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Understanding the Principles of Terrorism Risk Modeling from Charlie Hebdo Attack in Paris

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Abstract: *Learning from an example is one of the most direct ways of achieving understanding of any subject. The principles of terrorism risk modeling are explained in terms of one specific example: the Charlie Hebdo attack in Paris on 7 January 2015. Through better understanding of these essential principles, practical insights can be gained in improving terrorism risk management.*

Keywords: *Terrorism, Risk, Modeling, Paris, Charlie Hebdo*

Introduction

The principles of natural hazard modeling are based fundamentally on the laws of physics, and may be learned through academic studies or professional training courses. However, there are no academic programs or professional seminars where the principles of terrorism risk modeling may be learned. Academic discourse on terrorism is centered around humanities departments, where political risk briefings are prepared but there is no tradition for quantitative risk analysis. It is hardly surprising therefore that, with the Terrorism Risk Insurance Act of 2002, just renewed until 2020, there remains a widespread view that terrorism risk cannot be modeled. Indeed, testimony was given to the American Congress in September 2013 that terrorism risk cannot be modeled. Unless better informed, many in the insurance community assume that the best that can be done is to ask the subjective opinions of a panel of terrorism experts. For those unfamiliar with terrorism risk modeling, such as those new to managing this risk, this inevitably is the default assumption.

Excessive reliance on subjective opinion, however formally elicited using the Delphi method or any other, would never be acceptable for insurance risk modeling of meteorological or geological hazards. Robust and resilient risk modeling requires an underlying conceptual structure, and this must come not from opinion, but from principles that have a mathematical representation. For seismic risk modeling in California, these principles involve seismotectonics, power-law scaling of earthquake magnitudes, etc. However, there are few insurers who could state the relevant principles for quantitative terrorism risk modeling.

To avoid excessive abstraction, one of the best ways to learn the principles of any subject is through an exposition using illustrative real examples. Outside the classroom, the basic principles of hurricane, earthquake and flood risk analysis can be learned and comprehended from the study of any notable event. The purpose of this paper is educational: to explain and teach the basic principles of quantitative terrorism risk modeling, for the first time through one specific recent textbook terrorist event.

On Wednesday, January 7, 2015, the Paris office of the satirical weekly *Charlie Hebdo* was attacked by extremists claiming affiliation with Islam (*ECAI*). This was recognized by President Hollande as the most serious terrorist attack in France in more than forty years. It is also one of the most significant terrorist attacks in the Western world since 9/11. Indeed, this event has duly been referred to as ‘France’s 9/11’. President Hollande’s response has been compared with President Bush’s after 9/11 and President Clinton’s after the Oklahoma bombing of 1995.

A measure of the singular nature of this event is the global response it has triggered; not only was there an obtrusive heavily armed police security in Paris, but also a popular demonstration of millions throughout France, joined by world political leaders, expressing international solidarity against terrorism. The popular slogan, ‘Je Suis Charlie’, coined spontaneously at a French-style magazine, has echoed around the world.

This article will address this issue as a set of eight principles.

Principle A: Macroterror Attacks Leverage Maximum Impact

In December 1994, the Algerian terrorist group GIA hijacked an aircraft with the aim of crashing it into the Eiffel Tower in Paris. This terrorist plot was thwarted when the plane was stormed by French commandos when it was being refueled in Marseilles.¹ Had this plot succeeded, a change in safety policy over the control of hijacked planes would most likely have prevented 9/11. Two decades later, one of the cartoon drawings capturing the spirit of *Charlie Hebdo* was of the Eiffel Tower with its slender, pointed tower replaced by a sharpened pencil. This appeared as a tribute on the front cover of the *New Yorker* magazine.²

¹ Thomas Sancton, “Anatomy of a Hijack, *Time* (June 24, 2001), available at <http://content.time.com/time/magazine/article/0,9171,163487,00.html> (last visited 07 July 2015).

² Ana Juan, “Solidarité,” *New Yorker* (January 19, 2015), cover page, available at <http://www.newyorker.com/magazine/2015/01/19> (last visited 2 July 2015).

A central principal of RMS quantitative terrorism risk modeling is that terrorists seek to maximize damage, subject to the constraints of counterterrorism security measures. What is valuable to Western society is also valuable to terrorists to damage or destroy. There are various loss metrics: the casualty toll, destruction of property, economic loss, and damage to iconic symbols of society. A strike against the Eiffel Tower would be a strike at the heart of the French Republic. President Hollande emphatically declared that “very foundation of our society which has found itself under assault.”³

Fundamental to the quantitative modeling of terrorism risk is the distinction between occasional but spectacular ‘macroterror’ attacks for which the frequency is tightly constrained and controlled by counterterrorism action, and lesser ‘microterror’ attacks which may occur as commonly and sporadically as serious gun crimes.

The Charlie Hebdo attack counts as a macroterror attack, not because of a high casualty toll in excess of 50 or a large economic loss in excess of \$1 billion,⁴ but because of the priceless iconic value to French democracy of freedom of the press, which the terrorists, themselves French citizens, sought to suppress. The terrorists’ objective was openly expressed in their public acclamation outside the scene of the crime that they had killed not just the editor-in-chief, but Charlie Hebdo itself.⁵

Out of several dozen major plots, this stands as the only successful macroterror attack in France since 9/11. This is a statistic that reflects very well on the professionalism and dedication of the counterterrorism forces and judiciary in France. Microterrorism and lone wolf attacks are much harder to control. There are numerous microterror attacks in France each year, typically linked with separatist movements in Corsica and Brittany.⁶ There have also been some lone wolf ECAI attacks. In March 2012, an ECAI, Mohammed Merah, launched a gun attack in Toulouse targeting Jews and soldiers, which left seven dead and five injured. On May 25, 2013, just three days after the brutal killing of a British soldier on a London street by an ECAI, a French soldier was stabbed in Paris by a convert to Islam who had been radicalized.

The earlier opportunist firebombing of the Paris offices of Charlie Hebdo in November 2011 counts just as a microterror arson attack, because the property and contents damage from the Molotov cocktail were narrowly confined, there were no casualties and the publication continued with the editorial team unharmed and defiant. However, the wholesale assassination of the editorial committee of Charlie Hebdo, including some of France’s leading political cartoonists, ranks with the assassination of senior political figures or prominent public officials as a macroterror attack that has very widespread societal impact. In asymmetric warfare, where terrorists have a minuscule fraction of the military capability of nation-states, terrorists seek to leverage such assets as they have to create the biggest impact. The Charlie Hebdo attack was a prime example of terrorist leverage.

³ Francois Hollande, speaking at the 45th World Economic Forum Annual Meeting, Davos-Klosters, Switzerland from 21 to 24 January 2015. World Economic Forum New Release (23 February 2015), available at <http://www.weforum.org/news/french-president-hollande-calls-global-response-extremism-and-terrorism> (last visited 5 July 2015).

⁴ Gordon Woo, *Handbook of Science & Technology for Homeland Security* (Wiley, 2010).

⁵ “Vigipirate à son plus haut niveau”, *Le Monde* (7 January 2015).

⁶ *World Terrorism*, (James Ciment, ed., Sharpe, 2011), pp. 224-227.

However the insurance loss was very low and the attack had no negative effect on the Paris Bourse. As with all the previous successful spectacular terrorist attacks against the Western alliance since 9/11, substantial property damage and economic loss were not the motivation behind the attack in Paris. Ultimately, terrorism is about coercion through fear and intimidation. One way this can be delivered is through an assassin's bullet. Hardening of targets against possible terrorist attack is expensive.⁷ Consequently, the indirect economic impacts of a persistent terrorism campaign can be very onerous. In September 2013, the head of Al-Qaeda, Dr. Ayman Al Zawahiri, urged ECAI to carry out more attacks like the April Boston bombing, which can trigger huge economic expenditures on extensive counterterrorism measures, and so 'bleed America'⁸.

Principle B: Publicity Impact is Key to Targeting

The British Prime Minister, Margaret Thatcher, introduced the term 'oxygen of publicity' to describe the opportunist use of hijackers and IRA terrorists to publicize their political causes.⁹ To maximize the impact of a terrorist attack, a terrorist target should be of sufficient value to Western society so as to create a large stream of domestic and international publicity if attacked. Terrorist organizations use such publicity as advertising to inspire their followers around the world, raise funding and enlist new recruits. Impressionable young Muslims, marginalized and discriminated in their home countries, may be enticed by the perceived success of the ECAI community in promoting so-called Islamist ideals and Sharia law.

The RMS terrorism model has used international name recognition as a crucial factor in prioritizing target locations. This is in contrast with a theory espoused by some terrorism analysts, which hypothesizes that terrorists will target towns in the middle of nowhere so that everyone will be fearful of an attack.¹⁰ This never happened during the IRA campaign on the British mainland, where IRA attacks were heavily concentrated in the major English cities.¹¹ There were no attacks in the countryside, so that farmers would be fearful of the IRA. Terrorists leverage their greatest impact by focusing attacks on the key centers of political and economic life.

According to this theory, the threat gradient across the US should be quite flat, i.e. the risk in Iowa is not so different from the risk in Massachusetts. From Bali to Casablanca, Mumbai to Sydney, this theory has been discredited on every continent by the catalog of actual terrorist events and plots since 9/11. In the Western alliance, Madrid, London, Boston and now Paris have been attacked. All have prominent international name recognition.

⁷ John Mueller and Mark G. Stewart, *Terror, Security and Money* (OUP, 2011).

⁸ Ellie Buchdahl, "Al-Qaeda Calls for Fresh Wave of Terror Attacks Inside U.S. to 'Bleed America Economically,'" *Daily Mail* (13 September 2013), available at <http://www.dailymail.co.uk/news/article-2419911/Ayman-Al-Zawahiri-Al-Qaeda-leader-calls-terror-attacks-America-boycott-U-S-goods-bleed-America-economically.html#ixzz3fElhQ6aP> (last visited 7 July 2013).

⁹ Margaret Thatcher, Address to American Bar Association, (London, 15 July 1985).

¹⁰ See, e.g. Gregory Bennett, *Cross-training for First Responders* (CRC Press, 2010); see also Eric Lipton, "Come One, Come All, Join the Terror Target List," *New York Times* (12 July 2006), available at http://www.nytimes.com/2006/07/12/washington/12assets.html?_r=0 (last visited 7 July 2015).

¹¹ See Tim Pat Coogan, *The IRA* (Roberts Rinehart, 1994).

Principle C: Target Substitution Displaces Terrorist Threat

The RMS terrorism risk model was designed to embody the key game theory principle of target substitution: terrorists will attack the softer of two similarly attractive targets. This is equivalent to a basic law of the natural world: predators will seek out weak members of a prey population. Unlike natural hazards, all terrorist targeting is relative, not absolute. The earthquake risk to one building is not dependent on the earthquake risk to a building across town. This may not be true of terrorism. A change in the security of a hotel across town can affect the threat level at other hotels. Amman, Jordan, where a number of prominent hotels have been attacked by Al-Qaeda, exemplifies this threat predicament. Accordingly, it is not possible to assess the likelihood of one risk being targeted without taking into account the other risks that might also be targeted. This can bias the unstructured elicitation of target likelihoods from security experts.

This principle of target substitution can explain much about terrorist targeting, in particular the recent pattern of terrorism in France. It can also be used to forecast future terrorism risk there. First, a broader European perspective is instructive. In countries that have not censored the publication of blasphemy, the sources of these publications have become the prime terrorist targets. For ECAI, there is zero tolerance for blasphemy. Failure to appreciate this is a perilous form of ‘mindblindness’, the inability to sense what is in the mind of others.¹²

In Copenhagen, the Jyllands-Posten newspaper that published cartoons of the Prophet in 2005 was targeted, as was the cartoonist, Kurt Westergaard. On an Amsterdam street in November 2004, the Dutch film-maker, Theo Van Gogh, was murdered by Mohammed Bouyeri, a Dutch-Moroccan ECAI. This attack epitomizes the principle of target substitution.

Impaled in the chest of Theo Van Gogh with a knife was a letter – not addressed to him, but to Ayaan Hirsi Ali, the apostate subject of his film ‘Submission’. She had police protection following the publication of her book ‘Infidel’. Theo Van Gogh had declined extra security, and was therefore a soft target for the ECAI assassin. Blasphemy reprisals in Amsterdam and Copenhagen stand as the most significant terrorism plots in the Netherlands and Denmark since 9/11.

France has been active in combating the international spread of ECAI militancy, especially in Sub-Saharan Africa. As with the political leaders of all Western alliance nations, French President Hollande has extremely tight personal security and is a very hard terrorist target. Other French citizens would be much less attractive targets for terrorist attacks, except for those who have repeatedly and unrepentantly blasphemed the Prophet. Accordingly, the editorial committee of Charlie Hebdo was a prime terrorist target, one that had some extra security, but was soft enough to be successfully attacked by a two-man terrorist team.

Al-Qaeda in the Arabian Peninsula (AQAP) has flagrantly proclaimed on video its role in directing and financing the Charlie Hebdo attack, and has threatened yet more attacks to avenge the honor of the Prophet. As a riposte, the Prophet featured again on the cover of the issue of Charlie Hebdo immediately following the terrorist attack. Business will continue as usual. However, further violence against Charlie Hebdo will be much more difficult with the placement of heightened security.

¹² See Simon Baron-Cohen, *Mindblindness* (MIT Press, 1997).

Target substitution might then evolve down to the French writer Michel Houellebecq, whose latest novel portrays a France in 2022 under strict Muslim control, where pork is not eaten and women cannot walk the streets uncovered. The title of this new novel, *Submission*, echoes that of the film made by the assassinated Theo Van Gogh. On the fateful morning of the terrorist attack on January 7, Charlie Hebdo's cover was a caricature of Houellebecq's predictions, tragically transformed from fiction to reality. He and his publishers, Flammarion, have been recognized by the police as potential targets. Promotion of Houellebecq's new novel was suspended on January 7, and the author prudently left Paris for the tranquility (and safety) of the country.

One of the slogans of solidarity emerging from the Charlie Hebdo killings is 'France est Charlie' (France is Charlie). Any future attack against Charlie Hebdo or Flammarion would be an attack against the core French liberty to publish. Recognizing the relative nature of terrorist targeting, these developments are significant to understand the future terrorist threat in France. Liberty itself has become an iconic target that can elevate an otherwise minor terrorist crime into a major macroterror attack. The defense of liberty is a national priority for France; a worthy cause for French citizens to die to protect, and for ECAI to die to suppress.

But, like fear, loss of liberty is not covered by terrorism insurance. A shift of the ECAI threat towards suppressing French liberty to blaspheme will shift the attack spectrum towards events with comparatively minor property and casualty loss. The more that people robustly take up the mantle of freedom of the press, as further encouraged by Charlie Hebdo, the more pronounced this shift will be. Governments of the Western alliance have to be concerned about all manifestations of terrorism. Insurers have a much narrower focus on the subset of terrorist attacks that cause insured loss.

A French gift, the Statue of Liberty, is an embodiment of the freedom which has defined the US for generations of immigrants. It is recognized as a highly iconic terrorist target, and is protected accordingly. The principle of target substitution raises deep philosophical issues about the ethics of the allocation of finite resources for protection. At Scotland Yard, before the 7/7/2005 London transport bombings, a counterterrorism detective expressed a view that he would rather that Big Ben be struck instead of many Londoners being killed on the subway.¹³

Principle D: Terrorists Follow the Path of Least Resistance in Choice of Weaponry

Ever since 9/11, terrorism insurers have been apprehensive about innovation in the terrorist arsenal of attack weapons. All manner of sci-fi, high-tech ideas have been hypothesized as possible terrorist weaponry.¹⁴ But none of these 'unknown unknown' weapons has been even close to becoming operational. There has not been a chemical attack since Aum Shinrikyo dispersed Sarin gas in the Tokyo subway in 1995, a couple months after the Kobe earthquake, which this millenarian sect had interpreted as an augury for the coming end of the world. A few years earlier, Aum Shinrikyo had despatched a medical team to the Congo to investigate the weaponization of Ebola,

¹³ Personal Remark made to the Author.

¹⁴ Carl Boggs and Tom Pollard, "Hollywood and the Spectacle of Terrorism," *New Political Science* 28(3) (2006), pp. 335-351, available at <http://www.tandfonline.com/doi/abs/10.1080/07393140600856151#.VZk-nVKdcwA> (last visited 05 July 2015).

but this effort failed. The development of innovative weapons presents daunting technical challenges, and has an extremely high logistical burden under sustained pressure of counterterrorism surveillance and disruption.

The practical choice of terrorist weaponry is explained by a cardinal principle of terrorism modus operandi: terrorists follow the path of least resistance in their actions. This military strategy originates from Sun Tzu's master work, *The Art of War*. This means avoiding targets which have very high levels of security, instead seeking out softer targets, and attacking them with tested weapons known to be reliable. The optimal choice of terrorist weapon is one which uses technology already having a successful track record of being deployed by terrorist organizations. The RMS terrorism risk model includes all such weaponry. The most archetypal of these is the vehicle bomb, which has been called the terrorists' air force.¹⁵ Smaller improvised explosive devices, such as backpack bombs, are also commonly deployed in crowded places.

Another common type of conventional weapon attack involves the use of light military arms: assault rifles, automatic pistols, rocket-propelled grenades, mortars, etc. Such attacks can be targeted at large hotels and crowded shopping malls, as in Mumbai in November 2008 and Nairobi in September 2013, or they can be used for targeted assassinations as at the Charlie Hebdo offices. The scale of these military-style attacks is logistically limited by the time and effort taken to accumulate stocks of the weaponry under the constant risk of plot discovery and arrest. Complex plots run the chance of premature disclosure, if a cache of weapons is stumbled upon by others. This actually happened with the Charlie Hebdo plot, but secrecy was maintained by physical threats against the suspicious neighbor who broke in.

Porous European borders allow light military weapons to be shipped across the continent by road, and many ECAI returning from the Middle East have professional training and combat experience in their use. Already a number of recent interdicted ECAI plots in the UK and France have involved the use of such weapons. In contrast with improvised explosive device (IED) attacks, the terrorist objective of an attack using light military weapons is not to exact a massive toll in property damage or casualties. Accordingly, RMS does not associate light military weapon attacks with property insurance losses. The same holds true for casualty insurance losses: the number of fatalities is unlikely to exceed fifty, which is the lower threshold for macroterrorism for a general mass casualty attack that is indiscriminate in its choice of victims.

Spectacular macroterror attacks require diligent planning, reconnaissance and attack preparation, as well as a number of trained operatives - the more ambitious and extensive a terrorist plot is the more operatives that are needed. No person lives in complete isolation; every human being has his or her own social network. Social networks are amenable to a substantial degree of analytical characterization, providing a sufficient window on terrorist cell contacts for most plots to be interdicted. The various links between members of a social network provide key insight into the involvement of an individual in a terrorist plot. The singular achievement of the Western security services in interdicting more than 80% of significant plots since 9/11 is evidence of their command of terrorist communications networks.

¹⁵ Mike Davis, *Buda's Wagon* (Verso 2008).

Terrorist social network analysis by RMS in 2010¹⁶ has shown that the likelihood of a plot being interdicted increases with the number of operatives as indicated in the table below:

Cell Size	1	2	3	4	5	6	7	8	9	10
Interdiction Probability	0.26	0.46	0.60	0.70	0.78	0.84	0.88	0.91	0.93	0.95

Highly elaborate ambitious plots capable of inflicting catastrophic insurance losses would typically involve so many operatives as to have a very high likelihood of interdiction. This would be wasteful of terrorist resources. Discouragement of ECAI plots involving double-digit operative numbers has come from Osama bin Laden himself in a message from his Abbottabad hideout: “For a large operation against the US, pick a number of brothers not to exceed ten.”¹⁷ The more operatives there are, the greater the chance that one of them will compromise the terrorist venture: too many terrorists spoil the plot.

The need to minimize the number of operatives, subject to maintaining attack capability and effectiveness, was central to the planning of the Paris coordinated attacks. The main assault on the Charlie Hebdo offices required a minimum of two armed terrorists: one to attack, and the other to provide covering fire. These roles were taken by Chérif and Sa’d Kouachi. Another operative or two might have been useful for auxiliary support, or for an unforeseen operational contingency. But secrecy was paramount: even Chérif Kouachi’s wife knew nothing about the plot.¹⁸

Synchronous terrorist attacks are a hallmark of carefully planned major ECAI operations, a way of compounding public fear and anxiety to leverage impact of the attack. Provision of a second front to the Paris attack was the role of Amedy Coulibaly. All three operatives were members of the Buttes-Chaumont gang of ECAI, radicalized at the time of the second Iraq War. Hayat Boumeddiene, the partner of Coulibaly, may have been involved in some aspects of the planning. She is known to have made numerous phone calls to Chérif Kouachi’s wife,¹⁹ and may have passed on secret messages this way. She left for Syria shortly before the attack.

A plot with three or four operatives ordinarily has a 60-70% chance of being interdicted, but this can be reduced if the operatives are interconnected in such a way as to diminish the electronic communication signature between them – keeping a plot within a family helps to maintain a lower plot profile. As with the Boston bombing of April 2013, plot integrity was maintained by the fraternal relationship of the two leading terrorists. The marital relationship of two others would also have reduced the plot profile for detection.

¹⁶ Gordon Woo, “Terrorism Social Network Analysis” (RMS, 2010).

¹⁷ Peter Bergen, *Manhunt* (Broadway Books, 2013).

¹⁸ Kim Willsher, “Charlie Hebdo Gunman’s Wife Had No Idea He Was Extremist, Lawyer Says,” *The Guardian* (13 January 2015), available at <http://www.theguardian.com/world/2015/jan/13/charlie-hebdo-gunman-said-kouachi-wife-extremist> (last visited 5 July 2015).

¹⁹ Greg Botelho, “Untangling a Deadly Web: The Paris Attacks, the Suspects, the Links,” *CNN* (14 January 2015), available at <http://edition.cnn.com/2015/01/11/europe/france-terror-suspects-connection/> (last visited 7 July 2015).

Even though the plot was sufficiently compact to have had a reasonable chance of escaping the attention of the French security services, what should have helped in developing an intelligence assessment of a potential threat was that the three key operatives were no strangers to them. The older Sa'd Kouachi undertook military training in Yemen in 2011, where he met Anwar al-Awlaki, ideologue of Al-Qaeda in the Arabian Peninsula (AQAP).²⁰ The younger Kouachi, Chérif, had been jailed for seeking to join Iraqi ECAI nearly a decade ago. In French prison, he was mentored by the Al-Qaeda-linked Djamel Beghal, who had been jailed for his role in a plot in 2001 to attack the US embassy in Paris.²¹ Amedy Coulibaly was also radicalized by Djamel Beghal while in detention.²²

Social network tracking by the Western intelligence community has the capability to extend to several degrees of separation between an individual and a known or suspected terrorist. In this case, the three operatives were known to have a terrorist record. But with the focus on new ECAI returning from Syria, they were not thought to pose enough of a danger to be kept under surveillance.

An important lesson to be gained from an analysis of the dozens of ambitious terrorist plots against the Western alliance since 9/11 is the game theory observation that terrorism is as much about counterterrorism response as about terrorist actions. A corollary is that terrorism insurance in the Western alliance is effectively insurance against the failure of counterterrorism; a rare failure occurred in Paris.

Principle F: Event Frequency is Calculable through Interdiction Analysis

Since 9/11, the vast majority of major terrorist plots in North America, Western Europe and Australia have been interdicted. Of those that are not interdicted, a certain proportion fail for technical reasons. Both the aviation passenger shoe-bomb and underwear bomb failed technically, as did the 2010 Times Square SUV bomb.²³ In fact, there is a very short list of successful significant attacks before Paris in January 2015: the transport bombings in Madrid in March 2004 and in London in July 2005, and the Boston marathon bombing of April 2013.

Whatever the behavior of terrorists, it is the responsibility of a counterterrorism organization to maintain vigilance to detect plots as they form, and to break up plots before terrorists move towards their targets in readiness to strike. Intelligence officers cannot read human minds, but they can track communications and online activities, albeit at the societal cost of infringement of civil liberties. The astonishing mass surveillance revelations of the ex-CIA whistle-blower Edward Snowden have come as no surprise to those who have analyzed the network process by which the security services of the Western alliance have managed very capably to counter terrorism since 9/11. The global geographical extent of the surveillance is made possible through the international collaboration of intelligence communication agencies, notably between the NSA in the US and GCHQ in the UK.

²⁰ Ibid.

²¹ Ibid.

²² Cedric Mathiot, "Amedy Coulibaly et son mentor Djamel Beghal auraient été voisins de cellule en 2005" ("Amedy Coulibaly and His Mentor Djamel Beghal Were Cell Neighbors in 2005") *Libération* (16 January 2015), available at http://www.liberation.fr/societe/2015/01/16/amedy-coulibaly-et-son-mentor-djamel-beghal-auraient-ete-voisins-de-cellule-en-2005_1181425 (last visited 05 July 2015).

²³ "Times Square Suspect Had Explosives Training, Documents Say," *CNN* (10 May 2010), available at <http://edition.cnn.com/2010/CRIME/05/04/new.york.car.bomb/> (last visited 7 July 2015).

Andrew Parker, the director-general of MI5, the British security service, emphasized again after the Paris attack the vital need for intelligence to continue to be gathered through mass surveillance to deny terrorists the freedom to attack at will. If ever they had this freedom in the UK or elsewhere in the Western alliance, then the risk of terrorism would no longer be controlled, and loss outcomes would therefore be on terrorist terms. The notion that terrorist risk is unduly sensitive to the whims of human behavior stems from a misconception that terrorists can attack at will.

At the outset of risk modeling for terrorism insurance in 2002, RMS pioneered a quantitative objective model of event frequency based on the counterterrorism interdiction of plots. These are near-misses, to use the terminology of industrial safety analysts. The RMS model recognizes that, while most plots would be interdicted, a small proportion of major terrorist plots will evade the counterterrorism net.²⁴ The Paris attack was one of these few. Even countries like France, with an exemplary record of counterterrorism action and informants infiltrated deep inside terrorist networks, can slip up.

The number of plots may be assessed in an objective evidence-based manner from the tally of courtroom convictions for terrorist offences. A plot is not recognized as such if there is insufficient evidence to indict a suspect or gain a conviction.²⁵ Abiding by democratic values, those acquitted of terrorist offences cannot be called terrorists, and their reconnaissance and training activities cannot be called plots. Allowing for the uncertainty in parameter estimation, the annual frequency of successful attacks may then be calculated as the convolution of three probability distributions: the annual number of plots, the rate of plot non-interdiction, and the chance that a plot that is not interdicted is also technically functional.

Principle G: Post-Attack Response is a Control Feedback

The occurrence of macroterror attacks in the countries of the Western alliance does not follow the Poisson process where events occur randomly in time. This is commonly used in natural hazard modeling, but terrorism is subject to external control in the way that natural hazards are not. After a macroterror attack, new counterterrorism actions are taken to suppress the chance of another successful macroterror attack. Post-attack response exerts a control feedback on terrorist action. The rapid passage of the USA PATRIOT Act soon after 9/11 is a classic paradigm. RMS incorporated this non-Poissonian time dependence at the start of terrorism risk modeling in 2002.

Affirmation of the principle of control feedback came a few years later in the UK. In the immediate aftermath of the London transport bombings of 7/7/2005, Prime Minister Blair declared that “this changes everything” and introduced a raft of tough counterterrorism legislation to mitigate the risk of terrorism to the UK.²⁶ This has been effective, especially by making incitement to violence a criminal offence. Almost a decade later, there has not been another successful UK macroterror event since.

²⁴ Woo, *Handbook of Science & Technology for Homeland Security*.

²⁵ “The Counter-Terrorism of the Crown Prosecution Service,” CPS, at <https://www.cps.gov.uk/publications/prosecution/ctd.html> (last visited 7 July 2015).

²⁶ Terrorism Act 2006, available at <http://www.legislation.gov.uk/ukpga/2006/11/contents> (last visited 7 July 2015).

The post-attack response feedback control feature is validated further by the response to the 1/7/15 attack in Paris. It has long been known, yet tolerated, that prisons are radicalization centers and schools for extremists.²⁷ Ordinary criminals have been converted to Islam and become the fighter of so-called jihad. In France, prisoners with ECAI links will henceforth be segregated, thus reducing the risk of prison radicalization. At the national level, the French National Assembly passed a bill giving the intelligence services more powers to collect information.

On an international level, the president of the European commission, Jean-Claude Juncker, has promised a new program of European counterterrorism legislation. This will include better cooperation between European states, reinforcement of state links with Europol, and a requirement for airlines to divulge passenger name record (PNR) data to the police, so that so-called jihadi movements to Syria and Iraq can be more easily tracked. The latter counterterrorism change has long been resisted in the European Parliament for civil liberty reasons but it now has the very strong support of the French President.

The reality of the risk of French ECAI returning from fighting with ISIS/DAESH in Syria is exemplified by Mehdi Nemmouche, a 29 year-old French national of Algerian origin. Having spent a year in Syria with radical ECAI, he returned to Europe. On May 24, 2014, he attacked the Brussels Jewish Museum, killing four. A few days later, he was arrested in Marseilles. Although he was a lone wolf, he was ambitious: a potential terrorist plot he had in mind included an attack on the Champs Elysees on Bastille Day, July 14.

Principle H: The ECAI Threat is Long-Term

The RMS model of terrorism risk has been parameterized under the presumption that the threat from Al-Qaeda and other ECAI is long-term and multigenerational, and cannot be eradicated by any number of UAV strikes or other offensive military measures taken by Western counterterrorism forces. The validity of this modeling assumption would be demonstrated by firm evidence of a direct link between one generation of extremists and the next, i.e. that an older generation of terrorists is influential in perpetuating violence.

Such a link was crucial to the Paris attack, and existed in the form of the French-Algerian Djamel Beghal, an ECAI who spent time in Afghanistan before 9/11, between November 2000 and July 2001, and had a reputation as a fine theologian. Djamel Beghal himself was part of the European inner circle of radicals. He spent time at the notorious Finsbury Park mosque in north London, an ECAI refugee hub, where he was an associate of the influential radical preacher, Abu Hamza, extradited from the UK and now jailed in the US.²⁸

²⁷ Peter R. Neumann, "Prison and Terrorism: Radicalization and DE-radicalization in 15 Countries" (ICSR, 2010), available at <http://www.clingendael.nl/sites/default/files/Prisons-and-terrorism-15-countries.pdf> (last visited 2 July 2015).

²⁸ Josh Halliday, Duncan Gardham and Julian Borger, "Mentor of Charlie Hebdo Gunmen Has Been UK-based," *The Guardian* (11 January 2015), available at <http://www.theguardian.com/world/2015/jan/11/mentor-charlie-hebdo-gunmen-uk-based-djamel-beghal> (last visited 5 July 2015).

Chérif Kouachi and Coulibaly both became radicalized disciples of Djamel Beghal. Few have had a better understanding of the radicalization process in France than the indomitable terrorism magistrate, Jean-Louis Bruguière. He observed that in the suburbs, many have no hope for the future. A typical scenario is that they meet someone charismatic with some knowledge of Islam, who gives them hope through the so-called idea of jihad.²⁹ Coulibaly was one of these drifters. In 2013, he was jailed for conspiring with Beghal to release the GIA bomber of a Paris RER station in 1995 – the most notable French terrorist attack before January 2015. Coulibaly was let out of prison as recently as March 2014, under the mistaken presumption that he did not pose a continuing terrorist threat.

Beghal's wife continues to live in England, and is under security watch. In both the UK and France, the treatment of the families of ECAI prisoners, and of ex-prisoners, presents a major security challenge. The wife of one of the London bombers of July 7, 2005, achieved notoriety in her own right as the 'white widow terrorist'³⁰. Most ECAI prisoners on their release settle into society and do not engage further with terrorism, but a few will be motivated to continue on the path of violence, either by direct involvement in plots, or encouraging other extremists. Tracking of recidivism will now be a priority of Western intelligence services. What happened in Paris could happen in London, or any other major city in the western alliance.

Each year sees the release from prison of hardened ECAI who have served long sentences for serious terrorism offences. Their freedom to radicalize and incite the next generation of ECAI is part of the dynamic cyclical process which makes the threat from Al-Qaeda and other extremist groups a long-term persistent feature of the landscape of terrorism risk in the Western alliance.

LESSONS FOR TERRORISM INSURANCE RISK IN THE US

Both the Kouachi brothers were on US no-fly lists, so they would have been unable to enter the US to perpetrate any terrorist attacks across the Atlantic, had they been so inclined. More generally, the US-VISIT program, costly as it is, has been very effective.³¹ Its value is gauged not by the number of terrorists stopped at the US border, but the number of foreign ECAI deterred from attacking the US. An enhanced biometric exit program, whereby those leaving the US are fingerprinted, might have deterred Tamerlan Tsarnaev from attacking Boston in April 2013.

Target substitution operates at all geographical levels, from street to city to country. The Anglo-Pakistani ringleader of the London transport bombings of July 7, 2005, Mohammed Siddique Khan, declared in his martyrdom video that he was motivated by the many Muslim casualties of the US invasion of Iraq.³² Had it been easier for him to travel to the US, Washington DC might have been targeted rather than London.

²⁹ Tom Whitehead, "Three British Sisters Feared to Have Gone to Syria to Join Brother," *The Telegraph* (15 Jun 2015), available at <http://www.telegraph.co.uk/news/uknews/law-and-order/11676378/Family-of-12-missing-after-pilgrimage-to-Saudi-Arabia.html> (last visited 7 July 2015).

³⁰ Rachel Shabi, "The White Widow and Other Arch-villains," *Al Jazeera* (20 May 2015), available at <http://www.aljazeera.com/indepth/opinion/2015/05/white-widow-jihad-terror-150520074623342.html> (last visited 2 July 2015).

³¹ Woo, *Handbook of Science & Technology for Homeland Security*.

³² "London Bomber Video Aired on TV," BBC (1 September 2005), available at <http://news.bbc.co.uk/2/hi/uk/4206708.stm> (last visited 2 July 2015).

Of all European countries, the largest contingent of extremists fighting for ISIS/DAESH in Syria has come from France, which has a 10% Muslim population. The second largest European contingent has come from the UK, which also has a large minority Muslim population. Returning fighters pose a serious terrorist threat to both France and the UK. By comparison, relatively few have traveled from the US to Syria to fight. Geography is a greater logistical barrier for them. French and British citizens can take a short flight to Istanbul, then travel by road to cross the Turkish border with Syria. Travelers returning to France or the UK from Istanbul face intensive security checks and interrogation, as well as possible arrest if evidence is found that they have been involved in support for ISIS/DAESH.

CONCLUSION

The Charlie Hebdo attack marked a turning point in the episodic historical confrontation of the Western alliance with ECAI. Blasphemy is an affront to the faithful of any religion, but for many devout Muslims around the world, outrage and anger at the cartoon depiction of the Prophet was enough for them to side with those who say 'Je suis Kouachi'. For a few, in the extreme tail of the distribution of deeply offended Muslims, the personal insult to their faith may be felt so gravely as to be worth avenging with their lives.

As during the medieval Crusades, France finds itself at the center of the clash between Muslim East and the Christian West. Not only is France a prime terrorist target for French ECAI, but foreign extremists, including those radicalized in the US, may travel to France inspired, and even funded, by al-Qaida in the Arabian Peninsula (AQAP) to uphold the honor of the Prophet. Just as Danish consulates were attacked because of the Danish publication of defamatory cartoons, the same prospect holds for France. Within the US, French consulates will need the heightened security that Israeli consulates have always had. With Coulibaly's four Jewish victims laid to rest in Jerusalem, Israeli and French perspectives on future counterterrorism security will become more closely aligned.

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