explain the problem of non-specifiablity of the information need” (137). For websleuths, the information needed to resolve a case is dauntingly non-specific. It is likely that the investigator may not be certain which, if any, nugget of information may contribute to the identification of a body. In fact, a piece of information that appeared seemingly meaningless at one point could prove to be the key to the identification of a UIB. Belkin also says that “the ASK framework assumes that the user’s ASK will be changing on receipt of the information, leading to a different ASK…This point of view also assumes that it is unlikely that any one text will ever satisfactorily resolve any ASK (141). This framework of iterative information seeking behaviors seems likely to encapsulate the work of the websleuths.

Brenda Dervin’s (1983) notion of sense-making implies this same nagging feeling of incomprehensibility. Two of her core conceptual premises are particularly relevant. “Sense-Making starts at bedrock with an assumption that reality is neither complete nor constant but rather filled with fundamental and pervasive discontinuities or gaps… A second bedrock assumption of Sense-Making is that information is not a thing that exists independent of and external to human beings but rather is a product of human observing.”. Her model’s mention of discontinuities and cognitive gaps would seem to mirror the experience of gathering clues piece-by-piece to address ambiguities in the case. The non-linear nature of these searches fit Dervin’s concept of gap-bridging. “The gap-bridging metaphor…suggests that information use is a highly contextual activity. Information use depends on what kind of a gap has been encountered, and when and where it takes place”. (Savolainen, Information use as gap-bridging: The viewpoint of
sense-making methodology, 2006, p. 1221) The work of websleuths appears to fit very well with the epistemological model of sense-making and, in particular, gap-bridging.

**Serious Leisure**

Since websleuths do not pursue this activity in an occupational role, it can be conceived as a leisure activity. Robert Stebbins (1982) developed his theory of “Serious Leisure”, as an umbrella category for a subset of hobbyist, career volunteering, or amateur pursuits. Stebbins contrasts his concept of seriousness “as a dichotomous quality, with casual or unserious leisure as its opposite” (255). His characterization of the phenomenon is quite descriptive of the activities of websleuths. Stebbins notes that those who participate in serious leisure are defined by a series of qualities, including a tendency towards perseverance as well as “significant personal effort based on special knowledge, training, or skill, and sometimes all three” (256, emphasis in original). His list of eight durable benefits of serious leisure activities sheds some light on the attraction: “self-actualization, self-enrichment, recreation or renewal of self, feelings of accomplishment, enhancement of self-image, self-expression, social interaction and belongingness, and lasting physical products of the activity” (257). In this context newspaper clippings and letters of gratitude might be examples of these physical products. Stebbins goes on to assert that, “A ninth benefit--self-gratification or pure fun--which is considerably more evanescent than the preceding eight, is the only one that is also characteristic of unserious leisure” (257). Stebbins later mentions that career volunteers also benefit from a sense of altruism (264), which would most likely be a reward for websleuths.

**Information Quality and Evaluation**
Perhaps more than most other information seeking behaviors, evaluation of information quality surrounding identification of UIBs is precarious and delicate. Like a human pyramid, determining an identification requires that each nugget of information be reliable and well-founded. It is not unlikely that subsequent clues will rest on the veracity of earlier findings and any incorrect information has the potential to send the investigator’s case off target. While the availability of information on the internet could be viewed as the sine qua non for websleuths, the lack of required authority for posting on the internet raises significant concerns about the veracity of that information. The democratization of publishing on the internet has created a “leveling effect” (Burbules, 1998) that implies equal information credibility in the minds of internet users.

Rieh (2001) examined the ways in which Web users determine quality of information (“the extent to which users think that the information is useful, good, current, and accurate”. (Rieh, 146)) and cognitive authority (“the extent to which users think that they can trust the information” (Rieh, 147)). Of the four research questions explored, “What are the factors that influence people’s judgements about information quality and cognitive authority” seems most germane to this study. Rieh cites Hogarth’s (1987) concept that two types of judgements are involved in all choice situations: “predictive judgement” and “evaluative judgement”. Predictive judgement is the force that leads users to decide among multiple choices- in this context, information sources. Evaluative judgement occurs after the user has looked at the chosen source. Rieh found that in both predictive and evaluative judgements concerning quality and authority, “type of source” and “source reputation” were primary concerns. It is certainly reasonable to imagine that websleuths would share these concerns as well. It is possible that they implicitly and/or
explicitly follow a hierarchy of trust for the information sources they utilize. Assessing the process by which information sources are evaluated will be a focus of this research.

There are a great number of articles that attempt to provide guidelines for assessing information quality on the Web. Two approaches that would appear to be applicable to the needs of websleuths are comparison and corroboration (Meola, 2004). Comparison is the examination of the similarities and differences between items, while corroboration is the verification of information against one or more different sources. With serious, credible sites such as namus.gov, doenetwork.org and websleuths.com, websleuths can more quickly and confidently access UIB information. Then they can attempt to synthesize their new information with what was already known. Nevertheless, the process is far from foolproof.

**Knowledge Construction**

While information seeking behavior is the focus of this paper, in the context of websleuths, this behavior is inextricably linked to the outcome and ramifications of the seeking process- the use of information and knowledge construction. In particular, the iterative dynamic of information gathering/information synthesis seems particularly relevant. Rumelhart and Norman (1976) propose a three-step process that humans go through as they perform complex learning. Complex learning is contrasted with the “simple accumulation of new information into memory” (37). Complex learning “takes periods of time measured in months or even years [and is] much more than the successful storage of increasing amounts of information [and] appears to have an emergent structure. This learning seems to involve a modification of the organizational structures of memory as well as an accumulation of facts about the topic under study” (38). The
three-step process they put forward involves accretion, restructuring and tuning of knowledge. “Accretion is the normal learning that has been most studied by the psychologist [such as] the learning of lists, dates, names of presidents, [and] telephone numbers…In this case there are no structural changes in the information-processing system itself” (38). Tuning “involves actual changes in the very categories we use for interpreting new information” (39). For example, as we learn to type, and become better at typing, our response routines become more acutely tuned to the task and we begin to accomplish the task more easily. Restructuring is a more difficult and more significant process where “new structures are devised for interpreting new information and imposing a new organization on that already stored” (38). If by imagining the websleuth sifting through photographs on namus.gov while trying to match these photographs with a mental database of human remains in various states of decay while synthesizing geographical, relational and historical facts about the unidentified body, we begin to get a sense of the complex matrix of knowledge construction that contributes to the work of a case, as well as the specialized information seeking behaviors that this group uses.

To explore these issues, this study focused on interviewing successful websleuths and learning about their information gathering processes. Since these investigators are self-taught, they have devised a method or series of methods to find and evaluate the information they seek for identifying UIBs. After compiling and analyzing the results of these interviews, I identified trends and correlations between their information gathering methods. A discussion and broader implications of these finding are presented later in this paper.
Methods

This research focused on studying online websleuths in two ways. First, the study was restricted to individuals who concentrate on cases involving unidentified bodies. As a subset of all cases, UIBs appear to require the most intensive information seeking behavior due to the extreme inscrutability in such cases. The blankness of the slate concerning the identity of the body implies a more comprehensive information vacuum and therefore requires a more sophisticated information search process. Second, the study was limited to individuals who have been successful in their investigative efforts to solve UIB cases. While online sites such as reddit.com and websleuths.com have a large contributor base, the overwhelming majority of active members have not successfully identified a previously UIB, so their information seeking behaviors will not be included in this research. This study concentrated on individuals who take their information seeking activities very seriously, and have refined their techniques over time and have learned behaviors that have adopted principles and approaches that might be generalizable to a wider set of information seekers.

The lack of research directly related to this area of study would indicates that these individuals have rarely been the focus of a serious scientific study. Therefore, this work will provide a foundation towards further study of this group. I designed this study to gather as much information as possible without imposing restrictions that might hinder broad illumination of the subject group. I employed qualitative research methods in hopes
of gaining as nuanced and wide-ranging an understanding as possible given the inherent limits of the study. My intention is for the study to be idiographic in nature with a goal of discovering a high degree of specificity about these information seeking behaviors.

**Recruitment**

In her book, *The Skeleton Crew*, Deborah Halber states that many successful websleuths work in low-paying jobs that do not provide sufficient stimulation and challenge for their cognitive abilities (Halber, 2014). They are a group of highly autonomous, intrinsically motivated individuals. There is no organized entity with membership and regular meetings to which they belong. Therefore, they are not easily identified, especially in the pseudonym-filled environs of the internet. Fortunately, there are a number of avenues that can be useful in identifying and contacting successful websleuths. Halber’s book profiles several successful websleuths as well as people involved in the administration of sites containing databases of unidentified bodies such as NAMUs that have benefited from the contribution of websleuths. Preliminary contacts with such people have indicated that they were willing to help me identify and contact other individuals who might be willing to contribute to this study. Also, during the recruitment and interview process, I encouraged subjects to recommend other websleuths that they felt would be appropriate for this study. I interviewed 6 subjects for this study to provide as wide a sampling of behaviors as possible.

After identifying as large a group of investigators as seems manageable, I invited them via email or telephone to participate in semi-structured interviews. Because these interviews occurred during their discretionary time, they were compensated with a $20 gift card, paid at the end of the interview. Upon recruitment, a time and date for the
interview was scheduled and an informed consent document was sent either electronically or through the mail. Accompanying this document will be an explanation of the general form and areas of interest that will form the bulk of the interview. The subjects were encouraged to consider areas that they think are important to their process prior to the interview.

**Interviews**

The interviews were semi-structured in order to allow for more freedom to explore interesting and relevant details as prompted by answers to the interview guide. At the onset of the interview, participants were informed that they will be recorded during the interview and their verbal approval for the recording was confirmed. The interview began with a few minutes of informal introductions and description of the project to establish a favorable rapport with the participant. Then a series of open-ended questions (see Appendix) was asked concerning the micro and macro approaches that each subject takes in his or her work. I paid special attention to the concept of consistent process in each investigation. Each interview lasted approximately one hour.

**Coding and Analyzing Data**

Each interview was transcribed upon completion. Preliminary notes and tentative coding were entered on each transcript. Then, when all interviews were complete, they were re-read in their entirety so as allow for reconsideration and the chance to discover similarities and differences between the interviews and to permit larger themes to emerge. Instances of these emergent themes were captured and quantified. Subsequently,
each interview will be reviewed separately to begin extracting and coding the responses as recognizable patterns. In the qualitative tradition, the data will speak for itself.
Interviews: The Websleuths

Jenny

Jenny is a websleuth residing in the North Eastern United States. Her first successful identification of a UIB came in 2010. She has three ‘solves’ to her credit, though she suspects that she may have made more matches for which authorities have yet to give her official confirmation.

Jenny says that she first became interested in finding and identifying the missing when she was only 10 and became aware of another girl, also 10, who was reported missing. “I just started focusing on how I wanted to find her.” Although the girl was never found, Jenny’s fascination continued unabated and she began websleuthing in earnest in 2005.

Jenny says that older cases- those from the 1970s, 1980s, and 1990s- are “intriguing,” in part because DNA matching was not commonly available then. When Jenny has time available for websleuthing, she says she visits one of the online UIB websites such as -but not limited to- NAMus.gov, The Charley Project, or The Doe Network. Then, she says, “I pick one out for the day.” She tends to choose older cases that have only recently been entered into the site database, since fewer websleuths will be working on it. After deciding on a case to pursue, she visits the sites from which she did not find her UIB. Then she looks for matches using metadata such as height, weight, and hair color, as well as any unique features such as broken bones or tattoos that the UIB and
the missing person had in common. To make finding a match more likely, she tends to concentrate on UIBs with as much metadata as possible. Jenny then writes down all the metadata from the UIB and missing person’s posting on Post-It notes and puts them in a place where she can easily cross-reference the missing person’s data with that of the UIB. She says she takes her time and goes through the possible matches “with a fine-toothed comb.” “I just try to match up the descriptions.” She keeps county maps at her desk to compare geographical proximity between the UIB and the missing person to determine if the match is “feasible” and evaluates whether the cases’ event time frame is logical. If the cases have photos and/or a facial reconstruction, she will put them side by side to compare.

If she finds a missing person in her search that “has merit,” she will continue the investigation until she becomes sufficiently certain of a match, at which point she notifies law enforcement or conversely, she decides, based on experience, that the particular case lack sufficient data and should be abandoned. Jenny has found that some of her matches have been remarkably obvious and she is surprised that no one had noticed the connection before she did.

When evaluating the likelihood of a match, Jenny considers the possibility that the listed metadata may be inaccurate. Height, for example, is a data point that she finds often varies by a few inches between a confirmed UIB/missing person match. Similarly, she finds that hair color descriptions can vary greatly between two postings that are, in fact, a match.

Although Jenny has a full-time job and considers her websleuth activities to be a “hobby,” she feels strongly about her UIB work. “If I could do this full time- to give
these families closure- I’d do it.” Jenny’s online ISB exclusively requires seeking matches between her initial selection of UIB and a missing person listed on another site. She is saddened and frustrated by the information discontinuity between sites that preclude making a match. “It’s sad that some of these people who went missing have never been reported missing.”

**Donald**

Donald is a veteran websleuth with 8 years’ experience. He lives in the Northeastern United States and has an academic background as a textual scholar, which he feels is useful in websleuthing. He reports that his websleuthing activities are intermittent, although he sometimes becomes overly focused on a case, to the detriment of his other responsibilities. Donald says he became interested in websleuthing because, he says, “I’m haunted by the idea that people can disappear.” He is attracted to solving UIB cases because he enjoys puzzles, but with real world consequences “that are pertinent to the lives of actual people.” He enjoys television shows like “CSI” that feature the activities of forensic detectives.

Donald typically seeks out missing persons and then tries to match them with UIBs. He finds that he is more interested in cases that involve people who disappeared during his youth because he recalls putting himself in dangerous situations and feels fortunate not to have ended up as a UIB himself. He looks for cases that have as much information as possible about the UIB and is frustrated by listing that have very little information to use in the search. He describes his method for solving cases as “Making the best guesses and trying them out, and then trying something else when it doesn’t fit.”
Donald’s first solve was unusual in that he solved 2 cases simultaneously. He visited The Charley Project a site which, according to the site FAQ, “attempts to catalog as much information as possible about as many [missing persons] cases as possible into a database as a publicity/investigative aid for the public and law enforcement to help them solve cases.” Donald noticed two chronologically ordered cases side by side on the site. He initially was drawn to the cases because the individuals reported missing were originally from his hometown in the Central US. Donald noticed that the missing female was said to have left town with a sailor. The missing male’s information mentioned that he had been a sailor who had gone AWOL. Donald said that “The case kind of haunted me, and I kept coming back to it.” He was bothered that no one was attempting to make the connection between the two cases, despite the possible connection.

In the course of his research, Donald performed many keyword searches and used Google Maps to understand the cases better. One day he noticed the mention of a small town in the West connected with one of the cases. He did a web search of the name of the town and came across a lengthy article detailing a retired detective’s effort to solve the cases of the two UIBs found there. The article “furnished lots of salient details,” many of which Donald had uncovered as he researched the cases from the missing persons aspect. To better support his belief that the missing persons cases and the UIB cases in the West were connected, he went to the NAMus site in search of “rule outs” that might disambiguate his possible solution.

After finding nothing to cast doubt on his theory he contacted the retired detective with the relevant pages at The Charley Project and suggested that the cases were related. In a short time, the detective confirmed the match. Afterwards, the detective confirmed
that he had been through The Charley Project pages “a thousand times and the match just
never clicked.” Donald likens his solution to this case where others had failed “like a
Magic Eye painting” where some people can discern an image and others cannot.
Sometimes we read with too focused or insufficiently focused attention.” Nevertheless,
Donald is quick to recognize the role “extremely fortuitous circumstances” played in his
solution. “Circumstances have to be right.”

Because the information sources were textual, coupled with his background as a
textual scholar, Donald felt it resonated with him. Although he feels like a bit of an
aberration among websleuths since he does not have a strong visual memory, he
compensates by “caressing the details.” However, he feels that to be successful,
websleuths cannot be easily discouraged. He says that too many sleuths get obsessed with
a specific solution and “try to pound square pegs into round holes. You have to know
what you’re licensed to infer.”

Donald speaks of the process of solving UIB cases as employing an
“informational ecosystem,” sometimes involving information that has never been shared
or publicly posted. But, that ecosystem is “hit and miss”, however, and sometimes
information scarcity makes the chances of solving some cases a practical impossibility,
despite his own unlikely solve.

Donald lists several factors that hinder the solution of cases: inaccurate forensic
evidence, subjective categorization standards, and little incentive for sharing of
information on the internet. Some forensic evidence can be tainted because “some of
these coroners are well trained and some of them aren’t. There are people out there acting
as though widely accepted forensic methods, like tissue preservation, don’t exist.”
Donald also worries that there is no universally accepted set of standards or naming conventions for forensic categorization. He says he used a “fudge factor” when researching his solve to compensate for inaccuracies in height, weight and age of the UIBs. “There is so much inaccurate forensic evidence that you become wary about trusting info and you can’t take any of these things for granted.”

The information scarcity dimension of websleuthing bothers Donald on a human level. “It’s sad when there’s not enough information to conclude that anyone really cared or cared enough to post information on sites.”

**Jill**

Jill’s interest in unidentified bodies began in the mid 1990’s when her uncle went missing. However, she did not begin web sleuthing until 2007, when her personal situation left her with a great deal of free time on her hands. At this time, she discovered several online resources that made the process of internet searching among the UIB population more manageable.

In her search for cases, Jill scours several online resources, namely websleuths.com, NAMus, the Missing Persons Facebook page, and the Crime Watchers feed on Twitter. While on the lookout for new cases, she also familiarizes herself with other active cases. Although many states and foreign countries have sites with a UIB database, Jill finds that their usefulness is limited due to ongoing maintenance and organization issues. Since state sites are not currently required to post UIB cases and do not always update these sites after a case has been solved, they are often unreliable and incomplete. Jill also finds that web design and site search engines are inadequate for her needs and tend to hinder the kind of perusal she wants to do. Jill describes Interpol, for
example, as “universally terrible.” On the contrary, she reports that some sites, such as Websleuths.com do an excellent job of organizing information in an accessible way, including a requirement that thread titles be very descriptive to allow for quick scanning and evaluation. Furthermore, Websleuths is a very large and active community, so information tends to be updated often. Jill searches for what she calls “low hanging fruit,” cases that are potentially easier to solve but have not been given the attention that other more well-known cases receive, because “there are enough eyeballs on them already”. Her experience has taught her that sensational, salacious cases constitute a small minority of UIBs, and that a mistake that newcomers to the field make is to prejudge a case as involving a serial killer or dramatic circumstances. More often, she says, cases involve much more mundane facts and context.

Jill feels that there are several intangible factors that have contributed to her success at solving UIBs. She believes that she has a good memory for faces such that when she sees a face on a given site she remembers it and, if she sees it again, recognizes the potential for a match. She also credits her persistence as a factor in her success. “I don’t mind that it’s tedious and boring 90% of the time,” she says. Her willingness to explore databases ceaselessly may have its roots in the fact that she was an early user of the internet, and she feels that she has a robust understanding of web and site design, which also helps her in her UIB work. Jill also learned many techniques and approaches that have come to inform her information search process from other Websleuths. By trawling through websites that contained information about UIBs, she assimilated other successful Websleuths’ methods and procedures to enrich her work.
Jill’s information seeking has improved over the years with experience as she has become more adept at pattern recognition and parsing information. Moreover, she feels that she has learned to recognize “what is valuable” in support of solving a case. Jill’s understanding of the important components of UIB work are stratified as such:

- Area & Time frame
- Sex, Race
- Age
- Height & Weight
- Hair Color, Tattoos

Jill places most value on area and timeframe because experience has taught her that people tend to be found in fairly close proximity to when they were last seen. Sex and Race are next but are sometimes difficult to determine if the UIB is decomposed. Age is typically awarded a range value, given to the wide variance in possible experiences. For example, if the person was homeless, he or she could appear much older than someone with a more stable living situation. Height and weight are also assigned a range value. Jill has found that height and weight values as specified on databases or websites are often incorrect, and sometimes astonishingly so. To correct for potentially inaccurate data, she adds a four-inch range, positively and negatively from the reported height. Also, she adds and subtracts 25 pounds to the listed weight to account for incorrect data. In addition to the height and weight allowances Jill has developed a number of other heuristics that she considers while considering available data. For example, Jill has learned that eye color is notoriously unreliable, since anecdotal data has informed her that all eyes appear brown 3 days after death. Therefore, she only trust eye
color is the body appears recently dead. Similarly, hair color and tattoos only factor into her decision-making process if the body is intact.

Jill’s determination of “what’s valuable” informs her search behavior, and the stratification of these criteria help her compile evidence to support her hypothesis concerning a given UIB. Jill insists that she does not use intuition. Rather, her hypotheses require vigorous supporting evidence. Jill uses sophisticated web search techniques in pursuit of “little gems,” as she calls them.

Since Jill has been websleuthing since the early days of the internet, she has experience with an array of web search engines that were used prior to today’s de facto standard, Google. Ironically, Jill does not see the ascendancy of Google as a boon to her websleuthing endeavors. She is often not searching for the most popular “hit” for a given search, which is the algorithmic design of the Google engine. Instead, she looks for information that is rarely accessed, since UIBs often have murky personal histories. Therefore, she found that earlier search engines such as Lycos, AltaVista and Dogpile were more helpful. Since each engine used a different search algorithm, the search results would vary significantly. Jill became aware of these idiosyncrasies and used each engine’s tendencies to benefit her websleuthing activities. Through carefully calculated entry of search terms, and slight alterations of the search terms, Jill found that that she was able to find more useful information to help identify UIBs. The consolidation and deprecation of search engines in the latter 2000’s, Jill feels, made accessing seldom-searched information more difficult to find.

*Tom*
Tom is an experienced websleuth from rural Southeastern United States. He became interested in 1987 when he married a woman whose father had found a UIB years earlier and, yet the case remained unsolved. Tom, by his own account, became “obsessed” with identifying the body. As 1987 was well before the widespread availability and use of the internet, Tom traveled a lot in search of clues for the case. He searched for information in old newspaper and magazine articles. He sought out people who were quoted in these periodicals and tried to contact them, hoping for any new information. Tom was unable to find sufficient information to solve the case, although he remained very interested in identifying the body.

As the years passed the internet became more widely available in Tom’s area. He found the internet intriguing and his hope for identifying the UIB was rekindled. In November of 1997, Tom built a website for the UIB, hoping to attract attention to the case through the nascent internet. He collected and posted all available material on the site. Still, with no real way to drive traffic to his site, no leads were discovered.

Locally, the story of the UIB became an “urban legend.” Hoping to build interest in his site, Tom contacted an acquaintance who worked at a local television station and told him about the website for the UIB, hoping to capitalize on the burgeoning interest in the internet as well as the local phenomenon that the UIB had become. Although more newspaper articles were written in response to the story, no new leads were forthcoming and interest and awareness in the story had not expanded beyond the small town where the UIB was found. Tom became frustrated that “no one was picking up the bread crumbs,” as he recalled.
However, Tom realized that because of his appearances on television and in local news article, his was becoming much more associated with the UIB case. He began to realize that traditional media and the internet could spread the story on a larger scale. He began what would in time become a strategy of savvy media use that continues to this day. Whenever Tom made a new discovery in his UIB case, he would notify his media contacts in hopes of reaching someone who might be able to contribute to the solution of the mystery.

At the same time Tom continued his online searches, growing increasingly sophisticated in his use of the search engines that were popular at the time. Tom notes that in those early days of the internet, there was less content to sift through. “The youth of the internet was very helpful. I didn’t have to sort through so many piles.” Finally, in January of 1998 while scouring a bulletin board called Hibbs and Crane, which Tom likens to “the Craigslist of its day”, he noticed a post mentioning a lost sister, including mention of time and place that were consistent with the timeline he had established. “I found her buoy!” says Tom, referring to temporary marine navigation markers. He notified local authorities, and following exhumation and DNA testing, his UIB was conclusively identified. Tom says, “I found a scratch for my own itch.”

Throughout his work to solve his UIB case, Tom says he never considered the possibility that there were UIBs other than the one he was attempting to identify. “I saw an occasional Jane or John Doe on America’s Most Wanted, but I didn’t really think about it.” Over time, he began to see State and County websites for UIBs. But as a result of his publicity of his first solve, Tom began to receive calls from other people who were looking for a lost relative or acquaintance. Tom continues to use the media to help solve
cases. His experience has informed his media involvement concerning the importance of a compelling narrative. “You gotta make it interesting to them. It has to be a story,” which involves giving the UIB an identity, even without a name, says Tom. Tom thinks in terms of putting a puzzle together, trying to discern which pieces fit and how well they fit as he attempts to solve a UIB case. Nevertheless, he is careful not to provide data to outlets that may be speculative since such data, if incorrect, could eliminate possible sources of information. That is, if he speculates that a UIB had red hair when the person actually had blonde hair, a relative of the UIB might decide that this UIB could not be the person they are seeking and decide not to become involved. More broadly, Tom is concerned with inaccurate posted data on UIBs. Information categorization issues are a constant concern. Data concerning hair color, age and height are a few areas that can help to solve a case, but the accuracy of the data is often suspect due to the natural subjectivity of the information reporting source as well as the condition of the remains of the UIB. Tom says that he attempts to find out who the information source was and whether that person was a forensic subject matter expert. If not, he realizes that the information may well be inaccurate due to lack of training on the part of the reporter.

Tom feels that it is critically important to visit the locale where the UIB was discovered. Being on site optimizes his chances for finding a local person who can serve as his “link to the past.” By finding an information source who has “a living memory”-circumstantial details on local history, the social milieu of the time, and even recollections of weather conditions Tom can apply his experience to find possibly useful information that could lead to a solution of the case. Because Tom is a Southerner, he focuses on cases in the South because he feels that other Southerners relate better to him
due to similar backgrounds and regional vocal accents. When possible, he likes to work with local parties who “are moved by a compassionate connection” to the UIB, facilitating a collaboration and exchange of information.

Tom notes that sites such as NAMus.gov have become much more useful for assisting the identification of UIBs. NAMus.gov now has database search capability that can flag potential matches based on similarities based on geography, chronology and biometric comparison. Still, Tom says, the UIB identification process requires a human. “The machine has no instincts.”

**Debbie**

Debbie is an experience websleuth with over twelve UIB solves to her credit. Her interest in websleuthing dates back to 2003 when she read and was fascinated by a detective novel by Sue Grafton, *Q is for Quarry*, which featured a fictionalized account of a resolution to an actual UIB case. After reading the book, she went online and “could not believe the number of UIB cases out there. She perused the Doe Network, a website frequented by some websleuths that contains case files for UIBs. At Doe Network, websleuths can find cases and submit possible matches to the Doe Network Potential Match Panel, a group of seasoned websleuths that evaluate the potential match case and judge whether the evidence is strong enough to warrant being turned over to law enforcement for follow up.

In only a couple days, Debbie found a possible match for a case on Doe Network posted on another UIB site. Although that case had already been solved, Debbie joined the Doe Network. Debbie self-identifies as “a woman of faith” and says she “prayed about it and felt it was something that I was supposed to get involved in.”
Debbie makes it clear that she has a great respect for law enforcement and does not devalue their efforts. She recognizes that law enforcement is overworked and understaffed. She adds that cold cases receive less attention than new cases due to this lack of resources, but “I have time to do that stuff.”

Debbie has a wide-ranging approach to finding cases that interest her. She scours existing internet database sites such as Doe network and The National Center for Missing and Exploited Children. She says that she approaches a case from the UIB side first, then seeks a possible match from individuals listed as missing. “I have a passion for the missing, but my greatest passion is for the unidentified.” Furthermore, she looks for cases that have not yet been entered into any UIB database that she finds when scanning information sources like archived newspapers. She observes that estimates of 40,000 UIBs nationwide are “just a guess” since in many states there is still no requirement that law enforcement or medical examiners enter UIB data into any kind of database system.

Debbie’s information seeking behavior is influenced by the fact that she enjoys puzzles and loves to research. She has spent many hours at a local university looking at microfiche in search of information that is not on the internet. She also subscribes to newspaper archives such as Newspapers.com, which includes scanned images and Newsbank.com, which does not.

Debbie says she has an inherent facility for remembering and connecting details from disparate information sources and says she is a visual learner. For instance, she says she reads a document and “misspelled words are just popping off the page.” Her visual orientation leads her to attempt comparisons between two images. On her computer, she copies the missing person’s face alongside an image of the UIB’s face. Then she takes
half of one image, resizes it to fit with the other image and creates a composite image to check for a possible match.

Debbie experience has taught her that information integrity is an important issue in websleuthing. Her information search behavior reflects a number of heuristics that concern the veracity of data on UIB database sites. Her overarching belief is that “if data is not good, your system is not good.” She said, “It’s important not to be bound by the data” because the UIB database sites are rife with inaccurate data. “Don’t automatically exclude a possibility because something is not matching perfectly because mistakes happen all the time.” Conversely, she does not assume that because an identifying mark or feature is not in the database that it was not present on the UIB. She recalls a case where the UIB had a prominent birthmark, but there was no mention of it by the coroner. “It’s not an exact science. People put in incorrect information or guess wrong.” She recalls a case where the skeletal remains of a Black male were misclassified as a White female.

Debbie’s first solved case involved the issue of data integrity. While checking websites in 2004, she noticed a photo of a UIB found in Las Vegas. Based on her ability to retain details from previous searches, she recalled seeing a photo of a man from New Jersey who resembled the UIB from Las Vegas. However, the data was disconfirming. The man was listed as having been found on June 21, while he was listed as missing on June 27, six days after he was reported to have been found dead. Nevertheless, Debbie submitted the pair as a possible match. Fingerprints were compared, and the match was confirmed. The man had been missing for 16 years.
Because Debbie has concerns about information integrity concerning UIBs, she is a proponent of DNA testing. Prior to DNA testing, some matches were made simply because of the clothing that the UIB was wearing. She recalls a case where a UIB was wearing typical women’s clothes and therefore classified as a female. After DNA testing became available, the remains of the UIB were tested again, and the body was determined to be that of a male. The UIB was then understood to be a transvestite. Debbie is now an advocate of reopening many pre-DNA UIB cases for retesting because, she says, “We’re looking for the wrong people. In my opinion, the only thing you can trust, since there’s so much human error in all of this, is DNA.”

Mary

Mary’s interest in missing persons began in the 1990s. She worked with a search team in her area attempting to find bodies of individuals who had been missing. She found the work rewarding, but as she grew older she found it difficult to search rough territory over uneven ground. In 2004, she discovered The Doe Network online and started to get involved in the search for UIB’s. She noticed that cases involving missing children drew the most attention from websleuths on the site. She felt that other types of UIBs were less thoroughly investigated. She felt that such cases deserved attention, with the added benefit that there was an increased likelihood that she would be able to solve a lower profile case.

Mary decided, over time, that she would concentrate on solving cases involving suicides and cases involving older individuals. To date, she has solved “Four or five such cases.”
Mary searches databases, primarily NAMus, in search of possible cases to investigate. She uses the search feature on NAMus but complains that the site is still “difficult to navigate.” She also uses the North American Missing Persons Network because it permits a search by birthdate.

Experience has proved very important in Mary’s success. She has developed various heuristics and domain knowledge that assist her in solving cases. As a first step, Mary identifies a target UIB case as a suicide or older person. Mary states that while identifying cases involving older people is typically quite easy, identifying suicides requires contextual knowledge of the case. Details about the scene become relevant, as there will often be a weapon or pill bottle near the body that indicates the manner of death.

After Mary has determined that the UIB is likely a suicide, she relies on her personal theory about suicides, drawing on her experience and domain knowledge, that the body may or may not have had a historical connection to the area where it was discovered. “Suicides travel”, Mary notes, meaning that the UIB may have committed suicide far from home. To illustrate, she explains that an alarming number of suicide cases are members of the current or recently graduated college student demographic. “You know you're young and you think that you are going to do all these great things and you're away from home you become disillusioned very, very quickly. And a lot of these suicides are young college age men actually. They just become disillusioned with the whole degree process I think…they just disappear.” Also, she mentioned that there are an alarming number of suicides in the Las Vegas, NV area. “You know, they are going to end it all, and they go out there with their last $1,000 for their last hurrah.” Mary insists
that she has not read any scientific studies to back up her beliefs; her heuristics are simply the product of her experience.

Her heuristics include demographic rules of thumb and anecdotal probabilities. She recalled a recently solved case of a Black man who was last seen in England but was thought to be in Nevada. Mary asserted that since “there's not a lot of black people in Nevada,” the case would be easily solved. She says she was right, calling it “the easiest case I ever solved.” Similarly, she once ruled out a potential match with the body of a girl, last seen in California but found in New Jersey. “Nobody leaves California for New Jersey. They’re already in the promised land!” Mary has found, like other successful websleuths, that information concerning physical measurements of UIBs can be significantly variable or incorrect.

**Evelyn**

Evelyn is an experienced websleuth in the Southern United States with 8 solves confirmed by law enforcement. Her interest in finding and identifying UIBs began in 1994 when a relative of hers was involved in a high-profile kidnapping case. She did not solve her first case until 2005 because, as she said, she “needed the experience.”

Currently Evelyn works 40 hours per week at her regular job, but “when that’s done or on days off, I’m looking for matches. It draws you in.” She enjoys her websleuthing activities but wants to make sure she receives public credit for the solves. Because of her record of success and the attendant publicity, Evelyn is often contacted by others searching for lost relatives or friends.

To find cases, she visits sites such as The Doe Network, NAMus, The Charley Project as well as various sites established by state governments listing missing persons.
Evelyn says that she prefers to work alone and finds collaboration unwieldy and slow. She seeks out cases that appear more difficult to solve and with fewer clues available because, she believes, fewer people are likely to be working on them. Evelyn says she is attracted to cases where the only clue material available is “a skull or a few bones.” Her work is not geographically limited, and she has pursued matches throughout the United States and overseas.

When discussing her information seeking behavior, Evelyn makes it clear that the internet is indispensable for her work. “I couldn’t do this without the internet,” she says. Her main areas of concentration when attempting to solve UIB cases are time and distance. She first tries to establish a timeline between the points when the potential match UIB was found and the date when that individual was reported missing. However, she knows that any data concerning estimates of the amount of time the UIB is missing are susceptible to inaccuracy and that older cases are more likely to have inaccurate forensic information. Newer technology has improved the accuracy of the forensics, she believes.

After the timeline is established, Evelyn turns her attention to determining the distance between the location where the search subject went missing and the location where the UIB was found. “Most people are found within 20 miles of where they went missing,” she says, and she often uses internet resources like Google Earth to help her ascertain the geographical proximity of two locations in a case.

After establishing the time and distance informational foundation, she turns to specifics about the possible UIB match. If available, she closely examines facial reconstructions that might be included with the individual’s data on the respective
websites. Evelyn concentrates on the similarities of appearance between eyebrows and chin specifically when evaluating the likelihood of a match. She also works to determine any possible matches between the respective vital statistics such as height and weight and is also alert to any idiosyncratic details such as bones that show evidence of having been broken or tattoos that might support a match.

Evelyn also attempts to gather circumstantial data such as weather information when evaluating the accuracy of a possible match. Weather, she says, can affect the appearance of bones, depending on the amount of time they are left exposed to the elements. She also is curious about insect activity in the area where the UIB was found, since such activity can hasten the deterioration of the remains and add inaccuracy to the forensic information provided on the website.

Whenever she is trying to solve a UIB case involving a jawbone, Evelyn tries to utilize dental records that might be available to the police. In these cases, a forensic dentist might be able to disambiguate a possible match. Evelyn says that such evaluations are much quicker and less costly than DNA testing.

Evelyn credits her years of experience for much of her success solving UIBs. In addition to developing information gathering and use techniques that are helpful, she has also amassed a large recollection of, and memory for names, faces, circumstances and details that are often helpful in solving new cases. She says that many of her solves have come as a result of discovering new evidence posted online that reminds her of a case on which she worked earlier. These unsolved cases go on the “back burner but,” she says, “I always come back to it. You just have to keep at it. It’s persistence that gets these cases solved.” She has worked on some cases as long as 7 years and says, “I just keep trying.”
Evelyn feels it is important to remain creative while doing her work. She tries to remember to be sensitive to details that may, at first glance, appear unrelated yet, on closer examination contain crucial information. Finally, she says, she tries to use a process of elimination approach to narrow the scope of her information sources until the important surviving data increases the likelihood of a match that she can turn over to law enforcement for confirmation.

Despite her experience and successes in the field, Evelyn still expresses a sense of wonder at what she does. “I never dreamed I would be helping match unidentified bodies to missing people. Who in their right mind would?”
Themes and Patterns

Compared to the number of active websleuths, the percentage of those websleuths who have successfully identified a UIB is remarkably small. All the participants in this study have identified at least one UIB and are therefore aberrations among the general population of websleuths. As such, their information seeking behavior in their avocation is worthy of study.

All data for this study was collected in the course of interviews, almost exclusively over the phone. As such, it was important to build a rapport with the participants and to view them as individuals with unique approaches to their work rather than simply samples from a homogeneous set. Many of these participants have gained some attention from within the websleuthing community for their work. To more strongly instantiate them as individuals while protecting their identity, I gave each participant a pseudonym and expressed the location of each participant’s home geographically imprecisely to maintain anonymity.

The participant interviews were very informative and varied, yet for the purposes of this study a number of general thematic categories emerged as regards the information seeking behavior of these websleuths. These themes identified as follows: Life Experience, Finding Cases, The Task: Make a Match, Modus Operandi, Heuristics, and Non-productive Approaches. Each theme will be discussed to better understand the websleuths’ individual and collective ISB.
Life Experience

The successful websleuths that participated in this study all have at least eight years’ experience identifying UIBs, with Tom having the most experience, having started in 1987. None has any formal training in forensics or criminology. Other than Donald, who has a background as a textual scholar, none has any specific academic experience that they credit with helping them to be successful at websleuthing. Not surprisingly, all participants enjoy solving puzzles and explicitly use the metaphor of puzzle solving to describe their websleuthing activity.

Most participants were able to identify a specific event or situation that motivated them to begin websleuthing. In some cases, such as Tom, Evelyn, and Jill, their interest began as following a family event that involved a UIB. Debbie became aware of websleuthing by reading a novel involving a fictionalized UIB. Others like Jenny and Donald became interested in websleuthing because they noticed news articles concerning a specific missing person with whom they shared a birth year and therefore would be the same age. All participants have a full-time job that does not involve websleuthing except for Mary, who is retired. However, several participants confess to occasional websleuthing while at work.

Finding Cases

Contemporary websleuthing is, de facto, primarily an internet-based activity. As such, all participant websleuths find cases on the internet on UIB/Missing Persons websites such as namus.gov, charleyproject.org, and doenetwork.org as well as state government administered sites listing UIB/missing persons cases. Tom and Evelyn report
that because they have become well known for solving UIB cases, family members of missing persons sometimes contact them, looking for help locating a relative.

The criteria that each websleuth employs in picking cases to investigate vary significantly between participants. Three of the seven participants state that they look for cases with as much metadata present in the case profile as possible. They feel these cases should be easiest to solve, or “low hanging fruit” as Jill calls them. On the other hand, the rest of the participants seek out cases that have less metadata included and that appear to be more difficult to solve. Evelyn, for example, concentrates on cases with as little information available to work with, sometimes she says, “even just a jaw bone.” These websleuths agree that they seek out such cases because they feel that the information scarcity should mean that fewer other websleuths are working on these cases.

Some of the websleuths concentrate on UIB cases of particular types. Jill, for example, has a military background and concentrates on UIB cases that she feels could have a military connection. She looks for descriptive metadata that mentions tattoos or clothing that hint at, or are specific to, military personnel. Mary seeks out suicides and UIBs of older individuals.

**The Task: Make a Match**

At its core, the identification of UIBs is a straightforward process: choose a missing person and locate its UIB match (or vice versa) on the same or another database. However, this apparently uncomplicated information seeking process is typically a challenge for websleuths. UIB databases are not synchronized or coordinated. NAMus, The Charley Project, The Doe Network, The National Center for Missing and Exploited Children and other UIB sites often do not contain information that appear on other sites
dedicated to UIB and missing persons cases. On occasions where the UIB information and the missing person information is present on the same site, the match is easily made, generally through the use of pattern matching software and without websleuth participation. The information seeking process is typically nonlinear, involving searching multiple databases in search of a match. Of the study participants, Jenny is the clearest example of this process. She picks a case for the day and searches for its match on other sites. If no matches are found, she picks a new case the next day she pursues her websleuthing activities.

The websleuths that participated in this study made it clear that the information on these databases tend to fall into one of four categories: 1) Present and accurate, 2) present and partially (or completely) inaccurate, 3) present but incomplete, and 4) not present. The participant websleuths in this study are noteworthy because of their ability to successfully navigate the uncertain informational atmospheres in categories 2 and 3 and find matches that solve cases. However, category 4 is undeniably a frustrating and hindering factor in preventing websleuths making matches since the absence of either the UIB or the missing person profile effectively precludes the possibility of a match. Every participant mentioned this issue and a majority contend that the often-mentioned statistic that there are 40,000 missing persons cases not represented in databases is just a guess and the number could actually be much higher.

These websleuths' years of experience undoubtedly plays a major role in learning how to deal with information scarcity and uncertain reliability. They supplement or confirm database information by seeking out additional information sources such as newspaper archives and library resources. When available, these websleuths use facial
reconstructions or drawings. Each participant emphasized that persistence is a requisite quality in a websleuth. Each websleuth described numerous instances where he or she had spent hours scouring online and library resources in search of information that was not available on the UIB websites or was of questionable veracity. Sometimes a websleuth discovers information that disconfirms other data regarding a particular case. In that case, each websleuth agreed, in essence, with what Mary said, “I just keep trying.”

**Modus Operandi**

Each of the study participants employed a different modus operandi, or method of operation during the course of their websleuthing activities. Through experience, each websleuth has developed a unique approach to the information seeking task. Within the context of Information Science, these approaches could be considered information structures, pattern theories or heuristics. Examples include Mary’s paradigm that ‘suicides travel’, Evelyn’s concentration on eyebrow and chin location when comparing photos or Tom’s belief that he needs to visit the location where the UIB was discovered in hopes of finding someone with “a living memory” that might prove useful in solving a case. Jill asserts that dirty clothes are a strong marker that the UIB could have been homeless and that a UIB might be ethnically miscategorized because of skin complexion change due to protracted exposure to elements.

Successful websleuths have also developed modus operandi to account for the unreliable information system of the UIB/missing persons databases. Each study participant was adamant that errors in database metadata are so omnipresent that they are almost assumed. Unreliable database information can have many causes, according to the participants. Data entry error is always a concern, but inconsistencies in coroner expertise
can also be a factor. Deterioration of the UIB can lead to significantly erroneous height and weight estimates. Hair and eye color can be unreliable due to subjective color perception and/or the length of time the UIB has been exposed to the outdoors. Further complicating matters, Donald mentioned that there is “no universal set of standards or naming conventions for things like hair color.” As Debbie said of websleuthing in general, “It’s not an exact science. People put in incorrect information or guess wrong.”

*Heuristics*

These heuristics, or tools to make judgement amid informational uncertainty, have been tested and modified through their respective years of experience. They are essentially ad hoc probabilities and likelihoods that have proved useful in matching UIBs. For example, the websleuths who participated in this study allow for a range of the posted height metadata plus or minus 4 inches when comparing UIB and potential match height profiles. Similarly, a range of plus or minus 25-pound allowance for posted weight has proven to be justified for the websleuths when evaluating matches.

The websleuths interviewed have come to recognize that the mention of a UIB feature that would appear to be obviously discriminatory and disambiguating is not necessarily compelling. Debbie remembered a UIB with a prominent tattoo clearly visible yet not mentioned in the database profile. “It’s important not to be bound by the data. Don’t automatically exclude a possibility just because something is not matching perfectly because mistakes are made all the time,” cautioned Debbie. Nonetheless, such heuristics must be judiciously applied. As Donald said, “You have to know what you’re licensed to infer.”
Nonproductive Approaches

In the course of the interviews, I asked these successful websleuths for their opinion of what separates them from unsuccessful websleuths. Their responses were noteworthy because they were able to point to a number of approaches that they felt were not conducive to making matches. All the participants agreed that novice websleuths sometimes lack the requisite patience and tenacity to be successful. Another commonly mentioned dynamic was the tendency for beginners to approach UIB/missing persons cases as though they involve kidnapping, serial killers, or other high-profile scenarios. In reality, they say, such cases are rare, and the precipitating factor behind the situation is far more mundane, such as drugs or accidents. They feel that novices often find themselves obsessed with a preconceived narrative that explains a case and refuse to consider that they may be incorrect and trying to, as Donald says, “pound square pegs into round holes.” Participants agreed that such approaches can lead to frustration among “newbies” and may ultimately drive them away from the activity.
Discussion

In the course of interviews, the websleuths who participated in this study revealed approaches to information seeking behaviors that, while domain specific, resonate with some of the classic studies in information science. Belkin’s 1984 work “Anomalous States of Knowledge as a Basis for Information Retrieval” serves a particularly useful framework for exploring this avocation. The anomalous state of knowledge (ASK) in this domain seems obvious; the fact that UIBs are, by their very nature unidentified makes them anomalous and unsatisfactory information objects. The websleuths, as information system users, recognize this condition as an ASK and seek to rectify it using an IR system, the UIB/missing persons databases in this case. Making a match and naming the UIB is a remedy for this ASK. Belkin also considers the “non-specifiability of the need” which would be, to a websleuth, the uncertainty about which information will be needed to build a compelling case for a match or, as Belkin says, “the person is conscious of a need but does not know what information would be appropriate to satisfy it” (Belkin, 1980).

Allen Foster’s “A Non-linear Model of Information Seeking Behavior” study of inter-disciplinary information seekers dovetails with Belkin when applied to websleuths (Foster, 2005). As this study has revealed, websleuths are persistent information seekers, using a variety of information sources to make a match and following a non-linear information search path to find it. Foster describes a process in which the user
“Determines ‘where I am now’…establishing a baseline of information from which ideas of ‘identifying which gaps need filling next,’” an approach that sounds strikingly similar to the websleuths’ puzzle solving approach. He also brings to mind the flexibility in approach that the participant websleuths mentioned, which he refers to as Openness, “an open minded approach in which no prior framework for judging relevance is implemented: all sources, disciplines and ideas are viewed as viable until proven otherwise” (Foster, 2005).

One of the central findings of this study is the websleuths’ creation and use of rules of thumb that help them to make judgements in the uncertain information environment in which they work. Such heuristics were the subject of a seminal study by Tversky and Kahneman, “Judgment Under Uncertainty: Heuristics and Biases” (Tversky A. & Kahneman, D., 1974). They identify three types of heuristics, all of which have clear analogs in the websleuths’ ISB. Prior probabilities are key to the development of these rules of thumb. First, representativeness, which uses probabilities to evaluate the likelihood that a given situation or case resembles a similar, already experienced case. Jill and Tom refer to this heuristic as learning to recognize patterns in UIB cases. Jill, for example has recognized the potential that the subject of a case might be using aliases because she has seen many such cases before.

Second, heuristics can be based on availability, where users assess the likelihood or plausibility of a situation. Mary, for example, contends that a missing teenage girl last seen in California is very unlikely to be found in New Jersey, since California is so attractive to teenagers in a way that, she says, New Jersey is not.
Finally, websleuths devise heuristics which Tversky and Kahneman classify as *adjustment and anchoring*, which involves numerical prediction based on a given value. An excellent example of this heuristic is Evelyn’s hypothesis that UIBs tend to be found within 20 miles of where they disappeared. Also, the websleuths in the study agreed that, because of unreliable metadata, it is prudent to allow a “fudge factor” of 4 inches to posted heights of UIBs as well as a weight range of plus or minus 25 pounds.
Conclusion

Websleuths are energetic and tenacious individuals who spend much of their free time attempting to give unidentified bodies their identity back. All of the participants in this study indicated that they have great respect for law enforcement, yet recognize the lack of resource and time pressures under which officers work. The websleuths’ efforts are complementary to those of law officers, yet the websleuths have no formal training in criminology or forensics. Nevertheless, the websleuth participants in this study have developed expertise in finding and using publicly available information. Because of the unreliability of the information sources they use, the successful websleuths have developed modus operandi and heuristics to help them synthesize bits of information into a compelling whole, leading to the identification of the UIB.

To date, I have been unable to find any academic literature concerning the information seeking behavior of websleuths. Therefore, they remain an understudied group of information seekers and users. Stating the obvious, criminology and forensics can benefit from studying the information seeking behaviors of websleuths. Other fields of study that deal with information of uncertain reliability, including applied social sciences within psychology and anthropology, could benefit from the approaches that these successful websleuths employ.
Bibliography


CALIFORNIA UNIV SAN DIEGO LA JOLLA, CENTER FOR HUMAN INFORMATION PROCESSING.


Appendix

Interview Guide

• Please provide your name, address, phone number.

• Why did you start internet sleuthing?

• I’d like to specifically discuss your work identifying Does. How do you find cases?

• How many cases have you solved? Alone or collaboratively?

• If you work with others, how do you collaborate? What is your work sharing plan or practice?

• If you use information that you get from a forum on the internet, how do you evaluate that information for truth and value?

• What attracts you to a particular case? What aspect of a case makes you feel that you might be able to help?

• I’m interested in your behaviors in terms of information seeking that inform your investigation. In as much detail as possible, please tell me what your process for working on a case is. What pieces of information are most important to you to establish first?

• When you sit down at your computer do you think in terms of browsing or in targeted work? Or something in between?

• How often does serendipity come into play? Or is it a case of ‘the harder I work, the luckier I get’?
Do you have a metaphor for how you think of the pieces of information you’re seeking? Are they, for example, pieces of a jigsaw puzzle or points on a line? Or something else?

Chronologically speaking, what are the next steps in working on a case in terms of acquiring the information you need?

How do you evaluate the veracity of the individual pieces of information?

How do you place each piece of information in a context so that it forms a coherent narrative?

Are all of your information sources available to the public? If so, which information sources do you use? If there are sources that are not publicly available, what can you tell me about them?

At what point do you contact the authorities with your findings?

How do you decide if a case requires pieces of information that you simply cannot find? Do you have cases that you have given up on, or are all cases still actively being pursued? Currently how many cases are you focused on?

You’ve described your working method. Can you walk me through a past case as an example? Can you walk me through a current unsolved case so that I can see how far along you are?

Are there other things that you’d like to tell me that you think might help me to understand your work better?