Article

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Technology as a source of complexity and challenge for special victims unit (SVU) investigators

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Abstract

Although there has been significant public and academic interest in the ability of police to harness new technologies in order to solve crimes, 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 exploring some of the challenges mobile technologies pose to investigators working in a special investigations unit. Our work is informed by an analysis of data collected through in-depth interviews with police investigators to address the following research question: "To what extent has the complexity of special victims (sex crimes) investigations changed over time?". Our findings indicate that technology is the most prominent factor leading to increased 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 despite technological advances to assist in investigations, the process remains largely manual.

Keywords

Policing, technology, special victims unit, internet child exploitation, investigation

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> 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. Although we might expect that cyber-facilitated crimes, such as sharing images of child sexual exploitation, would produce hundreds, if not thousands, of pieces of digital evidence for police to comb through, the role technology can play in other forms of sexual offenses is less well known. For example, in sexual assault cases in which 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 applications that could be relevant to building a case and may, in fact, provide evidence of offenses that would not have been available were it not for the prominent role technology now plays in everyday social interactions. As with sexual exploitation cases, and threats to publicly release an individual's personal images obtained through consent, screengrabs or hacks, police investigations may also require the tracing of Internet Protocol addresses, as well as combing through phones, tablets and computers. In short, as the capacity for new and increasingly more accessible 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 Henry and Powell, 2015; A 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 harm and/or emotional burnout caused by handling disturbing images and texts (Burruss et al., 2018; N Powell et al., 2014). 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 (Henry et al., 2018; A Powell and Henry, 2018; Vincze, 2016). Although these are all relevant considerations in understanding the growing complexity of SVU work, our interest in this article presumes that the prominence of technology use in the course of committing offenses has facilitated more potential opportunity for technology-based evidence to be found and form the basis of a prosecutable case. This article therefore focuses 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—present.

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 et al., 2019: 6). These authors 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 this 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 must constantly learn and adapt.

Method of inquiry

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

To answer this question, we draw on an exploratory analysis of qualitative interviews with 14 police investigators at a small Canadian municipal police service.

To create an ideal sample size, organizational records were reviewed to determine the names of officers assigned to SVU duties in each of the three years of focus. Of the 16 officers identified, two declined. Thus, 14 open-ended interviews were conducted with police investigators[1] who were either current or previous members of a SVU. 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;
- 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, and were typically between 45 minutes and 2 hours in length. All interviews were conducted with the approval of a university ethics research board and in compliance with Canadian Tri-Council guidelines for ethical research. Once consent was received, 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

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). This initial coding, as well as a subsequent, more focused effort, was conducted through line-by-line readings[2]. 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 13 of 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 in Table 1.

Results

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. (Interviewee 7)

Table 1. Number of SVU members endorsing a major theme.

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

In this section, we examine the major themes and subthemes 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 the entire manual workload; that significant investment in training is needed 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 previously, 13 of 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 5,000 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 5000, 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 to look for evidence. The result? "[C]lose to a terabyte, which is like a building full of paperwork". In discussing the case further, the officer 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 cases producing the highest volumes of digital evidence, interviewees agree these are typically the internet child exploitation (ICE) 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 exploitation. 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 et al., 2012) and our interviewees observed, many traditional crimes found in the physical world are also likely to be committed in the online world and/or facilitated through mobile devices, online platforms and so on. 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 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. Although the relative ease of online social networking has 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 providing opportunities for committing crime (Bissias et al., 2016; Broseus et al., 2017). 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 needed 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 cameras mounted 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 of time over which the offenses had been occurring, and the number of devices that had to be seized and searched. "[T]hree 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 US $1000 a pop". With computerized cars, onboard Wi-Fi 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 Echos 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 statements 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 with 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, become a problem for investigators because of Supreme Court rules regarding both full disclosure of facts and 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]?".

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" 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 subthemes that emerged through our analysis: technical difficulties with software/hardware changes; and training requirements.

Changing 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 images of child exploitation 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 with 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.

Changing 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, particularly 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 officers 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 typically only used to narrow down a set of possible matches, and that the final match is done through manual assessments performed by Ident officers (Huey, 2010). In short, a lot of specialized policing—including SVU-related work—still requires manual labor.

While the above point is reflected directly and indirectly in some of the comments regarding transcription, it was most noticeably observed by two 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 exploitation, "[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, getting a warrant approval, for example, can place an additional burden on officers to articulate thoroughly in laypersons' terms what technologies are involved, how they were used and how police will secure evidence from them. As one 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 nine times out of ten 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 5)

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, is not 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".

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 occur 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 technological 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. Although technology can be used to assist investigators, it can only do so much and be so effective. Manual investigation remains the cornerstone of the investigative process. Although technology is a challenge for police investigators, explaining 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 the 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 within the broader policing literature (Vincze, 2016). Researchers show that these shortcomings, in combination with the huge amount of digital information now involved in many criminal cases, result in backlogs that considerably lengthen the timelines of many investigations (Vincze, 2016). We find these shortcomings have particular impacts in sex crime units wherein—as discussed above—preexisting 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 the shortcomings (e.g., lengthy investigations and delayed trials) of the criminal justice system (Dodge et al., 2019).

Recognizing that increasing levels of digital evidence in sex crime cases have not been met with adequate human and material support, 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 organizational support, signaling that the organization understands their professional needs and values their work. ICE investigators receiving organizational support in the form of training report better occupational well-being (Krause, 2009). Furthermore, acquiring ICE-specific skills meets a fundamental human need for competence which should enhance intrinsic motivation (Ryan and Deci, 2000). Intrinsically motivated ICE investigators appear to be more resilient than extrinsically motivated investigators (Krause, 2009). According to the Job Demands–Resources (JD–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 cataloging each individual item for use in court. Courts impose tight time frames 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 (when responsibilities and objectives are unclear) (Glazer and Beehr, 2005). These appear related to the combination of quantitative overload and lack of established guidelines. Participant comments suggest that role conflict and role ambiguity manifest as difficulty prioritizing between tasks. Role ambiguity and role conflict have been negatively associated with work engagement and perceived organizational support and positively associated with burnout (M Powell et al., 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 an 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, this research is not without limitations. Although we have focused on the challenges associated with the increase of technology-based evidence in modern investigations, we also acknowledge that for some type of crime, technology can be the source of evidence that would not have been available in the past. Future research could focus on the benefits of new technology-based evidence sources that now exist in many criminal investigations.

We recognize also that our sample size, although appropriate for exploratory research of this nature, is insufficient for abstracting greater 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.

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Notes

1. To preserve respondent anonymity, given the small sample size, we have randomly changed interviewee gender.
2. We note the decision to use a manual coding technique was made based on two considerations: the relatively small volume of data; and the desire of the third researcher to immerse herself more fully in material she had not herself collected.
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.

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