DEPARTMENT OF SOCIOLOGY AND WORK SCIENCE

'WE LOOK AT CRIME THROUGH THE LENS OF GEOGRAPHIC BEHAVIOUR'

Geographic profiling in operational settings

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Abstract

Title: 'We look at crime through the lens of geographic behaviour': Geographic profiling in operational settings

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Type of thesis: Scientific article

Date: Spring 2018

Aims and objectives: This study aims to investigate in what investigative context the use of geographic profiling is appropriate, but also to contribute with a breadth of knowledge and understanding of the methodology in operational settings. Additionally, this study will explore to what extent the implementation of geographic profiling differs depending on if the crime committed was expressive or instrumental.

Method and data: Six in-depth interviews were conducted by phone with individuals from four different countries. The interviewees were chosen based on their extensive experience with geographic profiling in operational settings.

Results: The study showed that for geographic profilers to fully understand the *where* and the *when* of a criminal act they ought to receive proper training, in terms of theoretical approaches, spatial analysis and investigative strategies, before using the investigative tool in operational settings. Although the overall use of geographic profiling is similar in several countries, one can establish that geographic profilers use different approaches when conducting a geographic analysis. Moreover, the results indicate that geographic profilers must be able to adjust to certain specifics depending on the nature of the case, i.e. expressive or instrumental. The study concludes that geographic profiling is much more than a crystal ball.

Key words: Geographic profiling, operational settings, expressive/instrumental offending, serial crime, geographic profilers

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Introduction

> We are a different lens, we look at crime through the lens of behaviour, be it criminal behaviour or geographic behaviour and it's that lens that can help focus investigations.

Those were the words used by a geographic profiler when asked to describe the use of geographic profiling in operational settings. Geographic profiling is a criminal investigative technique used to analyse 'the locations of a connected series of crime to determine the most probable area of offender residence' (Rossmo, 2014:1934). The investigative tool is primarily used to aid police officers in operational settings with suspect prioritisation during serial crime investigations (Rossmo, 2012). Compared to criminal profiling that focuses on the *who* of an offender (an offender's personality characteristics), geographic profiling seeks to discover the *where*, i.e. an offender's geographic behaviour (Rossmo, 2005). An offender's spatial behaviour is sometimes overlooked by investigators due to lack of education within the area of geographic profiling or lack of resources, and as a result valuable information that might identify an offender's anchor point is missed (Rossmo, 2000; Öhrn, 2016). Although the investigative tool has been available to police agencies since the early 1990s little is known about in which investigative context the use of geographic profiling is most appropriate in operational settings and to what extent the use of geographic profiling differs depending on the nature of the crime, i.e. expressive or instrumental crime.

Aim

This study aims to investigate in what investigative context the use of geographic profiling is appropriate. Moreover, the study aims to contribute with a breadth of knowledge and understanding of the methodology in operational settings, i.e. the use of geographic profiling during police investigations. In addition, this study will explore to what extent the implementation of geographic profiling differs depending on if the crime committed was expressive or instrumental. The following research questions are to be answered;

- In what investigative context is geographic profiling used most proficiently in operational settings?
- To what extent does the implementation of geographic profiling differ depending on if the crime is expressive or instrumental?

Background and theoretical approach

The use of spatial analysis was first implemented during the Hillside Stranglers investigation in 1977 when the Los Angeles Police Department relied on spatial information, i.e. distances between abduction and body dump sites, in search for the offenders (Rossmo, 2000). Further, similar spatial investigative methods were applied during the Yorkshire Ripper case in 1980 by the British police in order to apprehend the perpetrator (ibid; Rossmo, 2014). Since then the use of spatial analysis and crime mapping has increased and in the early 1990s the modern investigative technique known as geographic profiling was developed by scholars at Simon Fraser University in Canada (Rossmo, 2014). Geographic profiling was then introduced in operational settings by the Vancouver Police Department in 1995 (ibid).

Theoretical approach

Geographic profiling is based on the foundations of environmental criminology, i.e. for a crime to occur a motivated offender must intersect with a vulnerable victim in both time and place (Cohen & Felson, 1979; Brantingham & Brantingham, 1984; Rossmo, 2014). Rather than focusing on offender characteristics, the *who*, environmental criminology concerns the analysis of spatial and temporal aspects of the crime setting, i.e. the *where* and the *when* (Rossmo, 2014). Brantingham and Brantingham (1981) pioneered the field of environmental criminology and spatial analysis in the early 1980s and they deduced that offenders move about their everyday life much like non-criminals, i.e. they follow similar spatial patterns. These basic spatial patterns are based on the principle of distance-decay, i.e. an individual's routine activities such as social interactions, work or school, tend to cluster around that individual's home location or some other anchor point, such as a workplace (ibid). When investigating an offender's journey-to-crime it is therefore important to take distance-decay into account as studies show that offenders often commit crimes in the near vicinity of their home location, i.e. as the distance from an offender's home location increases, criminal activity decreases (ibid; Bernasco, 2010). Moreover, the least-effort principle suggests that an individual who is given several possible locations to commit a crime, will choose the location that requires the least amount of effort to reach (Brantingham & Brantingham, 1984; Rossmo, 2000). For instance, offenders often commit crimes close to their home location as travelling great distances can be expensive and requires time (Brantingham & Brantingham, 1984). Another reason as to why offenders commit crimes close to home is that the offender is familiar with the surroundings of the area (Bernasco, 2010). Nevertheless, one should be aware that the risk of apprehension increases when committing crimes close to a home location, since the offender is more likely to be recognised by neighbours, thus some offenders travel further from their anchor point to commit crimes (Brantingham & Brantingham, 1984).

The above-mentioned principles can be explained further by the three main theoretical approaches used in environmental criminology; routine activity theory, rational choice and crime pattern theory. Routine activity theory suggests that crime occur when the following

three aspects converge in time and place; a motivated offender, a suitable target and the absence of a capable guardian (Cohen & Felson, 1979). The rational choice perspective considers criminal behaviour as purposive and rational, i.e. crime is a deliberate act that is committed purely for its benefits, e.g. revenge, control or money, by using the most suitable means (Cornish & Clarke, 2014). Both routine activity theory and the rational choice perspective focuses on the viewpoint of the offender, rather than the standpoint of the victim or society (ibid; Cohen & Felson, 1979). Much like routine activity theory and the rational choice perspective, crime pattern theory focuses on the offender. Geographic profiling is heavily based on the premises of crime pattern theory, i.e. striving to explain the *where* and the *when* of a criminal act. To fully comprehend crime patterns, one must understand individual activities. For instance, offenders spend most of their time in non-criminal activities, thus offenders develop routines consistent to routines established by other individuals (Brantingham & Brantingham, 1984). Daily routine activities may differ between individuals but could include activities such as going to work or school, then to the gym before returning home (Brantingham & Brantingham, 2013). Although the daily activities may differ all individuals usually have a location, an anchor point, which they leave in the morning and return to later during the day or night. An anchor point does not necessarily have to be an offender's home as the individual may be operating from a work or social activity location (ibid, Rossmo, 2000). The well-known areas and locations within an individual's activity space, i.e. anchor points and paths, creates their awareness space (Bernasco, 2010). Awareness spaces can expand over time as an individual learns new information about other areas, for instance if an individual move to a new neighbourhood (Brantingham & Brantingham, 2013).

Assumptions of geographic profiling

Rossmo (2000, 2005) argue that there are five assumptions that should be used to assess if it is appropriate to generate a geographic profile for investigative purposes;

1. All the crimes are linked, i.e. committed by the same offender, and the crime series is fairly complete.
2. There are at least five crime locations in the series.
3. The offender is a marauder and not commuting into the area.
4. The offender has not moved anchor points during the crime series.
5. The target backcloth is rather uniform.

The first assumption concerns the importance of linkage analysis, i.e. establishing that the crimes have been committed by the same offender (Rossmo, 2000). A linkage analysis is of high relevance to a geographic profiler as the analysis provides them with more pieces to the puzzle. Further there ought to be at least five crime locations in the series which is required simply because more locations equal more information that can benefit the investigation and a linkage analysis (ibid). The third assumption refers to the offender type identification process which typically involves the distinction between the two offender types; *marauders* and

commuters (Paulsen, 2007). The identification process is based on the spatial relationship between the offender's anchor points and the crime sites.
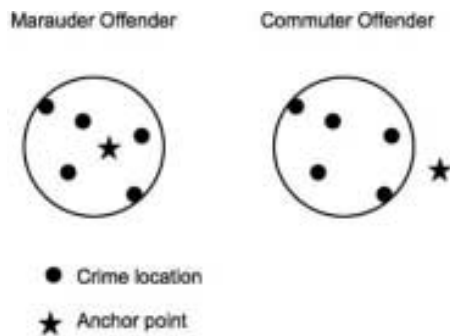

Figure 1. *Movement patterns for commuters and marauders (Paulsen, 2007, p. 350).*

A marauder is an offender that leaves their anchor point, i.e. their home location, and commits crimes within their awareness space and then return to said anchor point (Paulsen, 2007; Bernasco, 2010; Kocsis, Cooksey, Irwin & Allen, 2002). A commuter normally leaves their anchor point and then travels to another area to commit crimes. An offender might travel to another area if they are worried that they might be recognised by neighbours, however the targeted area does not have to be unfamiliar to an offender, for example the offender might travel to an area where they used to live (Paulsen, 2007; Bernasco, 2010). It should be noted that if police agencies were to apply geographic profiling when the crime was committed by a commuter they can expect failure rates up to approximately 50 % as the assumptions for geographic profiling will not have been fulfilled (Paulsen, 2007; Rossmo, 2000). The fourth assumption states that the offender cannot move anchor points, e.g. residence, during the crime series since this may result in mixing crime series during the investigation (Rossmo, 2005; Rossmo & Velarde, 2008). Lastly, to ensure a more reliable geographic profile the target backcloth ought to be uniform and not patchy (Rossmo, 2000). A target backcloth is simply put a spatial opportunity structure, i.e. for a crime to take place an offender and a victim must intersect in time and place. If the target backcloth is uniform, then the offender's activity space will influence crime locations whereas if the target backcloth is non-uniform then the crime locations are often chosen due to specific traits (ibid). For instance, if a burglar is targeting horse stables in search of expensive horse tack, the availability of those stables will determine possible crime locations. However, if the burglar does not have a specific target in mind then the target backcloth is more uniform, i.e. the burglar will consider most buildings and houses as possible targets (ibid).

Assessing all the assumptions during an investigation may be difficult as not all information might be readily available to the profiler (Emeno, Bennell, Snook & Taylor, 2016). The profiler may in that case chose to not generate a geographic profile, due to that the results will not be as reliable, or they can generate a partial profile by using the principles of geographic profiling (Rossmo, 2000). Nevertheless, experienced profilers may decide to generate a

geographic profile although some of the assumptions are violated, for instance geographic profiling was implemented during the Irvine Chair Burglaries investigation in the US (Rossmo & Velarde, 2008). Although assumptions were violated, the geographic profile was useful during the investigation since the profile was generated by well-trained and experienced geographic profilers, thus they were aware of the limitations that the violations might cause (Rossmo & Velarde, 2008; Daniell, 2008; Rossmo, 2000, 2005). There are also other studies which have violated the assumptions, however these studies are rather clinical, thus the reliability of those studies may be questioned as the studies were not conducted in operational settings (Paulsen, 2006a; Snook, Taylor & Bennell, 2004).

Expressive and instrumental offending

Geographic profiling was initially used during serial murder investigations but as it has proven to be a versatile tool it is currently used in many types of criminal investigations, for example serial rape, bombings, arson, robbery, burglary, fraud and vandalism investigations (Rossmo, 2012). As noted by Santtila, Laukkanen and Zappalá (2007) special considerations ought to be made when analysing spatial behaviour depending on if a crime classifies as expressive or instrumental. Expressive offending is largely motivated by emotions, thus often driven by impulsive and uncontrolled behaviour, whilst instrumental offending is motivated by the desire to acquire a secondary goal, e.g. money, and is therefore often planned (Youngs, Ioannou & Eagles, 2016). The two offending categories are sometimes referred to as interpersonal and property crime because expressive offending is usually directed at a person, e.g. homicides, assaults and rapes, whereas instrumental offending is focused on obtaining an object, such as in burglaries, robberies and fraud (Santtila et. al., 2007; Youngs et. al., 2016). Nevertheless, studies show that the two offending categories are not necessarily independent of each other, rather they often co-occur as, for example, certain expressive act may be influenced by instrumental motives (Youngs et. al., 2016; Kocsis & Cooksey, 2002). In addition, previous studies have suggested that there are certain differences between offending behaviours, e.g. expressive offenders are more likely to be marauders, thus profiles on expressive crimes ought to be more accurate (Emeno, et. al., 2016; Santtila et. al., 2007). Although the study by Santtila et. al. (2007) contributed with some insight to the area of expressive and instrumental offending in regard to geographic profiling, the study may be deemed too academic as the data was based on solved cases and analysed with CrimeStat (Canter & Hammond, 2007). Therefore, the current study will investigate to what extent expressive and instrumental offending may impact geographic profiles in operational settings.

Geographic profiling in operational settings

Geographic profiling cannot be used during judicial proceedings, only confessions, witnesses or physical evidence can be used to solve crime (Rossmo & Velarde, 2008). Geographic profiling is a suspect prioritisation tool used during investigations to identify an offender's anchor point and is best used in combination with other investigative means (Rossmo, 2000). Further, geographic profiling in operational settings differs from how it is used in academic geographic profiling (Daniell, 2008). Over the years scholars have focused on issues such as

the complexity and accuracy of geographic profiling, opportunity structures, marauder/commuter patterns and theoretical applications of the methodology (Snook et. al., 2004; Snook, Zito, Bennell & Taylor, 2005; Paulsen, 2006a, 2007; Bernasco, 2010; Block & Bernasco, 2009; Kocsis et. al., 2002). Although the results from academic geographic profiling have provided promising material, the focus of the studies have been criticised for being too academic, i.e. the studies bear limited resemblance to the use of geographic profiling in operational settings (Rossmo, 2005, 2011; Daniell, 2008).

Before an investigator or analyst can apply the method in operational settings they should attend a geographic profiling training programme, however research show that not all profilers receive training in geographic profiling (Rossmo, 2000; Emeno, et. al., 2016). When generating a geographic profile in operational settings a geographic profiler will often use a process which involves several steps, for example establishing that the crimes in the series are linked, reviewing the case information, generating the profile and then recommending relevant investigative strategies (Rossmo, 2014). Once the linkage analysis has been completed one ought to consider several crime and environmental factors by conducting an exploratory analysis of the existing case information (ibid). According to Rossmo (2014) there are ten aspects that should be investigated further when preparing a geographic profile, for instance crime locations, temporal factors, road networks, psychological and physical boundaries. The exploratory analysis is valuable as offenders, much like other individuals, adhere to geographic patterns that are easily influenced by routine activities, including environmental and psychological aspects (ibid; Brantingham & Brantingham, 2013).

Once the exploratory analysis is complete the data can be used to generate a geographic profile by using a computer software (Rossmo, 2000). During the years the use of computer software, i.e. complex strategies, instead of simple strategies have caused heated debates amongst scholars (Paulsen, 2006a; Snook et. al., 2005; Rossmo, 2005, 2011). The most commonly used computer software is called Rigel and due to its' use of the Criminal Geographic Targeting (CGT) algorithm and the ability to run scenarios it is used by many police agencies around the world (Rossmo & Velarde, 2008). Moreover, computer software such as Dragnet and CrimeStat are available, however they have been deemed too academic as the software mostly presents statistics on a map, thus not suitable for the use of geographic profiling in operational settings (Canter & Hammond, 2007; Block & Bernasco, 2009). Unlike the computer software, which produces a priority search area, the simpler approaches are often based upon simple error measurement analysis or educated guesses, thus often resulting in an X marks the spot approach which is not as reliable as the output from the software (Snook et. al., 2004, 2005; Paulsen, 2006a). Lastly, when the geographic profile has been created and a search area has been established the geographic profiler must recommend investigative strategies to the police agency that requested the geographic profile (Rossmo, 2014). Investigative search strategies are usually divided into two categories; suspect prioritisation and target area strategies (ibid). Suspect prioritisation strategies allow the geographic profiler to assess potential suspects by comparing addresses or other geographic data with the geographic profile. Further, target area strategies can be used to place

appropriate police resources, e.g. canvassing or surveillance, in areas which may contain the offender's anchor point (Rossmo, 2014). Recommending strategies are an important part during the process of generating a geographic profile but is not commonly mentioned by scholars (Snook et. al., 2004; Paulsen, 2006a; Emeno et. al., 2016).

Although the interest in geographic profiling has increased over the years it can still be considered rather unexplored. To illustrate this a small systematic literature review on four different databases was conducted.[1] One can establish that current research has focused on aspects such as accuracy (e.g. Snook et. al., 2004, 2005; Canter & Hammond, 2007; Emeno & Bennell, 2013) and theoretical applications to crime (for example Santtila et. al., 2007; Bernasco, 2010). Nevertheless, only one study (i.e. Emeno et. al., 2016) has discussed the use of geographic profiling in operational settings by conducting a survey with geographic profilers around the world. Although the study gave some insight in how geographic profiling is used in operational settings it was a quantitative study. The current study aims to contribute to the research field of geographic profiling by allowing geographic profilers to express their opinions on the use of geographic profiling in operational settings.

Method

The current study is based on six qualitative in-depth interviews with six individuals (5 males, 1 female). Snowball sampling was used to recruit interviewees for the study, i.e. after an initial contact with a gate keeper the author was able to contact other individuals around the world, who then recommended other possible interviewees (Bryman, 2016). The study relied heavily on the snowball sample to locate individuals with knowledge and experience of using geographic profiling in operational settings. Moreover, the interviewees included in the sample were chosen based on a few criteria to ensure that the study provides a significant contribution to the field of geographic profiling (Tracy, 2010). The criteria included were; individuals who were currently employed by police agencies as geographic profilers and/or analysts (1), individuals who provide advice to police agencies about geographic profiling as consults (2), individuals who have previously been employed as geographic profilers (3) and finally individuals who work as professors and/or researchers with knowledge about the use of geographic profiling in operational settings (4). The final sample for the study consisted of six individuals from four different countries with varied amount of experience in geographic profiling. All interviewees had worked with geographic profiling for several years, ranging from 6 years to approximately 23 years of experience. Three of the interviewees currently worked with geographic profiling at different police agencies and another interviewee had previously worked within policing but was at the time of the interview employed as a research professor. The fifth interviewee both worked with different police agencies, as well as with various research projects and as a professor at one of the training programmes in geographic

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[1] Search words "geographic profiling" (1), "geographic profiling" AND "crime" (2), "geographic profiling" AND "operational settings" (3). The different searches respectively resulted in 6-87 hits (1), 6-70 hits (2) and 0-3 hits (3).

profiling. The final interviewee had no experience within policing but worked as the CEO for a software company which also arrange training courses in geographic profiling, thus deemed suitable for the sample as the interviewee had a great deal of knowledge about the training aspiring geographic profilers receive prior to working with the investigative tool in operational settings. The small sample may implicate the external validity of the study, however as geographic profiling is rather unexplored compared to other areas within criminology and due to the constrained time frame the small sample was unavoidable (Forsberg & Wengström, 2015).

Further, a semi-structured approach was used during the interviews to establish a flexible process were the interviewees had some leeway in how they wished to reply to a question (Bryman, 2016; Marshall & Rossman, 2011). The views of the interviewees were important to fulfil the aim of the study, i.e. to contribute with a breadth of knowledge and understanding of geographic profiling in operational settings (Bryman, 2016). Additionally, an interview guide was constructed prior to the interviews, which was used as a supportive tool to assure that particular topics that were relevant to the study were discussed during the interviews (ibid). For instance, questions such as 'can you please explain when you believe it is appropriate to generate a geographic profile?' and 'can you please explain how you generate a geographic profile?' were included in the interview guide. Nevertheless, the interviewees were encouraged to follow their train of thought to maintain the flexible approach and as such the questions from the interview guide were not necessarily asked in a particular order (Bryman, 2016). The interviews were conducted by telephone and took approximately 30-60 minutes to complete. Since language is used to express meaning the interviews were held in the interviewees' mother tongue to ensure that the findings were not misinterpreted. However, interlingual interpretation was required twice to match the target language of this study, which may have affected the transfer of meaning from the transcribed material (Marshall & Rossman, 2011). Additionally, a disadvantage of conducting a phone interview is that one cannot observe body language, however this was unavoidable as it was not possible to travel to all countries or conduct the interviews over Skype. For the same reason it was not possible to conduct an observational study, however it would be of interest to include observations in future research as this will allow a deeper understanding of how the tool is used in operational settings and enhance objectivity, i.e. the data is not solely based on the viewpoint of the interviewees (ibid). Moreover, for clarification purposes additional questions were later sent to three of the interviewees via email.

All interviews were digitally recorded and transcribed before a thematic analysis was undertaken to process the data collected during interviews. The purpose of a thematic analysis is to create an index of main themes and subthemes (Bryman, 2016). The themes are simply put recurring patterns in the text that can be associated with the data. The data used in this study is the transcribed material from all interviews, thus by carefully reading the material the main themes and subthemes were chosen as seen in the table below (ibid).

Table 1. Thematic analysis

Core theme	Sub theme
Investigative use	Generating a profile
	Academia vs. Operational
	Software vs. Human
	Accuracy
	GP* & Criminal profiling
Current investigative status	Strengths
	Challenges
	Future
	Expertise
Theoretical approach	Criminological theories
	Theoretical principles
	Assumptions of GP*
Crime type	Expressive crime
	Instrumental crime
	Ultimate crime type

Table 1. Reoccurring themes found in the transcribed material. *GP= geographic profiling.

As seen in table one four main themes were chosen after an initial review of the transcribed material and 15 subthemes were then chosen to provide an insight to the meaning of the main themes (Bryman, 2016). Further, to ascertain a rich rigor throughout the study the author has been generous with descriptions and explanations (Tracy, 2010). For instance, a rich rigor was reinforced by demonstrating length and number of interviews including a description of the process of data analysis (ibid). Nevertheless, a rich rigor does not necessarily entail that the study can be replicated as another researcher may not interpret the data in accordance with the current author (Forsberg & Wengström, 2015). Moreover, to adhere to ethical guidelines of research an information sheet was sent to all interviewees which contained information about the purpose of the study, including aspects of confidentiality and that participation was voluntary (Marshall & Rossman, 2011). Moreover, it was decided that the interviewee's countries of origin would not be disclosed in the study as this may implicate the anonymity of the interviewees since the geographic profiling community is fairly small. Finally, all interviewees were offered a copy of the transcribed material to ensure that no statements were misconstrued.

Analysis

The analysis of the transcribed material will be presented in this section and will address the use of geographic profiling in operational settings. The analysis is largely based on the two research questions for this study, including the main and sub themes used during the analysis. Thus, the use of geographic profiling in investigative contexts will be analysed and the matter of expressive and instrumental crime will be discussed in relation to the implementation of geographic profiling during police investigations.

Theoretical approaches used in operational settings

> Human behaviour is to a high extent controlled by these principles. And they control us in our daily routine activities and what really separates us law-abiding individuals from offenders, is just that their daily routine activities are different from ours.

The use of criminological theories and theoretical principles are important when generating a geographic profile. An experienced geographic profiler, as seen in the quote above, explained that theoretical approaches such as the least-effort principle, journey-to-crime, rational choice perspective and the theory of comfort and buffer zones are always acknowledged during the process of generating a geographic profile. For instance, these theoretical perspectives were used during a serial rape investigation in a North European city in 2005-2010 where the recommended strategies from the geographic profile eventually identified the offender. Moreover, the interviewees emphasised the importance of an understanding of an offender's awareness space and routine activities, thus supporting previous research in that area (Brantingham & Brantingham, 1981; Rossmo, 2000). Further, the theoretical aspects were presented by an interviewee as underlying factors during an investigation, indicating that academic theory is converted into a practical aid. A geographic profiler explained the application of theory:

> If an offender has travelled 50 km and commits four crimes that day or he commits one crime a day, four days in a row. That tells us a lot about the offender and where he originates from. Because if he has the ability to commit a burglary every day then it is fair to assume that it is quite easy for him, that is the least-effort principle.

All interviewees believed an understanding of the theoretical approaches to geographic profiling and the training required to generate a reliable geographic profile was of high importance. This illustrates the difference between academic geographic profiling and the use of geographic profiling in operational settings. Investigators often receive training before using the tool, however most scholars have not attended such a course which is a cause for concern (Emeno et. al., 2016; Rossmo, 2005). One interviewee with an extensive background within one the training programmes argued that 'you really have no business doing police geographic profiling unless you have taken the course or received equivalent.' This statement was supported by another geographic profiler with a great deal of experience within research and teaching at one of the training programmes, who explained the importance of training:

> You can't just get some data and think that you can run it through some software and then you get a geographic profile out and that's then going to be accurate. Geographic profiling, [...] requires a minimum two weeks training course.

One interviewee stated that some academics have attempted to add things to geographic profiling, arguing that the addition will be an improvement to the tool. The interviewee explained that 'in general, those enhancements are not good' and gave an example of a group of academics who 'suggested that you should take the crime statistics of the area into account because it was more likely that the criminal would choose an area that was a high crime area'.

This example further illustrates the difference between academic geographic profiling and geographic profiling in operational settings as the attempt of enhancement was theoretically wrong since it exemplified a non-uniform target backcloth, which a trained geographic profiler would have realised (Rossmo, 2000). Moreover, this example also sheds light on Rossmo's assumptions for geographic profiling, i.e. the assumption of needing a uniform target backcloth. As a renowned geographic profiler Rossmo was well known by all the interviewees and most of them shared their thoughts on his assumptions. A geographic profiler explained his opinion:

> Some of them [the assumptions] are definite, they are absolute. Like [...] you cannot profile a commuter because the assumption of Rigel is that your offender lives in the hunting area, otherwise it's just wrong, so that's a very obvious one. In my experience I have done profiles with [...] as little as four crime sites, but you know, I felt that [...] it's still going to generate somewhat valuable score, I mean I wasn't happy with it but I did it.

Another interviewee argued 'well, assumptions, you have to document what the assumptions are, and the guidelines are always just that, guidelines.' The level of dedication to adhere the assumptions differed to a high extent amongst the group of interviewees. For instance, one geographic profiler only remembered one of the assumptions, i.e. that there should be at least five crime sites, and argued that a geographic profile can be done with as little as one crime location. This was also a common answer amongst the other profilers, which contradicts the notion that geographic profiling is only applicable on serial crime. Nevertheless, the interviewees did support the belief of "the more locations, the better" as mentioned in previous studies as the profiles based on less than five crime sites are often partial profiles, i.e. not complete (Rossmo, 2005, 2014). Moreover, the assumption regarding commuter and marauder movement patterns was debated. As seen in one of the previous quotations one of the profilers believed that the commuter assumption should not be violated, as in accordance with Rossmo's assumptions (Rossmo, 2005). Nevertheless, most of the geographic profilers believed that commuters could be used to generate a geographic profile, if the profile was based on the principles of geographic profiling, which corresponds to the results found in the study by Emeno et., al. (2016). Although the interviewees understood the reasoning behind the assumptions one of the geographic profilers explained 'I'm not that static, he [Rossmo] is probably referring to when using the software'. This statement was supported by another profiler who stated that the assumptions must be based on the criminal targeting algorithm and the Rigel software:

> These assumptions are associated with that particular mathematical assumption and not necessarily assumptions that apply to other aspects of geographic profiling.

A common belief amongst the interviewees was that the assumptions were created as guidelines for using Rigel and therefore all assumptions are not relevant, or as useful when generating a profile by hand. Moreover, one experienced geographic profiler explained his opinion on the use of the assumptions and violating said assumptions;

> Well that's a matter of grey, not black or white. That would depend on how many assumptions that are violated, so some you really want to ask in a case by case basis. [...] No one would

ever do any statistical analysis or research if you wanted a perfect world, it just comes down to how serious are the violations.

There seems to be some differences in opinion about following and violating the assumptions amongst the interviewees, however all of them support three of Rossmo's assumptions; the importance of linkage analysis, i.e. that all the crimes are linked, that the offender have not moved anchor points during the crime series and that the target backcloth is not patchy (Rossmo, 2000, 2005). It is reasonable to assume that these assumptions were supported by the interviewees as these assumptions are not necessarily based on the criminal geographic targeting algorithm used in Rigel, rather that there is a sound theoretical reasoning that supports the assumptions (Rossmo, 2000, 2005).

Is geographic profiling more than a crystal ball?

All interviewees explained that the first step of generating a geographic profile is to review the case information and establish that the crimes in the series are linked, which concurs to previous research within the area of geographic profiling (Rossmo, 2000, 2014; Daniell, 2008). The interviewees stressed the importance of conducting a linkage analysis on the material, even though the crimes have been linked by the person that requested the profile. The simple reason as to why the profilers conduct a second linkage analysis is because the other person may not have conducted an accurate linkage analysis, or perhaps some crimes might have been missed altogether. One of the geographic profilers summed up this process by saying 'truth be told, my actual time on doing the geographic analysis, like use the software, is quite minimal. It's deciding what is going to produce that best profile'. The interviewees explained that when they conduct the linkage analysis they are looking at factors such as DNA, other forensics or the modus operandi. Once satisfied with the linkage analysis one geographic profiler described the next step of the process:

> Geographic profiling is not just looking at spatial aspects it's also looking at temporal aspects, understanding days of week, times of day when these offences are being committed. Is there any seasonality to it? [...] Any information that exists around the description of the offender, then examining things around pre and post offence movement. Do we have any information that relates to how the offender approached the victim and the direction that they then fled to after committing a crime against such a particular victim?

The profiler provides a picture of a rather rigorous process, involving a detailed analysis of the crimes in terms of spatial and temporal factors, which is sometimes lacking in academic text (Paulsen, 2006a; Snook et. al., 2004, 2005). The aspects mentioned in the quote above were supported by all interviewees. Another geographic profiler also spoke of factors such as how the offender is moving in a neighbourhood, is the offender using mass transit, walking or driving? Further, a similarity that was found amongst most of the interviewees was that the analysis of the crime is often based on how the information can be used in Rigel. The interviewees explained that they use Rigel to generate a profile output by adding different scenarios into the software. Although a useful tool for profilers, Rigel was not used by all interviewees. A few geographic profilers stated that they do not use the software at all, in fact one of the profilers did not remember the name of the software at the time of the interview.

One profiler said, 'it is simply not necessary to use it [Rigel], and the profiles we generate are often based on less than five crime sites, which is a requirement for Rigel.' Further, another experienced geographic profiler explained:

> We do not use the software that Rossmo developed. Instead we work with manual spatial analysis methods and it is not because the software is bad in any way, but after using it [Rigel] in 20-30 cases you do not need to press the button to know the outcome. But it is also a matter of expenses and the upkeep cost for Rigel is approximately 1000 EUR each year. So, we have access to it [Rigel] but we do not pay the upkeep costs.

The matter of so-called complex (computer software) and simple (spatial analysis methods, educated guesses) strategies for geographic profiling was the cause of a heated debate a few years ago amongst scholars (Snook et. al., 2004, 2005; Bennell, Taylor & Snook, 2007; Rossmo, 2005, 2011). The interviewees that frequently use Rigel explained that they do not always use the software. One experienced geographic profiler stated that if it is not appropriate to use Rigel he will use the principles of geographic profiling instead, and explained how the principles were used after the bombings at Brussels airport:

> There was the man with the hat who [...] left the crime site. [...] And that was a single offence that was committed, and you were not going to Rigel then to work out where that person lives but it's then about applying geographical principles [...]. Any skilled geographic profiler would tell you that person is [...] retreating back into a place where they anchor their activities from […].

Although theoretical principles can be useful as seen in the quote above, the same geographic profiler also explained that 'one of the crucial things that Rigel does that is better than any other manual or other software process that attempts to do geographic profiling, is that it provides an environment that manage all your data.' Another geographic profiler was more critical towards using simpler methods by exclaiming 'well, that's not geographic profiling. You can throw a dart at a map that would be simpler.' It is fair to say that there are mixed opinions on the matter of complex and simple strategies, however as noted by Paulsen (2006a) and Taylor, Bennell & Snook (2009) educated guesses can be as reliable as using a more complex strategy if the profile is generated by an experienced profiler. But how does the process differ, and what are the similarities depending on if the profiler use Rigel or conduct an analysis by hand?

One of the experienced geographic profilers that does not use Rigel explained that after an initial linkage analysis he usually place the crime locations on a map and conducts an analysis of the area. If the area is not well-known by the profiler he prefers to travel to the area where the crime occurred, emphasising the importance of establishing a contact with an individual, not necessarily a police officer or investigator, that lives in that particular area. The geographic profiler said that the contact with a local resident is very important because the individual may provide valuable information about the everyday life in that particular city. Moreover, one of the profilers stated that 'to visit the crime locations, preferably at the exact time of day that the crime occurred, will give you an entirely different impression of the crime location. [...] It can give you an idea about how familiar the area is to the offender'. Arranging

a visit to the area did not seem too important to the investigators that use Rigel, however one of the interviewees believed that, if possible, a visit to the crime location was useful. Another geographic profiler explained that he would not visit the crime locations unless it was a high-profile case due to overseeing a very large area. Instead, the same profiler praised the use of modern technology:

> Today I use a very simple tool to get a feel for the neighbourhood and that's Google Earth with street view. I mean it's not ideal but it's not bad either because now I can go down a neighbourhood and […] I can see what the offender was seeing.

One can deduce that the interviewees use similar approaches during the initial steps of generating a geographic profile, e.g. all the interviewees conduct an analysis of both spatial and temporal aspects related to the crime. Nevertheless, most of interviewees that use Rigel did not find it as important to visit the affected area and the crime locations as the geographic profilers that rely on a manual analysis. Currently, there is no research that has focused on this aspect of the preparation process of a geographic profile. Previous studies within the area of geographic profiling are to a rather high extent based on data from criminal records, thus emphasising the difference between academic geographic profiling and the use of the prioritisation tool in operational settings (Block & Bernasco, 2009; Bernasco, 2010; Snook et. al., 2005; Paulsen, 2007). The noticeable difference between the interviewees that do not use Rigel and those that do is that once the initial analysis has been completed, instead of putting all the information in Rigel some geographic profilers conduct a manual analysis. 'One of us is usually in charge of the case and what we do is that we brainstorm and make sure that none of us suffers from confirmation bias.' Moreover, the profilers that do not use Rigel explained that when faced with a violent crime case, or a case with only one crime location, they also rely on the behavioural aspects of the offender, i.e. criminal profiling. The matter of criminal profiling was discussed amongst the interviewees. Whilst most of the interviewees believe a combination of the two profiling approaches is useful to fully understand the offender, a few geographic profilers had contrasting opinions on the matter and one of the profilers explained, 'I always try to make a clear distinction between behavioural and geographic profiling. Geographic profiling is all about understanding the geography [...] so it's a more exact science. Behavioural profiling [...] tends to be a little bit more vague.'

It is not surprising that the matter of criminal profiling caused a discussion amongst the interviewees as a similar debate has existed in previous studies regarding the empirical status of criminal profiling (Kocsis, 2006; Bennell, Jones, Taylor & Snook, 2006). Although the issue of combining criminal profiling and geographic profiling sparked some discussion all interviewees then described that once the analysis has been completed they present the profile, often with a map of possible locations, to the individual that has requested the profile with recommended strategies. Consequently, one may deduce that the process of generating a geographic profile is clearly more than gazing into a crystal ball. The interviewees all described a rigorous process which not only requires theoretical knowledge about the principles of geographic profiling but also experience from investigating crime in general seem to be very beneficial to ensure a reliable profile (Rossmo, 2005). Although the process

of generating a geographic profile seem to be similar amongst the interviewees, three significant differences were found, i.e. the application (or lack of) of Rigel during the process of generating a profile (1), visiting the affected area and the crime locations (2) and combining geographic and criminal profiling (3). The first difference concerns the application of Rigel. The benefits of using Rigel, as mentioned by some of the interviewees, includes storage of case information, the ability to run different scenarios and the software's criminal targeting algorithm to name a few. Nevertheless, some of the geographic profilers argued that it is possible to generate a geographic profile without Rigel. For instance, this approach is suitable when there are not enough crime locations, i.e. less than five, or if the offender is a commuter. Moreover, aspects such as lack of resources and expertise were mentioned as reasons for not using the software. The second difference found relates to the process of gathering case information by visiting the affected area and the crime locations. Whilst some of the interviewees believed this was an important part of the process when generating a geographic profile, the other interviewees either did not mention this part or they used alternative methods, such as Google Earth. This difference might be explained by factors such as time constraint and lack of resources, thus it might not be possible for the profiler to visit crime locations. Lastly, the third difference regards the combination of geographic profiling and criminal profiling. While the interviewees who only used geographic profiling in operational settings found that both disciplines were needed, the interviewees who used geographic profiling in operational settings, as well as in research, were opposed to the idea. It seems a reasonable explanation could be that the interviewees involved in research might favour their own discipline and/or be more informed about the empirical status of the two profiling methods.

The use of geographic profiling in expressive/instrumental crime investigations

> I would say more similarities than differences. Because I believe in that offenders and humans in general move through their environment in the same way, so having said that those are the similarities. [...] Offenders tend to hunt in similar ways [...]. There are always exceptions to that rule, especially when you're dealing with professional or organized offenders, particularly in burglaries or targeting specific types of places.

Those were the words used by one interviewee when asked about the application of geographic profiling in different crime types. Scholars have debated that the two categories, i.e. expressive and instrumental offending, are not solely independent (e.g. Youngs, et. al., 2016; Kocsis & Cooksey, 2002) and one of the geographic profilers gave an example of such a case:

> I was the lead investigator on a series of about 28 arson fires to homes in [city] and this was a case where the offender was going into carports of occupied homes setting combustibles on fire and fleeing. And you know, the residents were fleeing for their lives in the middle of the night, it was [...] quite a high-pressure case in that we had no idea who it was [...].

As noted by Canter and Fritzon (1998) arson can be difficult to place into the categories of expressive and instrumental offending as the fire setting may be directed at a person and/or an

object. One might therefore assume that a case, such as mentioned by the geographic profiler in the quote above, is a matter of grey, not black and white. Nevertheless, all interviewees explained that the process of generating a geographic profile is not altered in any way depending on crime type, i.e. if it is an expressive or instrumental crime. Rather, what the interviewees discussed as possible differences between crime types seem to concern theoretical and investigative aspects of the geographic profile. One of the experienced geographic profilers said, 'you then have to adjust for certain specifics related to the nature of the crimes and where the crimes are occurring from the landscape.' According to an interviewee a theoretical aspect that may differ depending on crime type is the journey-to-crime. In accordance to previous studies, the same interviewee explained that outdoor rapists tend to travel by bike or foot and generally these offenders do not travel further than 2 km from their anchor point, whereas burglars tend to travel by car and further away from their anchor point (Beauregard, Proulx & Rossmo, 2005; Cedergren, 2011). Additionally, some of the profilers stated that it can be difficult to establish an offending pattern as some burglars stay close to their anchor point whereas professional burglars tend to travel great distances. One might assume that it is difficult to establish if the journey-to-crime depends on the nature of the crime, or if it simply has to do with an offender's fear of being apprehended or recognised. Moreover, the interviewees also noted that linkage analysis may differ depending on crime type. Some of the geographic profilers explained that when dealing with expressive crimes, e.g. serial rapes, linkage analysis is usually conducted with forensic evidence. However, as noted by Rossmo (2000) and the interviewees, if no forensic evidence is available the profiler can often rely on other aspects, such as behavioural characteristics, by examining pre/post offence movement and asking the victim for additional information. When dealing with an instrumental crime, such a burglary, the profiler may not have as many options when conducting a linkage analysis as 'there are only so many ways to break into a home'. One can deduce that the use of geographic profiling differs to a certain extent depending on if the crime classifies as expressive or instrumental offending.

In addition, some of the interviewees discussed if there is a crime type that is more accurate, or suitable, for geographic profiling than others. One geographic profiler explained that the investigative tool works best if the target backcloth is not too patchy and when crime linkage is easy, thus supporting two of Rossmo's assumptions (Rossmo, 2000, 2005). Further, another geographic profiler shared his thoughts on accuracy between crime types:

> I don't think really that it is really any difference in accuracy between crime types at all, it's very much down to case by case basis of the individual information you have available to you.

This statement contradicts previous research on the area of accuracy. As noted by Paulsen (2006b) crime type does affect the accuracy of the geographic profile, regardless of the approach, i.e. use of software or simpler strategies. Moreover, findings from Paulsen's (2006b) study indicated that crime types such as burglaries, street robberies and auto theft are more accurate compared to other crime types. Surprisingly, the interviewees argued that crimes such as burglaries and thefts from autos may not result in reliable profiles since

linkage analysis in those crime types may be difficult. Another geographic profiler, who did not use Rigel, stated that expressive crimes are often more reliable as the geography is rather limited compared to instrumental crimes. The profiler explained that when generating a profile of an instrumental crime, e.g. a series of burglaries, they might only be able to tell the detective that the offender originates from a certain *city*, however if it is an expressive crime 'you can say that it's highly likely that the offender originates from this *neighbourhood*', thus increasing the likelihood of apprehending the offender. Yet another reason why the same profiler believed profiles on crimes of an expressive nature are more reliable has to do with the allocation of resources, i.e. it is easier to get the resources required to implement investigative strategies if it is an expressive crime. This type of reflection was not mentioned by the other interviewees, perhaps because they do not have the same problem with acquiring resources or due to that most of the other interviewees use Rigel during the analysis. Instead of highlighting a category, i.e. expressive or instrumental, as more reliable one of the profilers believed that geographic profiles on sexual assaults, robberies and arson were more reliable than other crime types. Arson was also mentioned by another profiler who explained why this crime type produces reliable profiles:

> It seems to me that arson always produces better scores, [...] the way they [arsonists] hunt and set their fires, it always seems to produce a really good hit score compared to other crimes. And I don't know why that is.

In accordance to previous research on arson, the geographic profiler deduced that arson most likely produces better scores, thus more reliable profiles, as the offenders tend to commit their crimes within 1.6 km of their anchor point (Rossmo, 2000). Nevertheless, it is difficult to establish if there is a crime type that produces more reliable geographic profiles. Most of the interviewees shared different reflections on why they believed, or did not believe, a certain crime type was more accurate. A reasonable interpretation may be that it boils down to experience, personal preferences and ease of acquiring resources.

The current status of geographic profiling in operational settings

> Perhaps we could tell you something about that offender that could help you identify him or if you have too many suspects perhaps bringing them up to the suspect list. One thing that I always stress is that geographic profiling doesn't solve crimes.

In accordance to previous research, it is very important to understand that geographic profiling cannot be used during judicial proceedings, it is an investigative tool (Rossmo, 2000; Rossmo & Velarde, 2008). As an investigative tool geographic profiling was described by the interviewees as a prioritisation tool and the interviewees argued that the major strength of geographic profiling is that it will 'manage large volumes of information' and prioritise suspects, thus improving the effectiveness of investigations. Yet another strength of geographic profiling that was mentioned by some of the interviewees was the importance of how a trained geographic profiler can provide recommended strategies. One of the interviewees explained:

What does this mean for the investigation? [...] Here's your detective [...] and you've presented him with the profile and he says, "so what? What does this mean? What am I supposed to do with this?" [...] The important thing is that you have some strategies otherwise the whole geographic profile is just an academic exercise. And the strategies have to make sense.

As noted by Daniell (2008) scholars do not seem to understand that there is more to a geographic profile than generating an output. Geographic profilers must have an understanding for investigative strategies to be able to conduct an analysis of the output material before recommending appropriate strategies (ibid). Specifically, a geographic profiler stated that most police agencies 'seem to be moving away from the most part on what people would call a profile, they're focusing on investigative strategies'. The interviewee argued that the strength of a geographic profile, over a behavioural profile, is that it provides a more hands-on approach what with providing recommended investigative strategies. Nevertheless, the interviewees discussed the issue of a geographic profile only turning into a paper product. 'A profile is just a piece of paper, in the end you have to turn that into actionable police strategies that takes resources personnel and if they're not willing to commit that then there's generally not much sense in doing the profile.' This quote came from a geographic profiler with a great deal of experience and he was referring to the issue of when police agencies request the profile as the case is 'winding down'. Generally, it is a last attempt to solve the crime when asking for the profile at such a late stage of an investigation, thus it is questionable if the police agency will do anything with the geographic profile. Further, a lack of resources may turn the profile into a paper product as the requesting police agency might not have the resources required to implement the recommended strategies. For instance, it appears that it is much easier to acquire the resources needed if it is an expressive crime compared to an instrumental crime. Since previous research has not focused on this aspect it is difficult to establish a reason as to why this difference exists. To avoid a "paper product situation" one of the profilers explained that he often asks the person who is requesting the profile 'do you want a profile, or do you want to solve the crime?' as he will not generate a profile if the police agency does not have resources for the recommended investigative strategies.

Although geographic profiling has proven to be empirically driven, most of the interviewees expressed that they have at some point in their career faced some sort of scepticism from colleagues. One interviewee with over 15 years of experience in geographic profiling explained 'I think one of them is investigators don't understand what it is that we do. So, explain to them that [...] we don't have a crystal ball.' Yet another example of a challenge the same profiler has faced when working with geographic profiling '[…] is Hollywood, you know that whole image of Criminal Minds and all that.' These types of issues with geographic profiling have not been portrayed in previous research as scholars have not shown an interest in the opinions of real geographic profilers. Moreover, the interviewees explained that another challenge they often face concerns the quality of data as described by an interviewee:

The police are still quite poor in recording geographic features of the data. [...] It's not just the crime itself, it's also thinking about other geographic information […]. For example, [...] if

someone carries out a sexual assault and steals that person's [...] purse. Where that purse is then found, if that is different to the location of where the assault takes place [...] is of interest. That can be useful in a geographic profile.

One can imagine that this type of issue can be quite problematic when attempting to generate a profile as the profiler might not have the information needed to generate a good profile. According to Daniell (2008) this challenge is often not discussed by scholars because they lack the skills required to identify such an issue with the case information. In addition, another experienced profiler explained that stranger crime investigations, i.e. the offender is unknown, '[...] are very different than anything else that a detective typically will face [...].' It is reasonable to believe that the police officers, or detectives in charge of the case might not be trained in geographic profiling and as a result they do not realise the importance of certain temporal or spatial aspects. One can deduce that there is a need to educate detectives and police officers to avoid mistakes as mentioned above.

Lastly, when asked about the future of geographic profiling the interviewees seemed to have some differences in opinion. Whilst most of the interviewees were optimistic about the future and believed that the use of geographic profiling will increase, some of the other geographic profilers did not share the same level of optimism. One geographic profiler explained that, sadly, the use of the investigative tool has stagnated in his country. A possible explanation may be lack of resources and awareness of the tool. Another experienced profiler believed that the investigative tool has 'a huge amount of potential' and although it has empirical support 'its use is still very poor':

> At the moment there's no one in [...] the whole of the Latin America region that is trained in geographic profiling. In the UK 7-8 years ago, there were four professional geographic profilers who worked for the National Crime Agency, now there's one.

It is interesting that some of the interviewees were rather negative towards the future of geographic profiling as research and the use of geographic profiling has expanded to other areas, e.g. zoology, biology, including military and intelligence agencies (Rossmo, 2012). Although some of the interviewees stressed that geographic profiling is more accepted and acknowledged today, perhaps the tool is not used all over the world due to lack of resources and training. For example, if a country does not have the resources required to fund software, such as Rigel, it might be more suitable to train investigators in those countries to conduct the analysis with simpler spatial analysis methods. It appears the countries that use the investigative tool today tend to be rather wealthy nations, thus indicating that geographic profiling does require a great deal of resources.

Concluding discussion

The purpose of this study was to shed light on the use of geographic profiling in operational settings by addressing the following two research questions:

- In what investigative context is geographic profiling used most proficiently in operational settings?
- To what extent does the implementation of geographic profiling differ depending on if the crime is expressive or instrumental?

An important aspect which ought to be reflected on before discussing the findings from the study is that the interviewees who participated originated from four different countries, thus representing different perspectives and judicial systems. Therefore, one must take into consideration that certain findings may not reflect on how geographic profiling is used throughout the world. Nevertheless, one can establish that to fully explain the *where* and the *when* of a criminal act it is important that a geographic profiler understands basic theoretical frameworks such as an offender's awareness space, the least-effort principle, the journey-to-crime, including comfort and buffer zones as the theoretical approaches often co-occur and seem to provide valuable clues about an offender's geographic behaviour (Brantingham & Brantingham, 1984; Bernasco, 2010). Moreover, by attending a two-week training programme the likelihood of producing an inaccurate profile decreases since the aspiring geographic profiler will be taught how to avoid common pitfalls. For instance, by learning relevant theoretical approaches and how to use software such as Rigel an aspiring geographic profiler will know what type of data to include in a profile. All interviewees in this study had received proper training, thus it would be of interest that future studies include interviewees who have not attended such a training programme to evaluate how the use of the investigative tool might differ. Furthermore, it appears that, in line with previous studies (e.g. Snook, et. al., 2004; Paulsen, 2006), Rossmo's assumptions are commonly violated in operational settings. The interviewees understood the rationale behind three of the assumptions, however they did not believe that all assumptions, i.e. a minimum of five crime sites and not profiling a commuter, had to be followed as those assumptions were most likely related to the use of the software Rigel. Based on the views of the interviewees it is difficult to establish to what extent Rossmo's assumptions may be of use to a geographic profiler since experienced profilers seem to generate useful profiles even though they violate some of the assumptions. As an interviewee stated, it might be 'a matter of grey, not black and white'. Clearly, an experienced profiler will be aware of the limitations that the violations might cause, thus one may wonder if the assumptions are more useful to a novice geographic profiler compared to an experienced profiler?

Moreover, in comparison to previous studies (e.g. Snook et. al. 2004, 2005; Paulsen, 2006a; Bennell et. al., 2007) it appears a geographic profiler ought to spend most time on analysing what data that will produce a reliable profile, not necessarily on the geographic analysis itself.

For example, linkage analysis seems to be incredibly important to a profiler, but the interviewees also expressed that linkage analysis is not always easy, as it is sometimes difficult to establish linkage in certain crime types, e.g. burglary investigations. Moreover, reviewing spatial and temporal factors is essential to fully comprehend an offender and what data that should be included in the profile. While important, this step of the process may be challenging to a profiler since the police is (despite modern technology) quite poor at recording this type of information, thus indicating a need to educate police officers about the importance of spatial and temporal factors. One can establish that geographic profiling is best used when crime linkage is not too challenging and when information regarding spatial and temporal factors is available. Further, these findings are important as they support claims made by Daniell (2008) that scholars often lack awareness and knowledge about the above-mentioned factors, thus emphasising that previous research bear little resemblance of how geographic profiling is used in operational settings (Rossmo, 2005).

It should be noted that the author of this study has not personally generated a geographic profile, which can be considered advantageous since this ensures that no prior assumptions might influence the study (Marshall & Rossman, 2011). The matter of using Rigel or manual spatial analysis was, much like in previous research (e.g. Snook et. al., 2004; Bennell et. al., 2007; Rossmo, 2005, 2011), the cause of a debate amongst the interviewees, i.e. some believed the use of Rigel was beneficial whilst others did not use the software at all. One can establish that simple strategies can work well if the geographic profiler is experienced or they can be considered as a cheaper alternative to countries that cannot afford the software. Nonetheless, one cannot ignore that the software is far more reliable than for instance, educated guesses (Bennell et. al., 2007; Rossmo, 2011). The findings contribute with information to the debate concerning complex and simple strategies, which indicates a need to further evaluate how real-life geographic profilers conduct the geographic analysis of a profile. In addition, one can establish that it can be beneficial for a geographic profiler to visit the affected area and crime locations before generating a profile as this will allow a deeper understanding of the offender's behaviour. If a profiler is unable to visit the area, the use of Google Earth can be a viable alternative, however one must acknowledge the limitations of modern technology, i.e. the street views on Google Earth do not change hourly, thus the crime location will not look exactly as it might have done at the time of the crime. While this study has shed light on this step of a geographic profile, previous research has not discussed this aspect to a high extent. Therefore, it is of interest to investigate if there are other techniques that can be useful if the profiler is unable to visit the area. Moreover, it appears that a combination of geographic and criminal profiling may be useful to a geographic profiler, specifically in expressive crime or in single crime location investigations. The interviewees that showed support for both profiling methods were all currently employed by different police agencies, thus indicating a more pragmatic stance compared to the interviewees involved in research, who believed the methods ought to be kept apart due to lack of empirical support (Kocsis, 2006; Bennell et. al., 2006). The findings from this study are somewhat surprising since they indicate that there are some practical and investigative

benefits when combining the two profiling methods, although previous research show that there is little empirical support for criminal profiling (Kocsis, 2006). Further evaluation on this matter is needed to establish in what way criminal profiling can be beneficial to a geographic profiler.

Regarding the matter of expressive and instrumental offending one can deduce that the process of producing a geographic profile is not altered in any way, however a geographic profiler must be able to adjust to certain specifics of a case, e.g. the challenge of linkage analysis or an offender's journey-to-crime. Additionally, it appears that there are certain crime types which may produce more reliable profiles, for instance crimes of an expressive nature and arson. While some of the interviewees' claims are supported by previous research (e.g. Santtila et. al., 2007) one can assume personal preferences may have influenced the geographic profilers' statements regarding accuracy. An interesting finding was that most of the interviewees opposed the claims made by Paulsen (2006b), i.e. that burglaries, street robberies and auto theft are more reliable compared to other crime types, since crime linkage is often difficult in said crime types. The findings are important as they indicate a need for further evaluation of expressive and instrumental offending with a larger sample to fully be able to establish how geographic profiling is used depending on crime type. Further, the findings support claims made by Daniell (2008) and Rossmo (2005) that academic geographic profiling does not resemble geographic profiling in operational settings.

Finally, it appears that although the situation has improved over the years, geographic profilers are sometimes faced with scepticism from colleagues. This study hopes to have contributed with enough information from real-life geographic profilers to ensure that geographic profiling is more than a crystal ball and that it is not a real-life version of Criminal Minds. Geographic profiling may not be viable during judicial proceedings, however if applied correctly it can be used to prioritise suspects, thus bringing you one step closer to identifying an offender's most probable anchor point. Nevertheless, without resources to turn the investigative strategies into actionable police strategies, it makes no sense in doing the profile as it will simply be a piece of paper. Future research should therefore focus on how "paper product situations" can be avoided. Moreover, by contributing with a breath of knowledge about the use of geographic profiling in operational settings this study hope that scholars and practicians understand that there is more to a geographic profile than generating an output (Daniell, 2008). Lastly, although some interviewees believed that geographic profiling has a bright future it appears that the use of the investigative tool has stagnated in some countries, thus indicating a need to further evaluate the use of geographic profiling in operational settings.

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