

**CRIME SCENE INVESTIGATION:  
INVESTIGATIVE ECONOMICS & THE DRAWING OF INFERENCES ABOUT UNKNOWN  
OFFENDERS**

**CSI: INVESTIGATIVE ECONOMICS**  
**Drawing Inferences about Unknown Offenders**

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In this paper I discuss the foundations of 'investigative economics'. This discipline explores the role of economic theory in the drawing of inferences about an unknown offender from evidence left at a crime scene or from aspects of the nature of the crime, such as the attack method chosen for a terrorist attack. These inferences may include inferences about the offender's sense of self or sense of identity, the offender's location and the possible locations of future criminal or terrorist activity, the amount of time the offender spends engaged in illegitimate activities and likely changes in the intensity of his illegitimate activities over time. Investigative economics, like investigative psychology, complements law enforcement experience and intuition. Because economic theory is not based upon a theory of personality traits and because it defines more clearly certain aspects of the environment, especially 'risk', it may facilitate the drawing of inferences about offenders that are not subject to certain weaknesses that presently characterise investigative psychology and the behavioural investigative advice it helps to generate.

**Key Words:** Investigative Economics, Inferences, Unknown Offender, Terrorist Attack, Criminal Activity, Investigative Psychology, Identity, Risk

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## Preface

I wrote the first draft of this paper in the middle of 2012. I was in Berlin for a conference about peace economics where I presented a paper on lone wolf terrorists who engage in shooting sprees or other ‘time concentrated’ acts of violence<sup>1</sup>. This was a follow up to my ‘Lone Wolf Terrorism’<sup>2</sup> written a year or two before. In between, I had written, along with a co-author, another article that introduced the idea of ‘investigative economics’ or the provision of behavioural investigative advice based on the application of economic theory and frameworks<sup>3</sup>. The Phillips & Pohl (2012) article looked specifically at lone wolf terrorists and demonstrated how inferences could be drawn about these individuals on the basis of evidence left at their crime scenes and other characteristics of their activity. In particular, we were interested in showing that once the different attack methods available to terrorists are delineated in terms of their risks and rewards, the choice of attack method must allow us to infer something about the type of person who chose it, especially their risk preference. In turn, an inference regarding risk preference may generate additional inferences about the unknown offender, including the likely frequency of their attacks. We worked through all of this in the context of lone wolf terrorism.

By the middle of 2012, more and more ideas about an investigative economics had fallen into place but most of the work had been written with reference to terrorism and terrorist behaviour. Also, the work was quite technical due to the nature of the economic theory that was being applied. In writing the first draft of this article, I wanted to touch on a broader application to other types of criminal behaviour and do so in a relatively non-technical way. My other motivation was the classic publish or perish force that compels researchers to get things done or risk missing the boat. It was clear to me from the questions and comments I received during my presentation at the conference that people were both very interested in these ideas and, if left to their own devices, would probably start to write about them. I knew, for example, that it was a small step from drawing conclusions about lone wolf terrorists who go on shooting sprees to drawing conclusions about so-called ‘school shooters’. I needed to take ownership of these ideas before others seized the opportunity. I called the first version of this paper ‘CSI: Economics’ and made it available on the SSRN platform.

Between then and now, I have worked fairly constantly on developing this research program. For the most part, the work has been concentrated on terrorism and terrorist behaviour because that is where we started and that is where some of the more substantial law enforcement challenges have been. It is difficult, now, to summarise the order in which the ideas were formulated because many came all at once and required a lot of effort to work out in detail and many ideas emerged in collaboration with Gabriela Pohl, who is co-author on several important papers. In the later part of 2012, I think, we set to work on expanding our theoretical frameworks by using and adapting behavioural economics, especially prospect theory, to the problems that we were interested in. This resulted in two papers, published in 2014<sup>4</sup> and 2015<sup>5</sup>, that explored terrorist choice from a behavioural

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<sup>1</sup> Phillips, P.J. 2012. The Lone Wolf Terrorist: Sprees of Violence. *Peace Economics, Peace Science and Public Policy*, 18, 1-11. <https://eprints.usq.edu.au/22700/>

<sup>2</sup> Phillips, P.J. 2011. Lone Wolf Terrorism. *Peace Economics, Peace Science and Public Policy*, 17, 1-29. <https://eprints.usq.edu.au/18630/>

<sup>3</sup> Phillips, P.J. & Pohl, G. 2012. Economic Profiling of the Lone Wolf Terrorist: Can Economics Provide Behavioural Investigative Advice? *Journal of Applied Security Research*, 7, 151-177. <http://dx.doi.org/10.1080/19361610.2012.656250>

<sup>4</sup> Phillips, P.J. & Pohl, G. 2014. Prospect Theory and Terrorist Choice. *Journal of Applied Economics*, 17, 139-160. <https://eprints.usq.edu.au/25305/>

economics perspective. We were able to show how reference points might shape attack method choice and identify those points that might trigger a higher risk strategy on the part of the terrorist or terrorist group. Alongside this work, I worked through the full structure of an investigative economics based on mean-variance analysis, a method that I had first applied to the analysis of terrorist choice in 2009<sup>6</sup>. The result was my first book<sup>7</sup> which, among other things, tested my ability to write a much longer analytical piece. I had thought the book was ready by late 2012 but it required substantial work throughout the first six months of 2013 before it was finally finished. During this time I had numerous other duties within my department and the book was completed away from the office, in a blur of afterhours and weekend work. Although the publisher is somewhat boutique, I think that the effort stands up in terms of accuracy of insight and analytical rigour.

Naturally, once one idea opens up, further ideas follow and there is much detail to fill in. Within the investigative psychology literature, there is a stream of study looking into the idea of ‘geographic profiling’. The general idea is to determine where the unknown offender may live based on the nature and patterns of his or her illegitimate activity. We had already had something to say about the location (near or far) of the terrorist offender and how inferences could be drawn about this from the riskiness of his attack method choices (Phillips & Pohl 2012). Using prospect theory and interpreting the reference point as a geographical reference point, I sketched the broad outlines of a theory of geographic profiling based on the theoretical structure of Kahneman and Tversky’s prospect theory. This was presented at a conference on the economic analysis of terrorism at Stony Brook University in 2014<sup>8</sup>. Later that year and throughout much of 2015, I worked on my second book which includes both this treatment and a more formal one<sup>9</sup>. This book is certainly focussed on the application of economic analysis to the terrorism context in ways that are operationally relevant for law enforcement but, in addition, it incorporates more general analysis of terrorist behaviour with a particular focus on brutality as the defining characteristic of terrorism.

So, with work on this research program ongoing, I have returned to the draft of this paper in order to refresh it and update it by either including new explanations or by pointing out those of our works that have been published since 2012 and in which more detail can be found. The title is now ‘CSI: Investigative Economics’ with a sub-title ‘Drawing Inferences about Unknown Offenders’. Generally, our work is focussed on terrorism but the analytical frameworks apply just as well to other types of illegitimate activity. Terrorism studies has taken a ‘criminological turn’ and the field is in a state of transition. Our work recognises the importance of law enforcement experience in getting the most out of any analytical framework. Our analytical framework is multifaceted and incorporates a number of different perspectives emerging from decision theory and decision-making under risk and uncertainty. The ‘results’ of our research will be found, we hope, in the ideas, new perspectives, insights and intuitions that our analytical framework generates when law enforcement practitioners

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<sup>5</sup> Phillips, P.J. & Pohl, G. 2015. Terrorist Choice: A Stochastic Dominance and Prospect Theory Analysis. Defence and Peace Economics, In Press. <http://dx.doi.org/10.1080/10242694.2015.1033888>

<sup>6</sup> Phillips, P.J. 2009. Applying Modern Portfolio Theory to the Analysis of Terrorism: The Set of Attack Method Combinations from which the Rational Terrorist Group will Choose in order to Maximise Injuries and Fatalities. Defence and Peace Economics, 20, 193-213. <http://dx.doi.org/10.1080/10242690801923124>

<sup>7</sup> Phillips, P.J. 2013. In Pursuit of the Lone Wolf Terrorist: Investigative Economics and New Horizons for the Economic Analysis of Terrorism. Nova Publishers, New York, New York.

<sup>8</sup> Phillips, P.J. 2014. *Geographic Profiling of Lone Wolf Terrorists: The Application of Economics, Game Theory and Prospect Theory*. In: Workshop on Strategic Aspects of Terrorism, Security, and Espionage, 16-19 Jul 2014, State University of New York, Stony Brook, New York, USA. <http://eprints.usq.edu.au/id/eprint/25573>

<sup>9</sup> Phillips, P.J. 2016. The Economics of Terrorism. Routledge, Abingdon, Oxon, UK. <http://dx.doi.org/10.4324/9781315637204>

think about a problem, an unknown offender, a terrorist group or illegitimate behaviour with some or all of our framework in mind. In each case, this insight may be small or it may be significant but if it is sufficient to keep an investigative process moving it will have provided a useful complement to the existing approaches and processes of law enforcement.

## I. Introduction

The criminal profiler character has been a main-stay on television for more than twenty years. An advantage of having a character who can get inside the mind of the criminal is that the otherwise scant evidence can be pieced together and the unknown offender caught all within a primetime hour. The profiler's special gifts figure prominently in these stories. He or she possesses a more or less unique insight into the mind of the criminal. Using the available evidence at the crime scene the profiler draws inferences about the criminal that no-one else could draw. These could include where the criminal lives, the type of car he drives and where he will next commit a crime. The profiler can say, "He drives a dark coloured van. It's all beat up. Only one headlight works. He works a menial job, maybe a janitor. He drives aimlessly through the streets at night. He cannot rely on his charm or talk. He must surprise his victims." And as the profiler speaks, the scene cuts to a dark street and a van with one headlight... Whatever one might think of the television shows in which the profiler is portrayed, one must admit that the profiler makes for an intriguing character.

Behind all of the make-believe, there lies the practice of offender profiling and the academic field of investigative psychology. These are inextricably linked but they are far from being the same thing even though offender profilers write articles about their work and investigative psychologists participate in real investigations. The most notable representatives of these two groups are John Douglas who played a leading role in the establishment of the FBI's criminal profiling unit and who is the author of articles such as "Criminal Profiling from Crime Scene Analysis"<sup>10</sup>, published in *Behavioural Sciences and the Law* and of books written for a more popular audience such as *Mind Hunter* (Douglas & Olshaker 1996). David Canter is perhaps the leading representative of the academic field of investigative psychology. He is the author of many scholarly articles which detail studies into core of the profiling process: the drawing of inferences about the offender from evidence left at the crime scene. He is also the co-author of the first authoritative textbook on the subject<sup>11</sup>.

The point of disagreement, if it may be described as such, between the two camps turns on the matter of the ability of the profiler to get inside the criminal mind. Criminal profiling is about drawing inferences about the criminal from the evidence that is left at the crime-scene. If one reads Douglas's books and articles, it seems to be the case that the profiler has a special, instinctive ability to perform this task. It may be built on or complemented by years of law enforcement experience and training and education in psychology but a large part of it is instinctive. That this cannot be accepted fully by the academic side is clear. If profiling is more or less a skill that relies on individual abilities then investigative psychology, as an academic or scientific field of inquiry, is at least partially undermined. That the construction of a valid and useful criminal profile relies not on

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<sup>10</sup> Douglas, Ressler, Burgess & Hartman (1986).

<sup>11</sup> Canter & Youngs (2009).

the instinctive ability of the profiler as such but on the detached 'laws' of inference obtained by careful academic study of crimes and offenders and which can be applied by *any appropriately trained person* must be the more desirable state of affairs for the academic side of the profiling community. The problem is that there is still so much doubt about the validity of criminal profiling that it is unclear who will ultimately be proved correct on this particular point.

Within some parts of the literature serious doubt has been cast upon the very possibility of offender profiling. According to some authors there are no patterns between crimes, crime scenes and offenders that are consistent enough to form the basis for any rigorous academic or rigorous practical offender profiling process. In short, the idea of profiling is better left in the television script than applied in real investigations. This point of view has found its strongest expression in the articles of Brent Snook and his colleagues who portray criminal profiling as fantastical. In an article entitled "The Criminal Profiling Illusion: What's Behind the Smoke and Mirrors?" Snook *et al.* (2008) argue there is an absence of 'compelling' scientific evidence that offender profiling is reliable, valid or useful and the belief that offender profiling 'works' is an illusion deriving from the mixture of fact and fiction that has characterised offender profiling since its inception. They say that the anecdotal evidence in favour of offender profiling is given too much weight relative to the scientific-empirical support for offender profiling and that this has led to the premature acceptance of offender profiling as an investigative technique.

The state of affairs that characterises offender profiling and investigative psychology is interesting to say the least. On the one hand, offender profiling has been applied in numerous real-world investigations and appears only to show signs of continuing the growth that the practice has experienced over the past two or three decades. On the other hand, the younger academic discipline of investigative psychology—its dedicated journal is only around ten years old—is struggling to establish its identity in the face of the possibility that the literature's ultimate contribution may be to one day conclude that the whole idea of criminal profiling is an illusion deriving from the entertaining, exciting and compelling but, in the end, entirely fictional notions that have attended the development of offender profiling and investigative psychology since its beginnings. This whole enterprise, not least the academic investigative psychology part of it, is sustained not only by the pursuit of an answer to the question about the possibility of offender profiling and the multiplicity of secondary research questions that derive from this but by 'pragmatism'.

From its inception, investigative psychology has emerged and evolved in an environment where the market for profiling has been on the up and in which each new approach to inference imagined and tried successfully in practice or developed through academic inquiry has been added to a set of tools that have come to be valued by law enforcement professionals. This value may be ephemeral but so might be the value of many things. Whether successful profiles have really contributed substantively to critical breakthroughs in tough cases and whether this success, even if substantive, is due to luck, innate and unique skill on the part of the profiler, guesswork, experience or science is beside the point if real law enforcement professionals believe that the profile has been useful. Maybe, and this is potentially very significant, offender profiling keeps the investigative process moving when otherwise it would stall. Not surprisingly, in a context such as this both the practice of profiling and the academic field of investigative psychology have become characterised by a noticeable pragmatism that keeps

both sides developing new ideas rather than grinding to a shuddering halt pending further investigation. Alison *et al.* (2010) argue that this scientific pragmatism must be embraced. Indeed, one could argue that it has been embraced all along.

## II. Offender Profiling & the Organised-Disorganised Typology

Offender profiling involves drawing inferences about the offender from evidence that is left at the crime scene. This is neatly summed up by Canter as  $A \rightarrow C$ , where **A** is the 'actions' that occur in and are related to a crime and **C** is the 'characteristics' of the offender (Canter 2004, p.5). The drawing of inferences for **C** from **A** is encompassed within the symbol ' $\rightarrow$ '. This is where all of the scientific modelling and processes underlying offender profiling sit (Canter 2004, p.5).

Douglas *et al.* (1986, p.407) describe a five-stage process followed by the criminal profilers working out of the FBI's Behavioural Science Unit:

1. Profiling inputs stage. Here, information about the crime is gathered. This includes physical information about the crime scene, the environment, economic, social or political factors particular to the crime scene, information about the victim and forensics.
2. Decision process models stage. This is the data analysis stage and may involve a complex information processing task. During this stage, the profiler is concerned with crime type and style, intent, victim risk, offender risk, escalation, time and location factors.
3. Crime assessment stage. This involves the reconstruction of the crime and classification of the crime as organised or disorganised. Aspects of organisation that are considered include victim selection, control of victim and the sequence of the crime. Other factors that are considered during this stage involve motivation and crime scene dynamics.
4. Criminal profile stage. This involves a description of the type of person who committed the crime and the individual's 'behavioural organisation' with relation to the crime. This is then validated against the information pertaining to the crime (collected at the earlier stages).
5. Investigation stage. Potential offenders are evaluated against the profile. The investigative process may end or further information may become available. The profile is re-examined and the investigative process continues until there is an apprehension.

The organised-disorganised typology emerges in steps three and four. Behavioural and personality characteristics are associated with an organised or disorganised offender and these can be determined from the crime scene (Canter *et al.* 2004, p.293). For example, Canter *et al.* (2004, pp.293-294) suggest that an organised offender may lead an orderly life. He will have at least average intelligence, be socially competent and in skilled employment. This organisation will be reflected in a crime that is planned, where the victim is restrained and the weapon carried to and from the crime scene. The disorganised offender leads a disorderly life. This disorganisation will be reflected in the crime scene which will exhibit disarray, evidence left at the scene including, possibly, the murder weapon, the body left in the open and no use of restraints on the victim. It is

quite clear that within the profiling process as described, the organised-disorganised typology is the central 'inference generating' model. If the examination of the relevant factors leads to a classification of the crime scene as organised or disorganised, then inferences can be drawn about the offender's characteristics.

Douglas *et al.* (1986) and Douglas & Olshaker (1996) include among these characteristics the type of automobile the offender is most likely to drive, the condition in which it has been maintained, its colour, whether the offender has a speech impediment or a law enforcement or military background, the offender's age, employment, marital status, intelligence, education, personality, race, criminal record and even whether the offender might have passed a lie detector test during the investigation. As explained by Douglas *et al.* (1986) the process of classifying the crime and the offender as organised or disorganised may also shed light on motivation. For example, what appears to be a disorganised crime may have been staged deliberately to give exactly that impression or to hide the primary intent of the crime. Douglas *et al.* (1986) give the example of an investigation where the 'staged' intent of the crime was extortion or kidnapping for ransom. The real intent of the crime was sexually motivated rape and murder. The profilers were able to determine that the probable staging was an organised attempt by the offender to divert attention from the real nature of the crime. By inference, the offender could be expected to be drawing on knowledge of law enforcement procedures gained from some previous association with law enforcement. The profile of the unknown offender, which concluded that the individual may have been previously employed in law enforcement, was accurate in many respects.

The problem is that much of the evidence about classification schemes or typologies is not very supportive of the idea that a robust typology is possible. Of course, practitioners would argue that this is not a critical flaw because such evidence overlooks the role of the instinctive ability of the profiler in piecing together the puzzle. But there are problems with this argument too. Some studies have compared the profiles constructed by professionals with profiles constructed by ordinary people and have found that no such innate ability exists. On a positive note, there does appear to be a semblance of structure in the crime scene and offender characteristics. There is not much to suggest something as neat as the organised-disorganised dichotomy but in a study of serial killings Canter *et al.* (2004) found that the murders were almost always characterised by a set of 'organised' characteristics (from the organised side of the disorganised-organised typology). These could prove to be interesting, particularly if all serial murderers exhibit similar 'organised' features but only particular 'disorganised' features. There may be structure conducive to some typology embedded in the different ways in which serial killers exhibit disorganised aspects of their activities.

The story of investigative psychology and offender profiling is unique because of its obvious pragmatism and the way in which fact and fiction interact so freely with the subject matter. Profiling is widely used and the organised-disorganised typology is the dominant typology despite a lack of empirical support within the academic investigative psychology literature. In empirical tests of the organised-disorganised typology, investigative psychologists have highlighted some of the hypotheses and assumptions that underlie the application of the typology within a profiling process. One of these is what Canter & Youngs (2009) call a 'consistency principle'. There are two ways in which this may be interpreted. First, the organised offender brings an organised approach to his criminal activity (Canter & Youngs 2009, p.336). His criminal behaviour is

consistent with his non-criminal behaviour. Second, the organised offender will *continue* to commit organised crimes *over time* (Snook *et al.* 2008). Organised offenders will not all-of-a-sudden start committing crimes that are disorganised. Both of these forms of consistency have been studied. An optimistic assessment from the point of view of proponents of the organised-disorganised typology would be that the evidence is mixed. Investigative psychologists tend to be more pessimistic about the results that have been obtained so far. Snook *et al.* (2008) argue that the whole idea of an organised-disorganised typology is flawed because it relies on personality traits, which have been discounted heavily as explanatory factors for behaviour within the broader psychology literature. Given the current state of affairs, we expect that an approach to profiling based on economic theory and the economic models of crime and criminal behaviour, which do not rely on personality traits, may be a useful complement to the existing approaches to offender profiling.

### III. Economics & Criminal Action

Drawing inferences about the offender from the evidence left at the crime scene where an economic theory or model of criminal action enters under Canter's '→' is the next step for the economics of crime and its related fields of study<sup>12</sup>. One point of contention must be cleared up immediately, however. Economics is inextricably linked to a 'rational choice' model of behaviour the nature and implications of which are widely misunderstood both within and without economic science. Rational choice should only be interpreted to mean that a person chooses to allocate his scarce means—time, money and other resources—towards the achievement of some end or ends. It does not mean that the person will never make a mistake or somehow makes an infinite number of calculations that never err both in terms of input and output. It simply means that people act *purposively*. Anyway, the 'non-expected utility' models of choice developed within behavioural economics are just as useful to the offender profiling task as the orthodox expected utility models.

It is probably true to say that Gary Becker is the most well-known 'crime economist'. Of course, his reputation, among those familiar with his work, is built on his avant-garde applications of the orthodox expected utility model of economic behaviour to everything from crime to marriage. His work adopts the mathematical approach and casts all these sorts of behaviours in mathematical formulas. In his "Crime and Punishment: An Economic Approach" Becker (1968) argues that economics can be used to develop optimal public and private policies to combat illicit behaviour. Obviously, this is broader subject matter than the development of an economic view of criminal action, which is to be found in his Section 3, 'The Supply of Offenses.' The supply of offenses is some function of the probability of apprehension, the punishment if convicted and a mixture of other variables such as income from legal activities, income from illegal activities, willingness to commit an illegal act and so on. Within this context, which really defines the opportunities for illegal and legal actions and the costs and benefits of each, the person will choose from among legal and illegal opportunities in a manner that maximises expected utility. Expected utility depends on the utility of the monetary and psychic income deriving from committing an offense and the disutility of costs of the punishment if the offender is caught. Each of these is weighted by the probability that the event (caught or not caught) will occur.

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<sup>12</sup> This includes defence economics with its study of terrorism and terrorist behaviour.

According to Becker (1968, p.176), this approach:

“...follows the economists’ usual analysis of choice and assumes that a person commits an offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities. Some persons become ‘criminals’, therefore, not because their basic motivation differs from that of other persons, but because their benefits and costs differ. I cannot pause to discuss the many general implications of this approach, except to remark that criminal behaviour becomes part of a much more general theory and does not require ad hoc concepts of differential association, anomie, and the like, nor does it assume perfect knowledge, lightning-fast calculation, or any of the other caricatures of economic theory.”

It is at the point where Becker ‘cannot pause’ that he references a work that is more important for our present subject matter and which more completely and painstakingly develops an economic view of criminal action. This is the work of Isaac Ehrlich. In 1967, his work was an unpublished manuscript. By 1973 part of this work and developments thereon had been published as “Participation in Illegitimate Activities: A Theoretical and Empirical Investigation.”

If economics can be summed up in two words they would be: opportunities and choices. By and large, economic analysis first determines the opportunities that are available and then examines the choices that a person will make when confronted by those opportunities. In Ehrlich’s (1973, p.522) work, this is very clear:

“...Even if those who violate certain laws differ systematically in various respects from those who abide by the same laws, the former, like the latter, do respond to incentives. Rather than resort to hypotheses regarding unique personal characteristics and social conditions affecting respect for the law, penchant for violence, preference for risk, or in general preference for crime, one may separate the latter from measurable opportunities and see to what extent illegal behaviour can be explained by the effect of opportunities given preferences.”

This passage also contains a clear statement of a key point of strength in the economist’s view of criminal action. This is the non-reliance on personality traits to explain criminal behaviour. This being said, it is still easy to fall into the trap of thinking that a criminal must be a risk-seeker and that economics has introduced a personality trait by sleight of hand. However, it is not necessarily true that a criminal is a risk-seeker. For one thing, risk-seeking would see the criminal engage only in the single most risky criminal activities rather than a range of criminal activities. More importantly, even if it is the case that criminals are on average more risk-seeking (less risk-averse) than law abiding citizens, risk-seeking is not a personality trait that is particular to the criminal mind<sup>13</sup>. Rather, risk preference is something that is revealed by the choices that people make from the available opportunities. Given the adequate incentives structure, even risk-averse people may be willing to take more risks. Opportunities that have much higher risks attached may be selected if there is an appropriate chance of a much higher reward than that which is available from the ‘safer’ option. This is, of course, the essence of the large number of articles on incentives structures that can be found in the economics literature. In the end, criminals and non-criminals both respond to incentives.

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<sup>13</sup> The reason why economic analysis may conclude that a risk-seeker will spend more time in criminal activity than a risk-avertter is because it is often assumed in the theory construction phase that legitimate activities provide a low risk or risk free return while criminal behaviour provides a risky return. If this assumption is not made, the risk-seeker may allocate time and resources to risky activities, all of which may be entirely legal. It would just depend on the opportunities (payoffs and risks) involved.

Ehrlich's carefully developed treatment of the nature of the incentives embedded within the opportunities available to engage in legal and illegal behaviour allows him to examine criminal action in a more complete theoretical context where costs and gains from legal and illegal behaviour are considered, rather than just the cost of punishment. The other interesting feature of Ehrlich's work is that it does not simply present the choice problem as one involving a choice of either a legal or an illegal activity as though these two things were mutually exclusive. Everyone has the option of doing legal and illegal things in some proportion. Many people who engage in criminal behaviour devote only some of their time to such illegitimate activities and spend the rest of their time doing legitimate things like holding steady employment. Over a life time, people may also drift in and out of criminal behaviour. The choice is an allocation of time and other resources to the available opportunities and the choices that are made need not be exclusively illegal or legal.

Ehrlich works in the neo-classical style of mathematically expressing the opportunity set and the (expected) utility that the person attaches to each choice. As such, a person has an expected utility function that is applied to the available opportunities which, in this case, consist of a set of legal and illegal activities each with a benefit and a cost. Ehrlich assumes that legitimate activities are safe because the returns that can be had from them are known with certainty. Illegitimate activities are risky because the returns that can be had from them are uncertain and depend upon whether or not the person gets caught and what punishment is imposed in the event of capture. The activities are not mutually exclusive and the person's choice problem is not to simply choose the activity (legal or illegal) that has the highest expected utility but to choose the legal activity, the illegal activity or a *combination* of both that has the highest expected utility. Since the decision-maker cannot carry on this 'market' activity without pause, he or she must also spend some time involved in *neither* legal nor illegal activity. Ehrlich calls this 'consumption' or 'non-market' activity. As mentioned before, many mistakes may be made in this choice process and it is not the case that the person is assumed to choose perfectly and accurately.

Once set down mathematically, the choice problem can be solved. This usually means that first order optimality conditions are determined and the equilibrium choices obtained. What can be said about the choices in equilibrium depends on the context that has been sketched or delineated. Within Ehrlich's analysis, the person is choosing to allocate time and resources to legal and illegal activities and 'consumption' activities such that expected utility is maximised. Ehrlich is able to work out the optimal values for each of these times spent under different conditions, especially when the person making the choice has different types of risk preference, and determine a range of different possible combinations of illegal and legal activities. For example, whatever a person's risk preference may be, a *sufficient* condition for entry into illegal activity is, roughly, that the marginal expected return on illegal activity exceeds the marginal return on legal activity. If the person is risk-averse, this is also a *necessary* condition. If this condition is not met, risk-aversers will never engage in illegal activity and will allocate all time and resources to legitimate activities (Ehrlich 1973, p.528). Ehrlich also determines under which conditions a risk-seeker will specialise completely in illegitimate activity and when a risk-averter can be expected to combine legal and illegal activities.

This theoretical framework can form the basis for an empirical analysis once estimates for the relevant variables, such as the probability of apprehension and the payoffs generated by legitimate and illegitimate activity, are

determined. Various predictions flow from the framework and these predictions can be tested empirically. For example, Ehrlich finds that it is optimal for some offenders to repeatedly offend and even increase the intensity of their illegitimate activity. Changes in the probability of apprehension or the cost of conviction will change the incentive structure. If these things increase and everything else remains the same, incentives for illegitimate activity are reduced. However, the response of the prospective criminal to this change in the structure of the available opportunities depends on his or her risk preference. A one percent increase in the expected marginal costs of punishment will have a more than proportional effect on the decisions of the risk-avertter but a less than proportional effect for a risk-seeker. In fact, Ehrlich (1973 p.530) shows that a risk-seeker who allocates some time to legal activities and some time to illegal activities may actually be inclined to increase his or her allocation to illegal activities when the expected marginal cost of punishment increases. Similar results can also be worked out for situations where there is an increase in the expected marginal return to illegal activity.

Opportunities and incentives matter in explaining how a person allocates time between legal and illegal activity. The best choices that a person can make when confronted by these opportunities can be worked out and the ways in which the best choices change when opportunities are reshaped can be determined. An economic perspective on criminal action along the lines developed by Ehrlich and the other economists that have followed in his and Becker's footsteps can tell us what to expect with regards to the conditions under which people will engage in criminal activity, the ways in which they divide their time between legal and illegal activity, the relevance of risk preference and the effect of changes in law enforcement strategies and penalties. Useful as this might be, we have come to the point where we must turn this theoretical work on its head. Once we observe an offense such as a murder or a robbery or assault or an act of terrorism, what can the economic view of criminal action say about the offender? If we observe a particular crime, what can economics say about the person who committed the crime? The essence of these questions is an economic approach to offender profiling where the framework that permits evidence left at the crime scene to be used to draw inferences about the offender is one that is some offshoot of the economic view of criminal action.

#### **IV. Drawing Inferences about a Thief or a Murderer or a Terrorist with the Help of Economics**

Crime has many dimensions and there are many types of crime. If it is possible to classify crimes and criminals according to some classification scheme or typology, if profiling is actually possible, then there could be lots of typologies that 'work' across a particular scope or range of criminal activity. Some of these may be drawn from psychology and some may be drawn from other fields of study. To me, if economics has an 'in-built' typology that is ready to use for offender profiling it is the one that emerges from the risk preferences of people making choices under risk and uncertainty. We have elsewhere tried to elaborate on this point with reference to lone wolf terrorism (Phillips & Pohl 2012) and if you read Ehrlich (1973) you will see how important risk preference is in shaping the choice to allocate time between legal and illegal activities. What Ehrlich does not do and what represents an exciting next step for the economics of criminal action is to ask what the crime itself says about the risk preference of the person who committed it and work from that point backwards through the theory to come up with a list of inferences about the criminal.

Risk is something that the investigative psychologists have not fully worked out. They certainly have no measure for it. Economists on the other hand do have a measure of risk and that is the variability or standard deviation of the outcomes to legal and illegal activities. If you like, you can assume that the returns to legal activities have no variability. This is probably true if the time frame selected for the analysis is short. But illegitimate activities have uncertain payoffs, returns or outcomes and so what actually results from a venture into illegitimate activity may be different from that which was expected. This is the risk. A criminal might get a higher or lower payoff than expected. What can be expected is the average of what has happened in the past. If one thinks for a moment about how many facets of risk the dispersion measure encompasses it becomes clear that it encompasses all of the things that lead to higher or lower payoffs. This could be detection by the police, having a bombing device malfunction, being informed on by a co-conspirator, being confronted with better or worse security, being able or unable to sell the stolen goods at the expected price, being able or unable to accumulate as many victims as expected or receiving more or less media attention than expected<sup>14</sup>.

The theory of risk preference divides people up into risk-averse and risk-seeking. However, it would be more accurate to say that people are *more risk-averse* or *less risk-averse*. The technical meaning of ‘risk-seeking’ implies that a person gives up expected payoffs to take on more risk and, furthermore, allocates all resources to the riskiest possible activity. In the case of criminal activity this would mean, strictly speaking, that the risk-seeker would not only allocate all of his time and resources to illegal activities—remember that legal activities are assumed to be safe—but he would allocate all of his time and resources to the riskiest possible illegal activity. Although some people probably are risk-seekers, the conclusion that some people are less risk-averse while others are more risk-averse agrees more with what we observe day-to-day. Less risk-averse people may engage in illegitimate activities to some extent but these need not be the riskiest available opportunities. Hence, we have a range of criminal behaviour from petty and less risky crimes to serious and very risky crimes. When we observe criminal action it is not always of an extremely serious nature and it is not always the most risky thing that a person could have chosen to do<sup>15</sup>. The technical definition of risk-seeking behaviour and what it means for a person to be a genuine risk-seeker tends to be overlooked too often, especially by economists.

Risk is higher when there is a greater dispersion or range of possible outcomes. It might be possible to extract some measure of dispersion to associate with various crimes, choices of weapons, locations and so on. By thinking about the objectives and choices of terrorists in a way that is different from which they were usually portrayed in the literature I have shown how risk might be measured from the terrorists’ point of view (Phillips 2009). That is, for the terrorist who aims to inflict fatalities, the variability of expected fatalities for a given attack method reflects the likelihood that the actual number of inflicted fatalities will be different from what the terrorist expected. The same idea can be applied to other types of crimes. However, even if a quantitative measurement cannot be obtained, the economic definition of risk as variability may still be very useful in classifying and analysing criminal activity and particularly useful in defining another aspect of offender behaviour. An offender who is more averse to a broader dispersion of possible outcomes will take ‘variance minimisation’ actions. An offender who is enticed by a broader dispersion of possible outcomes will not take

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<sup>14</sup> See Pohl, G. 2015. Media and Terrorist Choice: A Risk Reward Analysis. *Journal of Applied Security Research*, 10, 60-76. <http://dx.doi.org/10.1080/19361610.2015.972271>

<sup>15</sup> That is, it is not always the action with the largest possible dispersion or variability of potential outcomes.

such action and may possibly take 'variance enhancement' actions. We should be able to identify such actions from the evidence left at the crime scene or from the nature of a terrorist attack. This should allow us to classify offenders as more or less risk-averse based on their 'revealed risk preference'.

The process of drawing inferences about the offender from evidence left at the crime scene may begin by determining the riskiness of the crime and identifying variance minimisation or variance enhancement actions taken by the offender. Once inferences about the risk preference of the offender have been drawn, it should be possible to draw further inferences about the offender which include but are not limited to the amount of time (if any) he might spend in other activities besides illegal ones, his location relative to the crime scene, his likely response to law enforcement attention and his propensity to increase, decrease or cease his involvement in criminal activity. These are not insignificant potential contributions to the investigative process. Inferences along these lines are possible because the offender is continuously interacting with his available opportunities and incentives. This interaction is shaped by risk preference. Working through the implications of this interaction should shed some light on the characteristics that describe the unknown offender in any context where opportunities and choices can be delineated.

#### **IV (a). Risk Preference and Time**

An offender who is more risk-averse is more likely to hold steady employment or allocate a larger proportion of his time and resources to legitimate activities. He is less likely to specialise completely in illegitimate activity. Variance from the expected outcome is our measure of risk. An offender who is more risk-averse will be involved in crimes where this variance is relatively low and he will be seen to take steps to lower it. Richard Cottingham<sup>16</sup> is a convicted serial murderer serving a life sentence for six murders. The murders were committed between 1967, when Cottingham was just twenty-one years old, and 1980 when he was arrested while leaving a hotel where he had been assaulting a victim. All but one of his victims were prostitutes, which he would first make contact with on a city street or in a bar. The victims were drugged and taken to hotel rooms where they were killed. The more risk-averse offender will require vulnerability and accessibility among his potential victims. Cottingham focussed his attention on just such a type of victim. He further minimised the possibility of an outcome that differed from his expectations by drugging his victims. Once the victim had been drugged, he had effectively eliminated one of the main sources of variance from the outcome he desired or expected.

The drugging of victims and the almost exclusive focus on vulnerable and accessible victims must certainly be interpreted as being indicative of behaviour that is more risk-averse. Such a type of person is less likely to allocate all of his resources and time to illegitimate activities and is more likely to be engaged for most of the time in legitimate employment and other pastimes. Variance minimisation in this case would lead the investigator to tentatively conclude that the offender was likely more risk-averse and likely to be engaged in some form of employment. Of course, further inferences then flow from this starting point. If the offender is expected to be employed somewhere then he must have the type of job that allows him enough time to find,

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<sup>16</sup> Details from Vronsky (2004) and Radford University's Department of Psychology.

kidnap, assault and murder his victims. In order to remain engaged with his legitimate activities, the more risk-averse offender will need to complete his illegitimate activities within a relatively short time frame and may have less opportunity to travel long distances or to stalk his victims. For the entire time, Cottingham was employed as a computer operator at Empire State Blue Cross-Blue Shield insurance where he worked the 3 pm to 11 pm shift (Vronsky 2004, p.13). He was also married with three children. He lived in New Jersey. He would find his victims in Manhattan before driving them to hotels in New Jersey. This is a distance of about 15 miles. Depending on traffic, the distance could be travelled in about 30 minutes.

#### **IV (b). Risk Preference and Location and Geographic Dispersion of Criminal Activity**

If the offender is more risk-averse, he needs to find opportunities that present an appropriate risk-reward trade-off. For the more risk-averse offender, this is likely to mean drifting farther afield geographically in order to find such opportunities. This is especially likely to be the case if his crimes have attracted the attention of investigators. If there has been police or media attention regarding his crimes at a particular location, he is more likely to drift farther afield and his crimes will be characterised by a growing geographical dispersion. Offsetting this tendency to some degree will be the fact that the offender feels more comfortable within a particular location and, as discussed, the possibility that he is constrained in scope by the nature of his other activity (family or employment). It is likely that this tendency will continue to exert influence over his behaviour, keeping him close to home for longer than expected and leading him back there after some time has lapsed. In this regard, the risk seeking offender's expected behaviour is less uncertain. His opportunities for an appropriate risk-reward trade-off are enhanced by police and media attention and he will be enticed by the prospect of being so close to the focus of the investigation.

If geographic dispersion of criminal activity is a variance reduction strategy, the dispersion of criminal activity must reveal something about the offender's risk preference. Similarly, if we have already reached some conclusion about the offender's risk preference we may be able to make further inferences about the geographical location of his past and future crimes and his proximity to them. It should be noted that police and media attention are likely to be an important factor operating on this choice because such attention either repels or entices the offender and may also upset the distribution of his opportunities as potential victims take additional precautions. Ted Bundy murdered 36 known victims<sup>17</sup>. The characteristics of both his early and later crimes have several distinct variance minimisation features. Victims would be attacked while sleeping in their own homes or taken in carefully planned abductions from public places, including college campuses. Usually they would be bludgeoned and restrained before being transported to another location. In both types of attack, Bundy acts to minimise the chances that the victim will struggle, escape or call for help. Little evidence linking Bundy to his crimes was ever found at the scene, highlighting the careful risk management strategies that he used. Bundy's crimes took place over a very wide geographic area from Florida to California. At various times, police attention apparently placed enough pressure on him to cease his activity and move to a different location.

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<sup>17</sup> Details from Radford University's Department of Psychology.

The level of risk—the chances that the actual outcome will be different from that which was planned and expected—that the offender perceives is an important factor in shaping the behaviour of the offender and the geographic dispersion of his crimes. Although the offender who is more risk-averse is more likely to scatter his activities over a larger area, some offenders will manage to attract so little attention that this tendency is offset by these other variance minimisation strategies. It should be expected, therefore, that some offenders will display obvious variance minimisation strategies, such as drugging their victims, whilst simultaneously operating over a small geographic area in close proximity to their primary place of residence. Although this may appear to be inconsistent, some serial killers have so minimised the amount of attention directed towards their crimes that they have been able to operate within a very small area for considerable periods of time. Jeffrey Dahmer murdered 16 people in his own place of residence but disposed of the bodies (or kept them) such that minimal attention was drawn to the possibility that an active serial killer was operating in the area<sup>18</sup>. Dahmer usually drugged his victims before they were murdered. He worked various jobs, including at a chocolate factory. He was discovered only when a potential victim escaped.

#### **IV (c). Risk Preference and the Response of the Offender to Police and Media Attention**

A less risk-averse offender may be expected to be somewhat thrilled by law enforcement attention. If it is not forthcoming, he may invite it by taunting the police through letters or some other form of communication. Similarly, taunts may be evidence of risk-seeking behaviour and may further reinforce any conclusions already reached about the offender. A more risk-averse offender, on the other hand, is less likely to resort to taunting law enforcement. He might, however, be expected to engage in behaviour designed to divert law enforcement attention away from himself and away from the true nature of his crimes. This type of behaviour is described by Douglas *et al.* (1986) and may include staging in order to distract from the real intent of the crime. As such, if the offender has been classified as risk-averse, law enforcement may find that as the investigation closes in, the risk-averse offender goes so far as to come forward with information designed to distract the progress of the investigation. Viewing the offender as a decision-maker confronting and managing a risk-reward trade-off may lead to numerous interesting insights about the offender's possible behaviour.

The offender who is less risk-averse does not need to drift in order to find opportunities that have an appropriate risk-reward trade-off. In fact, his opportunities for an appropriate risk-reward trade-off grow as attention is directed towards him and his crimes. Sometimes, the offender may believe that this attention is not being directed forcefully enough and that the level of risk, the possibility that the actual outcome will be different from that which was expected, is not high enough. This will bring the offender forth in a series of taunts to police or the media. David Berkowitz murdered 6 people and wounded 9 in a series of shootings in New York City in the late 1970s<sup>19</sup>. His use of a firearm and the stalking and shooting of his victims on the street or in parked cars within a fairly narrow geography is indicative of behaviour that is less risk-averse. The actual outcome of attacks involving firearms must have a higher possibility of diverging from the expected outcome than a situation in which the victim is drugged or otherwise overcome. When the attacks take place in public places, there is also a much higher chance of witnesses, intervention by passers-by and so on. In at least several

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<sup>18</sup> Details from Radford University's Department of Psychology.

<sup>19</sup> Details from Radford University's Department of Psychology.

respects, Berkowitz's behaviour exhibited fewer signs of risk aversion than the other cases that we have mentioned. He taunted police and others in a series of letters.

#### **IV (d). Risk Preference and the Intensity and Frequency of Criminal Behaviour**

Risk preference is not solely an 'absolute' phenomenon. As the series of crimes progresses and monetary payoffs or victims or press speculation mounts, the behaviour of the offender comes to be shaped by his relative risk aversion. Relative risk aversion describes the amount of time and other resources that are allocated to a risky activity as payoffs accumulate or the proportion of overall activity characterised by more or less variable outcomes<sup>20</sup>. There are three types of relative risk aversion: (1) increasing; (2) constant; and (3) decreasing. If the offender has increasing risk aversion, he will allocate fewer resources and less time to risky criminal activities as his payoffs accumulate. If the offender has decreasing risk aversion, he will allocate more resources and more time to risky criminal activities as his payoffs accumulate. Both increasing and decreasing relative risk aversion make sense in different scenarios and neither is recommended over the other, though economists have usually used utility functions that are characterised by either decreasing or constant relative risk aversion. That being said, utility functions characterised by increasing relative risk aversion, such as the quadratic utility function, can be found to approximate or resemble utility functions characterised by decreasing relative risk aversion (Elton *et al.* 2003, p.220).

Relative risk aversion is an important concept that may find useful application in the field of offender profiling. One of disadvantages of the organised-disorganised typology is its implicit reliance on a 'consistency' principle. Disorganised (or organised) offenders are always disorganised (or organised) in their non-criminal activities. Disorganised (organised) offenders always commit disorganised (organised) crimes over time. A disorganised offender does not become organised. The economic concept of relative risk aversion is much more subtle and allows for changes in the frequency and intensity of the offender's crimes as payoffs accumulate. If the offender is characterised by increasing relative risk aversion, the resources that he allocates to his risky criminal behaviour will decrease as his payoffs accumulate. In this case, the risk-averse offender may be expected to curtail his activities after some amount of payoffs accumulates or after a particularly intense period during which many payoffs are obtained. The opposite reasoning applies for offenders who may be characterised by decreasing relative risk aversion.

Many of the serial killers whose profiles and cases have been detailed by the Department of Psychology at Radford University display a tendency to increase or decrease the intensity and frequency of their criminal activities at various points in time. A number of them abruptly ceased their involvement in serial killing at some point. A prominent example is Dennis Rader (B.T.K.). Rader killed his first victims in January 1974<sup>21</sup>. Rader would probably be classified as being less risk-averse. He knew some of his victims and had worked with some of them. He would force entry into the victims' homes and wait for them to arrive. He would usually leave his victims at the murder scene. He did not drug or bludgeon the victims in surprise attacks. After confronting his

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<sup>20</sup> For example, if a terrorist group is characterised by decreasing relative risk aversion, then as its inflicted fatalities increase its use of attack methods with more variable outcomes may increase as a proportion of its overall attack method portfolio.

<sup>21</sup> Details from Radford University's Department of Psychology.

victims in their home he would bind and gag them. His attacks involved multiple victims at a single location, in one case a whole family. He taunted police, the media and potential victims with letters on a number of occasions. He lived in close proximity to the attacks. After claiming 10 victims, Rader apparently ceased his activities in 1991. He re-emerged in 2004 with a series of letters to police and the media. These actions ultimately led to his arrest.

After a series of killings between 1974 and 1977, Rader ceased his attacks and does not appear to have engaged in any killings until 1985. At this point, there was a series of attacks between 1985 and 1987 before a further cessation and one final attack in 1991. Rather than concentrating solely on the nature of the crime scenes in an attempt to discern patterns linking the crimes to a single offender and to identify organised or disorganised features of the crimes that may allow the offender to be classified, the concept of relative risk aversion will lead the investigator to consider the intensity and frequency of offenses in relation to the number of victims that the offender has claimed in the past. An offender who is characterised by increasing relative risk aversion will allocate less time and resources to his criminal activities as his victims accumulate. There could even be a point of satiation that leads to the suspension of criminal activity for an indefinite period of time. Such behaviour is associated with particular classes of utility functions and further inferences about the offender may be drawn if the investigator is able to narrow down the type of utility function that mirrors most closely the offender's decision-making process.

#### **IV (e). Prospect Theory and a 'Copycat' Point of Reference**

Another way in which economics may contribute to the provision of behavioural investigative advice is through the application of non-expected utility models of behavioural economics, especially the 'prospect theory' of Kahneman & Tversky (1979; 1992). The idea that people reference their behaviour against some reference point is an important one. If a terrorist knows that another terrorist just got paid a ransom of two million dollars for his hostages, the terrorist will perceive a ransom of one million dollars to be a 'loss'<sup>22</sup>. Prospect theory may have a particularly valuable application in the analysis of 'copycat' acts of criminal behaviour. If it is ascertained or is otherwise revealed that the offender is obsessed with emulating the actions of a predecessor murderer, serial killer or terrorist then the results of the predecessor's actions, his number of victims, may become the reference point by which the unidentified suspect is making his assessment of potential gains and losses from his own planned actions. Under such circumstances, particular opportunities become more attractive than others and this ordering of preferences may be different when looked at from a prospect theory perspective than from an expected utility perspective.

Imagine for example a prospective terrorist who is obsessed with the actions of Theodore Kaczynski. Like Kaczynski and every other terrorist, the prospective terrorist can choose from a variety of different attack methods each with a particular expected number of victims per attack and each with a possibility (risk) that the actual number of victims will be higher or lower. Kaczynski was responsible for inflicting 26 injuries and fatalities. For the prospective terrorist who references himself to Kaczynski, this number of injuries and fatalities

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<sup>22</sup> The terrorist or terrorist group might be interested in media attention. The analysis would apply equally well in a situation where media attention is the desired payoff (Pohl 2015).

becomes the reference point from which he assesses the value of his planned actions. In choosing an attack method from his set of attack method opportunities within a prospect theory context, the assessment of the value (utility) of each opportunity is not made against some final state of affairs but against gains and losses from the reference point. Designed to correct some perceived shortcomings with expected utility theory, prospect theory could prove to be of value to investigative processes in cases where a suspect is thought to be making his decisions based on some point of reference. In such cases it should be possible to figure approximately the chances of the prospective terrorist taking particular opportunities rather than others. This would be of obvious value to the investigative process and to law enforcement efforts designed to pre-empt and protect the public from an unknown offender's potential actions<sup>23</sup>.

#### **IV (f). Identity as 'Sense of Self' and the Crime Scene**

Akerlof and Kranton's (2000) article on 'Economics and Identity' is one of those that tries to take a piece of psychology and embed it within orthodox economic theory. Identity has long been explored by psychologists and quite a lot has been written about identity and violent crime and terrorism<sup>24</sup>. Economists had tended to ignore the subject or treat it implicitly rather than explicitly in their models of choice but as Akerlof and Kranton have shown, the flexibility of the orthodox expected utility model is such that something that affects choice can be inserted into it relatively easily. If we put 'identity' into a utility function we are saying that the opportunities from which the person may choose are shaped by 'identity considerations' and that the person's choice will depend on all the usual things that economists might consider relevant to the particular situation plus the person's perceptions about gains and losses in utility that may be associated with those 'identity considerations'. What is more, the choice may not simply be one that is affected by identity considerations. The choice that we might wish to analyse is the person's choice of identity itself. This too may be looked at from the point of view of gains and losses in 'utility'.

Akerlof and Kranton only briefly touch on the implications of identity for criminal choice and the economic analysis of criminal action. What bears careful consideration is the possibility that a model of criminal action with 'identity' embedded within it may be made to yield inferences about an offender from evidence left at the crime scene and the nature of the crime. In this case, Canter's  $A \rightarrow C$  equation may be re-cast as  $A \rightarrow I$ , where  $A$  is the 'actions' that occur in and are related to a crime and  $I$  is the 'identity' or 'sense of self' of the offender. The drawing of inferences for  $I$  from  $A$  is encompassed within the symbol ' $\rightarrow$ '. Although there are many possibilities that might be explored in drawing inferences about the offender's sense of self from evidence left at the crime scene, one of the most important could be the ways in which the offender responds to police and media attention and particularly to their rhetoric and symbolism. In the context of serial murder or terrorism, the rhetoric and symbolism used by the police and the media in relation to a particular crime or series of crimes may shape the offender's actions through the interplay of rhetoric, symbolism and 'identity considerations'. Law enforcement professionals are aware that managing the media and publicity associated with a crime or series of

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<sup>23</sup> For more on prospect theory and the investigative process, including its application to geographic profiling, see Phillips & Pohl (2014; 2015) and Phillips (2014; 2016).

<sup>24</sup> See Victoroff (2005). We discussed identity in the terrorism context at some length in one of our very early articles (Phillips & Pohl 2011).

crimes is important. An identity model such as that developed by Akerlof and Kranton may allow for further enhancements in this management process. For example, the rhetoric and symbolism used within the media in relation to a particular offender's actions may reinforce or create a sense of self that perpetuates his criminal action.

Within an economic model that does not contain 'identity considerations' it is possible to say that the offender who is less risk-averse may experience positive increments in utility from police and media attention. He may even seek to enhance this attention by taunting law enforcement and the media. Adding identity to the analysis of such behaviour allows us to consider the choices of the offender within a context where his actions and the actions of others play some role in shaping his sense of self and his sense of self in turn plays a role in determining the utility he obtains from particular choices. For a person whose utility is described by the utility function presented by Akerlof and Kranton (p.719), the actions of others clearly play a role in shaping the person's identity. Identity in turn shapes his choices by affecting his valuation of the various opportunities available to him. Considering the identity-related payoffs to the offender's actions may allow something to be said about his sense of self. A weak sense of self may be revealed in his criminal actions and his communications with police and the media. A person's weak sense of self may be reflected in both his criminal action and in his legitimate action, such as occupation choice. A person with a weak sense of identity as a 'man' may choose an occupation more strongly associated with the social category 'man' (Akerlof and Kranton 2000, p.732). A person with a weak sense of self may try harder to establish his identity or to perpetuate or to overturn an identity portrayed of him.

Much more recently, we have returned to the subject of identity<sup>25</sup>. Again, in the context of terrorism where most of our work is set, we recognise that terrorist groups seek to assert their identity through perpetrating particular actions. We use *SP/A* theory, something which has not been done before, in order to examine a situation in which a terrorist group may be conflicted in its choice of alternative actions or attack methods. This allows us to identify the circumstances under which a terrorist group may be torn between its evaluation of potential gains and losses and its desire to assert the group's identity in some particular way. This analysis, in which we interpret aspirations as assertions of identity, shows how attack methods may be favoured for their 'security' or 'potential' by different types of decision-makers and explains how assertions of identity may conflict with strongly held emotions (fear, hope) which shape the evaluation the potential gains and losses of different courses of action. When aspirations lead a terrorist group to favour an attack method that does not align with its security-mindedness (fear) or potential-mindedness (hope), tension may emerge within the group that is difficult to resolve. Identity and the desire to assert it in a particular way may be at odds with the group's evaluation of gains and losses of the available alternatives. Identity is not necessarily a unifying concept for a terrorist group.

## **V. Concluding Remarks**

Investigative economics needs as much work as the investigative psychologists have dedicated to building their discipline. Years of work. Fortunately, both the theoretical frameworks of economics and the statistical methods

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<sup>25</sup> Phillips, P.J. & Pohl, G. 2016. Tension within Terrorist Groups: The Role of Aspirations in Conflicting Assessments of 'Identity Defining' Versus 'Generic' Actions. Working Paper. Available: <https://ssrn.com/abstract=2853138>

that are familiar to or have been pioneered by economists provide a strong foundation on which to build. What has been said here was intended to be, when I wrote the first draft several years ago, a primer for a future research program and I left the technical economics to one side as much as possible such that the potential contribution of economics to offender profiling may be understood by a wider audience. It will be important, as investigative economics builds, to retain the pragmatism that has characterised offender profiling and investigative psychology. The main reason for this is that, despite the results of some investigations, it is entirely possible that professional profilers do have a unique ability to construct inferences about an unknown offender. If this ability exists, built as it must be on a basis of the profiler's personal characteristics, experience and training, then there is every chance that such ability bridges gaps in the scientific work that supports it. If ideas are discarded because they are not quite scientifically complete, the chance to see how well they work when used by professionals will be lost.

Indeed, throughout my work I have stressed both the complementary nature of all of the different models and pieces of economic and decision theory that we have applied to illegitimate behaviour as well as the importance of law enforcement experience and intuition in bridging the gaps between theory and practice. In the terrorism context there is probably no such thing as a clear, unambiguous analytical result in the standard scientific sense. Studies have failed to find clear determinants of terrorism and no clear pattern of psychological or sociological attributes characterising terrorists. Economists and others involved in terrorism studies have, in the traditions handed down to them by twentieth century scientific methodology, directed their attention towards the identification of these 'determinants' and 'patterns' because the traditions they have inherited demand analytical closure at every step. This has induced a tendency to overlook the value of presenting consistent and logical but 'open' analytical frameworks that are designed to be used and 'closed' by law enforcement practitioners. The results are not lists of determinants or fragments of patterns but the insights that are generated in practice.

Here is an example of what I mean. Prospect theory is a formal model of decision-making under conditions of risk and uncertainty. We have shown how it can be used to determine preference orderings over alternative attack methods. This is our analytically 'closed' result, reported in our papers. Our 'open' result is potentially much more significant. Prospect theory, like each approach that we have taken, represents a different way of thinking about terrorist or criminal behaviour. This cannot be encompassed in a single reported result in the traditional sense. Rather, results emerge once the theory is connected to practice via the bridge of law enforcement experience and intuition. An investigative team, familiar with a particular type of offender and in the process of an investigation directed towards finding some unknown offender, will recognise an aspect of behaviour reflected in our analytical framework that would otherwise be overlooked. The analytical-theoretical framework and the investigative process must be connected via a bridge constituted of experience and intuition before the most important results can be obtained. Given the continuous evolution of contexts, these results will be dynamic in a way that cannot be captured by a set of results presented once and for all at a particular point in time<sup>26</sup>. Presenting the relevant pieces of theory in a coherent and visualisable framework is our ongoing task. We have managed, so far, to put a number of pieces in place.

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<sup>26</sup> For example, we show that terrorists will prefer particular attack methods over others. This will evolve as terrorist capability changes, new opportunities arise, old opportunities close and law enforcement adapts. The analytical frameworks must be used dynamically to realise their full value.

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