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Special Victims (Sex Crimes) Investigations Complexity Study

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The Crime Reduction Research Program

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The CRRP is a research grant program administered and funded by the Province of British Columbia in collaboration with the Royal Canadian Mounted Police (RCMP). The CRRP is focused on investing in independent research to inform priority policing operations, policies, and programs related to public safety in British Columbia. In doing so, the CRRP also aims to foster greater collaboration between government, law enforcement, and academic experts in the field of policing and public safety.

Eligible research topics are identified on an annual basis by the BC Ministry of Public Safety & Solicitor General and the RCMP based on current and emerging provincial priorities. All grants are awarded on a merit basis by the CRRP Working Group.

Disclaimer

Abstract

Although there has been significant public and academic interest on the ability of police to harness new technologies to solve crimes and resolve other public order issues—from debates on body worn cameras and other surveillance technologies to the use of predictive analytics—there has been significantly less focus on how the proliferation of new technologies has impacted police workloads. In this exploratory study, we begin the process of rectifying this oversight by identifying some of the challenges mobile technologies pose to specialized investigators working in a small to mid-sized agencies. To do so, we draw on an analysis of data from two sources: interviews with police investigators and the results of a systematic file review. What our findings indicate is that technology is the most prominent factor leading to increase complexity of investigations. Specifically, technology adds to the volume of evidence that must be examined and managed, rapid advances in technology require additional training and expertise, and that despite technological advances to assist in investigations, the process remains largely manual.

Background

"Hamilton Police Find Thousands of Child Porn Images" (O'Reilly 2011)

"Police eventually uncovered hundreds of cellphone texts that revealed Lund's fixation with children" (McLaughlin 2015).

"Abbotsford man charged with child porn; police say thousands of images found on computers" (Wong and Nassar 2017).

Officers assigned to special victims' units (SVU) deal with a range of sexual offenses that increasingly involve one or more types of digital evidence. While we might expect that cyber- facilitated crimes, such as the sharing of images of child sexual exploitation, would produce hundreds, if not thousands, of pieces of digital evidence for police to have to comb through, less well known is the role technology can play in other forms of sexual offenses. For example, in sexual assault cases where the perpetrator is known to the victim, there may be a strong possibility of texts, social media posts and/or direct messaging through Whatsapp, Snapchat or other messaging applications that could be relevant to building a case. As with sexual exploitation cases, threats to publicly release an individual's personal images obtained through consent, screengrabs or hacks, police investigations may also require tracing IP addresses, as well as combing through phones, tablets and computers. In short, as the capacity for new and increasingly more mobile technology has expanded, so too, we argue, has the workload—and its complexity—for police investigators.

Unfortunately, what has not kept apace is research in this area (see Powell 2015; Henry and Powell 2015). In relation to the work of SVU investigators in particular, we note that searches of the relevant scholarly literature located very few articles, most of which focus primarily on issues related to the potential for psychological harms and/or emotional burnout caused by handling disturbing images and texts (Powell, Cassematis, Benson, Smallbone and Wortley 2014; Burruss, Holt and Wall-Parker 2018). Those studies that represent exceptions to this trend typically focus instead on general challenges faced by police, including jurisdictional boundaries, legal, training and resource issues, among others (Vincze 2016; Powell and Henry 2018; Henry, Flynn and Powell 2018). While these are all relevant considerations in understanding the growing complexity of SVU work, our interest in this paper is more specifically on investigators' perceptions of the challenges that digital evidence – and the continuing development of new technologies and thus new forms and new capacities for ever-increasing volumes of digital evidence—presents.

We are not the first to observe that digital evidence has become a routine feature of SVU work. A study of sex crimes investigators released in 2019 similarly made the case that "digital evidence is now an element in the vast majority of cases" (Dodge, Spencer, Ricciardelli and Ballucci 2019: 6). These authors similarly noted the "huge increase in [the] volume of digital evidence in sex crime cases" (Dodge et al. 2019: 8; see also Vincze 2016), as do we. In the present study, we also rely on interviews with police investigators (n=14) to guide an initial understanding of the complexity of their work, and the role that

technology plays in creating an ever-shifting landscape within which they most constantly learn and adapt. Where our work represents a significant departure, however, is that we also use the medium of file review to track changes in the volume of digital evidence over time, as well as in the diversity of forms of digital evidence that police were increasingly tasked with dealing. To help us in this task, we identified different types of SVU cases that police investigators would be called upon to investigate, and then – with the input and guidance of SVU investigators – identified cases in each of years 2007, 2012, and 2017 to serve as exemplars representing a typical case of this type for a given year. What that method allows us to do is to document any potential trends over a 10 year period, in 5 year increments.

Method of Inquiry

The purpose of the present study was to address the following research question: To what extent has the complexity of special victims (sex crimes) investigations changed over time?

To answer these questions, we employed a mixed-methodological approach, drawing on analysis of qualitative interviews and quantitative (descriptive) analysis of selected case files. Primary data sources included interviews with fourteen (n=14) police investigators at a small Canadian municipal police service and general occurrence and investigation reports from that same service. As this research is both deductive and thus exploratory in nature, we chose to conduct the interviews first and to let the results of a preliminary analysis of this data guide our decisions as to what to focus on in the case reviews. Further detailed description of our methods follows.

Research methods: Interviews

To create an ideal sample size, organizational records were reviewed to determine the names of officers who were assigned to SVU duties in each of the three years of focus. Of the sixteen identified, two declined. Thus, fourteen (n=14) open-ended interviews were conducted with police investigators[1] who were either current or previous members of a Special Victims Unit. Investigators were asked a range of questions related to their current or previous work role, including questions on:

- Their police work history
- General features of their work within the SVU
- Factors that lead to successful case closures
- Internal challenges experienced in investigating SVU cases
- External challenges experienced in investigating SVU cases
- Factors that have had significant impacts on SVU work and workload

[1] To preserve respondent anonymity, given the small sample size, we have randomly changed interviewees' genders.

- Emerging trends that might impact future SVU work
- Suggestions for addressing challenges

Interviews were conducted both in-person and by phone by two research team members. These interviews were typically in the range of 45 minutes to 2 hours in length. All interviews were conducted in accordance with the approval of a university ethics research board and in compliance with Canadian Tri-Council guidelines for ethical research. Once consent was received, twelve (n=12) interviews were recorded and subsequently transcribed. In two cases, participants preferred not to be recorded and detailed interview notes were taken instead.

Data analysis: Interviews

To help guide the file review process, once transcriptions were complete a third researcher independently engaged in an initial open coding of the interview data using thematic analysis, which has been described as offering a rich, yet flexible, approach to analyzing qualitative data (Braun and Clarke 2006).[2] This initial coding, as well as a subsequent, more focused effort, was conducted through line-by-line readings. This open coding allowed for the identification of major themes related to our research question, including:

- Technology increases workload
- The Major Case Management Model (MCM) requires more work
- Crown disclosure requirements create more work

New knowledge of victim needs/eyewitness testimony has added further complexity. Initial counts of these major themes revealed that thirteen (n=13) of fourteen (n=14) interviews identified technology as a major issue driving increases in the volume and complexity of their work. Further, this theme also produced a cluster of sub-themes of interest, thus the decision was made to focus on 'technology' as a driver of complexity, and to re-code the data using a more focused approach. This second coding yielded the results displayed in Table 1 below.

Table 1. Number of SVU members Endorsing a Major Theme.

Themes	Frequency
Technology as a driver	13
Technology increases volume	10
Too much evidence	5

[2] We note the decision to use a manual coding technique was made based on two considerations: 1. the relatively small volume of data, and; 2. the desire of the third researcher to more fully immerse herself in material she had not herself collected.

Themes	Frequency
Increased range of offenses	3
Multiple technologies involved	4
Scale of offending/numbers of perpetrators	1
Transcription of interviews	5
Chasing technological change	8
Technical difficulties with changes	8
Technology requires more training	5
Technology can only do so much	2
Technology requires more explanation	2

Research methods: File review

To evaluate the extent to which investigators' perceptions as to the role of technology in increasing their workload volume and difficulty was mirrored in caseload activity, we conducted a file review of cases selected based on two criteria: 1. Case year and 2. File type. Cases in the years 2007, 2012 and 2017 were selected as they represented reasonable start, middle and end dates during a period of apparently rapid changes in societal use of technology, introduction of formal policing standards, and court rulings establishing new expectations with regard to investigative and time standard to name a few.

Figure 1 below sets out the advancement of consumer technology advancements beginning in 2000. The introduction of the iPhone to the market in 2007 appears to represent the beginning of a rapid increase in the use of consumer technology for a wide variety of societal interactions.

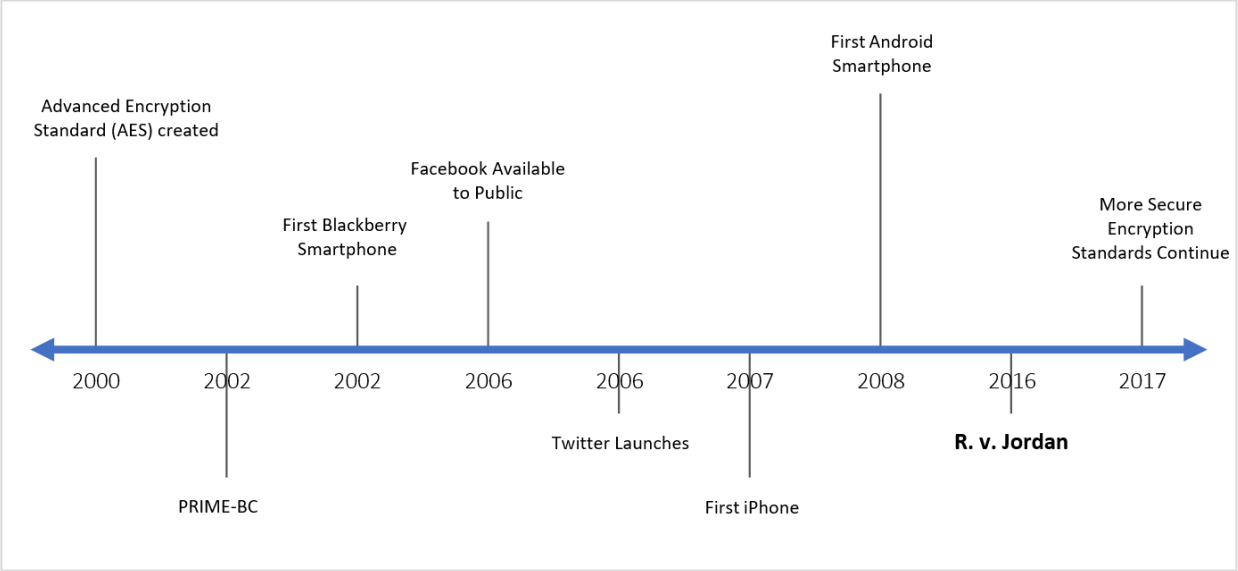

Figure 1. Timeline of Technology Advancements in Consumer Market.

As for which files types and specific cases were selected, we examined all reported sex related offences, and then identified only those cases handled in part or in whole by sex crimes investigators during the relevant periods. The majority of these files involved allegations of sexual assault or sexual interference. Each file was reviewed to further narrow the data set to only those files in which dedicated sex crimes investigators were assigned as the primary investigators on the file or provided assistance to front line patrol investigators as the investigation progressed. This was done in order to improve file comparability over time, as dedicated sex crimes investigators appear to conduct investigations within more standardized approaches.

In order to ensure reasonably comparable cases, incidents of online child exploitation and images of child sexual abuse were excluded, as there were few files of this nature in 2007 that could afford a reasonable comparison group for similar files in 2017.

Data analysis: File review

Each file was reviewed to identify the presence of individual technologies that was considered or handled during the course of the investigation. Specifically, individual technologies included:

- Video surveillance footage
- Text or other direct messages
- Social media platforms
- Personal handheld devices
- Computers / electronic storage devices
- IP address information

Results: Interviews

Theme 1: Technology increases volume

> *"Technology doesn't always decrease work and in a lot of cases, certainly in our world, it's actually increasing the work" (interview 7).*

In this section we examine the major themes and sub-themes that emerged through our interviews with SVU investigators, including: issues related to increasing workload, the effects of rapid technological change, the reality that technology does not replace all manual workload, that technology requires a significant investment in training to stay apace of technological change, and the burden on investigators to translate technology, and the digital evidence it produces, for other criminal justice actors.

Technology increases volume: Too much evidence

As noted in a preceding section, thirteen (n=13) of the fourteen (n=14) interviewees cited technology—in one or more different ways—as having a significant impact on their workload. The most common issue cited (n=10) was the volume of potential digital evidence produced through mobile and other technologies, material that – whether germane to the investigation or not– still had to be sifted through as part of the investigation process. One officer explained the volume of images, texts and other materials that may have to be waded through as part of the process:

> *Everybody operates on their cell phones, so you may get contact between the victim and the offender on the cell phone, or… like if their interaction started in the public, you may actually have that interaction on video. But it is tremendously laborious to go through that. You can imagine if you dump a cell phone. You may have 20,000, 30,000 photos, you may have countless amounts of text messages and e-mails. We try and keep it as narrow as possible for what's required, but it takes time to go through that and it can take a lot of time to go through that (Interviewee 4).*

Another officer described this aspect of their work as "so time consuming." Citing a recent case, "we had five thousand text messages to go through," including "'hey, band practice is tomorrow at three." And, as much as one might want to gloss over those messages, "I need to be able to say of these five thousand, there were 300 very explicit sexual messages." Another case involving an accused's smashed cell phone resulted in raw data having to be downloaded from the damaged device in order to look for evidence. The result? "close to a terabyte, which is like a building full of paperwork." In discussing the case further, she noted, "All the people we involved to try and crack this phone in the first place and then the dump afterwards - and we ended up finding what we need and convicting them and he just got out of jail last year and was an excellent file—but the work, you'd never have guessed." Officers also used phrases like "hundreds of hours", "too much information" and "overload" to describe the work time spent combing through digital evidence on different types of files.

In terms of the cases producing the highest volumes of digital evidence, interviewees agree these are typically the ICE, or the Internet Child Exploitation files. One current case described involved an estimated 100,000 images, which had to be gone through and categorized as to whether each image meets the legal definition of child pornography. Another described ICE files as "a different kettle of fish" because these cases tend "to be very difficult" involving "100,000 images of child pornography and all of it's got to be categorized before it goes for charge approval." How, he wondered, do you do that without burning out officers? An ICE officer provided a solution: "I could probably use another four of me in here, at least."

Technology increases volume: Increased range of offenses

As previous scholarly work has documented (Zhang, Xiao, Ghaboosi, Zhang and Deng 2012) and as our own interviewees observed, many traditional crimes found in the terrestrial world are also likely to be committed in the online world and/or facilitated through mobile devices, online platforms and so on. As one officer explained the SVU caseload: "we're dealing with child sexual abuse, we're dealing with serial sex offenses, we're dealing with… luring, child pornography." Another noted, however, that technological developments have also led to new, tech-enabled forms of older crimes, such as cyber-extortion or sexual harassment. "With technology comes technology problems," an investigator stated, "like the whole sexting things and where people send… like we get files now where people are distributing intimate images of somebody. That never used to be a thing until we had cell phones that could take pictures. And we have files where basically people are extorted via Skype or they were promised money to do whatever on video and then the people record it."

Technology increases volume: Scale of offending/numbers of perpetrators

Whereas the relative ease of online social networking provided tremendous personal and professional benefits for many individuals and groups, that ease has also allowed criminal actors to readily find each other, as well as new opportunities for committing crime (Bissias, Levine, Liberatore, Lynn, Moor, Wallach and Wolak 2016; Broseus, Rhumorbarbe, Morelato, Staehli and Rossy 2017; Mason and Bancroft 2018). The scale of certain forms of offending, has, in turn, as one officer noted, created huge resource issues for police services, which frequently lack the officers necessary to target every single criminal act. To illustrate this problem, one officer observed, "with the Internet, especially with the child luring now, that medium is huge… with our ICE officer, it's hunting fish in a barrel… it's everywhere, and it's just like how far can we go hunting for these people? Because it's very easy to find them." The problem is, he explained, "If we had 100 officers, I could use a thousand officers."

Technology increases volume: Multiple forms of technology

As the pace of innovation continues to accelerate and technology expands into new products or old products serving new functions, it is not simply the volume of digital evidence that increases, but also the forms of technology from which evidence can be

captured. Thirty or so years ago mounted surveillance cameras, and the occasional camcorder, were the principal modes by which people captured video images. Today, these have given way to cell phones and other mobile devices. Video images can be captured on laptop cameras and mounted cameras on desktop computers. As a result, what might otherwise seem like a relatively straightforward case could require searching through files on multiple forms of technology. For example, the investigation for one case lasted “probably at least a year and a half” because of the complexity of the case, the length for which the offenses had been occurring, and the number of devices that had to be seized and searched. “three different phones and the school computer and the personal laptop… one of the phones was a flip phone and one’s an iPhone 7 or whatever. It's just going through them”. And, if one of the phones is locked, “we've got to send it to an agency in the States… it’s a thousand dollars U.S. a pop.” With computerized cars, onboard wifi and smart home technology, it’s not only cell phones that create extra work for SVU members. “We get cars now that are coming in because they have computers,” one senior officer noted, “soon we’re going to getting the Echoes and the Google homes and the refrigerators.” Looking into the future, he added, “who knows what else we’re going to get.”

We were fortunate in that a couple of our interviewees had had long tenures in policing, particularly in the investigative division. As a result, they were able to contrast for us how technology had affected the evolution of their workloads and the complexity of their cases. One of the best examples was provided in the following story:

So, the complexity of… the very first homicide I ran, it was a true whodunit. A guy was stabbed to death downtown. We had no idea, and a lot of good cops did a lot of good work and eventually over a period of about three weeks, we were able to identify two suspects, arrested, charged them, and convict them of murder. That entire investigation—and I don’t know what it's called, but it's one of those banker’s box that was about four inches wide and the front flipped open you could file folders in it, so it's probably four inches—legal width—by paper height. That entire investigation fit into that box. If I transported that same crime to today? First of all, we don't do it in paper form anymore. If I had that same investigation today and put it in a paper form, conservatively, it would fill up two four-door filing cabinets. We didn’t have video surveillance. We didn't have all these phones where there's potential for tracking it all. And all that stuff has to be in there. We would go through and interview 20 witnesses—handwritten statements. Now they have to be audio-videoed. All have to be transcribed, proofread, etc. before they will go to Crown. Other pieces… everybody's got a cell phone. So would we have to do production order for cell phones, we have to have warrants for cell phones… All those things just cause the size of the investigation to increase exponentially. And conducting the same type of investigation in today's standards—that investigation would have been from ‘98—and you would have looked at that investigation in this little box compared to the probably eight drawers sitting beside it and you go ‘What the F? Come on.’

Technology increases volume: Transcription of interviews

Not all of the issues with technology stem directly from digital evidence, there is also an expectation that audio and videotaped forms of evidence will be submitted to Crown prosecutors and courts in written format. Thus, each and every interview must be transcribed. This process has significant implications for investigators who are tasked with reviewing transcribed statement to ensure their accuracy.

To explain the process, an officer described what happens with just one interview:

> *So that five-and-a-half-hour interview that I do? That needs to be transcribed and sent to Crown with the original copy of the video and audio and transcription, prior to charges being approved. And so it takes a transcriptionist at least a week to do that… Then it takes me at least a day, probably two days, to go over that and check it and then sign off on it. And then I've got to give it to our disclosure analyst who's got to take some time to build the file and put it into a format that can be disclosed to Crown so that they can in turn, disclose it as they're required to (Interviewee 10).*

Previously, written statements would be submitted to Crown, and only those deemed necessary to the case would be subjected to a full, formal interview that would be transcribed and submitted. Now all interviews are to be recorded and transcribed and each of those transcriptions must be reviewed by the officer. "I don't know if you've ever proofread a four-hour interview," one officer asked, "but it's frickin painful." Comparing SVU files to those in other areas of investigation, an SVU officer observed,

> *I would say sexual assault files are very transcript heavy. There's a lot of interviews that go along with sexual assault files. So those files require a fair amount of reading and vetting because when people are interviewing, that's when they disclose personal information and things that we would need to vet out. Whereas a fraud file is going to be document heavy with lots of cheques and balance sheets and things like that. So, it's a different sort of lens that you're looking at it (Interviewee 13).*

Summarizing the situation, a senior officer stated, "the transcription loads have increased exponentially," requiring "more resources." Another agreed, "in 2016 when I started, we had one disclosure analyst civilian position and now we've got three, and we could use more." These loads and the significant strain they can place on Canadian police departments, becomes a problem for investigators because of Supreme Court rules regarding both full disclosure of facts, as well as the timeliness of cases proceeding to trial. No officer wants a case to be thrown out of court because of either condition. "The disclosures [issue] is the big one, one interviewee stated, "And so how do you get these massive files to defense in the manner that's prescribed versus, you know, Stinchcombe[3]?"

[3] Stinchcombe refers to the Supreme Court of Canada decision in *R. v. Stinchcombe* [1991] 3 SCR 326. This case is generally considered a precedent setting case regarding the prosecution (Crown Counsel)'s obligations with regard to disclosure of case information related to criminal investigations.

Theme 2: Chasing technological change

With the speed at which technologies become obsolete and are replaced by newer hardware and software with expanding capacities, police services are continually forced into a game of 'catch up' in order to stay on top of the ability to identify and capture sources of digital evidence. Laughing, an officer expressed this as follows: "Everything is just changing all of the time… it's just so hard to keep up. And it's getting more complicated—like phones! Phones are getting so complicated." In this section, we explore two major sub-themes that emerged through our analysis: technical difficulties with software/hardware changes; and training requirements.

Chasing technological change: Technical difficulties with changes

One of the most significant challenges facing SVU and other police investigators is the rate at which new encryption tools come onto the marketplace. Officers working child exploitation cases are particularly challenged, as offenders are able to make use of encryption to hide child pornography and other incriminating files. As one officer explained, "from a forensics side of things on the ICE side, it's getting more and more difficult to get by that encryption." Another made a similar point, "our forensics people can't even get into these phones because they're getting so secure and they're very difficult for us to get into and for us to crack and access." Given the ubiquity of mobile technology, and the ease of online access, the growth of ever-stronger privacy technologies represents a nightmare scenario for ICE officers. Another relevant technological roadblock is the use of Virtual Public Networks to hide Internet Protocol addresses to access the 'dark web.' "It's exceptionally difficult," one officer stated, "for us to track them through that." Similarly, with the ability to buy used technology through online marketplaces, there is also the possibility that a phone may have been sold multiple times. Trying to track devices is "incredibly time consuming," one SVU officer explained, "and we can't even keep up with technology."

New technology also means not only having to learn new ways to track and collect evidence, but also having and keeping up on the latest hardware and software across an array of technologies. For example, "there is a ton of different video capture systems" and police services might not "have the right software" to access images. Not surprisingly, this problem also plagues those who need access to phones, computers and tablets, "because the phones and computers change so fast, suddenly the software the tools we use become obsolete and new stuff comes in. So it's always, always changing."

Social media platforms are another site of rapid change. One older investigator referenced the days when "child porn was Polaroids or Super 8 movies", "there was no advertising on social media for [names a platform] or any of these other goddamn sites that exploited young girls or boys." Now, with social media, predators "can actively hunt. They can actively go online and solicit this stuff." Police are forced to stay on top of each change, with the introduction of new modes of online chatting and private messaging, as well as a host of places to post pictures, share video content, and access people and their personal information.

Chasing technological change: Technology requires more training

SVU personnel require a diverse set of social, legal and technical skills, ranging from being able to conduct interviews to understanding how to craft production orders and warrants. They must also stay knowledgeable about the increasing array of hardware, software and social media platforms and on current and future uses for technology. Not surprisingly, then, finding qualified individuals is difficult, particularly when the often-disturbing nature of some of the work is factored in. Because it is incredibly rare to find someone with all of the technical skills necessary for the role, once individuals are selected to fill a spot in SVU, particular in the area of ICE, they must begin a set of training courses. As one senior officer explained of a new person in his section, "I think she's got about four or five courses that she needs to take before she's qualified to do her UC [undercover] stuff on the computer." These courses are offered in other cities, which means officers are away and "files just keep piling up."

Even when courses are available, and police members are able to take them, there was a feeling that the rate of technological change means "you're constantly behind the eight ball, for sure." Another officer put the matter succinctly, "I think we may need better training to try to keep up with the trends."

Theme 3: Technology can only do so much

Anyone who has ever watched an episode of *CSI* might be left thinking that forensic technology can accomplish some fairly amazing things, such as quickly matching fingerprints at a crime scene to those of a perpetrator stored in a national database. The reality is that database searches are only typically used to narrow down a set of possible matches, and that the final match is done through manual assessments performed by Ident officers (author cite). In short, a lot of specialized policing—including SVU-related work—still requires manual labour. While the point above is reflected directly and indirectly in some of the comments regarding transcription, it was most noticeably observed by two (n=2) officers reflecting on the handling and sorting of digital evidence. One noted that despite the development of 'concept software' that allows for a computer to sort through thousands and thousands of images, to more quickly identify those that have features of child pornography, "but you still have those forensic officers that are having to sort through those images." In the case where raw data from a cell phone was dumped to produce a terabyte of information, first a tech person, and then an officer on light duties had to be assigned to manually sort through the volume of evidence on the accused's iPhone because it was not in a form that was searchable by software. "It's all ones and zeros" and "because of the seriousness of the offense, we had to go through it. It took months and months."

Theme 4: Technology requires more explanation

Whereas police officers are forced to keep up with pace of technological change in order to conduct their investigations, a couple of those interviewed observed a noticeable lack of

similar knowledge among some Crown prosecutors and judges. Thus, to get a warrant approval, for example, can place an additional burden on officers to be able to thoroughly articulate in laypersons' terms what technologies are involved, how they were used and how police will secure evidence from them. As SVU investigator explained, "Especially for older judges where technology is not their first language. They need to understand what you're talking about and that's a skill in there. You need to be able to make them understand what you're saying with language." Another officer laughed and said, "I think 9 times out of 10 the judges don't understand." Using DNA warrants in the early 2000s as an example, he related the following story:

> *I remember going and this judge had never written a DNA warrant. And you had to go into chambers and sit down with a judge. Talk about intimidating. And he's asking me like all these questions, and I'm like, 'he doesn't have a clue'. I was trying to find things to look at to help me with the wording… like he is not up on this because it's new (Interviewee 05).*

The need to educate other officers of the court on new and different technologies and the techniques used to collect digital or other evidence from them isn't just about educating judges in chambers, it also has a tangible effect on report writing. Another officer advised, "you have to explain more and it takes longer. So, what was 15 pages when I started, might be 20 or 25 now because you've got more things that you're trying to explain."

Results: File Review

The results of the file review process are summarized in Table 2. It should be noted that in cases where technology in the form of personal computers and handheld personal devices were factors in the investigation, the volume of information was frequently observed to be substantial. In other words, where a computer was a factor in the investigation, there were often more than one computer/or electronic storage devices were involved.

Table 2. Technology Indicators.

Year	Files	Technology Indicators	% of Files
2007	25	8	32%
2012	32	18	56%
2017	42	30	71%

The results above indicate that there appears to be an increase in both the number incidents of technology as a consideration during the investigative process, and the frequency with which technology is factor in investigations. These findings appear to support investigators experience that technology is more frequently a factor when conducting investigations.

In order to establish a baseline for future study, investigations associated with Internet Child Exploitation (ICE) offences such as producing or sharing of images of child sexual abuse and were also examined. Comparisons of ICE related investigations over the

timeframe that is the focus of this study was negatively impacted by the fact that no ICE related investigations were handled by the agency in 2002, and only two were conducted in 2012. This finding is not surprising given that the state of the criminal law at this time appears to have been insufficient to address the rapidly expanding use of technology as a vehicle for these types of offences, and there were no dedicated investigators to ICE related offences in 2007.

By 2017, the agency had introduced a full-time investigator focused primary on ICE investigations. In that year, twelve files (n=12) were identified as being conducted solely by the ICE investigator, or where the ICE investigators provide assistance to patrol officers or SVU investigations related to ICE offences. Together, sixty-one (n=61) individual pieces of electronic evidence (computers, hard drives, personal mobile devices, electronic storage, cameras, etc.) were seized as part of these investigations. At least three of these investigations did not result in the seizure of electronic evidence as the investigations ultimately determined that the offender was located outside of the agency's jurisdiction and therefore no local charges were pursued. From a workload perspective, this is an important observation as each investigation required significant investigative work associated with alleged offences that affected local police resources, but these offences were later determined to be associated with offences outside the jurisdiction, and sometimes outside of Canada. In each case no local charged were pursued notwithstanding the significant resource allocation to these investigations.

Conclusions and Discussion

> *"[The Internet] has just really expanded the ability of people that are inclined to commit sex crimes. It's just opened up the world to them now and the ability of police to be a detective… it's much more challenging. And it's even more challenging once detected, to be able to capture that evidence, attribute to a person, and present it in court" – Interviewee 12.*

Technology has, independent of any other factors, added a new layer of complexity to police investigations, particularly over the past decade. Increases in complexity can be attributed to an increase in the volume of (mostly electronic) evidence, including increased number of codified electronic related offences, the scale of offending involving technology platforms and methods, elevated variety of the types of technology, and the investigative steps required to manage and report on this evidence. Changes in technology occurs frequently, making it difficult for police officers, police agencies, and the justice system as a whole to keep up in an effective way. With each technology change comes increased difficulty in being able to access electronic evidence due to such things as encryption. Ongoing training is required, and rarely can a single investigator hope to possess the necessary skills to effectively navigate each stage of the investigative process. While technology can be used to assist investigators, it can only do so much and be so effective. Manual investigative steps remain the cornerstone of the investigative process. While technology is a challenge for police investigators, explaining the technological evidence to prosecutors and judges is necessary. Without their understanding, successful

prosecutions are extremely difficult to secure as electronic evidence can be easily misunderstood.

Although exploratory in nature, there are several important practical and policy implications of this study. These include: the need for improved resourcing, better training, and recognition of the need for increased specialization within policing.

Our interviewees described a situation in which a huge increase in volume of digital evidence in sex crime cases has not been met with an equal increase in resources and staffing for digital forensic and tech crime units. Additionally, as Marissa expressed, there is a need for broader organizational change and training to allow all officers to deal with this evidence to some extent (Dodge et al. 2019). The under-resourcing of digital forensics units and digital training for police officers is well documented in the broader policing literature (Quick & Choo, 2018; Vincze, 2016). Researchers reveal these shortcomings, in combination with the huge amount of digital information now involved in many criminal cases, result in backlogs that considerably lengthen timelines for many investigations (Vincze, 2016). We find these shortcomings have particular impacts in sex crime units wherein—as discussed above—pre-existing relationships between most victims and offenders result in high levels of digital communication to sort through and—as discussed below—victims are particularly at risk of revictimization due to shortcomings (e.g., lengthy investigations and delayed trials) of the criminal justice system (Jordan, 2008; Randall, 2010) (Dodge et al. 2019).

Recognizing that increasing levels of digital evidence in sex crime cases have not been met with adequate human and material supports, many officers report attempting “to train themselves” to deal with this evidence, particularly that tied to social media sites. As training cannot be readily established for every new technological application and would become obsolete in a matter of months, officers who are more equipped to teach themselves or learn informally from other officers are identified as best able to keep up with the digital turn in policing. Many asserted that they would like to have more training on how to find and properly handle digital evidence. Some mentioned requesting technology-related investigative courses and others who had received training on Internet evidence analysis, cell phone forensics, and network investigative techniques mentioned that the training needed to be completed more frequently to keep up with constantly changing technology. Officers also mentioned, however, that often-overburdened sex crime units do not have enough officers to allow for frequent absences for training. Yet it may be necessary to prioritize this training, as many officers assert that the most difficult part of modern sexual assault investigations is keeping up with the rapid rate of technological change (Dodge et al. 2019).

Police members’ remarks identified a number of potential causes of qualitative overload. These include unclear guidelines associated with collating evidence, limited professional development opportunities and hiring inexperienced staff. Reducing qualitative overload would involve providing training, as knowledge deficiency is fundamental to the qualitative overload process. Provision of ICE-specific training is a form of organisational

support, signaling that the organisation understands their professional needs and values their work. ICE investigators receiving organisational support in the form of training report better occupational well-being (Burns et al., 2008; Krause, 2009; Perez et al., 2010). Furthermore, acquiring ICE-specific skills meets a fundamental human need for competence which should enhance intrinsic motivation (Deci and Ryan, 2000). Intrinsically motivated ICE investigators appear to be more resilient than extrinsically motivated investigators (Krause, 2009). According to the J D-R model, training is motivational and a coping resource (Demerouti and Bakker, 2011). Participants' comments suggest various sources of quantitative overload. For example, examining hard drives to establish ownership of files is time-consuming as is cataloguing each individual item for use in court. Courts impose tight timeframes and waiting for responses from collaborative partners causes delays. When an investigator is temporarily reassigned, their ICE work remains undone, increasing the backlog of ICE cases. There are signs of role conflict (experienced when attempting to meet two or more incompatible demands) and role ambiguity (occurring when responsibilities and objectives are unclear) (Beehr and Glazer, 2005). These appear related to the combination of quantitative overload and lack of established guidelines. Participant comments suggest role conflict and role ambiguity manifest as difficulty prioritising between tasks. Role ambiguity and role conflict have been negatively associated with work engagement and perceived organisational support and positively associated with burnout (Crawford et al., 2010) (Powell, Cassematis, Benson, Smallbone and Wortley 2014). The results of this project suggest that with the increased influence of technology associated with police investigations, a move away from the generalist approach to policing, which involves officers moving among several areas of specialty or focus throughout their individual careers, is necessary. Instead, an approach where investigators can learn and utilize specialized knowledge in highly technical criminal investigations over a longer period may be preferable. This approach may improve officer's ability to closely monitor the evolution of crime and the evolving legal requirements and then adjust the associated criminal investigative techniques leading to more successful investigations.

As with all studies, the present piece of research is not without limitations. We recognize that our sample size, although appropriate for exploratory research of this nature, is insufficient for abstracting larger generalizations and that significantly more work—on a national scale—is required. Further, a complete assessment of the change in complexity in police sex crimes investigations is challenged by the lack of robust baseline data. Specifically, it appears that increased complexity requires additional investments of investigators' time to complete various investigative steps. However, the steps are required in a particular case and the complexity of the individual steps themselves, appear to be unique to each case. This makes establishing complexity for an "average" case is virtually impossible to establish retrospectively. Future research should also seek to establish methods to capture baseline data in preparation for future comparisons as the investigative processes continue to evolve.

References

Bissias, G., Levin, B., Liberatore, M., Lynn, B., Moore, J., Wallach, H., and Wolak, J. 2016. 'Characterization of Contact Offenders and Child Exploitation Material Trafficking On Five Peer-To-Peer Networks.' *Child Abuse & Neglect*, 52(2): 185–199.

Braun, V., and Clarke, V. 2006. 'Using thematic analysis in psychology.' *Qualitative Research in Psychology, 3*(2), 77–101.

Broseus, J., Rhumorbarbe, D., Morelato, M., Staehli, L and Rossy, Q. 2017. 'A Geographical Analysis of Trafficking On A Popular Darknet Market.' *Forensic Science International*, 277(1): 88–102.

Burruss, G., Holt, T., and Wall-Parker, A. 2018. 'The Hazards of Investigating Internet Crimes Against Children: Digital Evidence Handlers' Experiences with Vicarious Trauma and Coping Behaviors.' *American Journal of Criminal Justice*, 43(4): 433–447.

Dodge, A., Spencer, D., Ricciardelli, R., and Ballucci, D. 2019. '"This Isn't Your Father's Police Force": Digital Evidence in Sexual Assault Investigations.' *Australian & New Zealand Journal of Criminology*. Advanced online publication.

Henry, N., Flynn, A., and Powell, A. 2015. 'Policing Image-based Sexual Abuse: Stakeholder Perspectives.' *Police Practice and Research,* 19(6): 565–581.

Henry, N. and Powell, A. 2015. 'Embodied Harms: Gender, Shame, and Technology-Facilitated Sexual Violence.' *Violence Against Women*, 21(6): 758–779.

McLaughlin, T. 2015. 'Parent's Worst Nightmare:' Lund Victim's Mom.' *Toronto Sun*, online.

O'Reilly, N. 2011. 'Hamilton Police Find Thousands of Child Porn Images.' *Hamilton Spectator*, online.

Powell, A. 2015. 'Seeking Rape Justice: Formal and Informal Responses To Sexual Violence Through Technosocial Counter-Publics.' *Theoretical Criminology*, 19(4); 571–588.

Powell, A., and Henry, N. 2018. 'Policing Technology-Facilitated Sexual Violence Against Adult Victims: Police and Service Sector Perspectives.' *Policing and Society*, 28(3): 291–307.

Powell, M., Casssematis, P., Benson, M., Smallbone, S. and Wortley, R. 2014. 'Police Officers' Perceptions of The Challenges Involved in Internet Child Exploitation Investigation.' *Police Practice and Research*, 17(2): 183–194.

Vincze, E. 2016. Challenges in Digital Forensics. *Police Practice and Research*, 17(2), 183–194.

Wong, D., and Nassar H. 2017. 'Abbotsford Man Charged with Child Porn; Police Say Thousands of Images Found on Computers.' City News, online.

Xhang, Y., Xiao, Y., Ghaboosi, K., Zhang, J. and Deng, H. 2012. 'A Survey of Cyber Crimes.' *Security and Communication Networks*, 5(4): 422–437.