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Research Note

Toward a Behavioral Model of "Homegrown" Radicalization Trajectories

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This research note presents a dynamic risk assessment model of homegrown terrorists. The model was tested in a study of convicted "homegrown" American terrorism offenders inspired by Al Qaeda's ideology. The New York Police Department model developed by Silber and Bhatt was chosen as the basis for creating a typology of overt and detectable indicators of individual behaviors widely thought to be associated with extremism. Twenty-four specific cues associated with each stage of radicalization were used to code and estimate the sequencing of behaviors and the duration of the average radicalization trajectory. Sixty-eight cases have been analyzed thus far. A decision was made to publish the initial results when it became apparent that the model was an effective tool for the evaluation of terrorist offenders.

The rapid rise in domestic violent extremism has created an urgent need for metrics that can help law enforcement assess the danger represented by radicalizing individuals. This article describes the methods used in a study of homegrown American terrorism offenders that aims to construct a dynamic evidence-based assessment model for analyzing the radicalization trajectories of individuals inspired by the *Salafi-jihadist* ideology.[1] The research is ongoing but a decision was made to publicize the preliminary results when it

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Color versions of one or more figures in this article can be found online at www.tandfonline.com/uter.

emerged that the findings could change current methods for assessing potential terrorists and violent extremists.

Risk assessment models typically have several purposes. One is to evaluate individuals to assess if they may be at high risk for engaging in terrorism and violent acts. Preventive de-radicalization programs, such as the "Countering Violent Extremism" (CVE) agenda announced by the White House in 2011, also rely on assessment protocols.[2] Intervention programs require assessment tools that should, at minimum, be sufficiently fine-grained to identify behaviors that raise concern and capture changes in behaviors suggestive of an individual's progression toward criminal action.

It is well established that terrorists and violent extremists inspired by Al Qaeda do not typically exhibit the types of socioeconomic problems and behaviors associated with non-political violent crimes. Many are well educated, and few exhibit the risk factors typical for ordinary violent criminals.[3] It is widely perceived by experts that extremists go through a roughly predictable process of radicalization related to the ideology but no consensus exists on how long the process takes, or even what the steps are, or if all terrorist offenders go through a similar process.[4] Opinions on the time frame from initial radicalization to criminal action can vary significantly. A Federal Bureau of Investigation (FBI) official (who spoke off the record) asserted that the opportunity for intervention is "a matter of days, not weeks." Abdurrahman Anderson, a British charity worker who is engaged by the United Kingdom's probationary services to work with terrorist offenders, concurred. He pointed out that, in his experience, certain individuals could radicalize quickly from "stage A, B, and straight to Z."[5] This tends to be a law enforcement perspective, but it is not generally shared by researchers in the field. Social scientists are inclined rather to the view that radicalization is the result of a process of increasing commitments, and that it can take years to become a violent extremist capable of carrying out a deadly attack. According to a widely cited definition that reflects this view, radicalization is "the process of adopting for oneself or inculcating in others a commitment not only to a system of beliefs, but to their imposition on the rest of society."[6]

The objective of our research is to outline a general and dynamic model for assessing the radicalization trajectory of violent extremists. The questions that concern us are how best to measure the timeline for the increasing commitments that accompany the radicalization process, and how to construct evidence-based dynamic risk assessment tools. Analyzing forensic biographies collated from court records and other public sources, we charted the timeline of radicalization using overt behavioral indicators that are thought to be associated with "homegrown" violent extremism associated with Al Qaeda-inspired groups.[7] This is the first such empirical study, and it is assumed that future reiterations of the study will be needed to test the utility of additional behavioral indicators.

A key assumption is that radicalization is associated with overt and observable behavioral changes linked to the ideology. This is not necessarily always the case. The so-called "lone wolf" would be an exception.[8] It is, however, a fair assumption in the case of homegrown terrorism, where the radicalizing individual typically goes through a process of political and ideological awakening and experiences strong impulses to convert others to the cause. Many of the behaviors are ideology-specific but social background and demographics (e.g., age and gender) also shape the behaviors of terrorist offenders. Ultimately, we expect to be able to identify variations between different groups of terrorism offenders. Are there, for example, significant differences in patterns of radicalization between the so-called social network generation, offenders radicalized after the introduction of Web 2.0 social media technologies, and earlier cohorts, who typically were

radicalized through direct personal contact with other extremists? The key working hypotheses are:

1. Radicalization follows a predictable sequential pathway exhibited in behavioral changes.
2. Increased commitment is indicated by simultaneously occurring changes in behavior that precede violent action.
3. The radicalizing individual will engage in public activity before moving on to the final cataclysmic action.
4. The process of radicalizing to the point of carrying out violent action is measured in months and years rather than days and weeks.

A Behavioral Model of Radicalization

One way of looking at the individual radicalization trajectory is to visualize the process as an arc from the initial formation of extremist sympathies to violent action.[9] To be clear, the dependent variable is not radicalization *per se* but rather the process, or the pathway, followed by individuals who embrace terrorist action. A pragmatic reason to think about "how" rather than "why" people become terrorists is that psychological motivations may be complex, conflicting, and often unknowable. Therefore, John Horgan suggests we should think of "pathways" to extremism.[10] Randy Borum has proposed that we should use the term "action scripts" to describe the process of becoming engaging in terrorism.[11] The intuition suggested by the concept of a "script" is that violent extremism is an enactment of a role scripted by others but open to interpretation and variation by the players.

No agreement exists, however, on the conceptualization of the process, or on how many steps are involved. For instance, in what has become known as the New York Police Department (NYPD) model, Silber and Bhatt identify four phases of radicalization: "pre-radicalization," "self-identification," "indoctrination," and "jihadization."[12] Fathali Moghaddam prefers the image of a "staircase to terrorism" with five steps, each requiring increasing commitment.[13] Gartenstein-Ross and Grossman identified six indicators of *jihadist* radicalization, three of which have to do with extremist interpretations of religious dogma, and three with manifestations of sectarian hate.[14] The basic idea is essentially the same: radicalization occurs through a process of deepening engagements that can be observed in changing overt behaviors.

The assessment protocols currently in use generally do not live up to these methodological requirements. The guidelines rely on multiple indicators, which are sometimes ranked by the frequency with which they have been observed in the biographies of known terrorists.[15] A study published in 2011 by the National Counter Terrorism Center (NCTC) ranked indicators by the frequency with which they presented themselves in twenty-two case studies of homegrown violent extremists. Risk factors are enumerated as unstructured binary options (present or not present). The study, which focused exclusively on *jihadists,* identified communicating with other extremists and watching *jihadist* videos as the most frequent activities associated with extremism, occurring in 91 percent of the cases.[16] No guidance was provided as to how important these behaviors were. Nor did the study investigate whether becoming engrossed in online extremism was a gateway activity or indicative of late-stage radicalization. Moreover, constant and pervasive behavioral cues are not helpful for determining dynamic and progressive radicalization.

The VERA2 assessment scale (standing for "Violent Extremism Risk Assessment protocol") used by the U.K. Home Office offers a more complex multidimensional

assessment methodology,[17] but like the NCTC model it utilizes what social scientists term nominal scaling in social science. A nominal scale, as the name implies, categorizes data without any order or structure. The guidelines essentially provide check-off menus. The more factors checked, the more serious the case. A frequent complaint is that the lists are overly inclusive,[18] and that they may, for instance, feed a perception that a "normal teenager" can be well on the way to becoming a terrorist simply by engaging in a "listed" behavior.[19]

We look rather for conditional risk measures that are both robust and unambiguous. Theories of radicalization suggest a logic of deepening commitments that are both conjunctional and propositional; for example, if behaviors A and B occur together or in sequence, then the radicalization individuals is likely to progress to behavior C. It follows that the methodology used for risk assessment should be capable of dealing with dynamic indicators and deal with how behaviors at different times are related. Watching *jihadist* videos occurs throughout the radicalization trajectory, from initiation to "bang." But the impact of this activity may vary contingent on the timing of the activity to the individual's progression down the path of radicalization.

Dynamic indicators should be able to identify, together or in sequence, patterns of behavior that indicate stages in a process that indicates a high risk of leading to violent action. With these methodological and practical considerations in mind, we aim to identify overt behavioral indicators of the radicalization process based on evidence drawn from the case histories of known terrorists. This is a first cut, as the research is ongoing, but it has already become clear that some of the indicators that we expected to be robust precursory variables—for example, premature school leaving ("dropout")—are in fact often not signifiers of increased radicalization.

Methodology

To our knowledge, the NYPD report is the only study that has attempted to provide dynamic indicators focusing on the radicalization process. Silber and Bhatt elaborated what they called "signature" cues to increased radicalization, but their study did not attempt to assess individual personal biographies. (The study presented a group-level analysis of ten conspiracies—five foreign and five U.S.-based.) A second problem with the Silber and Bhatt study is that although the authors describe the four phases as "unique," and associated with distinct "signatures," the phases are in effect described in roughly synonymous terms. In the schematic representation of their model, Silber and Bhatt have a large arrow labeled "*Salafi-jihadi* ideology" going across all four phases and pointing to "attack," indicating a causal relationship.[20] The depiction suggests that the ideology is a constant variable in the equation—but a constant cannot explain change. Another problem is that we do not have access to metrics of belief, only behaviors. Therefore, the behavioral cues and, specifically, linking different behaviors to different stages in the radicalization trajectory are key to our model.

We want to know how individuals typically move from the initial stage of cognitive opening to extremist belief to the final stage of "doing something." But without a known starting point, it is not possible to establish the timeframe for the average radicalization process. While an end point of an individual's forward march to "doing something" is clearly defined as the moment at which an individual commits a criminal offense, it is much harder to assess the onset of radicalization. A solution to the dilemma is to estimate radicalization trajectories by working backwards from the time of action. By defining the moment when an individual is arrested or "does something" as "zero hour," we are, given

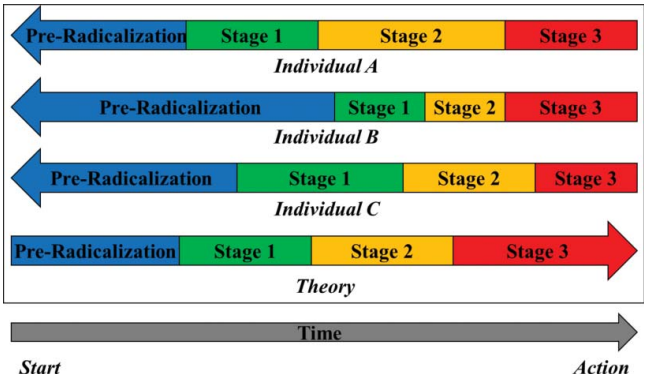

Figure 1. Model for estimating radicalization trajectory rates.

sufficient biographical evidence, able to retroactively trace signature behaviors of an increasing commitment to extremism. The methodology is a variant of process-tracing, a common theoretical approach to the study of social movement mobilization.[21] The conceptual model is depicted in Figure 1.

Particular individuals will exhibit different timelines (represented by Individuals A, B, and C in Figure 1). The radicalization trajectory rate, then, is the number of days and years it takes for an individual to move from initial identification with the ideas and objectives of an extremist ideology to undertaking violent action in the name of that ideology. With enough data, we are able to calculate the means and median values for radicalization trajectories, and identify distinct variations in the trajectories between different types of offenders. The standardized radicalization trajectory rate for a particular subset (hereon referred to as a cohort) of offenders—for example, individuals radicalized through social media—is expressed as the mean time the cohort took to progress to action.

Reducing ambiguity is vital in hypothesis testing. We therefore chose the NYPD model as the basis for creating a typology of overt and detectable behavioral indicators of behaviors widely thought to be associated with extremism. A codebook was then developed enumerating specific cues associated with each of the four stages: (1) pre-radicalization, (2) detachment, (3) peer immersion, and (4) steps to actions. The selection of behavioral cues was informed by the general literature and by our previous research on homegrown terrorists. The four stages and the behavioral cues used as indicators for each stage are listed in Table 1. A total of twenty-four cues were used.

The biographies are collated from court documents, online communications posted by the terrorist offenders, and investigations into their activities conducted by the U.S. government and news media. Media interviews with family and friends or local community members, including imams and mosque officials, are also drawn on when the information is considered reliable. Process tracing can be demanding in terms of the amount of evidence that is required to make reliable inference about sequences and causal mechanism.[22] Coders looked to infer dates for when an offender was first seen to engage in a particular behavior. Following the codebook, the researchers combed through the primary material and entered into a spreadsheet the first date at which a particular cue to behavioral changes indicative of increasing militancy occurred. Certain dates, such as arrest or travel abroad, are generally easily found. Other types of dates, such as evidence of incidents of personal trauma or dropping out of school sometimes require more research. In

Table 1
Behavioral indicators of stage progression in radicalization trajectories

Stage:	Pre-Radicalization	Stage 1: Detachment	Stage 2: Peer-Immersion and Training	Stage 3: Planning and Execution of Violent Action
Description:	Searching behavior indicative of cognitive opening.	Detachment from previous life; e.g. by spending inordinate amounts of time with online extremist peers	Leaves home to become closer to a peer group of like-minded individuals.	Attempts or enacts violent action—or joins a terrorist group abroad or attempts to join a group.
This could include:	Expressions of disillusionment with world affairs or with religious or political authorities.	Actively seeking get closer to new authority figures, or engaging in da'wah online or real-life.	Attempting to go abroad to join an organization or a network to "live" as prescribed by the ideology.	Actively supporting another person carrying out violent action on behalf of the ideology.
	Behavior indicative of a personal crisis in response to personal events, e.g. a family crisis, drug addiction, incarceration, or being arrested.	Picking fights with local mosque or teachers, colleagues, and family—or otherwise trying to convince others to change by starting a blog or a website.	Behavior indicative of a desire to permanently join the militant community, e.g. by finding a spouse (or spouses) found through the extremist community.	Issuing threats online or real-life, or in other ways supporting immediate violent action, e.g. by engaging in online fraud.
	Seeking out information in venues outside the individuals' established social milieu, either online or real-life, from new authority figures.	Experiencing a revelation or making changes to lifestyle such as dropping out of school or work.	Seeking out ways to demonstrate commitment to the new ideological community and its mission, e.g. by acquiring practical training in the use of firearms or other skills considered important to the mission of the extremist community.	Joining a foreign terrorist organization or taking practical steps to carry out an attack, e.g. by acquiring materials needed to fabricate a bomb or purchasing firearms.

US73	Dropout Date	Disillusioned	Seeking Information	Rebellion	Lifestyle Changes	Training	Peer Immersion	Desire for Action	Steps to Violence
US82	Seeking Information	Authority Figures	Peer Immersion	Training	Lifestyle Changes	Da'wah- Real Life	Desire for Action	Steps to Violence	
US97	Dropout Date	Seeking Information	Authority Figures	Lifestyle Changes	Peer Immersion	Da'wah- Virtual	Desire for Action	Foreign Org.	
US153	Authority Figures	Peer Immersion	Disillusioned	Lifestyle Changes	Desire for Action	Steps to Violence	Training		
US177	Seeking Information	Disillusioned	Lifestyle Changes	Da'wah-Virtual	Authority Figures	Peer Immersion	Desire for Action	Training	Steps to Violence
US184	Seeking Information	Authority Figures	Peer Immersion	Societal Withdrawal	Da'wah-Virtual	Steps to Violence	Passive Support		
US215	Disillusioned	Authority Figures	Lifestyle Changes	Peer Immersion	Desire for Action	Foreign Org.	Passive Support	Steps to Violence	
US268	Dropout Date	Personal Crisis	Seeking Information	Lifestyle Changes	Marriage Seeking	Peer Immersion	Da'wah-Virtual	Passive Support	Steps to Violence
US330	Trauma	Seeking Information	Authority Figures	Educational Withdrawal	Dropout Date	Underemployment	Desire for Action	Steps to Violence	Passive Support
US346	Seeking Information	Authority Figures	Desire for Action	Peer Immersion	Da'wah-Virtual	Training	Educational Withdrawal	Steps to Violence	
US351	Disillusioned	Authority Figures	Dropout Date	Seeking Information	Lifestyle Changes	Desire for Action	Societal Withdrawal	Steps to Violence	Foreign Org.
US488	Personal Crisis	Seeking Information	Authority Figures	Lifestyle Changes	Da'wah-Virtual	Desire for Action	Peer Immersion	Steps to Violence	
US508	Disillusioned	Authority Figures	Seeking Information	Lifestyle Changes	Peer Immersion	Training	Marriage Seeking	Foreign Org.	

Figure 2. Sample coding of overt expressions of behavioral indicators of radicalization by sequence and date (dates not shown).

each case, a biographical timeline is constructed based on obtainable dates related to the cues. Each date entered is rated on a three-point scale: a score of one indicating precision, two being accurate within a month, and three denoting estimation with a margin of error of up to three months. For instance, if a court document asserts that an individual attempted to go abroad in September, and a family member recalls that the individual began training with firearms about six months earlier, "domestic training" would be coded as March and assigned a score of two. Occasionally more specific dates cannot be ascertained, in which case coders are told to infer from the context if the event occurred in the first or the second half of the year.

Figure 2 displays a sample spreadsheet indicating how the methodology works in practice. Each individual was assigned a case number and a row in the spreadsheet. The data was then sorted chronologically, and the behavioral cues color marked following the cool-to-hot stage progression elaborated in the theory.

We are interested in both the assessment of timelines (how long does it take to move from one stage to the next?) and in the sequencing of behaviors (does behavior A typically precede behavior B?). Using a computer algorithm, the spreadsheet data was evaluated and sorted based on the degree of conformity with the hypothesized radicalization sequence. Each timeline was assigned a numeric value, or a "counter," which tracks whether an indicator falls within its expected stage of radicalization. A counter value of one is assessed when the indicator in a person's timeline conforms to the expectations. By way of example, if person A's first observed behavioral cue conform to one or more of the cues identified as indicative of the pre-radicalization stage, a value of one is assigned. If the next indicator is also in the pre-radicalization stage, the counter remains at one. If the following indicator falls in stage 1 as anticipated, the value moves to two. Whenever an indicator does not fall in the anticipated stage, the counter value remains unchanged and the specific indicator is recognized as out of order. The metric provides a tool both for assessing the timelines of individuals (does the radicalization trajectory of

individual A conform to our expectations?) and an aggregate metric for assessing the "fit" of a particular behavioral indicator. Cues that are found to be frequently out-of-order are reevaluated to see if they are consistently placed earlier or later in the trajectory than expected by the model.

Case Studies

Three individual case studies are summarized here to illustrate the logic of using forensic timelines to estimate individual radicalization timelines.

Biography 1

Shelton Thomas Bell, born in 1993, grew up in Jacksonville, Florida's rural Duval County. He has two younger brothers and attended Englewood High School. Sometime in 2010 a person who later became an accomplice gave Bell a *Qur'an*. By Bell's own account, he converted to Islam after reading a few chapters (*sura*).[23] Bell quickly became a devout Muslim and dedicated his time to studying the religion.[24] The transition was swift; a high school friend reported that Bell "dressed preppy" during his freshman year of high school in 2010, but that by his sophomore year he grew his hair and beard long.[25] Beginning in January 2012, Bell looked to a new authority figure: a local, American-born *imam*. Bell also searched the Internet for additional information on Islam.[26] By his own account, he watched nearly all of Anwar Al-Awlaki's online videos. In the spring of 2012 he dropped out of high school and opened a computer repair shop at the city's flea market.[27] His progression from the pre-radicalization activity of seeking information to stage 1 took between one and two years.

Bell started to express a desire to wage *jihad* in May 2012.[28] During that month he had his first confrontation with religious leaders at the Islamic Center of Northeast Florida, and had an argument with the imam he had initially turned to for advice. Bell's rebellion against local religious authorities deepened in June 2012, when leaders at the mosque alerted the *imam* that Bell had gathered a group of the mosque's youths and spoke to them about the virtues of *jihad*.[29] The mosque leaders attempted to reason with Bell but were unsuccessful and subsequently alerted authorities. After declaring his intention to wage *jihad*, Bell transitioned from stage 1 to stage 2 of the radicalization trajectory very quickly.

One month later Bell started to set up what he described as "domestic training" with three other accomplices in preparation for seeking to join a terrorist organization in the Middle East.[30] He engaged in nighttime training missions on no fewer than four occasions in July 2012.[31] Throughout, he produced videos of his sessions to show potential recruits. During his first "mission," held on 4 July 2012, Bell and a fellow conspirator recorded themselves destroying two statues of Jesus in Jacksonville's Chapel Hill Cemetery after declaring the figures to be "idols."[32] The vandalism was clearly motivated by his radical beliefs. As Bell engaged in peer immersion, his radicalization trajectory accelerated and he progressed from stage 2 to stage 3 within one month.

In order to fund his planned travel to the Middle East, Bell defrauded a business partner who had previously loaned him $4,500 and disappeared with several of his customers' computers, presumably reselling them. On 25 September 2012, less than six months after expressing his initial desire to wage *jihad*, Bell and one of his accomplices, a juvenile who has not been named, traveled to New York, then to Poland and on to Tel Aviv, Israel.

They aspired to join Al Qaeda in the Arabian Peninsula (AQAP).[33] They then went to Amman, Jordan, where they started to contemplate going to Syria instead. In Israel and Jordan, the pair exploited the hospitality of the juvenile's family for places to stay until the family threw Bell out. Bell was detained in Amman and deported back to the United States in November 2012.[34] The FBI interviewed him when he returned and put him under surveillance. Nonetheless, Bell continued to take steps to engage in violent domestic action and was arrested in January 2013. Bell pleaded guilty in March 2014. Before sentencing, he wrote a letter to the courts expressing regret for his actions. He indicated his hope to rejoin society, obtain an MBA degree, and even engage in counterterrorism studies.[35] The court did not think his expression of contrition was genuine and found him a threat to society. Bell was sentenced to twenty years in prison and life-long supervision.[36]

In total, Bell moved from stage 1 to stage 3 behaviors in slightly over a year—a comparatively rapid trajectory facilitated by online activity and association with a group of like-minded peers.

Biography 2

Najibullah Zazi was born 1985 in Peshawar, Pakistan, where he lived until 1999, when the family moved to the United States, settling in Queens, New York.[37] Zazi went to Flushing High School, where he met his future accomplices, Zarein Ahmedzay and Adis Medunjanin, before dropping out in 2003, apparently simply because he was a poor student.[38] The trio only became close friends around the fall of 2006 although they knew each other since high school.[39] After leaving school Zazi worked as a coffee vendor from a street cart in the financial district in lower Manhattan until 2009. He displayed a "God Bless America" sign on his cart.[40]

The first indication of radicalization occurred around September 2006, when Medunjanin gave him audio CDs of Anwar Al-Awlaki and Sheikh Faisal and the three friends started to listen to the sermons together.[41] Although he continued to attend his family's mosque, Zazi began to seek his own information about Islam and increasingly looked to his new online authority figures for guidance. By November 2006 the group spent a significant amount of time together, often listening to online lectures and discussing their duties as Muslims.[42] The same year, Zazi traveled to Pakistan in order to marry his 19-year-old cousin, and fathered two children with her during visits in 2007 and 2008.[43] The marriage was a traditional arranged cousin-marriage, and appears to have had little to do with Zazi's radicalization.

However, around January 2008, when Zazi returned to the United States from one of his visits to Pakistan, he began to grow his beard out and changed his clothing style, a stage 1 indicator.[44] Less than six months later, in April 2008, the trio solidified their desire to wage *jihad* and vowed to travel to Afghanistan by the end of the summer.[45] In August 2008 the group flew to Peshawar, Pakistan, intending to train with the Taliban.[46] They appear to have had no prearranged contacts. Once they arrived in Peshawar, the three young men walked around Peshawar asking for someone to bring them to a Taliban training camp. It took only a few weeks before they were interviewed by a recruiter and sent on to a contact in Waziristan, Saleh al-Somali, the head of operational planning for Al Qaeda.[47] That is where they were repurposed to carry out an attack in the United States. Zazi spent four months traveling between Peshawar and locations in Waziristan, where he was trained in the uses of chemical agents, bomb making, weapons use, and hand-to-hand combat.[48] He was in direct contact with the top of Al Qaeda, including

Rashid Rauf and Adnan Shukrijumah.[49] Both men were focused on the coordination of attacks in the West. Zazi was trained for a martyrdom operation. He was excited about the prospect of "sacrificing himself ... for the sake of saving other souls."[50] In January 2009, Zazi returned to the United States. In four months, Zazi had progressed from stage 2 to stage 3 in the radicalization process.

Zazi was broke upon his return to the United States, and moved in with his father who had relocated from Queens to Aurora, Colorado. With his accomplices, he began plotting an attack on the New York City subway. In March 2009, British authorities intercepted e-mails between a third party and Zazi's Al Qaeda handlers that provided clues to Zazi's involvement. Zazi had contacted his former trainer, an Al Qaeda operative in Pakistan, regarding bomb-making instructions. This operative was linked to a cell in the United Kingdom planning an attack on shopping centers in Manchester.[51] U.S. authorities now began to monitor Zazi.[52] On 9 September, Zazi drove from Colorado to New York City.[53] In New York, his car was towed and searched, and agents discovered notes detailing bomb-making techniques in his trunk. Aware that he was being watched, Zazi abandoned his plans and returned to Colorado.[54] He was arrested on 19 September 2009, and charged with his involvement in the plot. The attacks on the New York City subway system were scheduled for 14, 15, or 16 September.[55]

His individual radicalization, from initial exposure to extremist material to concrete plans to carry out an attack, took three years.

Biography 3

Mohamed Osman Mohamud was born 1991 in Mogadishu, Somalia, but moved to the United States with his parents at age five.[56] Mohamud has claimed that he became interested in violent *jihad* when he was fifteen. (*Jihadists* often backdate the timing of their own epiphany, or calling.) He was further inspired by the Mumbai attacks in late 2008.[57] It was around this time, during Mohamud's high school years, that his parents separated.[58] Parental discord is a relatively frequent traumatic event presaging radicalization among teenagers. (The exact trigger is not known. It could be that parental authority falls apart leaving the door open for other parental figures, or simply that the teenagers receive less supervision.)

By the beginning of 2009, Mohamud turned to the Internet in search of new religious authority. Between February and August of that year he exchanged over a hundred e-mails with Samir Khan, the American-born publisher of *Inspire*, an online Al Qaeda publication.[59] Mohamud's online communication alerted law enforcement officials, and the FBI began monitoring his activity. Within a few months, he took an active role in disseminating online propaganda information. The rapid pace at which Mohamud advanced from pre-radicalization searching behaviors to virtual *Da'wah* (a stage 1 activity) indicates the Internet's role as a catalyst to radicalization. On 17 March 2009, he e-mailed Khan hoping to obtain martyrdom videos. By August, he had already contributed and published four times in *Jihad Recollections*, an online magazine edited by Khan.[60] (Khan moved to Yemen in 2009, where he joined Anwar al-Awlaki. He was killed in a drone strike in 2011.)

In the fall 2009, Mohamud matriculated as an engineering student at Oregon State. Outwardly, he was a normal college freshman, drinking alcohol, playing video games, and attending campus events. This was no more than a façade: as he reminded himself in his diary, "you are: hipster Muslim ... no signs of extremism." Around this time, he

became interested in going abroad to Yemen to join AQAP, and an associate from Portland who had moved to Yemen sent him detailed e-mails describing how he should travel there under the guise of attending an Islamic school. Mindful of recent recruitment of Somali youth in Minnesota, Mohamud's father became concerned and contacted the FBI to say that his son might have been brainwashed.[61]

Mohamud became even further entrenched in virtual *jihadist* networks, ramping up communication on extremist forums throughout the school year. In June 2010, he once again tried to leave Portland, hoping to travel to Alaska and to get a job in the fishing industry in order to fund his travel abroad. [62] He was unable to leave due to having been placed on the "no-fly" list.[63] Frustrated in his hope of engaging in *jihad* overseas, Mohamud set his sights on a domestic attack. In July he met with undercover agents and expressed his desire to play an operational role. By August, he had selected the Portland Christmas tree lighting ceremony as an ideal target.[64] As his practical planning for a violent incident (stage 3 behaviors) progressed and the planned attack became imminent, Mohamud formally dropped out of school in October.[65]

On 26 November 2010, he was arrested trying to detonate an inert truck bomb planted by FBI operatives.[66] His progression from initial interest in *jihadist* ideology to actively planning a violent domestic attack took about two and a half years. It is worth noting that the process was considerably lengthened by Mohamud's twice-aborted attempts to travel abroad.

Preliminary Findings

Sixty-eight cases have been coded to date. The total expected observations are at minimum one indicator for each of the four stages in the model times the number of cases coded, for a minimum total of 272 observations. We were unable to find information relevant to one or more stages in the case of only three individuals. This showed that the research was feasible, something that could not be taken for granted at the outset.

The average time frame from the initial exploration of extremist ideas to "bang" was just over five years. The median (most typical) trajectory was four years and a few months. This is a far longer trajectory than expected. The finding contradicts the common perception that people become radicalized in a flash. The average is distorted by a few cases with very long pathways, lasting more than a decade from the initial radicalization to "doing something." The trajectory from stage 1 through stage 3 to the cataclysmic endpoint is far shorter, with an average of 2.85 years and a median of about 2.5 years. A caveat is that most of the cases coded so far are older cases, predating the shift to online social media networking as a predominant forum for radicalization. It may be that the average obscures significant inter-generational differences. We will be able to better address this issue once data collection has been completed.

Some behavioral cues conformed to expectations regarding the sequence of overt behaviors associated with radicalization. The types of behaviors associated with pre-radicalization were generally observed to occur early on in the offenders' timelines. Personal crisis, traumatic events, and evidence of disillusionment occurred in over 90 percent of cases in the first part of the trajectory described as "pre-radicalization." However, indicators in this category are often pervasive (e.g., personal crisis) and assume importance only in conjunction with behaviors linked to subsequent stages of radicalization. Stage

one indicators sometimes first occurred early on, blending in with indicators that we expected to be indicative of the pre-radicalization stage, which could suggest either that we placed the cue in the wrong stage or that the two stages are less distinct than we theorized. (This is a question we will revisit with more data.) Several stage-two indicators also occurred as expected in the sequencing of behaviors: for example, life-style changes and engagement in outreach attempting to spread the word (*da'wah*) either online or in real-life. In over 80 percent of the cases, such overt behaviors occurred at the expected time in the process of radicalization and were also almost universal among the offenders.

A few indicators chosen for the model performed poorly. Some were not common occurrences or occurred randomly across the timelines. Premature school leaving ("dropout") is widely thought to indicate early radicalization but in fact most people in our dataset are not dropouts. This finding was confirmed by an analysis of larger data set ($N = 235$) of American "homegrown" extremists inspired by *Salafi-jihadist* beliefs. Sixty-one percent complete their education, and close to one-third have completed college. (A handful obtained advanced degrees.)

Even among the dropouts the association between dropout and radicalization was weak. Typically, individuals who did not complete their education dropped out of formal education 0 to 2 years after they radicalized. A more common occurrence is disengagement from education while still in school or seeking out employment situations involving little oversight, in what may be described as under-employment. Dzhokhar Tsarnaev is an illustration. Considered a good student and praised by his high school teachers, the younger Tsarnaev brother received a scholarship to attend the University of Massachusetts but did not study after he arrived on campus. He was about to be expelled for failing to meet minimum grade point average (GPA) standards when he and his brother carried out their attack at the finish line of the Boston Marathon in April 2013.[67]

Low-threshold activities involving support for terrorism and the communication of threats (e.g., against individuals who "insult" the Muslim Prophet), also proved to be common, but, while these behaviors are part of the picture, they are not helpful for a dynamic risk assessment because they are engaged in throughout the radicalization trajectory.

Peer immersion with other extremists was thought to be a stage 2 activity but occurred in that stage in only ~60 percent of the cases. However, when not occurring in stage 2, it invariably occurred earlier in the radicalization process, and never later, in stage 3. If the finding holds up as more data is collected, this should have practical applications. Law enforcement often relies on group activities as an indicator of radicalization. The later that group engagement occurs, the smaller the window for preventive action.

Two sets of indicators proved not only robust, but also conjunctional. Actively seeking out information about extremist versions of Islam and looking for new authority figures (real-life and online) occurred together in the pre-radicalization stage. Likewise, three behavioral cues indicative of stage 2 activities generally corresponded with one another: expressions of desire for violent action, engaging in physical training or developing skills considered useful to terrorism, and peer-immersion.

Several preliminary conclusions may be drawn from the analysis. First, trigger events such as overt manifestations of rebellion (e.g., haranguing people at the local mosque) and low threshold activities such as online extremist engagements may feature at any time in the process of radicalization. They are part of the picture but not helpful to a dynamic risk assessment. Second, dynamic assessment models should focus on sequences, processes, and cues to extremist behaviors that occur in conjunction. Finally, in a

dynamic risk assessment, initiating behaviors that are generally regarded as legal if problematic activities assume evidentiary importance when they are linked to other cues indicative of a deepening engagement with violent extremism.

Conclusion

Recent years have seen an explosion in studies informed by a desire to use data-driven social scientific methods to understand the roots of terrorism. Regrettably, the schism over proper methodology that has plagued the social sciences has also affected the impact of social science in terrorism studies.[68] Memes from the frontlines of the paradigm war include calls for "scientific" methods and the use of control-case studies as the methodological "gold standard." Another mantra is that "selecting on the dependent variable" is cardinal sin, meaning that restricting one's set of observations to studying only *jihadists* is you are interested in *jihadists* is the wrong thing to do.[69] What is the base population from which we may select a population control group? Is "Muslim" the appropriate population? Young men? One effort to apply a public health approach to estimate population risks for violent extremism failed to identify population risk factors other than "youth" and "Muslim," thus inadvertently lending support to the notion that all Muslim youths are a terrorist risk.[70] (It should be noted also that the epidemiologic approach fails to capture the convert phenomenon.)

The reality is that there are no specific population risk factors that can predict chances of becoming a violent extremist. A quick estimation will make the point. Let us say that there are, today, 300 Muslim homegrown terrorists in the United States (this is a realistic estimate but probably on the high end). For the sake of the thought experiment, let us ignore for the moment that many Muslim terrorists are converts to Islam rather than demographically "Muslim" and that we do not actually know for sure how many Muslims live in the States, and assume a base population of about 3 million people. The risk rate is .0001, a number so low that the chance of making statistically reliable inferences is nil. Put differently, at most, 1:10,000 of the "base population" becomes a terrorist. The data selection rules applicable to quantitative theory testing are irrelevant to a broad range of studies and research designs in terrorism studies.

Comparative studies are often useful but the logic of inferences is one of variation finding. From a methodological viewpoint there is no inherent advantage to the research to include a comparative group of other types of violent terrorist offenders to study *Salafi-jihadists.* It depends on what you aim to achieve. The methodology presented here draws on a different tradition in the social sciences, what has been called *cliometrics*. (Clio is the muse of history; metrics is self-explanatory.) The goal is to translate qualitative records into numeric observations that then can be subjected to quantitative analysis. We have proposed an empirical and testable model for the comparative analysis of radicalization trajectories. The model is descriptive. It may eventually allow us to discern some variations between different groups and cohorts of offenders, and assess trends.

Finally, it may also be that the model can be used to describe and understand the radicalization processes characteristic associated with other types of extremist ideologies advocating violence. It is important to note that the observed regularities driving the characteristic radicalization process are endogenous to the ideology rather than expressions of innate psycho-social ailments characteristic of the *Salafi-jihadist* terrorism offenders. It has at various times been argued that terrorists are likely to be depressive or to suffer from post-traumatic stress disorder (PTSD), or to have narcissistic personality

disorders.[71] No evidence exists to support these assessments as general propositions. Instead, the evidence suggests that it is the ideology and the behavioral changes and adaptations required by the *Salafi-jihadist* belief system that lends a predictable structure to the radicalization process. Therefore, the specific behaviors may be assumed to be unique to this group of violent extremist offenders. That does not exclude the possibility that comparable mechanisms of dissemination and recruitment drive radicalization across different ideologies.

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Notes

1. The methodology and preliminary findings were presented at a meeting of researchers and law enforcement officials from Canada, the United Kingdom, and the United States held in Washington, DC, 28–30 July 2015. Jytte Klausen (PI), "A Behavioral Study of the Radicalization Trajectories of American 'Homegrown' Al Qaeda-Inspired Terrorist Offenders." Opinions or points of view expressed in this article are those of the author and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

2. "Strategic Implementation Plan for Empowering Local Partners to Prevent Violent Extremism in the United States" (Executive Office of the President of the United States, December 2011).

3. See, for example, Edwin Bakker, *Jihadi Terrorists in Europe: Their Characteristics and the Circumstances in which they Joined the Jihad. An Exploratory Study* (The Hague: Clingendael Security and Conflict Programme, 2006).

4. Readers are directed to Randy Borum's fine review summarizing the literature on radicalization theories: Randy Borum, "Radicalization into Violent Extremism I: A Review of Social Science Theories," *Journal of Strategic Security* 4(4) (2011), pp. 7–36.

5. Abdur Rahmaan Anderson is a manager with the U.K. probationary services, the National Offender Management Service (HMPS). He has worked with the de-radicalization of *jihadist* violent offenders in London and is a self-described *Salafist* Muslim.

6. Violence as the end point is stressed here. People can obviously be "radical" about any number of issues without resorting to political violence. Brian Michael Jenkins, "Foreword," in Daveed Gartenstein-Ross and Laura Grossman, *Homegrown Terrorism in the U.S. and U.K. An Empirical Examination of the Radicalization Process* (Washington, DC: Foundation for the Defense of Democracies, 2009), p. 7.

7. Jytte Klausen (PI), *The Western Jihadism Project.* [Data file]. Brandeis University, Waltham, MA. 2015. The data collection comprises detailed demographic records of Western citizens and residents who have been convicted of terrorist acts on behalf of or inspired by Al Qaeda. From this larger dataset, we identified a subset of American "homegrown" *jihadists*, including in this category only individuals who were born in the United States and grew up here, or arrived in this country before the age of 16 and therefore were assumed to have radicalized here.

8. The same does not necessarily apply to "sleeper" cells and individuals who arrive in the United States on a mission to "do something," in which evidence is in any case rarely available to us.

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10. John Horgan, "From Profiles to Pathways and Roots to Routes: Perspectives from Psychology on Radicalization into Terrorism," *Annals of The American Academy of Political and Social Science* 618, no. Terrorism: What the Next President Will Face (July 2008), p. 81.

11. Borum, "Radicalization into Violent Extremism I," p. 9. See Jeremy Ginges and Scott Atran, "What Motivates Participation in Violent Political Action," *Annals of the New York Academy of Sciences* 1167(1) (1 June 2006), pp. 115–123.

12. Mitchell D. Silber and Arvin Bhatt, "Radicalization in the West: The Homegrown Threat" (City of New York Police Department, 2007), pp. 6–8.

13. Fathali M. Moghaddam, *From the Terrorists' Point of View: What They Experience and Why They Come to Destroy* (Westport, CT: Praeger Security International, 2006).

14. Silber and Bhatt, "Radicalization in the West," pp. 12–13.

15. The Canadian protocol is the most detailed. See *Risk Assessment Decisions for Violent Political Extremism, 2009-02*. Public Safety Canada, Government of Canada. The FBI uses a cumulative risk model borrowed from the United Kingdom's Prevent program: "An individual becomes at-risk when three elements are present: threat, vulnerability, and consequence. These three elements are not independent of each other, but, rather, all must be present to result in an at-risk individual. The sum of these three elements equates to an individual's risk, which considers motivation, intent, capability, opportunity, and psychological gain from acting on intentions." Quoted from *A New Approach to Countering Violent Extremism: Sharing Expertise and Empowering Local Communities*, FBI Law Enforcement Bulletin (October 2014).

16. "Behavioral Indicators Offer Insights for Spotting Extremists Mobilizing for Violence" (National Counterterrorism Center, 22 July 2011).

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20. Silber and Bhatt, "Radicalization in the West: The Homegrown Threat."

21. Derek Beach and Rasmus Brun Pederson, "What Is Process-Tracing Actually Tracing? The Three Variants of Process Tracing Methods and Their Uses and Limitations" (University of Aarhus: Department of Political Science and Government, September 2011).

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24. United States of America v. Shelton Thomas Bell Sentencing Order (United States District Court of Florida Jacksonville Division 2015).

25. Kinner and Lush, "Florida Mosque Leaders Say Teen Talked of Jihad."

26. United States of America v. Shelton Thomas Bell Indictment (United States District Court Middle District of Florida Jacksonville Division 2013).

27. United States of America v. Shelton Thomas Bell Redacted Transcript Sentencing Hearing (United States District Court Middle District of Florida Jacksonville Division 2014).

28. United States of America v. Shelton Thomas Bell. Indictment, p. 2.

29. United States of America v. Shelton Thomas Bell. Sentencing Order, p. 4.

30. United States of America v. Shelton Thomas Bell. Redacted Transcript Sentencing Hearing, p. 79.

31. United States of America v. Shelton Thomas Bell. Indictment, p. 4.

32. United States of America v. Shelton Thomas Bell. Sentencing Order, p. 7.

33. Ibid., p. 9.

34. United States of America v. Shelton Thomas Bell. Factual Basis (United States District Court Middle District of Florida Jacksonville Division 2015), p. 1.

35. United States of America v. Shelton Thomas Bell. Sentencing Order, p. 1.

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39. Ibid., p. 421.
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42. Ibid., p. 428.
43. Ibid., p. 423.
44. Ibid., p. 439.
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48. Ibid.
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63. United States of America v. Mohamed Osman Mohamud Government's Trial Memorandum, p. 12.
64. Ibid., p. 18.
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67. United States v. Dzhokhar A. Tsarnaev. Exhibits. Day 12 (24 March 2015).
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69. The source for many of these arguments is the popular book by Gary King, Robert Keohane, and Sidney Verba, *Designing Social Inquiry* (Princeton, NJ: Princeton University

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