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Insights from Neurobiology on Influence and Extremism

Strategic Multi-Layer Assessment

These reports will provide the operational and policy communities with a deeper understanding of the unique behavioral and neurobiological factors that underlie political extremism, specifically in the cyber realm. There are three volumes contained within this series:

I. Cyber on the Brain: Insights from CyberPsychology and CyberNeurobiology on Political Extremism
II. Topics in Operational Considerations on Insights from Neurobiology on Influence and Extremism
III. The Neurobiology of Aggression/Counter-Aggression

Cyber on the Brain: The Effects of CyberNeurobiology & CyberPsychology on Political Extremism

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Volume I: Insights from Neurobiology on Influence and Extremism

OVERVIEW

This white paper provides a unique and multi-disciplinary perspective on political extremism in the cyberspace realm by assessing the processes by which political extremism is affected by advances in communication technology and the online environment. Advances in the Internet and related technologies have played, and continue to play, an important role in all aspects of national security. The convergence of technology and social media has presented great opportunities, but also generates security risks. It is suggested that cyber-based communications technology helps foster connections among groups of individuals, allowing for the spread of memes and movements for peaceful change. Yet, at the same time, the Internet and related technologies may enhance the emergence of violent extremist organizations as well as subsequent recruitment. This is an exploratory first step towards understanding the implications for cyber-based communications technology on the root factors pertaining to political extremism.

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Executive Summary

Advances in the Internet and related technologies have played, and continue to play, an important role in all aspects of national security. The convergence of technology and social media has generated opportunities for improved target audience communications and interventions, but also provides individuals who may seek to harm with the ability to communicate their own messages and ideologies around the world quickly and broadly. These opportunities, and the development and continued advances in cyber technologies including the Internet and social media applications and websites, present the United States Government (USG) and its allies with numerous intervention scenarios though there also are potentially grave risks. While these technologies help foster connections among groups of individuals, allowing for the spread of viral advertising, ideas, and memes[1] as well as movements for political change, they may also have facilitated the emergence and extended the reach of violent extremist organizations (VEOs).

The main question guiding this inquiry is: *What are the implications of cyber-based communications for theories of political mobilization and mass radicalization?* This document seeks to explore cyber-related implications for key concepts underlying current models of radicalization and mobilization (e.g., norm generation and propagation, cultural and genomic adaptations, attitude and belief formation). It explores peer-reviewed academic research on the topic of political extremism, radicalization, and mobilization in light of advances in communication technology and the online environment. In addition, interviews were conducted with researchers to ensure that even yet-to-be-published research findings were included. This report builds directly on recent Strategic Multilayer Assessment (SMA) projects pertaining to political extremism and countering violent extremism including the June 2012 SMA report entitled "*Neurobiological & Cognitive Science Insights on Radicalization and Mobilization to Violence: A Review*," while drawing on the vast literatures and ongoing research of scientists in the fields of neurobiology, social and cognitive psychology, social and cognitive neuroscience, political science, anthropology, communication science, and other related disciplines.

[1] According to Merriam-Webster a meme is "an idea, behavior, style, or usage that spreads from person to person within a culture" (Merriam-Webster, 2012)

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Acknowledgements

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Introduction

This project, sponsored by the Strategic Multilayer Assessment Office and conducted from March 2012 to September 2012, seeks to explore academic literature regarding radicalization and mobilization in the cyber realm and the implications of this literature for individuals tasked to understand and deter violent political extremist actions. The key motivating question is: In what ways do the Internet and related technologies, including telephonic and network connectivity, modulate radicalization from how it is generally understood to occur in the physical realm?[2]

The 2010 National Security Strategy white paper states "cybersecurity threats represent one of the most serious national security, public safety, and economic challenges we face as a nation" (Department of Defense, 2011, p. 1). Although the focus of concern primarily appears to be network security, there is growing acknowledgement of the importance of examining cyberspace as a medium for information dissemination and as a tool for radicalization and mobilization. Advancements in cyber-based communication technology (CBCT) raise important questions about the blurring of lines between physical-based reality and cyber-formed reality and how they may differ in delivering catalysts for extremist action while potentially removing vital inhibitors. For example, CBCT may be thought of as an enabler to individuals and groups of individuals who might not otherwise be exposed to radical elements. A subsequent concern is whether psychological and emotional responses to radical information differ depending on the medium by which connections were made and through which dialog continues. Additionally, while researchers have recently demonstrated differences between individuals who have and have not been raised with CBCT, the full extent of those differences are empirical questions yet to be explored (Moody, 2001; Frank, Marci, & Martin, 2012). Similarly, there is much research on the role of CBCT in radicalization and mobilization that remains to be done (Patel, 2011; Borum, 2011a; Nasser-Edine, Garnham, Agostino, & Caluya, 2011). Nevertheless, practitioners can extrapolate from knowledge gained from research on radicalization in the physical realm by overlaying emerging insights from CyberNeurobiology and CyberPsychology to augment understanding of the effects of CBCT on radicalization and mobilization.

The overall purposes of this project and this report are to

1) aid the operational and policy communities in understanding the unique behavioral and neurobiological factors that underlie political extremism via the cyber realm; and,
2) assess the implications of new research in CyberNeurobiology and CyberPsychology for countering extremist messaging and enhancing dissuasion efforts.

In order to pursue these objectives, the authors reviewed relevant literatures as well as contacted neurobiologists, social psychologists, and other academics with expertise on the current state of research in their fields. In addition, red-team workshops with operators were held in order to ensure that the results were operational and relevant to the community's requirements. By integrating the most recent findings in the continually maturing body of neurobiological research with existing operational and intervention strategies, this report seeks to provide an interdisciplinary, readily-usable summary of critical insights from the sciences that may inform current USG efforts in the cyber realm, while also highlighting for the academic community further areas for research.

[2] Throughout this report, "cyber" will be juxtaposed against the "physical realm."

Approach

The basic approach for this project comprised three-phases.

- **Phase 1:** Explore current radicalization models and theories through a thorough exploration of well-known radicalization and extremism frameworks and constructs while evaluating these models' applicability to the cyber realm given current understandings of that domain
- **Phase 2:** Review the state of the art in the literature across multiple disciplines, including the social and biological sciences, as well as radicalization theories, recent findings regarding the implications and effects of social media on information processing and learning, and the potential insights to be gleaned from recent developments in neurobiology, genetics, and experimental psychology
- **Phase 3:** Assess implications of behavioral and neurobiological factors impacting radicalization and mobilization in the cyber realm according to the academic literatures for the operational and policy communities

Definitions

Over the past few years, there have been a number of papers, reports, and conference proceedings published on the topics of radicalization, mobilization, political extremism, and violent extremism (Stevens & Neumann, 2009; Borum, 2011a). However, a close reading of these documents quickly illustrates the absence of widely accepted definitions for many important terms. The absence of a common lexicon is even more apparent when reviewing literature across disciplines. For the purposes of this white paper, we use the following working definitions to help bound the discussion.

- **CyberNeurobiology:** Includes the fields of neuroscience, genomics, and endocrinology as they relate to human/cyber interactions
- **CyberPsychology:** Includes the fields of social and cognitive psychology, political science, and learning sciences as they relate to human/cyber interactions
- **Cyber(space):** "A global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems and embedded processors and controllers" (England, 2008)
- **Internet:** A "subset of cyber(space). System of interconnected computer networks" (Stevens & Neumann, 2009)
- **Social Media: "**A group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" (Stevens & Neumann, 2009)
- **Mobilization:** The act of assembling and putting into readiness for action
- **Radicalization:** "The process by which individuals come to believe their engagement in or facilitation of non-state violence to achieve social and political change is necessary and justified" (Hunter, 2011)
- **Political Extremism:** "Political ideologies and methods that oppose a society's core values and principles and show disregard to the life, liberty and human rights of others" (Stevens & Neumann, 2009). Additionally, political extremists "oppose—in principle and practice—the right of people to choose how to live and how to organize their societies; and support the murder of ordinary people to advance their extremist ideological objectives" (Joint Pub 3-26, Counterterrorism, 2005)

Organization of the Report

This report is organized as follows.

- **Chapter 1** presents a brief review of how radicalization and mobilization have been researched by those working in academia and law enforcement. The approaches are divided into two categories: those that build up from general social science theories (such as social identity theory or rational choice theory) and those that infer a general model based on case studies. The Two-Pyramids framework, which describes radicalization and mobilization as transitions between opinion and action states, is introduced. This serves as the basis for subsequent discussion.

- **Chapter 2** examines factors that are linked to transitions between the opinion and action states captured in the Two-Pyramid model. Two kinds of factors are identified: shaping factors that affect the social and personal context within which people function and transition factors that activate or impede transitions between states. The factors are discussed and the implications of advances in cyber technologies on these factors is analyzed.

- **Chapter 3** discusses the broad implications of the analysis, with a focus on how to get "left of boom," and reviews key areas for future research.

Chapter 1: The Two-Pyramids Model of Radicalization and Mobilization

The emergence and evolution of CBCT across the globe has connected billions of individuals while providing access to information in ways that were only imagined in science fiction novels a mere 30 years ago. Today, academics, practitioners, and operators are facing an increasingly online, mobile, and interconnected world with more than two billion Internet users, over 6 billion mobile-phone accounts (ITU, 2011), and billions of television and radio viewers/listeners across every country in the world. While easy access to information, augmented by ongoing enhancements in wireless and broadband technologies, allows for the near instantaneous spread of ideas, innovations, and social movements, mass communication—and the magnitude and significance of its impact—is not a new development. A 1972 review (Mathiason, 1972 as cited in Thompson, 2011) found that mass media—then limited to print media, television, and radio—was effective in implementing social change by providing new opportunities to transmit social ideas and movements. According to the review, "instead of telling a population how to respond to social and political change, it *showed* the perspective of the individual and how that individual was responding and coping with social and political changes" (Mathiason, 1972 as quoted in Thompson, 2011). However, the speed at which information spreads and social connections are made provides fertile ground for modifications in the way in which CBCT affects how people process, trust, and disseminate information, build relationships, and translate cyber reality to the physical reality.

There are countless firms paid to identify target audiences and create persuasive messaging campaigns to help ensure that a brand, idea, product, or thought both resonates with that audience and is transmitted through various social networks. In other words, the word-of-mouth mechanism that often defined community grapevines or gossip mills has grown to a new and massive scale, transcending national borders, linguistic boundaries, and even the constraints of broadcast time. Moreover, this kind of communication and information sharing operates whether or not a person or group is deliberately trying to get a message out and regardless of the actual content of the message. With regard to the spread of radical ideas, researchers continue to grapple with understanding the implications of how advances in computer- and technology-mediated communications may impact the development, perpetuation, and elimination of violent political extremism in both the physical and cyber realms. Indeed, just as the Internet and related technologies have extended the reach of democracy activists, they have also provided terrorist organizations and their supporters with virtual spaces in which to reach potential recruits, build support networks, fundraise, and propagate their messages. What once could only occur in the physical realm, where governments could more easily track activities and interdict operations, can now occur among the trillions of messages exchanged every day in the cyber realm.

To begin to understand the implications of CBCT for the processes of radicalization and mobilization, this chapter reviews different approaches that have been employed in the study of those processes. The first section of this chapter discusses the current understanding of radicalization and mobilization as reflected in bottom-up frameworks that start with general social science theories and operational approaches that begin with analyses of cases and are currently in use by different agencies within the United States Government. The second section presents an overview of the Two-Pyramids framework that forms the basis for the analysis presented in Chapter 2.

Understanding Radicalization and Mobilization

The first phase of exploring whether there is reason to believe that what we know about radicalization and mobilization in the physical realm holds true in the cyber realm requires an investigation into the current understanding of radicalization and mobilization. An initial exploration of the relevant academic literature presents a wide range of theories, frameworks, and models exploring the basic mechanisms and root causes of radicalization and mobilization. Academics and practitioners have approached the phenomena from multiple disciplines and varying levels of analysis—from the macro level of societies and communities to the meso level of groups and organizations to the micro level of individuals and their biological characteristics. Working within the respective disciplines, these efforts typically build on established theoretical foundations or case studies to explain radicalization-to-mobilization. While it is beyond the scope of this effort to contrast, compare, and collapse the current state of understanding into a unified and comprehensive approach to explaining radicalization and mobilization, it is beneficial to review the current approaches and identify those factors commonly purported to be involved in an individual's developing extremism. For the purposes of this report, the emphasis is on identifying factors that are expected to be most susceptible to advances in CBCT.

Bottom-Up Approaches

Scholars conducting research in fields as diverse as psychiatry, psychology, sociology, economics, social psychology, and political science have contributed to our understanding of radicalization. In fact, there are as many as twenty different approaches or theories that have been applied to the study of radicalization, including psychoanalytical theory, social movement and mobilization theory, social justice theory, relative deprivation theory, transformative learning theory, and social network theory. A substantial portion of the literature over the past twenty years has focused on reviewing these theories and the empirical evidence—or in some cases, the lack of empirical evidence (Mazer & Lambert, 2010)—that supports them (e.g., Victoroff J. , 2005; Borum, 2011; Nasser-Edine, Garnham, Agostino, & Caluya, 2011). The following section reviews the most commonly discussed theories underpinning the current understanding of radicalization and mobilization.

Psychoanalytic theories: One of the earliest theoretical explanations of radicalization operates on the presumption that those who engage in extremist violence suffer from some form of mental illness or psychopathology (Stark, 1965; Swatos, 1998). To the theoreticians and practitioners in this field, radicalization and extremist mobilization were construed to be irrational and, therefore, aberrant. While it may be that some radicals and extremists do possess narcissistic tendencies (e.g., Ted Kaczynski), apocalyptic tendencies (e.g., Aum Shinrikyo), or novelty-seeking tendencies (e.g., Yitzhak Shamir), citing a lack of evidence[3], conventional wisdom has begun to move away from personality and psychoanalytic theories as explanations for radicalization (McCauley C. R., 2011; Horgan, 2008). This shift has caused academics and practitioners to accept the possibility that individuals engaging in these types of activities understand "right" versus "wrong," yet are motivated to engage in "wrong" behaviors. Instead, most theoreticians and researchers now focus on understanding the complex psychosocial processes underlying radicalization and mobilization (e.g., Borum, 2011a; Horgan, 2008; Victoroff J., 2005; Victoroff & Adelman, 2012).

[3] With the exception of some lone-wolf cases.

Personal experience theories: A number of scholars working in psychology and social psychology have explored several personal experience theories that suggest that humiliating or traumatic life events influence, and potentially motivate, extremist beliefs and actions. For example, the female suicide bomber who killed Indian Prime Minister Rajiv Ghandi was reportedly a victim of rape (Bloom, 2007), and Chechen suicide terrorists had experienced the imprisonment or death of a relative at the hands of the Russian forces they opposed (Speckhard & Akhmedova, 2006). Similar studies have found that Gazan teenage boys were more supportive of attacks on Israeli civilians if they had a family member wounded or killed by the Israeli Defense Forces (Victoroff, et al., 2010). Another personal experience explanation suggests that people learn by observation (Bandura, 1973). This perspective on social learning contradicts the notion that aggression is borne of frustration or is instinctual (Berkowitz, 1969) and instead suggests that aggression is a learned pattern of behavior (de Rivera, 2003). Other factors that may influence individuals include feelings of individual or egoistic relative deprivation (i.e., not having the same resources as my neighbor), humiliation, or marginalization. Work in the areas of stigmatized groups suggests that these individuals tend to have a lower sense of well-being and self-esteem, an altered self-perception and group identification, decreased motivation, and reduced task performance (see, for example, Levin & Van Laar, 2006), which may contribute to an increased susceptibility to radicalizing influences.

Socio-economic status theories: Popular discussion of terrorism in the Western media often implies that socio-economic deprivation is a critical driver of radicalization and mobilization. The classic frustration-aggression model (Dollard, Doob, Miller, Mowrer, & Sears, 1939) suggests that aggression is the response of an individual who does not receive what he expects. Aggression may be directed in at oneself or outward at others. Outward aggression may be either direct or displaced. Many interpretations of the frustration-aggression construct include "objective poverty and powerlessness as sources of frustration that can lead to anger" (Bongar, Brown, Beutler, Breckenridge, & Zimbardo, 2007). Gurr (1970) equates relative deprivation with "the tension that develops from a discrepancy between the 'ought' and the 'is' of collective value satisfaction, [which] disposes men to violence." However, while an application of the frustration-aggression model suggests a link between relative deprivation and a tendency toward violence, multiple literature reviews conclude that frustration by itself is neither a necessary nor sufficient condition for aggression, and that other factors, such as anger, must be involved in the frustration-aggression link (LaFree & Ackerman, 2009; Smelser, et al., 2002). Recent research with Pakistanis indicates that socioeconomic deprivation on its own may not be a primary mechanism or instigator of extremism (Blair, Fair, Malhotra, & Shapiro, 2011; Fair, Malhotra, & Shapiro, 2009). Other research that finds that Al Qaeda planners tend to be highly educated rather than deprived, impoverished individuals, raises questions about the appropriateness of purely socio-economic theories for explaining radicalization for members of Al Qaeda and other similar groups (Gambetta & Hertog, 2009).

Rational behavior theories: A large focus in the study of radicalization has been on the factors that lead an individual to move from neutral to extreme attitudes. One argument is that people make rational decisions based on some (conscious or unconscious) cost-benefit analysis that will maximize their own rewards (von Neumann & Morgenstern, 1944; Nash, 1950). To support this approach, some studies have noted the link between enacted policies and subsequent terrorist behavior modification (Li & Schaub, 2004; Rosendorff & Sandler, 2005; Weimann & Brosius, 1988). For example, following the implementation of X-ray screening in airports, terrorists' use of airplane hijackings diminished while other alternative targets and behaviors increased (Enders & Sandler, 2000; 2002; 2006). Strict rational choice theories assume that people behave rationally, have complete information, and are motivated by their own self-interests. Because those assumptions do not always hold (Caplan, 2006; Victoroff J. , 2005), many argue that the stringency of the rational choice assumptions weakens the utility of the approach. Theories rooted in strict rationality

assumptions are helpful in understanding some instances of radicalization and mobilization, but are insufficient to provide a holistic understanding of the factors at play. For example, rational choice cannot explain why 85 percent of World War II infantrymen failed to fire upon the enemy despite rational benefits (Victoroff J. , 2005) or why a 2000 (Schbley) study of Lebanese Religious Terrorists suggests that "very few individuals who rationally believe that terrorism may advance their causes even become terrorists" (Victoroff J. , 2005).

Social psychology theories and insights: Social identity theory (Tajfel H. , 1974) evolved from observations of ethnocentrism: the notion of in-group superiority over someone from a different ethnic or nationality group, that is, the out-group. According to Tajfel, social identities comprised the knowledge that one has of belonging to "a social group (or groups) together with the emotional significance attached to that membership" (p. 69). In other words, we are aware of the groups to which we belong; these are the groups that are self-relevant and important and, in turn, shape how we (and others) see ourselves. We use these identities to make comparisons to others. Our social identities allow us to gain a sense of order by providing a point of reference for who we are and how we interact with the world. In other words, they provide us with a set of normative behaviors, a worldview, and provide us with categorizing distinctions allowing us to identify members of our in-group as well as members of the out-group to aid in making sense of the world.

Expanding upon the basic premise of in-groups versus out-groups, research in the field of emotion (a sub-section of social psychology) suggests that individuals not only routinely categorize individuals according to in-group versus out-group identity, but also experience emotional responses relative to in-groups and out-groups (Motsumoto, Hwang, & Frank, 2010). For example, individuals may suffer from anxiety when confronted with a member of an out-group due to fear of negative evaluations or outcomes or a history of negative intergroup relations (Motsumoto, Hwang, & Frank, 2010; Niedenthal, Krauth-Gruber, & Ric, 2006; Stephan & Stephan, 1985). Additionally, individuals tend to exhibit in-group favoritism and out-group derogation. The concept of infrahumanization suggests that individuals tend to attribute more "human" emotions such as compassion, shame, serenity, bitterness, or contempt to the in-group versus more "primary" or basic" emotions such as surprise, anger, pleasure, fear, attraction, or disgust—a moral emotion used to sanction moral beliefs and actions (Chapman, Kim, & Anderson, 2009)—towards the out-group (Cortes, B.P., Demoulin, Rodriguez, & Leyens, 2005; Motsumoto, Hwang, & Frank, 2010). Additionally, intergroup emotions theory suggests that not only do individuals have anxiety over interactions with, and attribute basic emotions towards, members of the out-group, they also develop and foster feelings of anger which can lead to dehumanization, confrontation, opposition, hostility, and attacks against the out-group (Mackie, Devos, & Smith, 2000; Motsumoto, Hwang, & Frank, 2011).

Attribution of more primary emotions, particularly disgust, towards members of the out-group combined with anger facilitates dehumanization of the other can lead to hostile actions against the out-group (Motsumoto, Hwang, & Frank, 2010). It is critical, though insufficient, to understand differences in how individuals think and treat members of an out-group on an individual level when examining group-level phenomena. For example, research shows that when collective opinions and attitudes tend to become more extreme than individual group members' views, group polarization occurs (Borum, 2011a; McCauley C. , 1972). Group polarization can lead to actions based on decision-making that appears to be less rational and more biased than individual decision-making, a phenomenon commonly known as groupthink (Borum, 2011a). Thus, while there is significant reason to fear individual extremists—the lone-wolves—it is just as critical to understand the power of the group in motivating, forming, and shifting individual attitudes towards the more extreme

group attitude while at the same time reinforcing extremist norms and allowing for perceptions of diffused responsibility for action (Borum, 2011a).

Bottom-Up Summary

In summary, scholars across many disciplines have applied their foundational theories in an effort to understand better radicalization and violent extremism. The previous discussion highlights a number of these approaches. While each of the approaches discussed can contribute to overall understanding of radicalization and mobilization processes, at present no single theoretical framework captures the complex interaction of factors that explain any given individual's turn to radical or violent political action.

Operational Approaches

A substantial number of reviews have been produced on radicalization and movement to mobilization models (King & Taylor, 2011; Crossett & Spitaletta, 2010; Borum, 2011a; Nasser-Edine, Garnham, Agostino, & Caluya, 2011). By exploring current literature, three models of radicalization have been identified that have gained traction within the USG: the National Center for Counterterrorism model (National Counterterrorism Center, 2012), the FBI model (Borum, 2011a; Borum, 2011c), and the NYPD model (Silber & Bhatt, 2007; 2009). There are also commonly cited models within academic literature that are used by some members of the USG, such as Borum's (2003) four-step process of ideological development, Wiktorowicz's (2004) framing theory, Moghaddam's (2005) staircase to terrorism, Sageman's (2004) four emergent prongs approach, and Musa and Bendett's (2010) Islamic radicalization in the U.S. model. However, for the purposes of this paper, a brief review of several formalized models widely used within the USG is provided.

National Center for Counterterrorism Model

The National Counterterrorism Center (NCTC) model (see Figure 1), is one representation of how individuals radicalize, mobilize, and, in some instances, engage in violent activities. The authors of the NCTC framework emphasize that radicalization is a dynamic, multi-tiered process involving multiple interacting factors that influence an individual. These factors range from personal-level factors to the political and social context within which individuals find themselves. The circular nature of the constructed framework as well as the multi-directional arrows convey that radicalization and mobilization are neither linear processes nor are they necessarily permanent, insofar as a person can fall from a state of mobilization to one of radicalization or even a neutral position without exogenous interventions (National Counterterrorism Center, 2012).

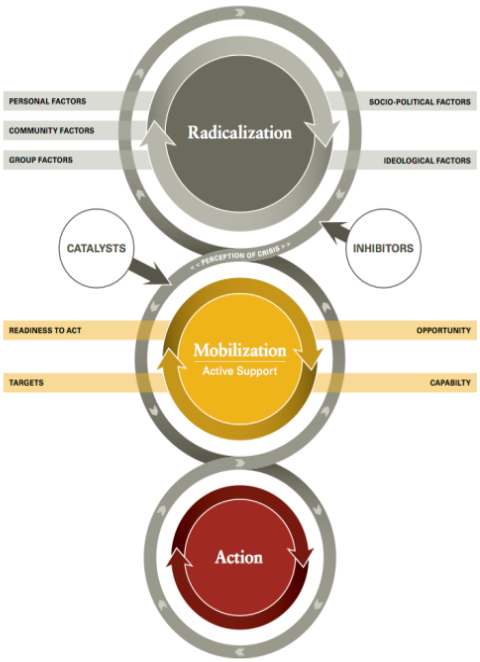

Figure 1: NCTC's Radicalization Framework

FBI Model

In contrast with the NCTC model, other radicalization models, including a model published by the Federal Bureau of Investigation (FBI) (Dyer, McCoy, Rodriguez, & Van Duyn, 2007) and reviewed by Patel (2011), show

a more linear progression from a pre-radicalization state to an action state (see Figure 2: FBI Radicalization Framework). However, each of the four steps in the process can, in principle, occur independently of the others, and transitions between steps can cease at any time (Miller, 2007). In public presentations of the radicalization process framework, it appears that the FBI has used this diagram to focus largely on home-grown Muslim extremism, and this is reflected in the descriptions of the process steps depicted in Figure 2 (Dyer, McCoy, Rodriguez, & Van Duyn, 2007; Miller, 2007; Patel, 2011). Application of this model to the analysis of other kinds of radicalization might require further generalizations of the model and its process steps.

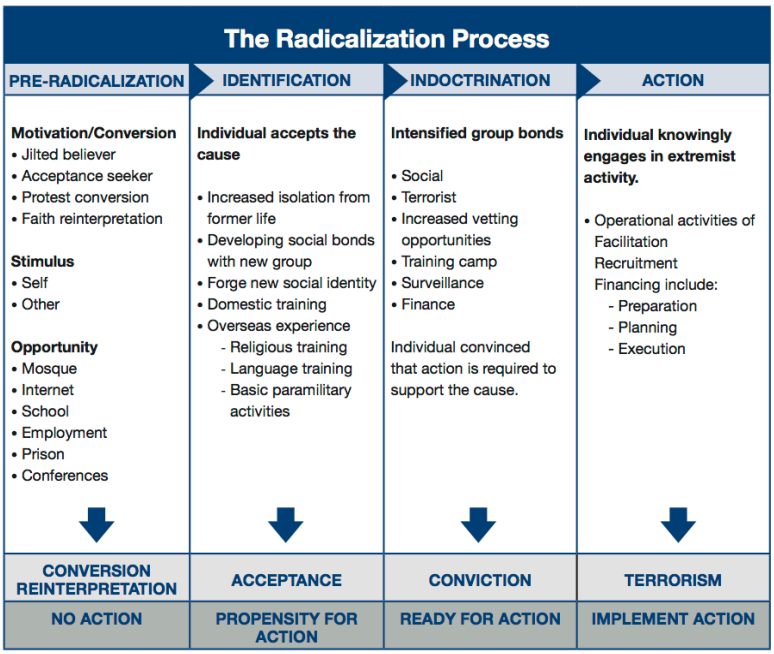

Figure 2: FBI Radicalization Framework

New York Police Department Model (Conveyer Belt)

In 2007, the New York Police Department Intelligence Division published *Radicalization in the West: The Homegrown Threat*. The report goes beyond the question of how terrorists commit acts and attempts to explain why they do so. The report details the authors' examination of how terrorist "intention forms, hardens and leads to an attack or attempted attack" (Silber & Bhatt, 2007) based on a four-phase model of radicalization: Pre-Radicalization, Self-Identification, Indoctrination, and

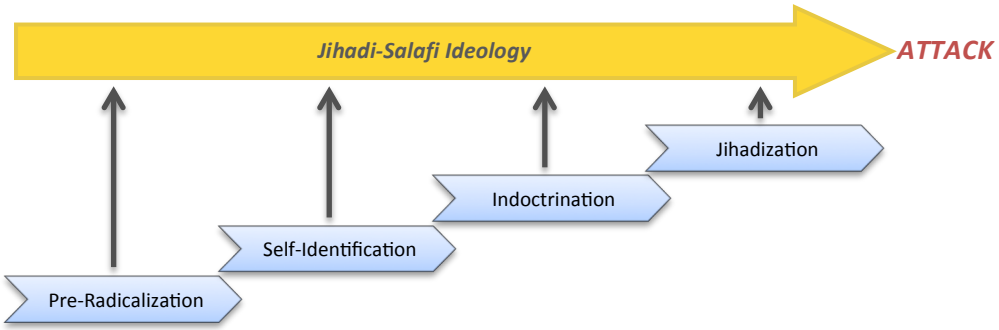

Figure 3: NYPD Model

Jihadization (Silber & Bhatt, 2007; 2009). The model (see Figure 3) is sequential; however, the authors note that individuals may not always follow the linear trajectory perfectly, with some individuals bypassing certain stages. The catalyst to move someone from pre-radicalization to self-identification with a radical ideology or group is some event occurring, a frame adjustment, or a search for identity. Next, individuals progress to the indoctrination stage where they accept the ideology and politicized beliefs of the radicalized group and have a greater reliance on the group.

Finally, the jihadization stage occurs, which involves accepting the obligation of jihad, as well as mentally preparing for and planning an actual attack.[4] Common to the FBI and NYPD models is an assumption of a type of "religious conveyor belt" in which religiosity is a central feature of the path to adopting radical beliefs; however, based upon existing literature, this may be an unfortunate oversimplification of reality (Patel, 2011).

SMA/McCauley "Two Pyramids" Framework

Despite the many efforts to understand radicalization, both operational and academic literatures fail to converge on a single comprehensive, empirically-grounded, and widely-accepted model or framework (Nasser-Edine, Garnham, Agostino, & Caluya, 2011; Borum, 2011a; Patel, 2011). The SMA team, in partnership with Dr. Clark McCauley, developed a SMA/McCauley "Two Pyramids" framework. The framework is based on a previous McCauley & Moskalenko model of radicalization and mobilization (McCauley & Moskalenko, 2008; Leuprecht, Hatley, Moskalenko, & McCauley, 2010). For the purposes of this paper, its application is principally illustrative; we use the pyramids as a basis for contextualizing and discussing the emerging findings from the fields of CyberNeurobiology and CyberPsychology.

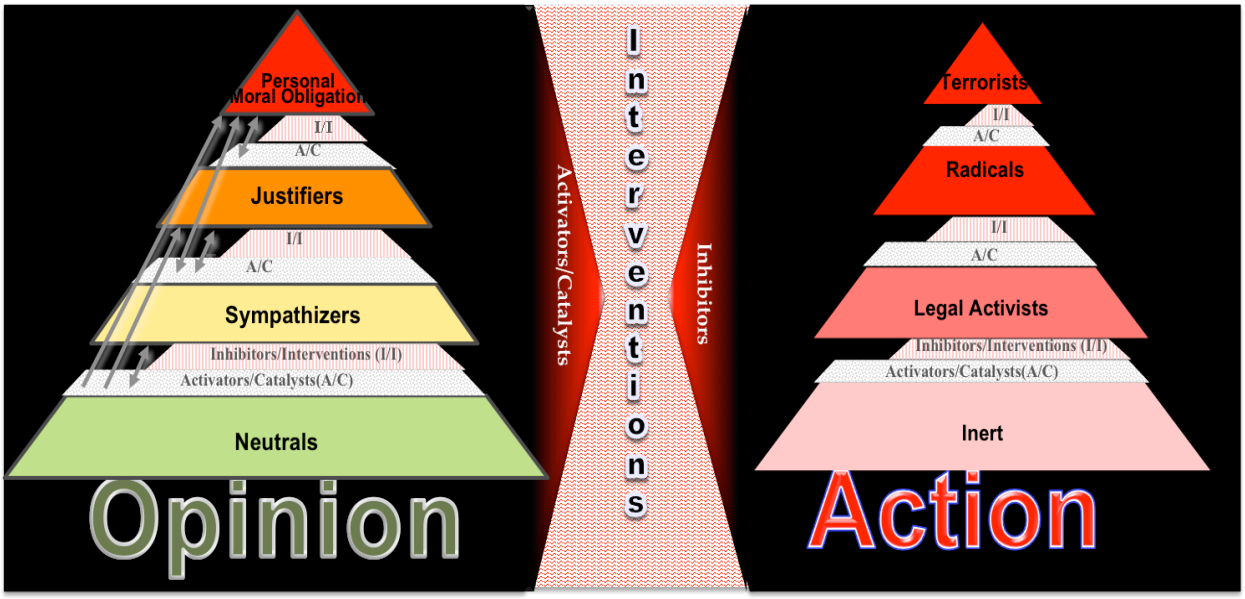

Figure 4: SMA/McCauley "Two-Pyramids" Framework

The two pyramids of the framework represent the opinion and action states that characterize individuals within a given population relative to a particular cause, which activists, radicals, and terrorists claim to represent. Within this framework, radicalization is a process that affects movement between opinion states, while mobilization is a process that affects movement between action states. Each pyramid is divided into four segments that correspond to varying levels—not necessarily ordinal—of radicalization (the opinion pyramid) and mobilization (the action pyramid). It is important to note that the two-pyramid framework is not a conveyor or stepwise functional representation of the complex radicalization and mobilization processes. Rather, the model

[4] It should be noted that the NYPD model has been subject to critique with one reviewer claiming that the report "rel[ies] upon a handpicked sample to draw conclusions about a broader population…based on just 10 case studies" (Patel, 2011, p. 20).

assumes that individuals can exist at any stage in each of the pyramids and move fluidly within the pyramids.

The layers or segments of the opinion pyramid are generally organized according to expectations about the largest to smallest subsets of individuals. They are below.

- **Neutrals (green):** Subset of the population who does not believe its group or cause is under attack and, thus, sees no need for violent action
- **Sympathizers (yellow):** Subset of the population who believes its group or cause is under attack, but opposes violent action for moral or practical reasons
- **Justifiers (orange):** Subset of the population who believes its group or cause is under attack and agrees that violent action is justified
- **Personal Moral Obligation (red):** Subset of the population who feels personally obligated to defend its group or cause

Similarly, the segments of the action pyramid are defined below.

- **Inert (light pink):** Individuals not participating in any form of political action
- **Legal activists (pink):** Individuals who participate in doing, planning, or financing legal political action (non-violent)
- **Radicals/illegal activists (red):** individuals who participate in doing, planning, or financing illegal political action (violent or non-violent)
- **Terrorists (red):** individuals who participate in doing, planning, or financing violent acts targeting civilians

In addition to depicting the varying segments, the framework suggests that for any transition between segments, there are two types of transition factors: 1) activators or catalysts that contribute to further radicalization or mobilization and 2) inhibitors or interventions that prevent or push an individual down to lower levels of the pyramids. Specifically, transition factors can be characterized as follows.

- **Activators:** Internal factors that enable or facilitate movement within or between segments of the pyramids
- **Catalysts:** External factors that enable or facilitate movement within or between segments of the pyramids
- **Inhibitors:** Factors unique to an individual or group that prevent or stall progression[5]
- **Interventions:** Factors inserted, through outside influence,[6] into a situation that prevent, stall, or reverse progression

It is important to note that individuals occupy both the opinion and action spaces simultaneously. An individual can be neutral (in terms of opinion) and inert (in terms of action) or can be neutral and a legal activist, and so on. The two-pyramid framework thus suggests 16 initial opinion-action base states (see Figure 5). If one assumes that any transition between states is possible, there are 240 possible transitions to consider. However, not all transitions are of interest in the present

[5] Inhibitors can be activators/catalysts and vice-versa depending on the circumstance and situation. For instance, sacred values like those in opposition to violence against civilians might inhibit an individual from taking a terrorist action; while on the other hand, the burning of a Koran (a violation of the sacred value regarding the holiness of Islam's principal religious text) might inspire an individual to take action.

[6] Factors inserted into the situation can be controlled or manipulated by any individual or group outside of the salient group identity including native governments, foreign governments, or competing groups.

discussion, particularly with regard to designing interventions or utilizing known inhibitors that hinder, or block, transitions to "higher-risk" states (up and to the right in the figure). Given that consideration, downward and leftward transitions can be set aside for the purposes of this paper, although future work should explore the factors unique to moving down the opinion and action pyramids, or, in other words de-radicalization. Considering only transitions from a state to states that are up or to the right of the initial state leaves 84 possible transitions related to radicalization or transitions toward violent action.

The 16 base states and the transitions between them are shaped by, or follow from, a variety of factors that establish the context within which the base states are formed as well as the space in which activators and inhibitors operate and catalysts and interventions are staged. It is through exposure to activators or catalyzing basic factors that an individual or group transitions from its initial state to another state. The original McCauley & Moskalenko model offers 8 mechanisms for change (McCauley & Moskalenko, 2008; McCauley & Moskalenko, 2010). The SMA/McCauley Two Pyramids framework amends this model based on an examination of a wider literature and insights from the models reviewed in Section 1 to offer eleven basic factors contributing to radicalization and mobilization. As specified in the framework, these are referred to as *transition factors*, which function as activators, catalysts, inhibitors, and interventions. These eleven transition factors do not operate in isolation; they interact with one another and may vary in their effects over time. In addition to the transition factors, we propose that there are certain aspects of an individual's local ecology—what we call "shaping factors" such as cultural values, genetic background, and access to technology—that condition whether and how transition factors, in combination with CBCT, play a role in their movement between radicalization states or levels of engagement in action.

TERRORIST	NEUTRAL-TERRORIST	SYMPATHIZER-TERRORIST	JUSTIFER-TERRORIST	PMO-TERRORIST
RADICAL	NEUTRAL-RADICAL	SYMPATHIZER-RADICAL	JUSTIFER-RADICAL	PMO-RADICAL
LEGAL ACTIVIST	NEUTRAL-LEGAL ACTIVIST	SYMPATHIZER-LEGAL ACTIVIST	JUSTIFER-LEGAL ACTIVIST	PMO-LEGAL ACTIVIST
INERT	NEUTRAL-INERT	SYMPATHIZER-INERT	JUSTIFER-INERT	PMO-INERT
	NEUTRAL	**SYMPATHIZER**	**JUSTIFER**	**PERSONAL MORAL OBLIGATION**

Figure 5: Summary of Available Opinion-Action States

Shaping Factors

Radicalization and mobilization occur in an existing political, social, and economic context within which the activators, catalysts, inhibitors, and interventions operate. Critical shaping factors operate at different levels of analysis. At the level of communities and societal groups, critical shaping factors include the cultural worldview, which entails master narratives, cultural levels of interdependence (individualistic v. collectivistic[7]), ideology, and the values and beliefs that pervade

[7] According to research by Hazel Rose Markus and Shinobu Kitayama (1991) on the concept of culture and self various cultures "have

the cultural and social milieu. Within these extended groups are social networks—the people and patterns of relationships that define a person's immediate and extended social connections and interact with the person's beliefs, attitudes, and behaviors. At the individual level, factors include the demographic characteristics of individuals, like gender, race, ethnicity, and language. Similarly, an individual's genomic ecosystem as well as the environment's interaction with his underlying genetic code (epigenetics) impacts the structure and orientation of various biological structures, namely the brain, that influence how an individual perceives and processes information from the outside world. Genomics, as well as related environmental interventions, impact an individual's risk of psychopathology and can alter the way the brain responds to particular stimuli. Finally, although this discussion is by no means exhaustive, technology, including the level of access and the types available, as well as an individual's exposure and comfort level with the available technology, all affect the potential impact of activators, catalysts, and inhibitors.

Transition Factors

Socialization into a radicalized culture is an ongoing process at the individual level, with various transition factors exerting more influence than others depending upon the context, individual, and associated social groups. While there are some individuals that radicalize, or act in a radical manner, in a matter of hours, days, or weeks, the vast majority come to it slowly after repeated perceived slights and exposure to a variety of transition factors (Horgan, 2008). The SMA/McCauley Two-Pyramid framework is constructed to emphasize the fact that the radicalization process is not linear, and time is not a critical element (e.g., someone can become radicalized or act in a radical manner in minutes or over a lifetime). In the context of the SMA/McCauley framework, the basic factors listed below are transition factors—factors that either catalyze or inhibit transition in opinion and/or action.

It should be noted that while this report seeks to distill decades of research from multiple disciplines, readers must recognize that there has been little by way of empirical inquiry on radicalization (Nasser-Edine, Garnham, Agostino, & Caluya, 2011; Borum, 2011a; Patel, 2011). While there have been several case studies, conclusions are limited to post-hoc insights and the population examined is limited to "deradicalized" individuals, failed terrorists, or individuals captured before action—needless to say there are numerous difficulties associated with interviewing individuals of this type as well as issues of selection bias. Additionally, studies on some of the psychological concepts discussed below, as well as some aspects of radicalization are often conducted with western subjects, including convenience samples on college campuses. While the available research offers insights into factors believed to be linked to radicalization, it is important to recognize its limitations, particularly with regard to generalizability to all instances of radicalization (Dimaggio & Markus, 2010).

About a dozen major transition factors, which include both activators/catalysts and inhibitors/interventions, can be identified including:

- Sacred Values
- Belongingness/Power of Love
- Social Isolation

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different construals of the self, of others, and of the interdependence of the two concepts. These construals can influence, and in many cases determine, the very nature of individual experience, including cognition, emotion, and motivation" (p. 224).

- Grievance
- Emotions
- Anomie/Uncertainty
- Reward/Pleasure Seeking
- Personal Tragedy or Trauma
- Narratives and Memes
- Social Movements
- Financial Incentives

As noted, the Two Pyramids model presumes that radicalization and mobilization processes involve complex interactions between transition and shaping factors. For example, an individual may experience a threat to strongly held sacred values, but whether that experience leads to a transition to a higher radicalization state (a higher tier on the opinion pyramid) may depend on whether the person also holds a grievance against the offending entity (a transition factor) as well as whether the person is embedded in a network of relationships with people whose attitudes mitigate the perceived offense (a shaping factor). Although such interactions among factors are expected to be the norm, it is useful to examine shaping and transition factors separately in order to examine how advances in CBCT might impact each.

Chapter 2 begins with a review of shaping factors and transition factors. It proceeds with a discussion of relevant research on the implications of technological advancement on these factors that affect radicalization and mobilization.

Chapter 2: Implications of CBCT for Shaping and Transition Factors

Every form of communication technology has features and limitations that shape how people adapt to their chosen medium. Basic cell phones support synchronous two-way voice communication while smart phones may also support video calls that enrich the quality of interactions—provided the necessary computing power, user know-how, and bandwidth are available. Short Message Service technology (SMS, or "texting") supports rapid, asynchronous communication (such that there may notable latency between sending a message and receiving a response) via existing cellular networks and limits the interaction to short snippets of text. Computers with Internet access offer a dizzying array of options via locally- and web-hosted software and services that provide one-to-one or one-to-many communication capabilities that can be synchronous and real-time or asynchronous with considerable latency. These include email, Internet messaging (IM), Internet protocol (IP) telephony that may carry text, voice, and video (e.g., the Skype service), social networking services such as Facebook and Twitter, and browser-based environments such as chat rooms and discussion forums. Technologically, all of these services provide seamless global communications. For example, the global telephone system has been engineered to connect calls between any two parties worldwide regardless of the particular devices that are in use locally (e.g., cellular technology, computer-based IP telephony, or traditional landline phones). The Internet is similarly agnostic to the devices people use to access the network, enabling connections between computers, smart phones, and set-top boxes running any modern operating system.

It can be argued that the impact of these communication technologies inevitably grows as their availability expands worldwide. Moreover, all such technologies benefit from network effects: while a telephone has virtually no value if only a single person has one—there would be nobody for that person to call—every additional telephone user increases the value of telephony for everyone. In some instances, the growth of CBCT goes hand-in-hand with reductions in cost, both to users and to the institutions providing the infrastructure. With this growth comes ubiquity and change, as can be seen in longitudinal data compiled by the World Bank (2012). For example, in 2000, the number of fixed telephone subscriptions worldwide was 16 per 100 people while the number of mobile-cellular telephone subscriptions worldwide was just 12.1 per 100 people. By 2010, driven in part by the lower costs of building cellular networks and the consequent availability and lower cost of service, worldwide mobile-cellular telephone subscriptions grew to 78.2 per 100 people while worldwide fixed telephone subscriptions crept up to only 17.2 per 100 people (down from a high of 19.4 per 100 people in 2005).

Not all CBCT variants have achieved a market penetration as high as mobile-cellular telephony. Although Internet usage has also grown in the last decade, the growth has been more moderate: from 6.7 users per 100 people worldwide in 2000 to 30.2 users per 100 people worldwide in 2010 (World Bank, 2012). To put that level into context, note that there were 74.2 Internet users per 100 people in the United States in 2010, and that across Scandinavia in 2010, there were 89.8 Internet users per 100 people. For much of the world, Internet usage remains somewhat of a luxury. In the Middle East and North Africa in 2010, while there were 86.1 mobile-cellular subscriptions per 100 people, just 30.4 percent of households had a computer at home and only 22.7 percent of households had Internet access at home.

Furthermore, although younger people are generally more likely to use the Internet, with 95% of 18–29 year-olds online in the U.S. in 2010, a large number of seniors are using the Internet as well—fully 77% of 50–59 year-olds and 72% of 60–69 year-olds are online (Pew Research Center's

Global Attitudes Project, 2010). Note, however, that Internet usage in the U.S. is much higher in all categories than in less developed states. In Egypt, for example, 41% of 18–29 year-olds, 15% of 50–59 year-olds, and 10% of 60–69 year-olds are using the Internet; while in Pakistan, just 10% of 18–29 year-olds, 3% of 50–59 year-olds, and 1% of 60–69 year-olds are using the Internet. This contrasts sharply with reported cell phone ownership: in Egypt, 62% of 18–29 year-olds, 66% of 50–59 year-olds, and 71% of 60–69 year-olds claimed to own a cell phone; while in Pakistan, 46% of 18–29 year-olds, 25% of 50–59 year-olds, and 19% of 60–69 year-olds claimed to own a cell phone. Although access to CBCT continues to expand and evolve, understanding the impact of CBCT on people in different regions of the world will require understanding which technologies are most prevalent and how they are being put to use.

The objective of this report is to examine the implications of advances in CBCT on radicalization and mobilization by building on general understandings of how radicalization and mobilization occur in the physical realm. The SMA/McCauley Two-Pyramids framework is employed to investigate the impact of CBCT advances on shaping and transition factors hypothesized to condition radicalization and mobilization. Shaping factors are elements that shape or influence the context within which radicalization activators/catalysts and inhibitors operate. Transition factors are elements that either enable or facilitate movement within or between opinion and action pyramids (activators/catalysts) or that prevent or stall progression within or between the opinion and action pyramids (inhibitors). It is worth noting that no single activator or catalyst is always necessary for radicalization or mobilization. For example, in one scenario, a single activator/catalyst may be sufficient for radicalization and mobilization while in another scenario, multiple elements may be necessary.

In this chapter, these shaping and transition factors are explored more deeply in light of the various ways in which CBCT might impact them and thus potentially play a role in radicalization and mobilization. The discussion is presented in two major sections. The first section examines the shaping factors that contribute to an individual's local ecology. It is organized into three sub-sections: 1) a discussion of shaping factors that operate at the collective level of communities, groups, and networks; 2) exploration of shaping factors that function at the individual level, focusing in particular on the role of genomics and epigenetics; and 3) examination of information processing in research in order to gain additional insight into how CBCT affects individuals' interactions with others and with information. The section concludes with a review of recent research describing CBCT adoption in different parts of the world and a discussion of potential implications for understanding how CBCT might affect an individual's radicalization and mobilization to political violence. The second section of this chapter discusses transition factors that move a person toward or away from radicalization and mobilization. While these factors are discussed individually, it is important to recall that no single factor is likely to explain fully a given individual's radicalization and mobilization to violent political extremist action. There is no exact science for understanding the process of radicalization and mobilization. It is likely that in most cases several factors interact to propel an individual's radicalization and mobilization.

Shaping Factors

Radicalization and mobilization occur in an existing political, social, and economic context within which the activators, catalysts, inhibitors, and interventions operate. Critical shaping factors operate at different levels of analysis. What follows is a discussion of identified shaping factors, including collective and individual level factors.

Collective Level Shaping Factors: Culture, Narratives, Interdependence, and Social Networks

The social sciences, particularly cultural and social psychology, anthropology, political science, and neurobiology, recognize the importance of a culturally sensitive and grounded understanding of the individual vis-à-vis social, political, economic, and cultural groups. This grounding, however, does not mean that an appreciation of radicalization or its constituents must be culturally relative, falling prey to the subjective "one man's radical is another man's freedom fighter" assertion. Rather, the recognition of culture as a potential external shaping factor contributing to radicalization emphasizes the need to test assumptions about the universality of western human experience in terms of social organization (e.g., collectivism versus individualism) (Triandis, 1990; Markus & Kitayama, 1991), the acceptance and rationalizing of violence, the dehumanization of the other (in-group versus out-group) (Taifel & Turner, 1986; Pettigrew, 1979), the impact of culture on the self as an individual (Markus, Kitayama, & Heiman, 1996; Markus & Kitayama, 1991), and the recognition that radicalization occurs within the context of a particular culture. If the radicalization process is understood to take different forms and trajectories in different cultural settings, the narratives and social networks to which individuals are exposed work to shape the environment within which transition factors serve as catalysts and, in some cases, inhibitors.

Culture is indistinguishable from experience itself as the medium through, and within which, individuals come "to be, to feel, to think, to do" (Shweder & Sullivan, 1993; Markus, Kitayama, & Heiman, 1996). Culture can be described as the intangible undergirding for humans as social beings. Individuals cannot be extracted from their cultural context as it is part of the very core of their being. Much of the analysis of culture in the context of radicalization and mobilization is derived from the fields of cultural psychology and cultural neuroscience. These fields overlap with the literatures of other social sciences and provide a suitable foundation for a discussion of the impacts of culture on cyber radicalization. For the purposes of this discussion, the concept of culture is taken to be more than just the social, technological, or political environment in which individuals find themselves but includes as well the "medium" that connects group members through schemas, narratives, memes, and other devices of cultural transmission (Markus, Kitayama, & Heiman, 1996). Culture, including the social norms and identities that are constructed on the Internet (Postmes, Spears, & Lea, 2000), in conjunction with physical-realm understandings, creates a framework for people to interpret and interact with the world. It plays an important contextualizing role in the mediation of radicalization narratives and messaging as well as counter-radicalization persuasive campaigns.

An additional factor that shapes the environment within which individuals form attitudes and operate is the existing system of stories that share themes, forms, and archetypes that form group narratives. Narratives provide context to assist individuals in framing and understanding the world in which they are living. Narratives "influence our ability to recall events, motivate people to act, modulate our emotional reactions to events, cue certain heuristics and biases, structure our problem solving capabilities" (Casebeer, 2005, p. 5). Master narratives, "the historically grounded stories that reflect a community's identity and experiences, or explain its hopes, aspirations, and concerns," (Monitor360, 2012) provide individuals and groups with understanding of who they are, where they come from, and how to make sense of unfolding developments around them. They allow individuals to make sense of the world given the group's shared history, rituals, and values that exist within the narratives. At the same time, narratives are social constructs—driven by both society and the individuals who incorporate them and are subject to influence and change over time.

Without considering the norms, narratives, schemas and worldviews that reflect a person's culture, counterterror strategies may fall flat or be construed as irrelevant or even exacerbate the grievances that led to terrorist actions (Matsumoto D. H., 2010; Hatemi, McDermott, & Stenner, 2011). For example, according to genomic research conducted by Hatemi, Stenner, and McDermott (2011), it believed that promoting democracy in areas where democracy runs counter to their their foundational beliefs will likely serve to elicit aggression, particularly those individuals who may be attracted to terrorism. Indeed, research conducted by Almaney and Ahwan (1982) demonstrates the importance of understanding a cultural context and its effects on a target audience. Smith and Bond (1993), recognized scholars on conformity and culture, argue that the failure of Westerners to appreciate this Arab-cultural norm in terms of impression maintenance has led to fundamental misunderstandings of conflict in the Middle East (Markus, Kitayama, & Heiman, 1996, p. 897).

In addition to culture and social context, the networks of interpersonal relationships in which individuals are embedded are critical to our understanding of human behavior (Borgatti, Mehra, Brass, & Labianca, 2009; Emirbayer & Goodwin, 1994; Ward, Stovel, & Sacks, 2011; Watts, 2004). Social networks comprise people and the relationships that connect them, both in the physical and cyber realms. The particular collection of people in a network, their personal characteristics, and the properties of the relationships among them can be referred to as the composition of the network. The particular pattern of relationships that connect a collection of people can be referred to as the structure of the network. Both network composition and network structure affect, and are affected by, the experiences of the people in the network. Granovetter (1985) suggests the concept of "embeddedness" to reflect the fact that in practice, people's attempts at individualistic, goal-driven behaviors are embedded in the structures of their ongoing social relations—people's social networks and cultures. Individual behaviors are not taken without any (conscious or unconscious) consideration of social structure, but structure does not determine behavior in a manner that eliminates all possibility of choice and self-determination. This is the sense in which social networks are viewed as a shaping factor. The beliefs and actions of individuals who share social bonds are interdependent. Social networks do not strictly determine radicalization and mobilization pathways, but the impact of any given transition factor on an individual's trajectory will be affected by the networks in which that person is embedded.

Structurally, human social networks tend to have a so-called "small world" topology in which groups of densely connected individuals are themselves sparsely interconnected (Ebel, Davidsen, & Bornholdt, 2002; Palla, Barabási, & Vicsek, 2007; Wang & Chen, 2003). In an influential paper, Granovetter (1973) theorized a relationship between the pattern of people's interpersonal relations and the strength of their connecting ties. Specifically, he suggested that ties within a person's densely connected local network were more likely to be strong than to be weak, while ties connecting a person to an acquaintance in a different densely connected subgroup were more likely to be weak than to be strong. Tie strength can be specified in a variety of ways, but typically is defined as some combination of the frequency, the amount of time, the emotional intensity, the intimacy, and the reciprocity of interactions between two people. Evidence supporting Granovetter's essential propositions has been reported in a variety of settings (Friedkin, 1980; Granovetter M. S., 1983). This characteristic property of human social networks suggests that there may be differential effects of social networks on radicalization and mobilization depending on whether interpersonal factors are operating over strong or weak ties and the relative involvement of people from the close, densely connected network or the distant, sparsely connected network. Because this argument is, at present, conjectural, future research should investigate whether tie strength, as a property of individuals' networks ties, plays a role in shaping radicalization transitions

Advances in CBCT may affect various shaping factors, such as social networks, interdependence, and culture, by increasing the size of people's social networks, diversifying the composition of people's networks, and increasing the scope and rate of information flow to which people are exposed. Technologies and services such as Facebook and Twitter allow people to connect with others who may be far removed from their immediate strong social circles, thus becoming "networked individuals." CBCT allows for diverse social interactions and "looser, more fluid, but still meaningful social networks" (Wang K. , 2010). Expanding upon social science research, neuroscientists have found that larger physical and online social network sizes are correlated with increases in grey matter density in brain regions that have been previously implicated in social perception and associative memory (Kanai, Bahrami, Roylance, & Rees, 2012). More research is necessary to understand the full implications of this finding; however, it is indicated by current research that there are implications for transition factors such as social isolation and belongingness/power of love.

If such ties were enabled by technology, they would provide access to information that might not be available in a person's immediate physical network (Granovetter M. S., 1973). This novel information could include memes and other conveyors of culture that in turn may shape an individual's perceptions. However, it is important not to place too much emphasis on the idea that CBCT-enabled social networks will greatly expand people's connections with the world outside their immediate circles. Research indicates that, at present, the primary use of CBCT, including email, text messages, and instant messaging, continues to be the maintenance of existing relationships that span the cyber and offline domains (Valkenburg & Peter, 2007; Kanai, Bahrami, Roylance, & Rees, 2012). In fact, variability in the size of people's online social networks is correlated with variability in the size of their offline social networks, suggesting that most people use online social network services to support, maintain, reinforce, or otherwise strengthen existing or pre-existing offline relationships (Kanai, Bahrami, Roylance, & Rees, 2012). Moreover, social networking services are not the only CBCT media that expand people's access to information. Global news networks, YouTube, and Google, for example, can also shrink the distances between people and events that take place around the world and increase the ways in which information is shared. Overall, CBCT enables individuals to maintain and strengthen their existing relationships while providing an opportunity for expanding networks and increasing access to information from outside their immediate physical networks, depending upon how individuals choose to use the technology. Finally, research on potential changes in the way we neurally process information with use of technology, exposure to either conflicting or supporting narratives, and persuasive memes through CBCT would add value to our understanding of CBCT on processing of important aspects of culture.

Individual Level Shaping Factors

Shaping factors that affect individuals internally, such as genomics, information processing capability, and familiarity with CBCT also impact the environment within which the transition factors operate. These factors are unique to the individual and may serve as differentiating elements for individuals exposed to the same collective, or group-level, shaping factors. While researchers have explored these fields for decades, applying to the findings to the study of radicalization and mobilization is relatively nascent and, as such, the discussion that follows should be treated as research insights highlighting the need for further research.

Genomics and Epigenetics

Genes underlie all neuronal and brain structures, thus influencing all emotion, thought, and action.[8] They code for all the machinery that allows neural transmission and, thus, cognition to occur. This includes neurotransmitters, their receptors, and transporters. Scientists are just beginning to map genes to particular areas of the brain and are attempting to learn which complements of different genes may contribute to aspects of brain function (see Harmon-Jones & Winkielman, 2007). Individual neurons express particular genes based on their function. So, for example, neurons of the hippocampal area of the brain contain genes for serotonin, the primary signaling molecule in that region of the brain. If an individual has inherited a genotype that does not produce adequate levels of serotonin, that individual may be predisposed to clinical depression. Similarly, if the individual is exposed to an environmental factor that suppresses the gene for serotonin, the same result may occur where the person suffers from depression as a result of that environmental trigger. However, a genetic predisposition does not always manifest in a particular trait.

Understanding the complex factors of inherited and environmental triggers that control genetic expression is important to the understanding of basic brain function as it relates to an individual's relationship to externally and internally arousing stimuli providing by interacting with CBCT. Moreover, when trying to relate specific genes to behaviors, the scenario becomes more convoluted as single genes are not responsible for complex behavioral traits. Complex behaviors involve a collection of genes, learned neuronal signaling over time, environmental factors, cultural influences, and potential other factors yet to be identified. It is not fully understood how neuronal activity, in the context of emotions and thought processes, affects these complex genetic controls. While genetics is not deterministic, it is important to understand as the basic unit of cellular control for modulating responses to stimuli. Environment plays a significant role in modulating human behavior and instigating particular genetic pathways. While each cell has the same genetic code in an individual, different switches and stimuli alter the expression of those genes. To assume that a person is irredeemably violent based on his genetic makeup is unfairly reductionist and arguably unethical (Rose, 1996; Hatemi P. K., 2011). Taking these facts into consideration, the nascent field of neurogenetics should be recognized as another tool in examining all the complex factors that contribute to an individual's behavior.

The implications of CBCT are yet to be explored; however, an initial understanding that there may be genomic differences underlying the way in which various cultures understand concepts, such as democracy, should be explored further as the field matures as this is an important consideration for understanding the impact of various transition factors.

Information Processing

The way in which individuals process and understand information is a complex phenomenon that has been studied for decades across multiple fields of study, as well as by marketing firms and companies. Understanding the mechanisms by, and through which, people understand visual (words and images) and auditory (speech and sounds) information is critical to understanding how attitudes and opinions are formed and, as such, to understanding the ways in which individuals are malleable and vulnerable to suggestion. For example, information received via images tends to elicit

[8] Genes are sections of DNA that provide the master blueprint for every protein made in the human body. Each cell of the human body contains an identical set of genes inherited from one's parents; each cell only expresses those proteins that are necessary to help it perform its specific function.

quicker and stronger emotional responses engaging different processing models (Childers & Jiang, 2008).

Research on persuasion suggests that there are two routes through which individuals receive and process information: the peripheral, or heuristic, route and the central, or systematic, route (Petty & Cacippo, 1986; Chaiken, 1987). The basic assertion is that when individuals process information through the central route, they do so slowly with careful examination of the argument made and presentation of the information; they are engaging in high-order cognition. Research has demonstrated that persuasion is difficult when information is processed this way, some academics assert that when persuasion is successful, the receiver of the information would have carefully considered the argument, embraced the new or previously discounted information, and thus formed a stronger opinion than if the peripheral route had been engaged (O'Keefe, 2008; Petty & Cacippo, 1986; Petty & Wegener, 1998). However, research also has demonstrated that when information is processed through the peripheral route, persuasion is a simpler task, requiring that the receiver employ a simple decision rule to quickly and simplistically evaluate the information presented (such as communicator credibility or likeability or degree of contrast with existing beliefs) (O'Keefe, 2008; Petty & Cacippo, 1986; Petty & Wegener, 1998). In recent studies designed to understand the impact of website design on information processing, researchers found that motivation (opinion-based versus emotion-based) to receive specific information and the style of the website, for example serious versus amusing, affected which route individuals utilized to process the information (SanJose´-Cabezudo, Gutie, & Gutie´rrez-Cilla´n, 2009). This finding implies that the motivation of an individual using CBCT may impact the cognitive process engaged in, thus influencing the persuasiveness of an argument and subsequent opinion formation by the user.

In addition to either a reliance on heuristics or a systematic determination to fully understand an argument, individuals process different types of information differently. A plethora of brain imaging studies indicate that visual processing is localized to specific "vision processing centers" that move inputs from our eyeballs to specific areas of the brain (e.g., visual and extrastriate cortices as well as parts of the occipital and temporal cortices) that can distinguish body parts, words, colors, and other objects (Ratey, 2001; Childers & Jiang, 2008; Haxby, Gobbini, Furey, Ishai, Schouten, & Pietrini, 2001). Verbal processing, on the other hand, is localized in other processing centers that are associated with speech (e.g., inferior prefrontal gyrus, prefrontal cortex, and parts of the middle temporal cortex) (Ratey, 2001; Childers & Jiang, 2008; Martin, Wiggs, Ungerleider, & Haxby, 1996). Furthermore, the Childers and Jiang processing model predicts

> …speedier responses via the visual cortex to the emotional processing structure amygdala for visual processors independent of whether participants make evaluative or non-evaluative judgments. For verbal processors, research indicates the more resource demanding judgments of pictures leads to slower responses in the amygdala via this frontal word processing brain region for evaluative judgments (2008, p. 267).

Thus, this research suggests that information received via images, as opposed to text, tends to elicit quicker and stronger emotional responses, engaging different cognitive processing models. In a real world context, "pictures can provide the cognitive 'glue' in connecting events, facilitating construction of image-based narrative and increasing the extremity of the evaluations that are based on it" (Wyer, Hung, & Jiang, 2008, p. 277). Expanding comprehension of information processes is essential to increasing the understanding of individual reactions and understanding of visual-based communication medium given their increasing use across the globe.

Researchers studying executive function[9] have shown that individuals process information differently depending upon their ability to engage in executive function tasks (Ybarra & Winkielman, 2012). The factors affecting an individual's ability to process information, such as emotional state, level of stimulation, and mental well-being, "underl[ie] the[ir] ability to manipulate and maintain tasks, plans, and goals in an active state while monitoring performance and inhibiting distracting stimuli, whether from the environment or internally" (Ybarra & Winkielman, 2012, p. 3). Moreover, in an effort to increase efficacy, humans have integrated CBCT into executive function tasks. For example, rather than memorizing a phone number with seven disparate pieces of information, individuals now only need to remember one piece of information, the location of their cell phone. The implications of this are not yet fully understood; however, utilizing technology to enhance our working memory capacity may result in a de facto trust in the technology to provide individuals with accurate and relevant information. By placing de facto trust in technology, individuals may begin to process information received via CBCT heuristically, thus becoming more susceptible to low-effort persuasion, including targeted efforts to radicalize and mobilize, as well as the individual reactions by virtually-connected others to stimuli that gain traction in a community of interest. Over time, individuals may find themselves shifting attitudes or responding emotionally to a call to mobilize without fully understanding the motivations.

Exposure to and Comfort with CBCT

As CBCT has become more common, the question of differences between CBCT and face-to-face interactions has continued to spark debates among social researchers, with some arguing that CBCT is distant and impersonal while others find that differences between CBCT and face-to-face communications are small and fade over time (Derks, Fischer, & Bos, 2008). The extent to which the impacts of CBCT and face-to-face communications differ could be a function of how well adapted individual users are to the media they employ. For example, many CBCT media are asynchronous where it is understood that responses to sent messages may be immediate, delayed, or entirely absent depending on the medium employed, as well as the distance and the nature of the relationship between parties. One might expect a friend to respond more quickly to an SMS message than to an email, but not expect any direct response to a message posted in an online newsgroup. One effect of the latency between message and response is that respondents can take time to craft responses with the content and tone they want to convey. Another consequence of asynchronous, CBCT-mediated communication is that it tends to be less spontaneous than synchronous communications, including face-to-face interactions (Derks, Fischer, & Bos, 2008). People manage and manipulate their online self-presentation due to such factors as social desirability, luxury of time, and the opportunity to edit communications in a goal-directed manner (Attrill, 2012; Walther J. B., 2007). On one hand, such managed communications may result in "hyper-personal" social outcomes in which individuals develop idealized impressions of one another (Walther J. B., 2007), while, on the other hand, such impressions may not align with what was intended or expected because people are not very good at gauging the impressions that others form from online communications (Sherman, et al., 2001). Another characteristic of many CBCT media is the lack of non-textual or non-verbal signals, requiring a person to infer—and possibly overestimate or underestimate—the emotional state and intent of the communicator, which may result in inappropriate reactions (Derks, Fischer, & Bos, 2008). This is one of the features of CBCT that falls under the *cues-filtered-out* theoretical framework, a model which argues that the distinguishing feature of CBCT-mediated communication is its inability to convey social cues that

[9] Including working memory, executive attention, or cognitive control and inhibition.

help people identify the kinds of situations and interactions in which they are participating and which is one basis for arguing that technology impacts human communications. However, as noted previously, people adapt to the limitations of technology. For example, the use of 'emoticons'—originally used by engineering students at Carnegie Mellon University—evolved as a way of distinguishing communications meant seriously from those meant in jest. Today, people use emoticons to signal a variety of emotions and intentions within the restrictions of text-only communications. There are even variations in emoticon design that reflect cultural and generational differences among users (D'Costa, 2011; Walther & D'Addario, 2001). These could provide clues to the characteristics of individuals communicating via CBCT, something that may be exploited by the counterterrorism community.

Fundamentally, the extent to which CBCT affects the radicalization process will depend on the kinds of technologies that exist, the accessibility of those technologies to people of various demographics, and the comfort level people have with the technologies, including the degree to which a person has adapted to a tool's affordances and constraints. Recent research has demonstrated that individuals who have grown up exposed to CBCT (web-savvy or "digital natives") demonstrate different areas of brain activation, information processing patterns, and comfort with using CBCT than individuals who are considered "digital immigrants" (Small, Moody, Siddarth, & Bookheimer, 2009; Frank, Marci, & Martin, 2012). Additionally, emerging neuroscience research demonstrates that in order to engage and capture the natives' attention, information must be presented in "bite size," relevant, and emotionally charged chunks (Frank, Marci, & Martin, A [biometric] day in the life, 2012). Natives tend to demonstrate shorter attention spans, higher trust in the technology and information generated by the technology, and often use technology to regulate their emotional states. A study conducted by Time Inc. and Innerscope Research found intriguing insights about technology use by digital natives. Digital natives switch their attention between media platforms 27 times per hour, are rarely more than an arm's length away from their smartphones, and prefer texting, rather than talking to, people. Additionally, natives more frequently use media to regulate their mood; for example, as soon as they grow tired or bored they turn their attention to something new. Arguably, the most striking difference between digital immigrants and digital natives is ability to process non-liner information. Digital immigrants are linear thinkers; they prefer stories to have a beginning, middle, and end, in that order. While digital natives still need a beginning, middle, and end to their stories, it does not matter what order they receive that information. Due to the near constant switching of platforms, natives can pick up different pieces of the story, from different platforms. "This study strongly suggests a transformation in the time spent, patterns of visual attention and emotional consequences of modern media consumption that is rewiring the brains of a generation of Americans like never before" (Lehamn, 2012). The long-term implications of this are still unknown. While further work must to be done to establish the effects on short-term and long-term memory, it is reasonable to suspect that web-savvy natives fold CBCT into short-term memory processes. Trust in technology, and information generated by it, could lead to misplaced trust online and the potential for highly malleable digital natives.

There are also gender differences in trust, both offline and online. Interestingly, women trust less than men and several surveys found evidence that women are less likely to believe that a majority of people can be trusted (Alesina & La Ferrar, 2002) (Glaeser, Scheinkman, & Soutter, 2000) (Terrell & Barett, 1979). In a study of online trust and brain behavior, fMRI scans found that the men and women encode trustworthiness in different brain areas (Riedl, Hubert, & Kenning, 2010). Notably, women activate more regions of the brain and confirms the "empathizing-systemizing theory, which predicts gender differences in neural information processing modes" (Riedl, Hubert, & Kenning, 2010). In addition to mechanical differences in men's and women's brains, there are also structural differences. Men's brains are bigger than women's; however, some areas of a

woman's brain are more developed, notably the corpus callosum which serves as the communicator between the two hemispheres of the brain suggesting that tasks such as language, are better performed by women (Halpern, Geary, Benbow, Gur, Hyde, & Gernsbacher, 2007). Other brain regions which are, on average, larger in women include the caudate nucleus and hippocampus. In contrast, men usually have larger amygdalae and hypothalami (Cosgrove, Mazure, & Staley, 2007). Gender-specific size differences of certain brain regions may affect performance in decision making, memory, and learning tasks (Cahill, 2006; Riedl, Hubert, & Kenning, 2010). Moreover, differences in online behavior of men and women have been found. For example, although perceptions of e-mail differ between the genders, the actual use of e-mail does not (Gefen & Straub, 1997), and that in virtual communities, men communicate to establish superior social standing, while women communicate with an undertone of rapport, compassion, and empathy (Gefen & Ridings, 2005). These differences affect the respective perceptions of community quality for men and women (Riedl, Hubert, & Kenning, 2010). Finally, gender differences may affect the ease with which individuals become radicalized through CBCT. Trust in sources is essential to conforming to the worldview and values offered by online communities. If an individual is skeptical of these, their radicalization will be more difficult.

Available CBCT ranges from low-cost and widely available cellular telephones to more sophisticated and less common smart phones and home computers that can run many types of software and access Internet communication and information resources. When considering how CBCT might impact radicalization and mobilization, it is important to specify the population of interest, who constitutes these populations (e.g., age, digital native, etc.), and to establish which of the existing technologies is most commonly employed. At present, cellular telephone technology, and the services it delivers, is used by many more people across the world than computer-based communication technology. As smart phones and computers become less costly and more accessible to people in the developing world, this certainly will change. Future investigations should examine the effect of introducing computers and Internet access to regions where they were previously unavailable. In locales where radicalization poses a material threat, in what ways does the introduction of advanced CBCT affect the individualist and collectivist shaping factors? For example, are there windows of time during which digital immigrants are particularly vulnerable to radicalization and mobilization efforts?

Transition Factors

Transition factors are those elements that function as activators, catalysts, and inhibitors that motivate or stymie movement among and between the opinion and action pyramids comprising the SMA/McCauley Two-Pyramids model. Transition factors do not operate in isolation, but rather are expected to interact with each other and with the shaping factors described above. In this section, the eleven most prevalent transition factors from the radicalization and mobilization literature are discussed. For each transition factor, findings are drawn from CyberPsychology and CyberNeurobiology research, when available, to examine how advances in CBCT might affect the transition factor and thereby impact radicalization and mobilization.

Sacred Values

Violations of sacred values, including attacks on cultural norms and values are critical activators or catalysts and sometimes even inhibitors of radicalization (Berns, et al., 2012; Borum, 2011a). Sacred values include "fundamental religious beliefs, core constructs of national and ethnic identities, and moral norms" (Berns, et al., 2012). Although sacred values can themselves be characterized as cultural shaping factors, we focus here specifically on *challenges* to these values.

By definition, sacred values are those values for which individuals will resist trade-offs with other values, particularly monetary or material incentives. Consequently, perceived violations to these values are especially provocative. Recent examples of sacred value violations include the inadvertent burning of Korans in Afghanistan, the Netherlands Mohammed cartoon, the Mohammed movie, and the burning of Korans by a Florida minister. All of these events produced significant protest throughout the Muslim world. The almost-immediate global awareness of these events, and the subsequent global outrage, was quickly spread via social media, including Facebook and SMS texting, illustrating the significant role the Internet plays in the dissemination of information and potentially facilitating the catalyzing to violence. Sacred values may also act as inhibitors in that opposition to violence against civilians is often at the core of many religious traditions. In addition, respect and acknowledgment of shared values may serve as a powerful inhibitor by shifting the focus to common interests rather than differences.

Recent neurobiological research (Berns, et al., 2012) indicates that when individuals process statements regarding sacred values, which can be either heuristic or systematic depending on the context, they use neural systems generally associated with evaluating rights and wrongs (temporal-parietal junction, TPJ) and semantic rule retrieval (ventrolateral pre frontal cortex, VLPFC) but not with systems associated with utility estimations (determining costs and benefits). The involvement of the TPJ is consistent with the notion that moral sentiments exist as context independent knowledge in the temporal cortex. These findings are important because "when individuals hold some values to be sacred, they fail to make trade-offs, rendering positive or negative incentives ineffective at best" (Berns, et al., 2012). Thus, some of our best intervention strategies may be to inhibit the violation of sacred values. As Hatemi, McDermott, and Stenner note, "forcing one set of cultural values on populations who espouse a different set will be perceived as a direct psychological attack by the recipients of such persuasive attempts" (2011). Thus, there are major risks to deploying sacred values inappropriately, getting them wrong, or trying to provide viable alternatives.

As noted, the function of sacred values as a transition factor in radicalization and mobilization is not that they exist, but rather that people's opinion or action states may change in reaction to perceived violations of them. CBCT may play a role in this mechanism in several ways: by facilitating the propagation of information about an occurrence that might be viewed as a sacred values violation, by providing a platform for individuals to deliver messages that shape others' perceptions about a potential violation, and by mediating communication among people who felt the violation. CBCT may, potentially, also enable those people who felt violated to find each other in the first place, and are seeking ways to confront or resolve the threat.

CBCT-enabled information propagation can function in two ways: one-to-one and one-to-many. One-to-one information follows the pattern of "telephone trees" in which people transmit information or beliefs they hold regarding challenges to their sacred values to those with whom they are directly connected. The pattern of the spread of information is a function of people's social network structure, reinforcing the important role of social networks as a shaping factor in the process. CBCT, particularly cellular telephone and SMS technology, have greatly enhanced this mechanism by enabling more people to reach more of their contacts in less time that was possible even a few years ago (Pew Research Center's Global Attitudes Project, 2010). One-to-many information transmission is, perhaps, even more powerful. Online social media services such as Facebook, Twitter, and YouTube allow an individual to post content that can quickly spread around the world to people far-removed from the originator's direct network. For example, a video posted to YouTube on 11 January 2012 depicting a group of four U.S. Marines desecrating the bodies of three dead Afghans went viral in a matter of hours and quickly made headlines around the world

(Whitlock & Jaffe, 2012). Although the video was removed by the original uploader within two days, copies were uploaded by others and several versions continue to be available. In cases such as this, CBCT provides a platform for the original uploader of the video to communicate and shape perceptions about a potential violation of sacred values while also accelerating and broadening the propagation of the message.

Another function of CBCT in situations when sacred values are threatened is to mediate communications among individuals who perceive that threat. Access to Internet-based communications, such as message boards and chat rooms, enables individuals who perceive threats to their sacred values to find groups online, potentially comprising people from distant communities, that offer a safe environment for sharing their beliefs. Participation in such groups might itself affect how people respond to the perceived threat. Group shift theory suggests that groups of strangers brought together in an experimental context will display greater and greater agreement with one another, with individual opinions shifting towards an extreme version of the beliefs originally held by group members (McCauley & Moskalenko, 2008), a phenomenon that has been observed in radical online groups (Wojcieszak, 2011). This may be exacerbated by the fact that people have been shown to be egocentrically biased when attempting to take another person's perspective, creating a false-consensus bias in which people overestimate the extent to which others perceive the world as they do (Epley, Keysar, & Morewedge, 2004; Bauman & Geher, 2002). When attempting to take another person's perspective, people first anchor on their own perspective and then tend to insufficiently adjust for differences that might affect another person's beliefs. In computer-mediated communication, where face-to-face social cues are unavailable, there is a risk that people will believe that others agree with them more than is actually the case, thus legitimizing and reinforcing the perceived threat. When a group comes together around a common concern, it may induce an echo chamber that promotes false consensus such that members believe the concern is also widely held by those outside the group. This perception may contribute to members' motivation for offline political engagement (Wojcieszak, 2009; 2011). Online extremist groups may even make members feel that they have a personal moral obligation to take action, a critical state in the opinion pyramid of the radicalization framework outlined above (Counter Terrorism Implementation Task Force (CITTF), 2011). Web technologies enable such groups to operate in relative secrecy when, for example, membership is approved and participation is monitored by a group moderator. This sense of security, combined with the anonymity provided by CBCT and the echo chamber effect, may support the emergence or perpetuation of extremist perspectives within the group while also protecting the group's long-term survival.

Social Bonds (Belongingness and Social Isolation)

Human beings have an innate desire to be connected to others, a phenomenon rooted in the evolutionary need for survival and reproduction (Carter S. C., 2007). Advances in neuroscience and neurobiology have allowed researchers to explore the biological underpinnings and factors at play during the formation, dissolution, and aspiration of social bonds. For example, researchers have uncovered small peptide hormones (e.g., oxytocin and vasopressin), which are synthesized in the hypothalamus during social bonding (Carter S. C., 2007; McCall & Singer, 2012). Of particular interest is the linking of stressful situations or environments, such as war or perceived threat, to sacred values, with the formation of social bonds and the tendency of individuals to seek out and form bonds with others (DeVries, DeVries, Taymans, & Carter, 1996). There is reason to believe that endocrine and social histories, especially in the early development of individuals, can fundamentally alter the formation of social bonds and alter an individual's pattern of social

involvement. Specifically, research has shown that early exposure to oxytocin[10] in childhood facilitates a later tendency to form social bonds or to be generally more social (Bales & Carter, 2003).

Inherent in the need to form social bonds is the drive for belongingness, or the desire for love, and without strong social bonds, individuals can feel a sense of social isolation. Both phenomena can serve as powerful transition factors that can lead an individual down the path towards radical opinions or actions.

Belongingness/Power of Love

This pathway has received considerable attention as of late and has often been called the "power of love" (see, for example, Sageman, 2004 and Ballen, 2011). This area of research suggests that the draw of fraternal or romantic love, belongingness, group solidarity, and devotion can be critical drivers of radicalization. Terrorist groups largely recruit those that they trust; this trust is closely linked to existing relationships and connections that individuals have with one another (McCauley and Moskalenko, 2008). A member of the Italian Red Brigade noted that "as far as I am concerned [joining] was up to emotional feelings, of passions for the people I shared my life with" (della Porta, 1995). Devotion to friends or family members can facilitate quick group radicalization with a clique of friends joining a terror group at once. Once an individual has become a member of a radical group or has constructed a social identity with one, "love for friends and comrades in the group is likely to increase further as common goals and common threats increase group cohesion" (McCauley & Moskalenko, 2008).

Horgan (2008) notes that important factors that put people at risk of radicalization include, "the presence of some emotional vulnerability, in terms of feelings of anger, alienation (often synonymous with feelings of being culturally uprooted or displaced and a longing for a sense of community) and disenfranchisement." Multiple studies of radical groups like the IRA and Sinn Fein have shown that group loyalty and solidarity coupled with the desire and hope to make a difference for the group are "the two strongest forces holding militants together in the face of arrests and attacks" (McCauley & Moskalenko, 2008). Notably, the Internet might serve as an inhibitor to this type of catalyst by providing individuals multiple opportunities to seek companionship and diminishing feelings for those that might be alienated or disenfranchised, providing opportunities to develop a variety of social identities and a broader social network.

For individuals seeking a sense of belongingness, CBCT opens up new ways for people to build connections both with existing friends and new acquaintances. Early studies of Internet newsgroup participants found that personal relationships between people who met online were "common" with more than half of those who reported forming online friendships characterizing them as "deep" and moderately interdependent, and roughly a third reporting that they established contact with their online acquaintances via telephone or face-to-face communication (Parks & Floyd, 1996). Although this research did not focus on communications about radicalization, it is important to consider the possibility that initial online encounters may be relatively benign, with radical ideas introduced during the ensuing offline encounters. Still, research on Western subjects provides evidence that people are cautious when entering online relationships, taking care to protect their anonymity by being truthful in general while withholding their names, and progressing from online

[10] Oxytocin is a neuropeptide that is not only responsible for the reduction in the release of stress hormones and reactivity of the autonomic nervous system (reduction in heart rate and blood pressure) (Porges, 1996; Neuman, 2001) but also assists in the facilitation of pro-social behavior (Carter C. , 1998; Carter & Keverne, 2001).

communication to telephone communication before meeting face-to-face (McCown, Fischer, Page, & Homant, 2001). This caution may be related to the challenges inherent in building online trust, when individuals are engaging in central root processing of information, because the lack of personal contact and the relative anonymity provided by CBCT results in an information asymmetry in which one is initially unsure about the identity of and the quality of information provided by a new online acquaintance (Ba, 2001). Thus, while CBCT-mediated communications clearly provide opportunities for people to meet, it also raises the bar with respect to establishing trust and may therefore impede the formation of a sense of belongingness.

One area of research that deserves mention is online seduction. Although this research was rooted in romantic seduction, all relationship formation is a negotiated interaction between two parties; that is, relationships begin as a strategic communication process. Mantovani (2001a; 2001b) developed a conceptual model of online seduction that considers the objective-seeking behaviors of the participating individuals in light of the particular characteristics and affordances offered by the CBCT media that are in use. Seduction is defined as "a strategic and intentional behavior, primarily induced by the attraction … to another person" such that the "main goal is the engagement and its outcome is the reduction of interpersonal distance in view of a relation of intimacy" (Mantovani, 2001b, p. 148). There is reason to believe that the Internet, as a setting for this process, may be particularly amenable to the shy and to people with extremist views who are seeking out similar others (Counter Terrorism Implementation Task Force (CITTF), 2011). Anonymity allows a person to "test the waters" without being immediately at risk, while the asynchronous nature of many CBCT media allows a slow and cautious reciprocal exchange of information that might not have a chance to evolve in face-to-face interactions. Whether an individual is seeking to recruit a new member to a radical group, or a person is trying to approach a group with the goal of joining, Mantovani's model of online seduction may offer insight into the strategic steps people take to bridge the social gap and build a relationship with others who initially appear to be a good match.

Social Isolation

A desire to achieve belongingness or to feel as though one is part of something larger is often a hallmark of feelings of social isolation. An individual's failure to integrate into a community or society (for example, as a first- or second-generation immigrant or a student studying abroad) can catalyze radicalization. The radicalization of Umar Farouk Abdulmutallab, the "underwear bomber," is an example of how loneliness and isolation *may* contribute to radicalization and mobilization. While there may have been other shaping factors at work, it is believed that the primary shaping factor was that Abdulmutallab felt isolation while studying in London, and that this perceived sense of isolation led him to seek peers online, to open up to them about his feelings, and ultimately to accept Salafist ideology (Jamestown Foundation, 2011). In addition, other mechanisms of isolation, including socio-political alienation including feelings of discrimination, victimization, and xenophobia/exclusion can contribute to the activation of this catalyst. The failure to integrate into a broader social milieu and perceptions of alienation can drive individuals closer to other, more minatory groups with which they can identify. In the case of Abdulmutallah, the radicalization process involved a combination of online and face-to-face interactions (Jamestown Foundation, 2011). Finally, once someone has joined a group, severing of outside ties, whereby a radical group forces a new member to associate only with likeminded individuals, may increase the influence and power of the radical group and its leadership.

Wilner and Dubouloz (2010) discuss the role of social isolation in homegrown terrorism when the radicalization process unfolds for individuals who are raised outside of their birth country and are separated from their home communities. They note that as "'alienation is replaced by identification

with the group, powerlessness is replaced by potency derived from being involved in group operations, while humiliation is mitigated by participation in actions." Wilner and Dubouloz emphasize the fact that claiming social isolation as a precursor to radicalization fails to explain how people who have been well-integrated into their host nation subsequently pull away from or feel rejected by that community, as was the case for the Time Square Bomber. The duality may be explained by a radicalized individual possessing multiple identities: for example, a majority/host nation identity and a minority group identity.

Individuals who feel disconnected or unable to integrate into their immediate offline communities may turn to an online environment to find a place to fit in (Ko, Yen, Liu, Huang, & Yen, 2009). The main objectives of terrorist messages are to build a sense of community, instill a sense of responsibility to defend it, and promote that it is under attack from a specific enemy (Counter Terrorism ImplementationTask Force (CITTF), 2011; Attrill, 2012). These messages appeal to different types of people, notably individuals isolated from their physical community. Recent work on lone wolves theorizes that the Internet can provide "virtual wolf packs" (Goldsmith & Siegel, 2012). Barriers with one's offline community may range from ideological to cultural, and the global expanse of the Internet, with so many specialized online communities, may be the place where such barriers fall. The social distance afforded by interjecting technology into communications—including anonymity and the opportunity to carefully manage one's self-presentation—may be beneficial to individuals for whom face-to-face interactions are difficult, due to shyness, or risky, because their beliefs run counter to the mainstream. The stages that have been identified in online relationship formation, which begin with an initial low-risk series of self-disclosures during which participants develop their perceptions about one another and progress cautiously to a reduced interpersonal distance and an eventual offline encounter. An offline meeting may offer assurances that one is safe. A process of strategic online seduction, combined with selective self-presentation by both the recruited and recruiter (Walther J. B., 2007), might be employed by someone seeking to recruit a person who has revealed beliefs that are aligned with a radical group, progressively engaging the target so as to provide the sense of belongingness that was missing.

Whereas the communications aspect of CBCT spans a wide range of human relations and interactions, the connecting aspect, as reviewed here, focuses more on the role CBCT plays in making an initial connection with another person or a group and potentially developing that connection into something that is personally meaningful. Hence, CBCT as a platform for connecting may have substantial implications for several transition factors. As a medium for building new social connections, CBCT provides a way for individuals to mitigate perceptions of social isolation and establish a sense of belongingness. CBCT also presents opportunities to reduce uncertainty, regulate mood, air grievances, and deal with the consequences of a personal tragedy or trauma through interactions with others who are experiencing similar challenges. Although the evidence is mixed, such online relationships may prove to be deep and meaningful enough to satisfy people's needs. A potential consequence of utilizing CBCT for communication is the potential for individuals to become accustomed to positive and immediate reinforcement of their opinions providing instant gratification and triggering the neural reward process. The areas that are activated during this process are the same areas activated with reward and addiction (e.g., orbitofrontal cortex) resulting in a desire to continue to achieve the "high" attained through instant gratification and continuation with the rewarding behavior (Hoeft, Watson, & Kesler, 2008).

Grievance

The events of the Arab Spring illustrate the significant power of grievance to motivate social movements and, on occasion, violence. The instigator of Tunisia's riots, Bouazziz, was an unlicensed

vegetable/fruit seller on the street. When his cart was confiscated by a policewoman and he could not remedy the situation by a visit to a government office, he returned to the office a few hours later and immolated himself. Since his economic livelihood had been compromised, Bouazzi was motivated to action and helped to set off the Arab Spring. Bouaziz's grievance was personal, he sought recourse that Tunisia's regime could not or would not provide. Grievances are "feelings of dissatisfaction with important aspects of life such as housing, living standards, income, employment, health care, human rights, safety and education" (Klandermans, Roefs, & Olivier, 2001). Various academic theories argue that "shared grievances and generalized beliefs (loose ideologies) about the causes and possible means of reducing grievance are important preconditions for the emergence of social movements" or collective action, including terrorist and radical groups (McCarthy & Zald, 1977; Klandermans, Roefs, & Olivier, 2001; Olson, 1971).

Throughout history, changes in the status quo or government policies have precipitated collective grievance of a social, economic, or political sort. Personal and group victimization, like those stemming from collective punishment and attacks on specific communities can serve as an additional powerful activator of radicalization and mobilization (Klandermans, Roefs, & Olivier, 2001; Speckhard & Akhmedova, 2006). The loss of family members and property, among other grievances, provides a prime motivator for violence against perceived victimizers. Activists can take action because they either have direct experience of a grievance or they perceive that their ethnic group (or other identity characteristic) has been slighted. In these instances of collective grievance, one hypothesized explanation is that a group is seeking a larger share of resources or power because its members perceive themselves to be relatively more deprived than their neighbors or compatriots. In this form of grievance mitigation, if an actor sees that he is more aggrieved relative to his neighbor or the community, he might be motivated to take action against the grievance or the cause of the grievance (Klandermans, Roefs, & Olivier, 2001). Academics typically conclude that grievances, whether considered relative to others (relative deprivation) or resulting from a perceived miscarriage of justice (social justice), are key motives for social and political discontent. If peaceful protests fail or are disallowed by authoritarian regimes, such a failure *may* lead to more violent protests including riots and terror attacks as seen during the Irish liberation movement and at the end of South African Apartheid (Klandermans, Roefs, & Olivier, 2001).

McCauley and Moskalenko (2008) suggest that while individuals can be radicalized by "political grievance" mobilization to political violence, where individuals act alone rather than as part of a larger group, are fairly rare. The few examples that McCauley identifies for this type of radicalization typically demonstrate psychopathology. On the other hand, "groups of radicals, especially those who get as far as terrorism, are unlikely to recruit or tolerate the unreliability that goes with psychopathology. Individualist radicals can be responding, at least in part, to their private demons." McCauley and Moskalenko also identify "individual radicalization by personal victimization" as one of 12 mechanisms or pathways to violence. Importantly, McCauley and Moskalenko indicate that there is little data to show how many or what percentage of terrorists are motivated by this cause, but they also note that it may be individual victimization against a backdrop of collective victimization that instigates violence and action. They also suggest that, "a social psychological view would be that personal grievance is unlikely to account for group sacrifice unless the personal is framed and interpreted as representative of group grievance." Finally, individuals may be motivated by "personal agendas in response to some real or perceived organization or institutional event" (Bates, 2012). As Horgan and others note, "dissatisfaction with their current [protest] activity, whether it be political or social protest, and the perception that conventional political activity just does not work or produce results" can produce violence and extremism (2008) pushing someone who might otherwise be inclined to seek legal recourse (e.g., legal activists) to take more extreme measures.

Grievances and both personal and cultural humiliations, like threatened worldviews or sacred values, are sometimes thought to contribute in the initial motivation for radicalization by fostering emotional vulnerability which either drives an individual to reach out to radical groups or increases his vulnerability to recruitment and radicalization (Borum, 2011b; Savage, 2011; Horgan, 2008). Importantly, most social psychologists believe that a "personal grievance is unlikely to account for group sacrifice unless the personal is framed and interpreted as representative of group grievance" (McCauley & Moskalenko, 2008). Thus, one man's grievance is unlikely to precipitate collective organization or violence unless it can be construed as an assault on the group. Nonetheless, individuals can and often are radicalized by personal grievances, which may create a ready pool of potential recruits to a terrorist or radical organization.

While the Internet and other CBCT provide users with near limitless access to information, one of the most profound features is that they also reduce costs and other barriers so that virtually anyone with access to CBCT can publish, produce, or broadcast their own ideas or content, including their grievances. In other words, CBCT is not just about information consumption or one-to-one and small group communications. The power to deliver an idea to a global audience is no longer restricted to large, well-funded enterprises. Personal home pages, blogs, and microblogging services (such as Tumblr and Twitter) are all low-cost ways in which people can share their ideas with a community of followers without requiring the infrastructure of a major media outlet. Moreover, Web technology development in the past decade has created a widespread norm in which information consumers are given a voice alongside producers' original content. This is most commonly observed in comment threads attached to the original content that can be the site of heated debate. Several features of CBCT, including ubiquity, anonymity, and asynchronicity (which allows people extra time to craft their thoughts and responses and also relieves them of the threat of immediate repercussions), all contribute to an environment in which people can freely and safely express their thoughts and air their grievances.

Several implications may follow from people using CBCT as a medium for airing grievances. First, people who use CBCT to air their grievances may actively seek—or be found by—others who share a common perspective. A dialog may arise through responses to an author's original post or between like-minded commenters who visit the same web site. If grievances are posted to a chat room or discussion forum, a person may encounter a group of people who are sympathetic to the grievance. Interactions such as these may provide needed social support and psychological buffers (Lewandowski, Rosenberg, Parks, & Siegel, 2011) as well as new ideas that could reinforce the grievance, or may instead mitigate the grievance and reduce its power to activate a radical shift. The discovery of a shared grievance may serve as a trigger for a process of online seduction (Mantovani, 2001a; 2001b) in which one party seeks to establish a relationship with another who has expressed a shared grievance. The seduction process may be part of recruitment for existing terrorist or extremist organizations that identify vulnerable targets based on their expressed grievances.

Having a personal grievance is a strong transition factor in the radicalization and mobilization framework, and CBCT has profound implications for how people deal with their grievances. CBCT provide a platform not only for airing one's grievance, but receiving an immediate emotional release. In some cases, this emotional release can be cathartic, while in other cases, it adds fuel to a fire as well as serve as a platform for connecting with like-minded others. The implications of CBCT for people gathering around a shared grievance are similar to the situation described above for online communities that revolve around a perceived sacred values violation. In both instances, people form connections based on common beliefs, finding opportunities to express their dissatisfactions and concerns and often do so under the protection of anonymity. Such connections

can be limited to members of an online community or may span a far-flung social network connected by services such as Facebook or Twitter. Online communities that harbor people who share a common grievance can produce a shift to more extreme perspectives while creating a false consensus (McCauley C. , 1972; Wojcieszak, 2011). In other words, participation in the online CBCT-mediated group may increase the possibility that the original grievance will be a factor in transitioning to a more extreme opinion or behavior state. This may happen despite that fact that individuals simultaneously reside in the online community and in an offline community that may include close ties with people who do not share the extreme perspective (Wojcieszak, 2009; 2011).

Emotion

According to Taylor and Horgan (2007), the critical contributors to terrorism are the "psychological and emotional context of the individual on which the bigger and essentially non-psychological forces of opportunity and context operate." Thus, emotions, while possibly being a trigger from one position of the pyramid to another, may also be an inhibitor. According to some literature, if individuals are in a positive mood, they are more likely to engage in heuristic or peripheral processing of information (Beer, 2007). This can result in quicker actions, underestimation of risk, and an overemphasis on positive explanations to explain decisions or judgments (Beer, 2007). On the contrary, when individuals are in a bad mood, they are more likely to engage in more effortful processing of information, react slowly, overemphasize risk, and focus on negatives when attempting to explain their decision or judgment (Beer, 2007). Additionally, research indicates that emotion, especially emotions shared by individuals with regard to their own group or other groups, helps regulate social behavior and, in some instances, prevents social chaos (Matsumoto, Yoo, Alexandre, Altarriba, Anguas-Wong, & et., 2008).

Emotional responses that trigger extreme physiological responses, such as fear and anger, activate the sympathetic nervous system and, in particular, the insula and the amygdala (Heberlein & Adolphs, 2007). It is believed that the insula is involved in the modulation of emotional response, particularly the response of disgust (Heberlein & Adolphs, 2007; Calder, Keane, Manes, Antoun, & Young, 2000). Individuals with lesions to these regions do not recognize facial expressions of disgust of others or respond to disgusting stimuli, including moral disgust (Calder, Keane, Manes, Antoun, & Young, 2000; Chapman H. , Kim, Susskind, & Anderson, 2009). Disgust is an important moral emotion as it seems to operate as a boundary between harm and not, motivating avoidance as well as facilitating dehumanization (Harris, 2011).

The amygdala is the area of the brain wired to respond to threats and produces fight or flight responses. As human brain structure evolved over time this "fight or flight" response likely enabled survival in hostile environments. In modern society, while a bear or tiger may rarely threaten a human being, something physically threatening is not fully distinguished by the amygdala from something psychologically threatening. The "fight or flight" response, as part of a hyperarousal state, may shut down higher cognitive function so in the modern day setting, this can have ramifications for individual response to non-physical threats (Beer, 2007). Additional studies have demonstrated that the amygdala is also involved in the processing of positive stimuli, particularly appetitive conditioning or pleasurable, rewarding stimuli (Heberlein & Adolphs, 2007). This is of interest for individuals interested in the study of radicalization as the line between fear, anger, and emotionally arousing responses may be blurred and may all result in the activation of the sympathetic nervous system, overriding detailed exploration of arguments and rational thought. Further study concludes that "unconscious emotional processing in the brain exerts a substantial direct influence on subsequent conscious processing and behavior that is not always mediated by rational thought" (Siefert, Kothuri, Jacobs, Levine, Plummer, & Marci).

An early and widely cited study found an unexpected phenomenon among new Internet users. Specifically, the "Internet Paradox" study found that increased use of the Internet for communication, which would be expected to increase communication, was associated with lower levels of communication between family members in a household, a reduction in the size of people's social circles, and increases in people's sense of loneliness and depression (Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998). A follow-up study reexamined a subset of participants after three years and found that the originally observed negative effects had dissipated (Kraut, Kiesler, Boneva, Cummings, Helgeson, & Crawford, 2001). The second study also examined a second sample and found differential effects of Internet usage with positive effects on communication, social involvement, and psychological well-being for people with more social support, but worse outcomes for people with less support. Both studies, and others that followed from the original Internet Paradox Study, demonstrate the linkages between Internet usage and people's emotional states. Other studies have linked increased Internet usage with decreased psychological well-being (Huang, 2010; Schiffrin, Edelman, Falkenstern, & Stewart, 2010). Moreover, while computer-mediated communication has been found to have an effect on people's emotions, the effect is not the same as face-to-face communication. Specifically, in one study, whereas high degree face-to-face friendship networks—those in which individuals had a relatively high number of close, offline friends—were associated with low levels of both social and emotional loneliness, high levels of Internet use were associated with low levels of emotional loneliness and high levels of emotional loneliness (Moody, 2001). Similarly, online support groups are apparently not as effective as face-to-face support in helping people deal with disruptive life events (Lewandowski, Rosenberg, Parks, & Siegel, 2011). Still, online communications and support groups might be very valuable to those who do not have access to direct, offline support for reasons such as introversion, social isolation, or physical isolation.

According to research conducted by advertisers, email messages (and presumably other online media) are more likely to be forwarded if the "messages spark strong emotional feelings—humor, fear, sadness, or inspiration" (Eckler & Bolls, 2011). Indeed, even infrequent email senders are more likely to pass along emotional appeals or messages than more neutral messages—potentially inspiring a contagion effect based upon the emotions of one individual or a group of individuals. While in advertising, it is positive (awe-inspiring) messages that more readily become viral, the dissemination of an individual's heightened emotional arousal (e,g., anxiety, fear) among a disaffected or primed population might instigate greater emotionality among receivers of those messages (Berger & Milkman, forthcoming). Therefore, emotional appeals by radical groups or movements might prove more compelling to vulnerable populations. Finally, even offline emotionally engaging material creates online buzz. An Innerscope study found that advertisements that emotionally engage consumers are likely to create online buzz and influence an individual's online social network (Siefert, Kothuri, Jacobs, Levine, Plummer, & Marci).

Anomie/Uncertainty

Anomie[11] and the desire to seek an end to uncertainty can act as activators/catalysts of radicalization. If an individual is comfortable with uncertainty, the current status quo can redefine existing social norms to accommodate current conditions. The power of anomie to instigate radicalization and mobilization may be mitigated, or inhibited, through exposure to new social groups that may reduce uncertainty and provide alternative group norms. Uncertainty-identity theory suggests that individuals are motivated to join groups, or seek out similar others, in an effort

[11] Anomie is described as the lack of social norms and describes the subsequent fragmentation of social identity and social norms after the breakdown of the social bonds between individuals and their community.

to reduce uncertainty (Hogg, 2007, 2008, 2011; Hogg et al., 2008; Hogg, 2006b, 2007, 2008, 2011; Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007; Mullin & Hogg, 1998, 1999). When people feel more uncertain, they look to those groups that are cohesive with clear guidelines and norms (Hogg, Meehan, Parsons, Farquharson, & Svensson, 2006; Hogg et al., 2007; Mullin & Hogg, 1999), sticking more closely to group social norms (McGregor, Zanna, Holmes, & Spencer, 2001), and even adhering to more extreme group norms (Hogg, 2004; Hogg, Meehan, & Farquharson, 2010; Hogg et al., 2006).

Uncertainty that motivates us to identify with self-relevant groups and to act on behalf of those groups—even extremely—is based on context (Hogg, Adelman, & Blagg, 2010). In other words, uncertainty-identity theory goes above and beyond theoretical frameworks focused on personality differences (in which people are more or less likely to avoid uncertainty). For example, in research conducted outside of the laboratory in Israel (see Adelman, Hogg, & Levin, 2009), Muslims reported the degree to which they felt uncertain about themselves as well as about the Israeli-Palestinian conflict. Analyses showed a positive relationship between Palestinian identity importance and support for the use of suicide bombings. However, this was a function of their contextual uncertainty: Greater support of suicide bombings was found among those with highly important Palestinian identities, but only when they also felt more uncertain about the Israeli-Palestinian conflict or about themselves. In fact, those Muslims with a very important Palestinian identity, but who felt little uncertainty, were more likely *not* to support the use of suicide bombs. On the other hand, respondents with a very important Palestinian identity coupled with strong feelings of uncertainty were more likely to very strongly support the use of suicide bombs—average scores were more than double in this uncertain group than in the non-uncertain group (Adelman et al., 2009).

An important function of CBCT, in addition to communication and connecting, is to facilitate the search for information and acquisition of new knowledge. Data suggest that nearly 50% of all online activity involves searching the Web for information (Small, Moody, Siddarth, & Bookheimer, 2009). Because of the relative openness of the Web and the anonymity and privacy afforded by it, virtually any content that one might seek is available to anyone who goes looking for it including children, adolescents, and the emotionally or psychologically vulnerable individuals (Donnerstein, 2011). Information seeking can be motivated by a wide variety of factors. For example, the transformative learning theory of radicalization (Wilner & Dubouloz, 2010; 2011) posits that individuals who encounter a disorienting life event that forces them to reconcile their prior expectation about the world with a newly perceived reality will engage in critical self-reflection and a search for new knowledge to support that internal reconciliation. For people with access to CBCT, and particularly with access to the Internet, there is a virtually limitless supply of information to be found, both through individual search and through interactions with others via social media, newsgroups, or online discussion forums. Given the vast information stores available online, information seeking via CBCT is not without its challenges and risks. Some risks may be mitigated by the fact that CBCT media often provide anonymity, which may serve as a layer of protection when on is searching for sensitive of socially stigmatizing information (Buchanan, Joinson, Paine, & Reips, 2007; McKenna & Bargh, 1998; Piazza & Bering, 2009). Although locating information sources may be easy at first, users must then make determinations about the trustworthiness of online information and credibility of the sources who provide that information (Kelton, Fleischmann, & Wallace, 2008; Metzger, 2007). With so much information available one concern is that a vulnerable individual engaged in information seeking may find collections of extremist ideas and materials and thereby self-recruit into an extremist community without any aid or seduction by an intermediary (Counter Terrorism Implementation Task Force (CITTF), 2011). Upon joining such communities, which can

be very resilient and adaptive, vulnerable individuals finding like-minded others may then be swept along by the groups' ideologies.

Additional complications arise as a result of the design of most online search technologies. To keep users engaged and connected, search engines such as Google, for whom profits depend on providing content that is maximally appealing to users, use searchers' past searches and behaviors to tune future search results. The upshot of this design feature is that users' search results are filtered to present those things that are expected to be what users want based on what they preferred in the past (e.g., which links did people follow in previous search results). In other words, people do not see all the links that match their search queries; they see a subset that is likely to agree with what they preferred in the past. This creates a so-called "echo chamber" in which people ultimately are presented only with information that reinforces their already held preferences and beliefs which might otherwise be difficult to sustain (Counter Terrorism Implementation Task Force (CITTF), 2011). This can result in people overestimating the extent to which the rest of the world agrees with their perspective, a phenomenon called false consensus. False consensus has also been found to occur in a study of participants in neo-Nazi online groups (Wojcieszak, 2011). Notably and contrary to expectations, for individuals who participated in neo-Nazi online groups, having close offline ties with people who held opposing views did not reduce false consensus, and exposure to ideologically dissimilar news media actually exacerbated false consensus.

As a final point regarding CBCT information seeking activity, it was found that, among Chinese immigrants in Singapore, individuals who stayed in the host country longer were more likely to change their behaviors and visit host-country websites instead of home-country websites and communicated significantly less often with friends and family in their home country via the Internet (Chen, 2010). However, a tendency to continue visit home-country websites despite an extended stay in the host country was associated with poor intercultural adaptation, which includes the ability to "fit in" and interact effectively with host-culture members. Note that the causal arrow of the latter finding is indeterminate, so it cannot be inferred from this study alone whether Internet behaviors drive intercultural adaptation or adaptation drives Internet behaviors.

One of the first stages in the transformative learning theory of radicalization (Wilner & Dubouloz, 2010; 2011) involves engaging in a search for information to resolve cognitive conflicts after experiencing a disruptive event, such as a personal tragedy or trauma, which is a key transition factor. In addition, using CBCT in the information seeking process may be challenging for people dealing with anomie and uncertainty, as there is considerable responsibility placed on the information seeker with regard to making determinations about the trustworthiness and credibility of what can be found online. The Internet and other CBCT offer such a vast array of information that making sense of it all can be a tremendous challenge. However, navigating the Web and all its resources may be simplified by a combination of human behavior and technology. Human behavior reduces the complexity of information search by quickly filtering out things that are undesirable or perceived to be unhelpful. For example, research demonstrates that when individuals are presented with negative information that runs counter to their stated attitudes, they engage in motivated reasoning. This is neurally demonstrated via suppression of the dorsolateral prefrontal cortex, an area of the brain most associated with reasoning. Moreover, researchers have seen specific patterns of activation suggesting that the individual was engaging in positive reinforcement, thus "the combination of reduced negative affect (absence of activity in the insula and lateral orbital cortex) and increased positive affect or reward (ventral striatum activation)"…suggests why motivated judgments may be so difficult to change (i.e., they are doubly reinforcing) (Westen D. , Blagov, Harenski, Kilts, & Hamann, 2006). Beyond motivated reasoning and avoidance, individuals receive filtered information via the dominant Internet search technologies that learn from repeated actions

what information tends to be preferred and apply their own filters to ensure that users only see search results that are likely to be used and, therefore, most likely to keep the user engaged.

The latter process, in particular, may quickly drive individuals to resolutions of their informational needs by implicitly suggesting that alternative ideas do not exist. Moreover, and especially for those with anomie, the Internet may guide a person to an online community, group, or forum where information is shared by other users providing access to different cultural norms and groups which can either increase or diminish feelings of connectedness with group norms. To the extent that the people who frequent a given online community do so because they feel a connection and kinship with others, such communities can amplify the "echo chamber" effect created by search technology. Although one would expect information filtering to occur in any media, the key implication of CBCT for the transition factors of anomie, uncertainty, and personal tragedy is that many technologies that are used for information seeking and information exchange, by their very design, may drive people toward a self-fulfilled foregone conclusion (Walther & D'Addario, 2001) while creating the impression that there is widespread agreement or few alternatives.

Reward/Pleasure Seeking

To ensure survival of the species, humans are innately designed to engage in behaviors that end with reward (reward-seeking) and avoid behaviors that can result in loss (loss-avoidance). When individuals perceive a potential reward (e.g., food, money, social reward) the brain begins to set the reward-seeking system into action (Knutson & Wimmer, 2007). The reward system involves transmission of dopamine—the 'pleasure' chemical of the brain. Numerous studies demonstrate that when predominantly dopamine centers of the brain are stimulated (in a controlled lab setting with electrical stimulation), subjects reported intense feelings of well-being (Aharon, Etcoff, Ariely, Chabris, O'Connor, & Breiter, 2001; Olds & Milner, 1954). The desire to engage in experiences that result in the release of dopamine can, in some cases, result in individuals engaging in dangerous behaviors at the expense of the individual's' overall well-being (e.g., addictive behaviors or engagement in extreme activities that warrant praise or attention from others). The desire for release can serve as a potential transition factor for some individuals as they seek behaviors or actions that have the potential to result in reward, in some cases acting as a catalyst, in other cases—when the release of dopamine is inhibited—acting as an inhibitor. Furthermore, studies suggest that "Internet addiction…has a unique impact on aggressive behavior" and that heavy Internet use has influence on real-world aggressive behavior among adolescents" (Ko, Yen, Liu, Huang, & Yen, 2009).

Some individuals may find physiologically rewarding behavior through engaging with CBCT to such an extent that they exhibit neural activation similar to that of addicts. Studies suggest that Internet addicts "have enhanced reward sensitivity and decreased loss sensitivity" than non-addicts (Dong, Huand, & Du, 2011). Web developers, including game, gambling, and websites in general, attempt to satisfy individual's need for achievement while increasing the individual's desire for small victories, over and over again during play. This may lead to online behavior continually rewarded by "feelings of being in control, they synchronous interactive quality, the immediate achievement, and the freedom of self-representation" (Leung, 2004). Further study has shown that individuals who are engaged in reward seeking behaviors have lower impulse control ability, enhanced reward sensitivity, and more likely to show high preferences for present reward with neglect for long-term adverse consequences (Dong, Huand, & Du, 2011; Becker & Murphy, 1988). This reward seeking behavior may be as simple as updating a Facebook status. If the user receives positive feedback (i.e., the reward), it incentivizes the user to repeat this behavior. This could be of concern if the individual begins to post extremist opinions and receives rewarding affirmations thus embarking

upon a feedback loop, driving them to repeat the behavior with the potential for escalation of opinion.

Personal Tragedy or Trauma

Tragic and traumatic events may serve as "disorienting dilemmas" (Wilner & Dubouloz, 2010) that compel an individual to seek ways to resolve or rectify newly perceived inconsistencies between the way one thought the world operated and the experiences that violated that expectation. Borum (2011a) describes the state that arises after a disorienting dilemma such as a cognitive opening or openness to new worldviews, which may precipitate greater vulnerability to alternative worldviews, including those of radicals. Traumatic events can produce feelings of resentment and anger, extreme grief, humiliation, stress, and survivor's guilt. Mroz (2009) reviewed literature related to the effects of traumatization and found support for the notion that trauma can follow from being part of an event, witnessing an event, or hearing about an event, and may lead to irrational thoughts and behavior, including coming to believe that extremism is a rational response.

A critical element for recovering from a personal tragedy or traumatic event is an individual's ability to cope with or manage stress. Researchers from the fields of neuroscience and neurobiology suggest that while there are environmental factors at play in stress response, there are various biological factors that foster a predisposition for some individuals to respond stronger or take more time to recover from stressful events (Kudielka, Hellhammer, & Kirschbaum, 2007). For example, numerous studies have demonstrated that men have a more pronounced response to stressful stimuli (Kudielka, Hellhammer, & Kirschbaum, 2007; Kirschbaum, Wust, & Hellhammer, 54). Recent findings demonstrate that digital natives utilize CBCT to regulate their emotion by using CBCT as a way to share, vent, or sufficiently process the tragedy without turning to extreme anger. However, instant communication and instant awareness means that some may instantaneously respond with anger, not thinking of consequences (Lehamn, 2012; Frank, Marci, & Martin, A [biometric] day in the life, 2012). Furthermore, research demonstrates that CBCT provides a platform for enhanced empathy in already more empathetic people, which may be a sufficient transition factor for some.

Narratives and Memes

Following Corman and colleagues (see, for example, Corman, 2011; Halverson et al., 2011), a narrative is "a system of stories that share themes, forms, and archetypes" such that narratives have the ability to organize and structure how people make sense of the ideas, events, and people they encounter by providing a way in which to "communicate attitudes, values, beliefs and opinions across generations" (Motsumoto & Juang, 2007, p. 6). While the stories that make up a narrative need not have exactly the same features, together they elaborate the overarching meaning of the narrative. Master narratives are a specific class of important narratives that are "deeply engrained" in the minds of people who share a common culture and can be invoked by making reference to simple words and phrases rather than by retelling a full story that is a component of the narrative. Master narratives form the basis for local narratives that provide structure and meaning to the people and events of a particular time and place and personal narratives through which people "project themselves as characters in local narratives" (Corman, p. 37). The collection of narratives that exist within a culture creates a rhetorical vision, which "contains a stock of values, morals, story forms, archetypical actors that can be used in narrative action" (Corman, p. 38).

By exploiting a group's master narratives, small groups, such as extremists, can communicate and promote their ideals and rationale within a culturally recognized and meaningful context while at the same time promoting the notion of "us versus them" and strengthening negative emotions

towards the out-group(s) (Motsumoto, Hwang, & Frank, 2011). Moreover, certain master narratives, such as the Crusader narrative identified by Halverson, Goodall, and Corman (2011) as a part of Islamic culture, provide an efficient way to portray current events in a way that recasts them in terms of an attack on Islam while invoking memories of past attacks on Islam. Such a mechanism might contribute to an escalation in a person's opinion vis-à-vis the opinion pyramid. Master narratives can also be reinterpreted to reflect an individual's or group's view of the world and communicated to others to identify those people whose interpretations are similar or to substitute the new narrative in other people's minds to change how they interpret events. The substitution of an alternative frame can be mitigated through a community of strong adherents to the original narrative frame. In addition, feelings of cognitive dissonance, where the interpretations conflict with held beliefs, can inhibit the adoption of alternative memes or narratives and minimize the efficacy of a radical narrative or the like.

As with the sacred values transition factor, discussed above, a key consideration regarding narratives and memes as a transition factor is not simply that they exist or are known to a person, but rather that there may be incidences or deliberate efforts that affect how a person frames and understands a narrative or meme such that the new perspective motivates a change in the person's opinion or action state. Halverson, Goodall, and Corman (2011) described this in terms of a reinterpretation of a master narrative. When considering the implications of CBCT for the narratives and memes transition factor, key issues include how CBCT can be used to communicate alternative interpretations of the narrative, to propagate information or materials that support an alternative interpretation, and to create and reinforce a meme that conveys a particular unit of cultural knowledge that strengthens one interpretation over another.

Social Movements

Social movements are defined by Zald and McCarthy, as cited in Borum, (2011a), as "a set of opinions and beliefs in a population, which represents preferences for changing some elements of the social structure and/or reward distribution of a society." The critical aspect of this emphasis is that social movements are viewed as occurring at the collective level. There are two perspectives in the literature with regard to social movements. As Borum (2011a) describes, social movements may operate as rational, somewhat coordinated, phenomena. Social movements persist because "adherents/members collect and maintain a body of supporters."

An alternative perspective takes a complex systems perspective and views social movements as emergent phenomena. Emergent social movements do not function under the direction of any central coordinator, but rather arise as a consequence of the individual, local decisions that people make in response to their own needs, wants, and opportunities. Individuals get caught up in the movement, but it is the independent, synchronous action of multiple individuals that leads to an emergent group phenomenon that may eventually become self-reinforcing. Regardless of approach or perspective, social movements can empower protest and radicalization. The Internet provides opportunities for self-publication of ideas and content, which enables many voices and wide (global) distribution such that members of a movement can find, and be found by, new members. The relayed messages communicated over the Internet can, in a short period of time, affect many individuals who independently experience emotional reactions or cognitive shifts that drive behavioral changes such that a movement emerges without any central coordination. The extent of this dissident cyber activity through Facebook, Twitter, blogs, and YouTube is not known; however, "there is a sense of agreement that social media had a significant effect on the effectiveness and speed of regime overthrow" (Goldsmith & Siegel, 2012, p. 7). These various platforms were used to disseminate information, inspire activists, and coordinate between different groups.

Financial Incentive

A powerful catalyst for mobilization to violence can include financial incentives, particularly in situations of chronic unemployment or economic hardship. Financial incentives can activate the reward system and can relate to reward and pleasure seeking behavior or can be perceived as a simple method of survival for individuals and their families (Africa Center for Strategic Studies, 2012). In fact, monetary loss is "associated with decreased activation in the anterior cingulate cortex (ACC)." The ACC is strongly implicated in adverse processing and is part of "a network suggested to mediate emotional responses to pain" (Vogt and Sikes, 2000). Furthermore, Petrovic et al., found that the activation in ACC was enhanced in line with the increased unpleasantness ratings for losses (2008). Decreased activation in this region may help explain why some individuals indulge in mobilization and fail to worry about the consequences of their actions (Dong, Huand, & Du, 2011). While the draw of money is a potentially strong catalyst, the power of financial incentives can be minimized by demonstrating the cognitive dissonance between opinion states and the activities required for payment as well as the provision of alternative, non-illicit sources of income. Finally, CBCT facilitates ease of financial transactions through the ease of making connections between those looking to earn money and those who want to pay someone. For example, radical group recruiters could obtain online gambling sites' rosters and target those who are deeply in debt, making those individuals vulnerable to extortion.

Conclusion

This chapter explored insights from neuroscience, psychology, and social psychology to help explain how and why individuals might move along the radicalization and mobilization pathway. Shaping factors reflect the environmental context of radicalization and shed light on considerations that affect *how* individuals make decisions that lead toward extremism. Transition factors reflect the reasons *why* people modify their beliefs and decide to take actions that progress, and sometimes regress, along the radicalization pathway. There are many ways in which both shaping and transition factors motivate or mitigate individual choices. It must be noted that none of these factors is "more powerful" than another, and the order in which they are presented is not intended to emphasize or preference any particular factor over the others. While psychologists and sociologists have been investigating political violence for many years, the application of neuroscience research to political violence, and in particular the factors pertaining to radicalization and mobilization, is a new and emerging field. The findings discussed here represent the earliest stages of understanding. In addition, while it is increasingly clear that continual use of CBCT has drastic effects on the brain, the full impact of CBCT on the developing brain is yet to be determined. Research has shown that access to CBCT can change brain structure, in particular the pathways that are used and even the density of some regions of the brain. Moreover, while it is clear that CBCT has a multiplier effect on radicalization and mobilization, its pathology is only beginning to be unlocked.

Chapter 3: Discussion and Conclusion

How Do We Get Left of Boom?

Cyber-based communication technology (CBCT) and, in particular, the Internet have revolutionized the way business and interpersonal interactions occur—flattening the world and providing a cheap, accessible conduit for propagating ideas, innovations, and movements. Just as the Internet has facilitated the emergence of YouTube sensations as innocuous as popular song videos performed by athletes or aspiring musicians, or as dangerous as the "Innocence of Muslims—Muhammed" video, it has also provided a powerful platform for extremists to influence vulnerable populations. CBCT provides easy, cheap, accessible communications media that crosses international borders and increasingly facilitates voice and video communication opportunities. Through this cheap communication media, CBCT facilitates the creation of connections among and between groups, diminishing physical normative barriers to communication, assisting in the spreading of memes, and connecting individuals across thousands of miles of geographic distance. Perhaps most importantly for radicalization, CBCT and specifically the Internet provides an anonymous forum where individuals can explore identities in an environment where what you say or do cannot be readily traced back to you if you choose not to overtly link your virtual and physical persona (McKenna & Bargh, 2000).

Given the low cost of entry and the ease of use, the United States' counterterrorism efforts cannot afford to lag behind in understanding how to best utilize advances in CBCT for counterterrorism efforts. Chris Battle, a former homeland security advisor to the U.S. government suggested that:

> …those who continue to dismiss the power of New Media sources to enhance planning and coordination—not to mention its most powerful capability, which is to magnify public attention to [terrorists'] cause—are either delusional or compensating for their own failure to stay ahead of the curve. (Battle, 2009)

This statement still rings true as the United States continues to grapple with such a complex, fluid, and multi-dimensional problem-space.

Better understanding of the power behind advances in CBCT for forming attitudes, fostering connections, and creating radicalization opportunities necessitates further exploration of the impact that CBCT has on the factors that contribute to radicalization and mobilization to political violence. This report represents a first step in this endeavor. The links between researchers in the emerging fields of neurobiology and those working national security issues is an important one to maintain in order to ensure that the latest insights from science are applied before another iteration of technology floods the environment. For example, research expanding upon the research insights gleaned from InnerScope (Frank, Marci, & Martin, 2012) is critical as CBCT continues to gain ground in more technologically primitive countries. Fully understanding the implications of research demonstrating CBCT's effect on individuals (including reduced attention spans, desensitization to disturbing stimuli, modifications of determining credibility and trustworthiness, and increasing reliance on heuristics to process large amounts of information in short amounts of time) is critical to projecting future areas of concern and crafting targeted messages and strategies.

Additionally, as steps are taken to move towards a deeper understanding, a potential tool or useful framework may be the next phase of the SMA/McCauley Pyramid model. Through further

development of the SMA/McCauley Pyramid, the framework has the potential to go beyond serving as a tool upon which to hang, or explore, the factors pertaining to radicalization and mobilization at the basic level, to serving as a planning tool against which operators can quickly identify the unique factors at play in a given situation. However, significant empirical work must go into refining the shaping factors as well as exploring and identifying the unique factors relevant for transitions within and between the two pyramids. The tool would then assist planners in designing intervention strategies that either build upon existing inhibitors or temper catalysts and activators. Appendix A provides a notional cross-walk of the transitions of interest (from low-level threat to higher level threat), suggesting various shaping and basic factors at play behind the transition, as well as offers various inhibiting factors upon which various intervention strategies can build. This work will also serve to deepen the bench of understanding on target audience identification through isolating critical and unique shaping factors, activators, catalysts, and inhibitors allowing for refined interventions and tailored measures of effectiveness.

In addition to continuing to explore the impact of CBCT on the various basic and shaping factors, the low-hanging fruit for the operational community is to understand the advantage that the U.S. now enjoys in gaining unique insights into the training, planning, and, in particular, the execution of political extremist activities. For example, preceding the 2008 attacks in Mumbai the attackers used CBCT to maximize the effects of the attacks, and in doing so provided some of the "earliest pieces of critical information necessary for security agencies to develop a picture of events as they unfolded" (Amble, 2012). Twitter users post "tweets" at a rate of 400 million per day. This number is growing rapidly, having more than doubled in just one year (Farber, 2012) and provides a data, or information, management problem, especially when attempting to find the "red" within the grey noise. Various tools such as thematic content analysis, advanced social network analysis, or targeted analysis may help USG analysts gain a wealth of potentially invaluable information in often difficult to penetrate areas (Amble, 2012). For example, even state-supported and well-financed operations undertaken with every security precaution are vulnerable to CBCT as illustrated by the tweets on unusual helicopter activity by a local resident preceding the May 2011 raid that killed Osama bin Laden.

Conclusion

The Internet and other forms of cyber-based communication technology do not likely contribute to radicalization and mobilization to political extremism in a linear fashion. It is more likely that the various modes of CBCT interact with shaping factors and transition factors to produce psychological and behavioral outcomes (McKenna & Bargh, 2000). It is important to note that only a very small subset of individuals become more radical in their thinking or becoming mobilized due to interactions with CBCT. Additionally, the impact of a given mode of communication on a person is dependent on that individual's motivation for using the medium (Stevens & Neumann, 2009). For some individuals, the Internet provides the opportunity to construct new identities, test out new personalities, and experiment with modes of self-presentation and representation to others. Since an Internet user develops contacts with a new peer group that may lack any ties to their offline social groups, the user can "successfully implement wished for changes in their self-concept…increas[ing] feelings of self-worth and acceptance" (McKenna & Bargh, 2000, p. 62). In this regard, the Internet can be an escape from an inhospitable offline world—for example, a gay young man in a rural, conservative area might reach out to other gay young men on the Internet and develop a sense of community online that he does not have offline. Not only can people garner positive reinforcement for things that they may be stigmatized offline for, but a radical's negative social beliefs can be reinforced by the positive feedback and encouragement of other like-minded individuals. This feeling of social support for atypical and radical beliefs is only further encouraged

by a reasoning fallacy sometimes called the "illusion of large numbers" (McKenna & Bargh, 2000, p. 64). Since the Internet facilitates the development of social groups organized around fairly rare shared interests or ideologies in ways that would not typically be possible offline, radicals (and others) on the Internet may believe that the few thousand members of their website represent the tip of the iceberg of support, when in fact they represent a ceiling on total support for the movement or ideology.

While advances in CBCT may impact the ways in which individuals receive and process information and connect with others, "the Internet does not….have by itself the power or ability to control people, to turn them into addicted zombies, or make them dispositionally sad or lonely (or, for that matter, happy or popular), and neither does the telephone, or television, or movies" (McKenna & Bargh, 2000). Rather, the Internet provides ready and fast access to information, facilitates the coming together of likeminded individuals, and encourages the development of the "self", a concept that can change daily from the observer's perspective. Additionally, the Internet provides increasingly unique and isolated individual information streams, providing an echo-chamber of sorts, with individuals selecting to read—often automatically through applications like Google Reader—information that confirms and is consistent with their existing world view rather than encountering information that is potentially contradictory or disconfirming (Kristof, 2009; Duneier, 2012). This echo-chamber, the ready access to like-minded individuals that was not possible before the advent of the Internet, along with the illusion of large numbers may increase the extremity of an individual's beliefs, but it does not, generally, incite them directly because the Internet is only one of "several social domains in which an individual can live his or her life, and attempt to fulfill his or her needs and goals, whatever they happen to be" (McKenna & Bargh, 2000, p. 72).

Areas for Future Research

As noted throughout this report, further research must be conducted to fully understanding the implications of advances in cyber-based communications technology on the root factors pertaining to radicalization and mobilization. The research examined here suggests a greater emphasis on empirical testing of hypotheses is necessary along with adaptation of common, cross-disciplinary vernacular to ensure holistic approaches are taken on the road to discovery. Some additional areas for future research include:

- Application of research paradigms outside of known contexts (Chiao, 2012; McKenna & Bargh, 2000). This includes drawing a wider net for the participant pool to include individuals from harder to reach countries;

- Longitudinal studies exploring the effects of CBCT on basic brain development, specifically on attention, high-order cognitive processes, and emotion regulation;

- Understanding the degree to which functional Magnetic Resonance Imaging studies which invariably use projected images and recorded auditory stimuli actually mimics virtual environments versus the physical environments they are meant to mimic;

- Desensitization to emotionally provocative images;

- Expand upon neuroscience research demonstrating correlations between gray matter density of amygdala and social network size and the implications for the factors underlying radicalization and mobilization such as emotional arousal, aggression, social belongingness, and information processing.

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Appendix A: SMA/McCauley Model Transitions of Interest

NOTIONAL

Transitions with Opinion = 'Neutral' (1 of 2)

Movement with a neutral opinion does not require conformity to the cause, but rather compliance and/or obedience

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Potential Indicators	Interventions & MOE	Role of Cyber
Neutral-Inert to Neutral-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Social Belongingness • Influential Memes • Financial Incentive • Social Factors • Anomie/Uncertainty	• Social Factors • Lack of opportunity • Cognitive dissonance between neutral opinion and action	• Use of #[event] on twitter • Initiated cyber connections with known legal activists people & groups		• Facilitates opportunity through exposure to people and ideas • Can serve as the medium through which to engage in legal activism • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Inert to Neutral-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Social Belongingness • Influential Memes • Financial Incentive • Social Factors • Anomie/Uncertainty	• Social Factors • Lack of opportunity • Cognitive dissonance between neutral opinion and action	• Initiated cyber connections with known radical people & groups		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Inert to Neutral-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Social Belongingness • Influential Memes • Financial Incentive • Social Factors • Anomie/Uncertainty	• Social Factors • Lack of opportunity • Cognitive dissonance between neutral opinion and action	• Initiated cyber connections with known terrorists & groups		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

NOTIONAL

Transitions with Opinion = 'Neutral' (2 of 2)

Movement with a neutral opinion does not require conformity to the cause, but rather compliance and/or obedience

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Potential Indicators	Interventions & MOE	Role of Cyber
Neutral-LegalActivist to Neutral-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Social Belongingness • Influential Memes • Financial Incentive • Social Factors • Anomie/Uncertainty	• Social Factors • Lack of opportunity • Cognitive dissonance between neutral opinion and action • Achieved success through legal means	• Increased cyber connections with known radical people & groups		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to Neutral-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Social Belongingness • Influential Memes • Financial Incentive • Social Factors • Anomie/Uncertainty	• Social Factors • Lack of opportunity • Cognitive dissonance between neutral opinion and action • Achieved success through legal means	• Increased cyber connections with known terrorists & groups		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Radical to Neutral-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Social Belongingness • Influential Memes • Financial Incentive • Social Factors • Anomie/Uncertainty	• Social Factors • Lack of opportunity • Cognitive dissonance between neutral opinion and action	• Increased cyber connections with known terrorists and groups		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Transitions with Opinion = 'Sympathizer'

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Potential Indicators	Interventions & MOE	Role of Cyber
Sympathizer-Inert to Sympathizer-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Influential memes • Financial incentive	• Use of #[event] on twitter • Initiated cyber connections with known legal activists people & groups	• Removal of grievance • MOE: diminished # of legal activities	• Facilitates opportunity through exposure to people and ideas • Can serve as the medium through which to engage in legal activism • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Inert to Sympathizer-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Influential memes • Financial incentive	• Initiated cyber connections with known radical people & groups • Money flowing to known actors		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Inert to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Influential memes • Financial incentive	• Initiated cyber connections with known terrorists & groups • Money flowing to known actors		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Transitions with Opinion = 'Sympathizer'

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Potential Indicators	Interventions & MOE	Role of Cyber
Sympathizer-LegalActivist to Sympathizer-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance Achieved success through legal action	• Increased cyber connections with known radical people & groups • Money flowing to known actors		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others
Sympathizer-LegalActivist to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance • Achieved success through legal action	• Increased cyber connections with known terrorists & groups • Money flowing to known actors		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others
Sympathizer-Radical to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity	• Increased cyber connections with known terrorists and groups • Money flowing to known actors		• Facilitates opportunity through exposure to people and ideas • eases dehumanization of others

Notional

Transitions with Opinion = 'Justifier' (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Justifier-Inert to Justifier-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Financial incentive • Removal of grievance			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber
Justifier-Inert to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Financial incentive • Removal of grievance			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber
Justifier-Inert to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Financial incentive • Removal of grievance			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber

Notional

Transitions with Opinion = 'Justifier' (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Justifier-LegalActivist to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Financial incentive • Removal of grievance • Achieved success through previous legal action			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber
Justifier-LegalActivist to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Financial incentive • Removal of grievance • Achieved success through previous legal action			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber
Justifier-Radical to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Financial incentive • Removal of grievance			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber

Notional

Transitions with Opinion = 'PMO' (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
PMO-Inert to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber
PMO-Inert to PMO-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber
PMO-Inert to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber

Notional

Transitions with Opinion = 'PMO' (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
PMO-LegalActivist to PMO-Radical	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Achieved success through previous legal action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
PMO-LegalActivist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through previous legal action			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber
PMO-Radical to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Financial Incentive • Social Factors	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Eases dehumanization of others • Echochamber

Notional

Transitions with Action = 'Inert' (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Inert to Sympathizer-Inert	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
Neutral-Inert to Justifier-Inert	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
Neutral-Inert to PMO-Inert	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others

Notional

Transitions with Action = 'Inert' (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-Inert to Justifier-Inert	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
Sympathizer-Inert to PMO-Inert	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
Justifier-Inert to PMO-Inert	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others

Notional

Transitions with Action = 'LegalActivist' (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-LegalActivist to Sympathizer-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Achieved success through previous legal action • Removal of grievance(s) •			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to Justifier-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Achieved success through previous legal action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Achieved success through previous legal action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Transitions with Action = 'LegalActivist' (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-LegalActivist to Justifier-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Achieved success through legal action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-LegalActivist to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Achieved success through legal action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-LegalActivist to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Opportunity • Technology • Social/Political/ Economic Context • Individual psychopathology • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Achieved success through legal action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Transitions with Action = 'Radical' (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Radical to Sympathizer-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Radical to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Radical to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Transitions with Action = 'Radical' (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-Radical to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Radical to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-Radical to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Transitions with Action = 'Terrorist' (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Terrorist to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber
Neutral-Terrorist to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber
Neutral-Terrorist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber

Notional

Transitions with Action = 'Terrorist' (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-Terrorist to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Terrorist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-Terrorist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Neutral-Inert" (1 of 3)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Inert to Sympathizer-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Inert to Justifier-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Inert to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Neutral-Inert" (2 of 3)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Inert to Sympathizer-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance) • Eases dehumanization of others
Neutral-Inert to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance) • Eases dehumanization of others
Neutral-Inert to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance) • Eases dehumanization of others

Notional

Diagonal Transitions from "Neutral-Inert" (3 of 3)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Inert to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action (in this case there is no action) • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Inert to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-Inert to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Eases dehumanization of others

Notional

Diagonal Transitions from "Neutral-LegalActivist" (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-LegalActivist to Sympathizer-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Cognitive dissonance between opinion and action • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Neutral-LegalActivist" (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-LegalActivist to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Neutral-LegalActivist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Neutral-Radical"

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Neutral-Radical to Sympathizer-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
Neutral-Radical to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others
Neutral-Radical to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others

Notional

Diagonal Transitions from "Sympathizer-Inert"(1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-Inert to Justifier-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Inert to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Inert to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Sympathizer-Inert"(2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-Inert to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Inert to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Inert to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Justifier-Inert"

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Justifier-Inert to PMO-LegalActivist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-Inert to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-Inert to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s)			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Sympathizer-LegalActivist" (1 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-LegalActivist to Justifier-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-LegalActivist to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Diagonal Transitions from "Sympathizer-LegalActivist" (2 of 2)

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-LegalActivist to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-LegalActivist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/ epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Other Diagonal Transitions

Transition	Key Shaping Factors	Activators/ Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Sympathizer-Radical to Justifier-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Sympathizer-Radical to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-LegalActivist to PMO-Radical	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)

Notional

Other Diagonal Transitions

Transition	Key Shaping Factors	Activators /Catalysts	Inhibitors	Indicators	Intervention	Role of Cyber
Justifier-LegalActivist to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/ Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)
Justifier-Radical to PMO-Terrorist	• Cultural worldview • Demographic Characteristics • Technology • Social/Political/ Economic Context • Genetic/epigenetics • Individual psychopathology	• Threat to sacred values • Social Belongingness • Social isolation • Grievance • Emotion • Anomie/ Uncertainty • Physiological Response • Personal Tragedy • Influential Memes • Social Factors • Financial Incentive	• Social Factors • Lack of opportunity • Removal of grievance(s) • Achieved success through legal action			• Facilitates opportunity through exposure to people and ideas • Echochamber • Eases dehumanization of others • Provides a legal course action for airing grievances (however depending upon other factors this may either enhance or diminish grievance)