

Identifying Sex Trafficking in Adult Services Websites: *An exploratory study with a British Police Force*

Dr Xavier L'Hoiry, Dr Alessandro Moretti & Professor Georgios A. Antonopoulos

Authors' contact details:

Xavier L'Hoiry (** corresponding author*)

Department of Sociological Studies

University of Sheffield

Sheffield, S10 2TU

United Kingdom

Tel: +44 114 222 6404

x.lhoiry@sheffield.ac.uk

Alessandro Moretti

Department of Anthropology

University of Copenhagen

13153, Copenhagen

Denmark

almo@anthro.ku.dk

Georgios A. Antonopoulos

School of Social Sciences and Humanities,

Teesside University,

Middlesbrough, TS1 3BX,

United Kingdom

g.antonopoulos@tees.ac.uk

Acknowledgements

The authors would like to thank Cityshire Police and the participants of the study as well as Klaus von Lampe and Georgios Papanicolaou for the insightful discussions. We are also indebted to the anonymous reviewers of *Trends in Organised Crime* for their comments and suggestions.

Funding

The article is based on a project funded by *N8 Policing Research Partnership*. Grant number BH141990-014.

Compliance with ethical standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Informed consent was obtained from all individual participants included in the study.

Identifying Sex Trafficking in Adult Services Websites: *An exploratory study with a British Police Force*

Abstract

Human trafficking, commercial sexual exploitation and modern slavery have experienced an unprecedented boom over the past decade due to the development of information and communication technologies (ICTs), particularly in digital and networked environments. These developments have created new opportunities for human exploitation and illegal profiteering. Adult Services Websites (ASWs), online platforms on which sex workers post profiles advertising their services, are a key conduit for human traffickers to exploit their victims. Alongside profiles of independent sex workers, traffickers are posting false ASW profiles, advertising the forced services of their victims and camouflaging these false profiles amongst legitimate adverts. In response, police practitioners are proactively investigating ASWs to identify suspect profiles. A key obstacle for practitioners, however, is to distinguish between ASW profiles posted by independent, consenting sex workers advertising their services, and those posted by traffickers exploiting their victims. The exploratory study presented in this paper seeks to address this particular challenge. Working with a British police force, the researchers in this study gathered existing knowledge on the traffickers' use of ASW profiles to create a bespoke tool of analysis, the Sexual Trafficking Identification Matrix (STIM). The aim of this tool has been to identify 'risk indicators' on ASW profiles and to flag these for potential police investigation. This paper presents the results of this exploratory study and its four stages. Furthermore, more broadly, it reflects on the use of evidence-based tools by law enforcement to tackle complex domains of offending such as those of human trafficking and commercial sexual exploitation.

Keywords: human trafficking; commercial sexual exploitation; organised crime; policing; Information and Communication Technologies; evidence-based policing

Introduction

Human trafficking, commercial sexual exploitation and modern slavery have experienced an unprecedented boom over the past decade due to the development of information and communication technologies (ICTs), particularly in digital and networked environments (Latonero 2011; Latonero et al., 2012; Di Nicola et al., 2013; Europol, 2016; Mendel and Sharapov, 2016). These developments have created new opportunities for human exploitation and illegal profiteering. In the UK, commercial sexual exploitation has grown to the point that it is said to be taking place on an 'industrial scale' (APPG 2018). This growth has been largely facilitated by the use of Adult Services Websites (ASWs) as a key conduit for human traffickers to exploit their victims. ASWs are online platforms on which sex workers post profiles advertising their services, effectively creating a 'virtual red-light district' (Cauduro et al. 2009: 59) connecting sex workers and their clients online. Alongside profiles of independent sex workers, traffickers are posting false ASW profiles, advertising the forced services of their victims and camouflaging these false profiles amongst legitimate adverts.

In response, police practitioners in the UK and elsewhere (see, for example Brå, 2008) are proactively investigating ASWs to identify suspect profiles. A key obstacle for practitioners,

however, is to distinguish between ASW profiles posted by independent, consenting sex workers advertising their services, and those posted by traffickers exploiting their victims. Making this distinction, however, is fraught with complications (Diba et al. 2017; see also Perer, 2012) and presents a key challenge for law enforcement agencies. The exploratory study presented in this paper seeks to address this particular challenge. Working with a British police force, this research gathered existing knowledge on the traffickers' use of ASW profiles to create a bespoke tool of analysis, the Sexual Trafficking Identification Matrix (STIM). The aim of this tool has been to identify 'risk indicators' on ASW profiles and to flag these for potential police investigation. STIM is not a software similar to those used by the police to identify potential instances of trafficking (e.g.: *Traffic Jam*; see later in this article). Neither is STIM a comprehensive risk-based methodology to measure 'organised crime', or one of its empirical manifestations in this instance (Vander Beken, 2004), nor is it a rigorous weighted index assessing harm such as the Cambridge Crime Harm Index (Sherman et al. 2016). Rather, it is intended as a research-based aid (in the form of a checklist) for enforcement practitioners to more effectively triage high-risk profiles during their investigations of ASWs. This paper presents the results of this exploratory study and its stages. Furthermore, more broadly, it reflects on the use of evidence-based tools by law enforcement to tackle complex domains of offending such as those of human trafficking and commercial sexual exploitation.

This paper is set out in four parts. First, we briefly discuss the role of ICT in human trafficking and commercial sexual exploitation, focusing specifically on ASWs, and present a number of tools currently used by law enforcement to facilitate their investigations of ASW profiles. We then describe the methodological approach taken in the study before presenting the findings of the research. In that section, we present the STIM, which is a synthesis of existing literature and the views of expert participants in this study on the types of risk markers one may expect to find on ASW profiles likely to be posted by traffickers to exploit victims. Finally, we discuss the implications of the use of the STIM for the policing of commercial sexual exploitation mediated online via ASWs. We conclude that while tools such as the STIM can perform valuable and complementary functions of risk assessment and can serve as an important accountability mechanism, they should not be expected to replace the 'craft' of policing (Bayley and Bittner 1984; Innes, 2010) and the continued importance of officers' occupational experience and knowledge (Fleming and Rhodes 2018). Instead, greater consideration must be afforded to understanding how research/evidence-based tools can be integrated into policing practices to complement officers' craft in order to realise the maximum benefits of science and craft in policing (see Willis and Mastrofski 2014; 2016).

The paper adds to the existing literature in two important ways. First, by examining the role of ASWs in facilitating commercial sexual exploitation, the paper addresses a timely but under-researched field of study in organised crime. Second, the paper contributes to existing debates concerning how to most effectively mesh research-based tools with existing police practice and specifically the craft of policing. These debates are long-running but are growing in prominence as the use of technology and the online sphere have become a central part of contemporary policing practices.

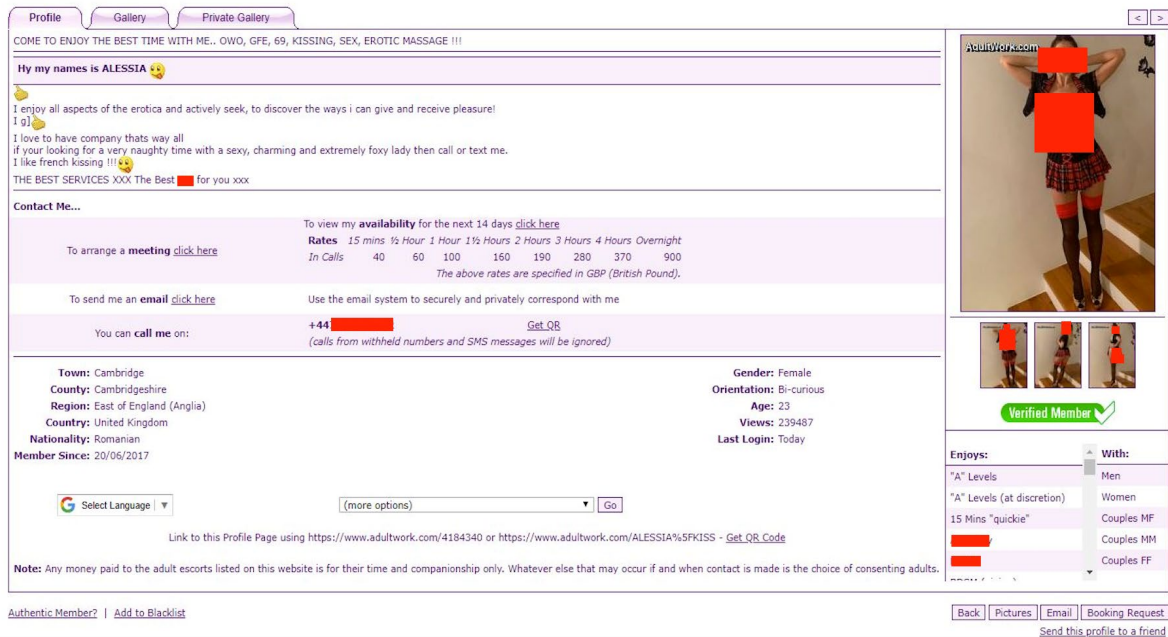
The role of ICT in human trafficking and commercial sexual exploitation

The advent of the internet has propagated a significant increase in human trafficking activities (OSCE, 2020; Volodko et al 2019; Alvari et al 2017; Latonero, 2011). Online platforms do not merely complement existing offline practices but significantly expand the potential for illicit enterprise (Diba et al. 2017), enabling new modes of exploitation of victims and profitability

for offenders. Technological advancements have enhanced the means through which sexual trafficking networks communicate and operate, the ability of such networks to exploit a far greater number of victims, and the reach of offenders in larger and previously ‘unavailable’ markets of consumers (OSCE, 2020; Antonopoulos et al. 2020). For instance, in 2007, a comparative examination of sex tourism and trafficking across Japan, Jamaica, the United States and the Netherlands (all countries characterised by high levels of sex tourism) found that ‘technology has become the single greatest facilitator of the commercial sex trade in all of the countries observed, with the exception of Jamaica where word of mouth continues to dominate’ (Shared Hope International 2007: 1). Elsewhere, Feehs and Cotton Richmond (2017) have found that 84.3% of sex trafficking cases federally prosecuted in the US in 2017 were mediated online, also via well-known social media and websites such as *Facebook* and *Craigslist*. Similarly, Thorn and Bouche (2018) have drawn upon insights from trafficking survivors to estimate that 75% of their participants advertised their forced sexual services online. The OSCE (2020) has also reported that so-called ‘hobby boards’, online platforms where customers of sexual services share information and reviews, have also been used to advertise victims of sex trafficking. Other communication platforms such as *Whatsapp* and *Telegram* have also previously been named as conduits to exploitation in this context (Spectre 2019).

In the context of commercial sexual exploitation, the use of ASWs appears to be critical in maximising new opportunities for traffickers. ASWs are open access websites on which sex workers post profiles advertising their sexual services. These profiles may include pictures that are often explicit, lists of services offered and their costs, locational information and contact details. It has been argued that ASWs offer sex workers a safer environment within which to operate, and a welcome retreat from the potential risks of street-based sex work (Fiveash 2018). In recent years, however, traffickers have increasingly used ASWs to post profiles advertising their victims, falsely portraying them as consenting sex workers (Ibanez and Suthers 2016; Diba et al. 2017; Antonopoulos et al. 2020). So critical is the role of ASWs in the exploitation of victims that the Joint Slavery and Trafficking Analysis Centre has described ASWs as ‘the most significant enabler of sexual exploitation in the UK’ (APPG 2018). Central to traffickers’ use of ASWs is the opportunity to vastly expand their consumer pool. Advertising sexual services online rather than on the streets provides a layer of anonymity for pimps, traffickers and, critically, sex buyers (OSCE 2020; Alvari et al. 2016). As Ibanez and Suthers (2014: 1556) explain this ‘virtual red-light district’ offers a ‘low risk environment for buyers to connect with sellers’.

Image 1: Screenshot of an ASW profile¹



The continued use of ASWs by traffickers has led law enforcement agencies to turn their attention to examining these websites to locate and investigate suspect profiles. This move is underpinned by a belief that the very websites that facilitate trafficking could concurrently offer law enforcement investigators an unprecedented opportunity to apprehend offenders since ‘online transactions leave behind traces of user activity, providing a rare window into criminal behaviour, techniques and patterns’ (Latonero 2011: iv). Tools and technology including but not limited to ‘data mining, web crawling, computational linguistics, and mapping’ have been proposed as potential methods via which to identify trafficking online (Latonero 2011: 9; see also Andrews et al., 2016; Brewster et al., 2014a and b; Voloshin et al., 2016). Information posted on ASW profiles, including the services offered, the use of language and the explicit nature of photographs, have been identified as potential indicators that may indicate a profile has been posted by traffickers rather than independent sex workers (Diba et al. 2017). Such indicators, or ‘risk markers’, could be used to detect and even predict human trafficking, thus potentially assisting law enforcement interventions.

A number of tools are currently used by law enforcement to facilitate their investigations of ASW profiles. In the US and the UK, the most prominent software used by police forces are *Traffic Jam* and *Spotlight*, both of which are tools to analyse open access online content, including ASWs, and to identify potential instances of trafficking. The founders of *Traffic Jam*, Marinus Analytics (2020), describe their product as a ‘suite of analytics tools developed to help save precious investigative time to rescue vulnerable victims by quickly turning big data into actionable intelligence’. This suite of tools includes facial recognition software and data scraping tools. Marinus Analytics (2020) have claimed that 3,800 victims of trafficking were identified via the use of *Traffic Jam* in 2019. *Spotlight*’s founders, Thorn (2020), estimate that their tool has helped identify almost 15,000 trafficked children since 2016 and saved over 60%

¹ The particular screenshot was provided by one of the participants in our study (#24).

of law enforcement investigative time. Similar to Traffic Jam, Spotlight seeks to gather ‘millions of data points to identify and locate those most at risk’.

These tools are not the only ones used by law enforcement in the fight against commercial sexual exploitation. The OSCE (2020) have estimated that no fewer than 305 tools are currently available, including phone apps and bespoke pieces of software seeking to combat human trafficking. Their report shows that 29% of these tools specifically focused on tackling trafficking for the purposes of sexual exploitation, while 46% of these tools were concerned with labour trafficking. The OSCE report cites examples of apps that focused on various stages of the trafficking process, from the identification of grooming techniques to recruit young children to the use of artificial intelligence and facial recognition to locate missing persons that were likely victims of trafficking. The report echoes Latonero’s (2011) call for collaboration and joint efforts on the part of government, public and private sectors in the enhancement of existing tools (OSCE, 2020).

Despite the growth in law enforcement use of technological solutions and the claimed successes of these tools, these approaches are not without their limitations. Firstly, there remains a lack of empirical research to establish the reliability and accuracy of such tools. Where research has examined ASWs to identify instances of profiles posted by traffickers, these studies are speculative in the sense that they only identify potential or suspect instances of trafficking (Diba et al. 2017). Secondly, according to the OSCE (2020), the scale of opportunities ASWs *potentially* create for traffickers far outweigh the police’s capacity to investigate these activities, something that is often facilitated not only by lack of resources but also by the complex (personal) relationships between sex workers and their exploiters (see, for example, Cockbain, 2018; Verhoeven et al., 2011; Verhoeven et al., 2015; Weitzer, 2014). As such, the opportunities afforded by technology are not equally distributed between offenders and law enforcement, and the latter are undoubtedly fighting against the tide in this context. Our exploratory study contributes – among other – to the discussion of opportunities afforded by law enforcement to tackle human trafficking and online commercial sexual exploitation.

Methods and data

The research was conducted alongside Cityshire Police², a police force in Northern England. The study was co-designed with Cityshire Police and, as described below, Cityshire Police officers and analysts were instrumental in the study’s methods and in the co-production of research outputs. Cityshire Police is a large police force covering both urban and rural areas where a variety of serious and organised crime activities takes place, including human trafficking, modern slavery and commercial sexual exploitation. The overarching aim of the study was to create a bespoke tool of analysis enabling police practitioners to more effectively identify high-risk profiles posted on ASWs. In order to meet this aim, the project undertook four key methodological phases. Since existing research suggests that traffickers display repetitive and distinct patterns of behaviour in their use of ASWs and in creating fake profiles online (see Antonopoulos et al. 2020), the first two phases of the study sought to consolidate existing knowledge to inform the design of the analytical tool – the Sexual Trafficking Identification Matrix (STIM). The latter two phases of the study focused on ‘testing’ and refining the STIM.

² The name of the Force is fictional in observance of guarantees of confidentiality.

In the *first* phase, a literature review of existing work concerning the use of ICT in human trafficking, modern slavery and sexual exploitation was conducted. This review collated the findings of previous academic and non-academic research – among other – on the likely indicators of suspect ASW profiles. Though much of this literature concerned the use of the now-defunct ASW *Backpage* in the United States, some knowledge was deemed transferable to a British context and the ASW platforms operating in the UK.

In the *second* phase, 26 semi-structured interviews were conducted with a range of participants with expertise in human trafficking, commercial sexual exploitation and the role of ASWs. Interviewees included law enforcement officers and analysts, legal representatives, NGO representatives and academic researchers. A full list of participants, their roles and organisational backgrounds is presented in Table 1. All participants were granted anonymity by default. Interviewees were selected due to their occupational experiences of investigating or researching human trafficking and commercial sexual exploitation. The study used a purposeful sampling strategy designed to achieve maximum variation in order to gather the views of a diverse range of experts in this field. Snowball sampling was also used, as part of which participants recommended other individuals whom they felt could make rich contributions to the study. Nine of the 26 participants were recruited using snowball sampling. Interviewees were asked to draw on their occupational experience and expertise to suggest potential indicators of trafficking activity on ASW profiles. The interviews acted as a consensus building exercise, synthesizing the participants’ expertise before this knowledge was fed directly into the design of the STIM alongside the findings of the literature review. Interviews lasted between 40 and 90 minutes each. Participants were given the choice of having the interviews recorded and all agreed to do so. Interviews were transcribed verbatim and transcripts were thematically analysed and coded to identify meaningful and repetitive patterns in interviewees’ responses (Clarke and Braun 2013).

Table 1. Interviewees’ roles and organisational backgrounds

<i>Participants #</i>	<i>Role</i>	<i>Organisational background</i>
P1	Executive Director of an anti-trafficking organisation	NGO
P2	Senior Policy Advisor	Governmental
P3	Special Agent	Police
P4	Barrister	Legal
P5	Modern Slavery Intelligence Project Manager	Police
P6	Human Trafficking Team Leader	Governmental
P7	Assistant Professor	Academic research
P8	Detective Inspector	Police
P9	Lecturer	Academic research
P10	Senior Analyst	NGO
P11	Lead Analyst	NGO
P12	Detective Sergeant	Police
P13	Lecturer	Academic research
P14	Research Associate	Academic research
P15	Special Representative	Governmental
P16	Associate Officer	Governmental

P17	Research Manager	Academic/NGO
P18	Lecturer	Academic research
P19	Senior Policy Advisor	Academic/governmental
P20	Senior Officer in MSHT Unit	Police
P21	Senior Officer in MSHT Unit	Police
P22	Analyst	Police
P23	Analyst	Police
P24	Professor	Academic Research
P25	Detective Constable	Police
P26	Special Constable	Police

In the *third* phase of the study, the STIM was used by Cityshire Police officers and analysts over a two-month period (March and April 2020) as part of a live operation to analyse ASW profiles and identify profiles highly indicative of trafficking activity. At the conclusion of this testing phase, in the *fourth* part of the study, Cityshire Police officers took part in a focus group to provide feedback to the project team on the STIM, its operational utility as well as its limitations in practice. Based on this feedback, a second iteration of the STIM was created and delivered to Cityshire Police at the conclusion of the study.

Identifying sexual trafficking on Adult Service Websites

The following section presents findings from the above-described phases of the study. At the conclusion of this section, we present the final version of the Sexual Trafficking Identification Matrix, which synthesized the learning across all four phases of the study.

Literature review

The literature review revealed firstly that there is relatively little research concerning the use of ASWs in facilitating trafficking despite the rapid proliferation in such activity in recent years. What little literature does exist is largely US-centric, but lessons can be applied to other contexts in which ASWs are used by traffickers. Latonero's (2011) study was one of the first to examine the use of social network websites and ASWs in commercial sexual exploitation. Latonero (2011) explored the link between sporting events and sex markets. Specifically, he tracked an increase of 136% in listings on US-based ASW *Backpage* during the weekend of the Super Bowl XLV, held in February 2011 in Dallas, Texas. However, despite conducting an analysis of the language used in the adverts and its specific frequency across the sample, the research was unable to establish whether this increase represented cases that were definitively instances of trafficking or simply legitimate sex workers responding to an increase in potential customers in Dallas during this weekend. The research acknowledged the limitations of relying on analyses of ASWs to identify trafficking and Latonero (2011: 26) concluded that while 'basic computational linguistics and data visualization' were important means to convert large samples of ASW profiles into a smaller, more manageable number of cases, these approaches also require expert human intervention to confirm the identification of potential cases of sex trafficking online.

Building on Latonero's work, Ibanez and Suthers (2014) conducted a content analysis of 1,436 profiles on the ASW *Backpage* posted within the region of Hawaii over a six-week period. Guided by a list of suspect ASW profile indicators previously published by the United Nations Office on Drugs and Crime (2012), the authors identified the following features of ASW profiles as noteworthy indicators suggesting potential trafficking activity: inconsistency of a subject's story across different profiles (e.g.: different ages used for the same subject; different

alias used for the same subject); frequent movement by the subject (e.g.: the same subject advertises in numerous locations in a short period of time); apparent shared management (e.g.: several subjects travel in groups); profile posted by third party (language used suggests profile not posted by subject themselves); potential restricted movement of subject (e.g.: will not travel to customer's home; only accepts in-calls). Ibanez and Suthers (2014) also emphasized the criticality of tracking phone numbers listed on ASW profiles. Phone numbers were searchable in the *Backpage* database and by focusing their analysis on phone numbers, the authors were able to demonstrate patterns of movement of sex workers advertised in profiles listing the same phone number.

In a later study, Ibanez and Gazan (2016a & b) used web crawling software to analyse 600 ASW profiles posted on *Backpage* across four US states. The authors re-affirmed the indicators previously identified by Ibanez and Suthers (2014) and once more highlighted the importance of tracking phone numbers listed in ASW profiles. They argued that the appearance of the same phone number in multiple locations was indicative of traffickers moving their victims “from city to city on a circuit in order to maximise profits and reduce the potential of detection by law enforcement” (Ibanez and Suthers, 2014: 892). Ibanez and Gazan's (2016a & b) study showed that phone numbers which appeared on *Backpage* could also be tracked beyond ASWs to other fora, such as chat rooms and so-called John sites, where customers discuss their experiences not only in terms of sexual gratification, but also to share law enforcement avoidance techniques. By tracking the appearance of phone numbers listed on *Backpage* and elsewhere, Ibanez and Gazan (2016a & b) mapped the movements of phone numbers and presented detailed maps of identified circuits, outlining the key movement routes for what the authors argued where trafficking activities.

Alvari et al. (2017) also analysed *Backpage* profiles, collecting 20,000 profiles and applying machine learning techniques including textual analysis to identify indicators of trafficking in the sample. Their analysis presented six ‘feature groups’ (2017: 5) as indicative of trafficking, some of which echo previous findings: key language patterns in profiles such as the use of the third person or first-person plural pronouns (such as ‘we’ or ‘our’); key words and phrases of interest particularly those indicative of youth, such as ‘sweet, candy, fresh, new in town, new to the game’ (2017: 5); subjects from specific countries associated with high levels of trafficking into the US, such as those in South East Asia; the presence of multiple subjects in a single profile; the weight of subjects (with any listed weighted under 115lbs considered suspect); and links in profiles to external websites where subjects’ services are advertised or references to spa massage therapy.

In the UK, Diba et al (2017) conducted a virtual ethnography of *Adultwork*, an ASW operating the UK. Their study echoes much of the work outlined above, finding that suspect ASW profiles contained the following features: the same phone number used by multiple subjects; a single phone number used by the same subject across multiple profiles that presented different aliases or ages, and were located in different cities; key phrases including ‘new in town’ and ‘fresh’; poor English language with syntax and grammatical errors; the use of emojis, particularly a peach or love hearts; the cost of services considered low; and a wide range of sexual services advertised, particularly unprotected sex or anal sex. Echoing Ibanez and Gazan (2016a), Diba et al (2017: 31) also highlighted the importance of investigating phone numbers listed in ASW profiles, describing mobile phones as the crucial ‘nexus between the virtual and real-world physical environments’. The authors went as far as identifying the named individual registered as the phone's owner using the website *Truecaller*. They found that registered owners of phone numbers listed in ASW profile contact details were often male and therefore

not the subject advertised in the profile itself, potentially signalling an element of control. Further, phone numbers were often attached to pay-as-you-go services, suggesting involvement with criminal networks (Diba et al. 2017: 32). Diba et al.'s (2017) study, conducted over two years, also revealed that on a recurring basis multiple ASW profiles would appear online at once, with text in the profile using key phrases such as 'new in town', 'new for you' or 'fresh'. The same profiles would include poor English language with identical typographical errors appearing across several profiles, suggesting text was copied and pasted from one profile to the next. These groups of profiles would then collectively disappear, before reappearing in different locations with names and other characteristics slightly modified. The authors proposed that these collective patterns of movement are indicative of trafficking activity.

Finally, Hickle (2017) worked in partnership with Sussex Police in the UK to analyse the content of 59 profiles sourced from *Adultwork*. Unlike previous research in which large samples were freely extracted from *Backpage* or *Adultwork* – thus in theory including profiles posted by both traffickers and independent sex workers – Hickle's (2017) study focused on 59 profiles which had previously been identified as suspect during various human trafficking operations conducted by Sussex Police. The analysis therefore aimed to extract common data across the sample to discern trends in profiles already identified as potential trafficking activity. Hickle's (2017) analysis largely echoed previous research in identifying the following features across the sample: simplicity of a profile with short or sparse description; poor grammar; repetitive text across several profiles suggesting copying and pasting; same phone numbers appearing across several profiles; services offered include unprotected sex; inference to travel or transience such as 'new in town' or 'here for three days'; key phrases indicating youth such as 'fresh' or 'teen'; cost of advertised services considered low; and a low amount of customer feedback provided in the profile information. Additionally, the study found a similar pattern to that identified by Diba et al. (2017), with several profiles in the sample appearing online in the same period, suggesting coordinated activity across multiple profiles.

Interviews with experts

Participants in interviews listed a variety of potential indicators of trafficking one may identify in an ASW profile. It is worth noting that participants largely echoed the indicators previously identified in the literature. Interview data was thematically analysed and divided into six categories. The order in which the categories are presented below reflects the prominence of each theme amongst interviews, with the first being the most frequently discussed and the last being the least frequent.

Profile repetition and duplication: Participants highlighted the importance of individual characteristics within an ASW profile appearing unchanged, essentially being duplicated across several different profiles. This, it was argued, was evidence of coordination and management of multiple subjects and was indicative of sex workers not working independently and instead being controlled. Key for participants was the repeated appearance of the same phone numbers listed across several separate ASW profiles. Likewise, the appearance of the same user ID³ in several profiles was considered to reflect coordination in advertising and posting of profiles. Posting patterns of ASW profiles were also highlighted. Examples of suspect activity included the same profile appearing in several different geographical locations; profiles being uploaded, removed and then re-uploaded at sporadic intervals in order to appear

³ ASWs such as *Adultwork* require users to register before they can post profiles online. Registered users receive a User ID which is listed in any ASW profile posted by the user.

new despite having been posted in the past; the same profile posted for different subjects (including exactly the same text, the same list of services offered, the same use of emojis, but having a new name and/or photographs); new profiles uploaded to align to major sporting or entertainment events in specific locations; the same photograph used across several different adverts.

Text on profiles: Typographical and grammatical errors, poor quality of English language and the same errors appearing across different profiles were all features highlighted by participants as indicative of trafficking. Moreover, key phrases were highlighted including references to subjects having recently arrived in a location. For instance, the use of ‘new in town’, ‘just arrived’, ‘new for you’ was identified as indicative of transience and movement and, therefore, linked to trafficking.

Services offered and pricing: Participants argued that the cost and extent of sexual services offered in an ASW profile was critical in discerning potential trafficking activity. When services were advertised at a cheaper cost than local market rates, this was deemed as suspect. Non-itemised pricing was also mentioned as problematic, such as ‘all inclusive’ prices failing to list specific costs for specific sexual services. Similarly, long and apparently unfiltered lists of services offered were deemed problematic, particularly when services such as anal sex and oral and vaginal sex without protection was offered without additional charge. Participants argued that legitimate sex workers rarely offer unprotected sex and almost never without additional charge, hence long lists of services offered suggested the subject was not in control of the ASW profile. Further, when services were only offered as ‘in-calls’, participants suggested this indicated a lack of independent movement and an element of control exerted by traffickers over victims.

Subject’s biographical information: Key biographical information listed on an ASW profile may point towards trafficking activity. Participants listed the following information as being of interest: the ethnicity/country of origin of a subject aligns to trafficking victims found in the local marketplace for commercial sexual exploitation (e.g.: Romanian, Vietnamese); the low weight of the subject; and an age range of between 18-24 (with underaged victims advertised on ASWs as being ‘just over 18’).

Features of photographs: Few participants pointed specifically to features in photographs but one recurring reflection from interviews was the use of the same background in photographs posted across different profiles. This would indicate that photographs had been taken of different subjects in the same location, perhaps a hotel room or temporary accommodation, indicative of control.

Absent features: Finally, participants proposed that the absence of some features in ASW profiles might also be suggestive of trafficking. *Adultwork*, for instance, includes a section in ASW profiles in which customers can provide feedback of their experiences. The absence of such customer feedback was viewed as suspect. Elsewhere, the failure of a sex worker to confirm a customer’s identity after initial contact was also identified. In some ASW profiles, sex workers will explain that customers’ identity must be confirmed before sexual services will be provided. This may take place via video call and acts as a safety protocol for sex workers. However, in several ASW profiles, no such protocols appear to be in place and all contact takes place via text messaging. This reluctance to engage in visual contact with customers until the moment of sexual service delivery was seen by interviewees as an attempt to reduce the chances that subjects are identified as victims of trafficking.

At the conclusion of these two phases (literature review and interviews) the study produced a first iteration of the Sexual Trafficking Identification Matrix (STIM). The STIM synthesized the data collected to create a matrix, which listed several risk markers potentially appearing in any given ASW profile (Table 2). It is worth noting that a category/item entitled ‘X Factor’ was included, designed as a space in which practitioners could add comments and reflections on an ASW profile, meaning that while an ASW profile may not necessarily feature many of the risk markers listed in the STIM, an officer could still flag a profile as requiring further investigation if on the basis of their professional expertise, captured in the X Factor, this was deemed necessary. The STIM was delivered to Cityshire Police and practitioners, including officers and analysts, who used the STIM in their investigations of ASWs. Practitioners were instructed to review ASW profiles and complete a STIM template to identify all the risk markers which appeared on the profile. The more risk markers were identified in any one ASW profile, the higher the risk category assigned to the profile.

Table 2. Indicators/items in the first iteration of STIM

<ol style="list-style-type: none"> 1. Age explicitly under 18 or implied 2. If over 18, subject no older than 24 years old 3. Subject’s weight/size < 110lb/50 kg 4. Subject’s nationality/ethnicity matches local marketplace 5. Multiple subjects in one photo 6. Background looks like non-private residence (hotel, etc) 7. Background is familiar 8. Neutral expression or subject showing distress 9. Low quality / resolution image 10. Use of ‘s/he’ / ‘they’ / ‘we’ instead of ‘I’ 11. Same contact number in different ads 12. Same poster/user ID across multiple ads 13. Same/similar text as other ads for different subjects 14. References to being new: ‘new in town’ / ‘just arrived’ / ‘new for you’ 15. Poor grammar and misspellings in the text 16. Inconsistencies in username or age or ‘story’/location 17. Use of emojis e.g.: peach/cherries 18. References to youth: ‘young and cute’ / ‘sweet’ / ‘fresh’ / ‘candy’ 19. Little or no further information in Q&A section 20. In-calls only 21. Long list of services offered in ad e.g.: 10 or more services 22. Specific services: bareback / anal / OWO (oral without a condom) 23. Additional services at no extra price or very low price 24. Services offered at an ‘All Inclusive’ price 25. Multiple subjects available e.g.: ‘duo services’ 26. Availability in multiple locations 27. Low price 28. X Factor
--

Note: At this point we offer just the indicators/items in the first iteration of STIM rather than the first iteration of STIM for reasons of space economy.

‘Testing’ the STIM and Feedback from the Police

Once Cityshire Police officers and analysts tested the STIM, a focus group was conducted and practitioners offered feedback on it. First, the STIM was deemed to be a user-friendly tool, which enabled a relatively rapid sifting of profiles into broad categories of ‘low’, ‘medium’ and ‘high risk’. This enabled prioritisation of resources towards higher risk profiles and ensured some degree of consistency and rigour in practitioners’ initial examination of ASW profiles. The latter was deemed particularly useful as an additional layer of accountability supporting practitioners’ decision-making processes (see Akinci and Sadler-Smith, 2020).

Second, the STIM was seen as a flexible tool and one which could align to the local commercial sexual exploitation marketplace. Different geographical areas tend to show variances in some aspects of the local sex work marketplace, including differences around pricing of sexual services, the use of massage parlours or the ethnic backgrounds of trafficked women. Practitioners found that the STIM can be rapidly altered to capture these local variances, meaning that it could potentially be adapted by other forces in different areas. Third, the STIM was well suited to work alongside existing software. At the time of the study, Cityshire Police used *Traffic Jam* in their investigations of ASW profiles. Yet rather than replicating the capabilities of *Traffic Jam*, the STIM was deemed a complementary tool, which offered a profile-specific risk assessment after *Traffic Jam* has highlighted profiles as potentially indicative of trafficking activity.

Fourth, despite the positive features outlined above, the risk of false positives remains. In one instance, the STIM identified an ASW profile as highly indicative of trafficking but Cityshire Police officers’ local knowledge, which is “specific and contextual” (Fleming and Rhodes, 2018: 8), in fact revealed the profile was used by an independent sex worker known to the police. The indicators flagged by the STIM in this instance were false positives and this serves as a useful reminder of the limitations of analytical tools such as the STIM as well as reinforcing the importance of using such tools within a broader suite of other risk assessment measures. As the OSCE (2020: 53) has emphasized, there is ‘no substitute for on-the-ground knowledge’ and ‘real contextual expertise is crucial to effective responses’. The potential for false positives in the design of the STIM is particularly noteworthy since many of the risk markers listed in the STIM could, potentially, be applied to ASW profiles posted by independent migrant sex workers. For instance, a migrant sex worker may have poor English language skills, may charge less for sexual services than British sex workers and may move frequently around the country voluntarily. The ability of law enforcement practitioners to use their occupational experience and expertise in distinguishing victims of coercion from consenting migrant sex workers, even when the STIM identifies profiles as high risk, is critical to avoid subjecting migrant sex workers to unwarranted law enforcement attention.

Finally, and relatedly, Cityshire Police practitioners concluded that while tools such as the STIM can complement investigatory efforts, practitioners’ experience and knowledge remain key components of these investigations. Knowledge of the local marketplace, intelligence on known offenders and existing contacts with sex workers were all used alongside the STIM during the study. This occupational ‘craft’ was deemed critical in both mitigating the limitations of the STIM as well as maximising its potential benefits. With this in mind, practitioners reflected that the inclusion of the ‘X Factor’ category was particularly welcome and helped practitioners to note their concerns even where the STIM had not calculated the risk as high.

Three specific areas of development between the first and second iterations of the STIM were proposed by Cityshire Police practitioners. First, practitioners suggested that a greater analytical emphasis be placed on the photographs appearing in ASW profiles. While interview participants in the second phase of the study mentioned photographs, it was the background elements rather than the subjects themselves that were highlighted as a critical feature in identifying potential trafficking activity. In contrast, Cityshire Police practitioners fed back that images on ASW profiles were often a quick way to identify a profile that immediately stood out as suspect. This was due to the excessively explicit nature of a photograph and Cityshire Police practitioners explained that while the vast majority of ASW profile images may seek to be suggestive or sexually alluring, in their experience those posted by traffickers tend to include extreme close ups of genitalia and a level of explicitness not usually seen in ASW profiles which practitioners knew to be operated by consenting sex workers. The new version of the STIM, therefore, placed a stronger emphasis on assessing the explicit nature of photographs in ASW profiles, in addition to potentially relevant background information contained in the photos. Second, what was also suggested by the law enforcement practitioners as an addition were any or multiple inconsistencies between photo and description, and the use of stock photos which appear to have been used multiple times or the officers know it has been used elsewhere. On the other hand, indicators such as the subject's weight/size and the subject's nationality/ethnicity matching the local marketplace were not highlighted as particularly useful by the police practitioners.

Finally, practitioners suggested clearer scoring criteria to categorise ASW profiles as high, medium or low risk. In response, the second iteration of the STIM added a traffic light system with 'low', 'medium' and 'high-risk' categories outlined, depending on the total score entered into the STIM. At the conclusion of the study, a new iteration of the STIM was delivered to Cityshire Police and is presented below. This new version of the STIM created a 27-point matrix split across four key categories: images/photos; language and advert details; services offered; and X Factor. At the end of the STIM, the traffic light risk scoring system was added (Appendix 1).

Discussion

A number of observations can be made on the basis of the process followed and our findings. Initially, it should be noted that this paper does not seek to deliver final proof of the efficacy of the STIM *per se*. Rather, the project was exploratory in nature, was rather short, and the sample size was insufficiently broad to deliver robust, provable findings as to the STIM's efficacy. Instead, the STIM is intended as the basis for a discussion of the balance between policing 'craft' and the use of research/evidence-based solutions in combatting a complex and highly harmful form of offending.

In delivering the STIM to Cityshire Police practitioners and receiving their feedback, we are able to reflect on long-running discussions concerning how best to combine the introduction of new (research-based) tools with the 'craft' of police practitioners. The craft honed and deployed by police officers in the course of their everyday policing functions is well recognised in academic literature (Repetto 1978; Hobbs 1988). The rapid advancements in technology in recent years, and the adoption of myriad technology-based solutions by the police (see, among other, Ariel et al. 2015; Coudert et al. 2015; Manning 2011; Norris and L'Hoiry, 2017; Ratcliffe et al 2019; Sathyadevan et al. 2014) has come not only with concerns as to fairness and legitimacy (Neyroud and Disley 2008), but has also called into question the extent to which the craft of policing can be effectively aligned to technological tools (Willis and Mastrofski

2016; Fleming and Rhodes 2018). Algorithms, apps and other technologies intended to support police functions offer attractive possibilities, not least the potential for predictive and ‘smart’ policing which may aid in targeted deployment of police resources (Coldren et al. 2013), something particularly desirable during economically challenging periods when the police, like other public sector institutions, may be expected to ‘do more with less’. But it remains critical that police and policy actors do not fall into the trap of viewing tools and technology as the panacea to complex domains of offending. The ongoing drive towards the undoubtedly important evidence-based policing, supported by technological advancements, should not come at the expense of valuing police officers’ craft, a set of skills, knowledge and experience often honed over years and passed from one generation to the next (Innes 2010; Willis and Mastrofski 2016; Fleming and Rhodes 2018; see also Hudson et al. 2019). Instead, what tools such as the STIM and others offer is an opportunity to create an ‘amalgam of art, craft and science’ (Innes 2010: 12), or what Willis (2013) defines as a ‘hybrid approach’, where officers are exposed to evidence and are encouraged and prepared to use it, while also being exposed to the best that craft has to offer, and which delivers the most effective solutions.

In this study, Cityshire Police officers’ craft, reflected in their knowledge of the local marketplace for commercial sexual exploitation, their contacts with local sex workers and their previous experience of investigating suspect ASW profiles, was able to mitigate the limitations of the STIM. The false positive produced by the STIM was identified by an officer based on their existing networks and contacts with independent sex workers in the area. Likewise, despite enthusiasm for the STIM, officers voiced concerns that potential false negatives may occur if risk assessments were to rely exclusively on unquestioningly entering data into the STIM and acting on its results. The use of the ‘X Factor’ category enabled practitioners to deploy their subjective occupational expertise alongside the objective analysis delivered by the STIM and they acknowledged the value of building a subjective indicator into an evidence-based analytical tool. This moulding of assisting tools by law enforcement practitioners is not new. Von Lampe (2004: 92), for instance, refers to the German Federal Criminal Police’s (*Bundeskriminalamt*) composite index ‘to capture the level of organisational and operational sophistication and ‘professionalism’ of criminal groups’ comprising 50 (unpublished) indicators ‘originally formulated to assist investigators in detecting organised criminal structures’. These indicators were weighted on a basis of a survey with German investigators of central organised-crime units, who were asked to rank the importance of each indicator *according to individual evaluations*. What both the STIM and the German Federal Criminal Police’s composite index highlight is that “*there are many sources of knowledge and we need to weave them together. In this weaving, local knowledge, or experience, is one source of evidence, and is essential*” since it effectively operates as the lens through which “*different forms of knowledge are evaluated*” and relevant information is acted upon (Fleming and Rhodes, 2018: 20).

Further, allowing for individual interpretation and flexibility in the use of the STIM is an explicit recognition that traffickers’ activities, like the activities of other serious and organised crime offenders, evolve. Traffickers’ use of ASWs will change and the content they post within profiles will develop over time, particularly if law enforcement become more successful in apprehending offenders by identifying suspect ASW profiles. As a result, creating mechanisms through which practitioners can mould tools like the STIM to reflect (new) developments in offender behaviours will ensure that such tools are responsive to this fluid environment. In this way, practitioners’ experience, expertise and know-how – in other words the ‘craft’ they have acquired – can be effectively married up to a technological solution to deliver the most effective policing interventions.

When interventions are not weaved into the ‘front line’ practitioners’ craft, this can lead to instances where poor results are produced. A relevant example is the issue of the *financial* investigation of human trafficking, which has been an important policy concern in the UK (and internationally) (see HM Government, 2015; Shentov et al. 2019). The UK now has a vast array of tools available to investigators to support disruption, criminalisation, and confiscation of assets. Within this context, there have been successful cases involving the investigation of human trafficking through even rudimentary financial evidence online (Middleton et al., 2019) Although in some cases financial investigation has been instrumental in the conviction of human traffickers in the UK, it does not often produce results commensurate to the effort and resources invested by law enforcement. The theoretical and politically-imposed advantages of integrating criminal and financial investigations of human trafficking are diluted by the practical considerations that - among other – are linked to the nature and organisation of human trafficking that law enforcement practitioners are aware of (e.g.: small human trafficking schemes, illegal schemes often embeddedness in legal businesses, small or in some cases no profits, quick spending of profits and modest investments) (Middleton et al. 2019).

Conclusion

This paper has presented a new analytical research-based tool, the STIM, designed to aid police practitioners to identify ASW profiles used by human trafficking offenders as a conduit to advertise the forced sexual services of their victims. In presenting this tool, the paper has reflected on the ways in which police practitioners developed the tool and moulded its design and functions to align to their own experience and knowledge. This process reflects the way in which police practitioners draw upon varied sources of knowledge, weaving different forms of evidence to perform their policing functions (Fleming and Rhodes 2018). This was evident in our study and while practitioners valued the STIM (and other tools at their disposal) as supportive to their investigations of ASW profiles, they also weaved their use of the STIM within their own subjective experiences and expertise, including their local knowledge and contacts. Only then were the STIM’s limitations minimised and its benefits maximised. With this in mind, the study serves to echo previous research in calling for an appreciation of the continued value of craft in policing and the importance of weaving this important source of knowledge with the potential benefits offered by new technological solutions. As a final point, we propose that this study also shows the benefits of police-academic collaboration. The study’s methods were specifically designed to empower practitioners to work in collaboration with the research team to co-produce the key research product, the STIM. This approach sought to situate practitioners as ‘change agents’ (Toch 2008) of sorts, recognising the value of their experience and expertise to help shape the design and functionality of the tool.

Acknowledgements

The authors would like to thank Cityshire Police and the participants of the study as well as Klaus von Lampe and Georgios Papanicolaou for the insightful discussions. We are also indebted to the anonymous reviewers of *Trends in Organised Crime* for their comments and suggestions.

Funding

The article is based on a project funded by *N8 Policing Research Partnership*.

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

- Alvari, H., Shakarian, P., and Snyder, J. E. (2017). 'A Non-Parametric Learning Approach to Identify Online Human Trafficking'. Available online at: [1607.08691.pdf \(arxiv.org\)](https://arxiv.org/pdf/1607.08691.pdf)
- Akinci, C. & Sadler-Smith, E. (2020) 'If something doesn't look right, go find out why': How intuitive decision making is accomplished in police first response, *European Journal of Work and Organizational Psychology*, 29(1), 78-92
- Andrews, S., Brewster, B., and Day, T. (2016). 'Organised Crime and Social Media: Detecting and Corroborating Weak Signals of Human Trafficking Online'. In Haemmerlé, O., Stapleton, G., and Zucker, C. F. (Eds.). (2016). *Graph-Based Representation and Reasoning. Lecture notes in Computer Science* (Vol. 9717). (pp.137-150) Heidelberg: Springer.
- Antonopoulos, G.A., Baratto, G., Di Nicola, A., Diba, P., Martini, E., Papanicolaou, G. & Terenghi, F. (2020) *Technology in Human Smuggling and Trafficking*. Cham, Switzerland: Springer
- APPG (All-Party Parliamentary Group on Commercial Sexual Exploitation) (2018) 'Inquiry: MPs urge Prime Minister to tackle "industrial scale" sexual exploitation in 'pop-up' brothels'. Available online at: www.appg-cse.uk/inquiry
- Ariel, B., Farrar, W. & Sutherland, A. (2015) 'The Effect of Police Body Worn Cameras on Use of Force and Citizens' Complaints Against the Police: A Randomised Control Trial', *Journal of Quantitative Criminology*, 31(3), 509-535.
- Bayley, D.H. and Bittner, E. (1984) 'Learning the skills of policing', *Law & Contemporary Problems*, 47(4), 35-59
- Brewster, B., Ingle, T. and Rankin, G. (2014a). 'Crawling open-source data for indicators of human trafficking'. In IEEE (ed.) *Proceedings of the 2014 IEEE/ACM 7th International Conference on Utility and Cloud Computing*. (pp. 714-719). IEEE Computer Society.
- Brewster, B., Polovina, S., Rankin, G. and Andrews, S. (2014b). 'Knowledge Management and Human Trafficking: Using Conceptual Knowledge Representation, Text Analytics and Open-Source Data to Combat Organized Crime'. In IEEE (ed.) *International Conference on Conceptual Structures*. (pp. 104-117). New York: Springer
- Brå (2008) *The Organisation of Human Trafficking: A Study of Criminal Involvement in Sexual Exploitation in Sweden, Finland and Estonia*. Report 2008:21. Stockholm: Brå.
- Clarke, V. and Braun, V. (2013) *Successful qualitative research*. London: Sage

Cauduro, A., Di Nicola, A., Fonio, C., Nuvoloni, A., and Ruspini, P. (2009). 'Innocent When You Dream: Clients and Trafficked Women in Italy'. In Di Nicola, A., Cauduro, A., Lombardi, M., and Ruspini, P. (2009). *Prostitution and human trafficking: Focus on clients*. (pp.31-66) New York: Springer.

Cockbain, E. (2018) *Offender and Victim Networks in Human Trafficking*. London: Routledge

Coldren, J.R., Huntoon, A. & Medaris, M. (2013) 'Introducing Smart Policing: Foundations, Principles, and Practice', *Police Quarterly*, 16(3), 275-286.

Coudert, F., Butin, D. & Le Metayer, D. (2015) 'Body-Worn Cameras for police accountability: Opportunities and risks', *Computer Law & Security Review*, 31(6), pp. 749-762.

Diba, P., Antonopoulos, G.A. & Papanicolaou, G. (2017) *Improving and Sharing Knowledge on the Internet's Role in the Human Smuggling and Trafficking Process: UK Report*. Report to the European Commission

Di Nicola, A., Cauduro, A. & Falletta, V. (2013). 'Dal marciapiede all'autostrada digitale: uno studio sul web come fonte di informazioni su prostituzione e vittime di tratta in Italia', *Rassegna Italiana di Criminologia*, 7(3), 219-228.

Europol (2016). *Trafficking of Human Beings in the EU*. The Hague: Europol

Feehs, K. & Cotton Richmond, J. (2018). *Federal Human Trafficking Report 2017*. Fairfax, VA: Human Trafficking Institute

Fiveash, K. (2018) 'Under the threat of new laws, British sex workers fear for their websites and their safety', *Wired*, available online: <https://www.wired.co.uk/article/adult-work-vivastreet-fosta-law>

Fleming, J. and Rhodes, R. (2018) 'Can experience be evidence? Craft knowledge and evidence-based policing', *Policy & Politics*, 46(1), 3–26.

Hickle, S. (2017) *An Exploratory Study Identifying Indicators of Human Trafficking Online*. Unpublished.

HM Government (2015) *Report of the inter-departmental ministerial group on modern slavery 2015* London: HMSO.

Hobbs, D. (1988) *Doing the Business: Entrepreneurship, the Working Class, and Detectives in the East End of London*. Oxford: Clarendon Press

Hudson, B., Hunter, D. and Peckham, S. (2019) 'Policy Failure and the Policy-Implementation Gap', *Policy Design & Practice*, 2(1), 1-14.

Ibanez, M. and Gazan, R. (2016a). 'Virtual indicators of sex trafficking to identify potential victims in online advertisements'. In IEEE Computer Society (ed.) *Advances in Social Networks Analysis and Mining (ASONAM), 2016 IEEE/ACM International Conference*. (pp. 818-824). IEEE.

Ibanez, M. and Gazan, R. (2016b). 'Detecting sex trafficking circuits in the US through analysis of online escort advertisements'. In IEEE Computer Society (ed.) *Advances in Social Networks Analysis and Mining (ASONAM), 2016 IEEE/ACM International Conference*. (pp.892-895). IEEE.

Ibanez, M. and Suthers, D.D. (2014). 'Detection of Domestic Human Trafficking Indicators and Movement Trends Using Content Available on Open Internet Sources'. In IEEE (ed.) *2014 47th Hawaii International Conference on System Sciences*, (pp.1556-1565). IEEE.

Ibanez, M. and Suthers, D.D. (2016). 'Detecting covert sex trafficking networks in virtual markets'. In IEEE (ed.) *Advances in Social Networks Analysis and Mining (ASONAM), 2016 IEEE/ACM International Conference*. (pp.876-879). IEEE.

Innes, M. (2010). 'The art, craft and science of policing'. In Cane, P. and Kritzer, H. (eds.) *The Oxford Handbook of Empirical Legal Research*. (pp.11-36) Oxford: Oxford University Press

Latonero, M. (2011). *Human trafficking online: The role of social networking sites and online classifieds*. Los Angeles, Ca.: University of Southern California, Centre on Communication Leadership & Policy.

Latonero, M., Musto, J., Boyd, Z., Boyle, E., Bissel, A., Gibson, K. and Kim, J. (2012). *The rise of mobile and the diffusion of technology-facilitated trafficking*. Los Angeles, Ca.: University of Southern California, Centre on Communication Leadership & Policy.

Manning, P. K. (2011). *The Technology of Policing: Crime Mapping, Information Technology, and the Rationality of Crime Control*. New York: NYU Press.

Marinus Analytics (2020) *Traffic Jam*. Available online:
<https://www.marinusanalytics.com/traffic-jam>

Mendel, J. and Sharapov, K. (2016). 'Human trafficking and online networks', *Antipode: A Radical Journal on Geography*, 48(3), 665-684.

Middleton, B., Antonopoulos, G.A. & Papanicolaou, G. (2019) 'The Financial Investigation of Human Trafficking in the UK: Legal and Practical Perspectives', *Journal of Criminal Law*, 83(4), 284-293.

Neyroud, P.W. and Disley, E. (2007). 'The Management, supervision and oversight of criminal investigations'. In Newburn, T., Williamson, T. and Wright, A. (Eds.). *Handbook of Criminal Investigation*. (pp.549-571) Cullompton: Willan.

Norris, C. and L'Hoiry X. (2017) 'Times of crises and the development of the Police National Automatic Number Plate Recognition System in the UK' in Boersma, K. and Fonio, C. (eds) *Big Data, Surveillance and Crisis Management*, London: Routledge.

OSCE (2020) *Leveraging innovation to fight trafficking in human beings: A comprehensive analysis of technology tools*. Vienna: OSCE

Perer, A. R. (2012). 'Policing the Virtual Red Light District'. *Brooklyn Law Review*, 77(2), 823-859.

Ratcliffe, J.H., Lattanzio, M., Kikuchi, G. (2019) 'A partially randomized field experiment on the effect of an acoustic gunshot detection system on police incident reports', *Journal of Experimental Criminology*, 15, 67–76.

Repetto, T.A. (1978). 'The detective task - state of the art, science, craft?', *Police Studies: The International Review of Police Development*, 1(3), 5-10.

Sathyadevan, S., Devan, M. Surya Gangadharan, S. (2014) 'Crime analysis and prediction using data mining', *Proceedings of IEEE 1st International Conference on Networks and Soft Computing, Guntur, India*: 406–412.

Shared Hope International (2007). *Demand: A Comparative examination of sex tourism and trafficking in Jamaica, Japan, the Netherlands, and the United States*. Available online at: www.sharedhope.org

Shentov, O., Rusev, A. & Antonopoulos, G.A. (eds) (2019) *Financing of Organised Crime: Human Trafficking in Focus*. Sofia: Centre for the Study of Democracy.

Spectre, R. (2019) *Beyond Backpage, Buying And Selling Sex In The United States One Year Later*. New York: childsafe.ai.

Sherman, L., Neyroud, P.W., & Neyroud, E. (2016) 'The Cambridge crime harm index: Measuring total harm from crime based on sentencing guidelines'. *Policing: A Journal of Policy and Practice*, 10(3), 171-183.

Thorn (2020) *Spotlight*. Available online at: <https://www.thorn.org/spotlight/>

Thorn & Bouche, V. (2018). *Survivor Insights: The Role of Technology in Domestic Minor Sex Trafficking*. Thorn. Available online at: https://www.thorn.org/wp-content/uploads/2018/01/Thorn_Survivor_Insights_DMST_Executive_Summary.pdf

Toch, H. (2008) 'Police officers as change agents in police reform', *Policing and Society*, 18(1), 60-71.

United Nations Office on Drugs and Crime (2012) *Human Trafficking Indicators*. Available online at: https://www.unodc.org/pdf/HT_indicators_E_LOWRES.pdf

Vander Beken, T. (2004) 'Risky business: A risk-based methodology to measure organised crime', *Crime, Law and Social Change*, 41, 471-516

Verhoeven, M., van Gestel, B. and De Jong, D. (2011) *Mensenhandel in de Amsterdamse raamprostitutie: Een onderzoek naar aard en opsporing van mensenhandel [Human trafficking in Amsterdam window prostitution: A study into the nature and criminal investigation of human trafficking]*. The Hague: Boom Juridische Uitgevers.

Verhoeven, M., van Gestel, B., De Jong, D. and Kleemans, E. (2015) 'Relationships between Suspects and Victims of Sex Trafficking: Exploitation of Prostitutes and Domestic Violence

Parallels in Dutch Trafficking Cases’, *European Journal on Criminal Policy and Research*, 21(1), 49–64.

Volodko, A., Cockbain, E. & Kleinberg, B. (2020) “Spotting the signs” of trafficking recruitment online: Exploring the characteristics of advertisements targeted at migrant job-seekers’. *Trends in Organised Crime*, 23(1) [special issue on “Illegal labour practices, trafficking and exploitation’], 7–35

Voloshin, D., Derevitskiy, I., Mukhina, K. and Karbovskii, V. (2016). ‘Identifying Venues for Female Commercial Sex Work using Spatial Analysis of Geocoded Advertisements’. *Procedia Computer Science*, 80, 345-355.

Von Lampe, K. (2004) ‘Measuring Organised Crime: A Critique of Current Approaches’. In van Duyn, P.C., Jager, M., von Lampe, K. and Newell, J. (eds) *Threats and Phantoms of Organised Crime*. (pp.85-116) Nijmegen: Wolf Legal Publishers

Weitzer R. (2014) ‘New Directions in Research on Human Trafficking’, *The ANNALS of the American Academy of Political and Social Science*, 653(1), 6-24.

Willis, J.J. (2013) ‘Improving police: What’s craft got to do with it?’, *Ideas in American Policing*, 16(June), 1-14

Willis, J.J. and Mastrofski, S.D. (2014) ‘Pulling together: Integrating craft and science’, *Policing: A Journal of Policy and Practice*, 8(4), 321–9.

Willis, J.J. and Mastrofski, S.D. (2016) ‘Improving policing by integrating craft and science: what can patrol officers teach us about good police work?’, *Policing and Society*, DOI: [10.1080/10439463.2015.1135921](https://doi.org/10.1080/10439463.2015.1135921)

Appendix 1. Revised and Final Iteration of STIM

SEXUAL TRAFFICKING IDENTIFICATION MATRIX	
CASE ID	OFFICER
WEBSITE	URL
LAST UPDATED	LINKED PHONE NUMBER(S)

INDICATOR	✓	Explanatory notes	Comments
IMAGES/PHOTOS			
Pose seems unusual or extreme; appears overly explicit.		The photo is overly explicit (e.g. reveals genitals). Consider camera placement e.g. the camera is very	

		close to the subject, resulting in full or partial genital exposure.	
Facial expression of subject shows general or potential unease		Any indication that subject is not completely comfortable.	
Any or multiple inconsistencies between photo and description		Subject's age does not appear to match the written description; the ethnicity/nationality appears to have been deliberately changed (e.g.: you suspect the subject is Eastern European but is described as Latino).	
Background looks like non-private residence (hotel, etc.)			
Background is familiar		You have seen this background or similar in previous profiles identified as trafficking.	
Use of stock photo(s)		Photo appears to be stock or you know it has been used elsewhere.	
Low quality/resolution image(s)			
Age: subject appears to be between 18-24 years old			
LANGUAGE AND DETAILS			
Use of 's/he' / 'they' / 'we' instead of 'I'			
Same/similar text as other ads for different subjects		The text and language are similar, possibly copied and pasted.	
Same contact number in different ads		Intelligence has identified phone number as used in other ads.	
Same poster/user ID across multiple ads		Intelligence has identified ID as used in other ads.	
Poor grammar and misspellings in the text			
Inconsistencies in username or 'story'/location		E.g. username is 'ManchesterMandy' but location is Sheffield, or username is 'lola87' but age is 21.	
Current availability in multiple locations across the region		Ad states subject is immediately available in a number of locations across the region (e.g. Sheffield, Leeds, Bradford).	
Historical availability across the country		Has the subject advertised in other locations across the country in the past (e.g. London, 6 months ago)? <i>You may require specialist software to check this - e.g. Traffic Jam</i>	
References to being new: 'new in town' / 'just arrived' / 'new 4 you'			
References to youth: 'young and cute' / 'sweet' / 'fresh' / 'candy'			
Use of emojis, e.g. peach/cherries			
Little or no further information in Q&A section			
SERVICES OFFERED			
In-calls only			
Long list of services offered in ad, e.g. 10 or more services			

Specific services: bareback/anal/OWO (oral without a condom)		Check both the list of services offered and the ad's text. These will sometimes differ.	
Additional services at no extra price or very low price			
Services offered at an 'All Inclusive' price			
Low price for the local marketplace		Price you would consider to be lower than average for the local market, based on your knowledge and intel.	
X FACTOR		Apply your professional judgement based on previous experience and other intelligence.	
TOTAL SCORE		See scoring categories below.	
0-10	Low priority.		
11-15	Consider further investigation.		
16 AND ABOVE	Prioritise as high-risk.		