



# White Paper on Social and Cognitive Neuroscience Underpinnings of ISIL Behavior and Implications for Strategic Communication, Messaging, and Influence

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## Foreword: LtGen (Dr.) Robert Schmidle, USMC

This White Paper makes a significant contribution to the study of terrorist behavior in general and ISIL behavior in particular. Unique in this work is the melding of neuroscientific considerations about the basic structures and functions of the brain with social and cultural influences in order to provide a holistic insight into the motivations for terrorist behaviors. Importantly, this paper also explores the relationship between the narratives that support terrorist behavior and the neuro-cognitive processes that contribute to those behaviors. That relationship is accurately portrayed as symbiotic in the sense that one can only truly understand seemingly aberrant behavior if one understands the continuous ebb and flow of chemical and cultural influences that are manifested in an individual's actions.

Important in framing the discussion of terrorist behavior is the presentation of two foundational constructs; the postulation about the normality of aggression and the admonition against the use of terms such as deranged, psychotic, and evil in describing ISIL behaviors. When thinking about the normality of aggression one wonders if Hannah Arendt's observation about the banality of evil, alternately interpreted as describing the many dull organizational tasks that need to be done by ordinary people in order to perpetuate genocide, has relevance to this discussion about ISIL.

What we classify as evil is influenced by the local moral order or culture in which we live. It has been said before and remains historically valid that what one culture calls a terrorist another culture calls a freedom fighter. As morally disturbing as the ISIL beheading videos are, they are informed by a certain rationality that is shared by those who belong to or want to be accepted by ISIL. Trying to understand this rationality is made more difficult when terms such as deranged and psychotic are applied to members of ISIL, since they are actually behaving in accordance with the norms of rationality within their own organization. People seek to join ISIL and aspire to be accepted by that organization in the same way that they join any other self-described elitist organization.

The terrorist narratives that support and justify their behavior are linguistic manifestations of non-epistemic beliefs and are critical to supporting terrorist agendas and rationalizing the outcomes of actions inspired by those agendas. Those narratives are defined by language and were appropriately characterized by Ludwig Wittgenstein when he said: "the limits of my language mean the limits of my world." The micro-world of ISIL is defined by the language and the narratives they use in identifying themselves. However, there are also influences on the individuals in ISIL that shape and sustain those narratives, which can be empirically assessed and perhaps influenced, in part by using the scientific approaches articulated in this report. Presenting the totality of context, which should inform any discussion of ISIL behavior, is the great strength of this paper and is the reason for the unique contribution it makes to the contemporary literature about ISIL. The wide diversity of expertise and experience of the authors combine to produce exclusive insights into the origins of terrorist narratives and the manifestations of those narratives in intentional acts.

## Executive Summary: Drs. James Giordano (Georgetown University Medical Center) and Diane DiEuliis (HHS)

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This white paper provides a succession of chapters designed to lead the reader through a logical series of discussions intended to: (1) describe and define neuro-cognitive mechanisms involved in the type(s) of aggressive narratives and violent behaviors exhibited by ISIL/ISIS; (2) afford an overview of brain structures and function involved in these cognitive and socially-interactive behavioral processes of thought, emotion, decision-making and actions; (3) provide insight to the possible effect(s) of narratives and discourses upon these neuro-cognitive processes; (4) describe ways that religious constructs afford meta-narratives that can be engaged to influence individual and group cognitions and behavioral activity; (5) illustrate how these narratives can be utilized in psychological operations and actions to support terrorist agenda and outcomes; and (6) explain how an understanding of these processes and factors can be important to developing operational techniques, tactics and strategies that are viable and valuable for deterring ISIL/ISIS' rhetoric, recruitment and actions upon the world stage.

In **Chapter 1**, Dr. James Giordano provides an introductory view of the basic processes by which various environmental circumstances can lead to individual and group sentiments of marginalization, vulnerability and repression, and describes how these situations can foster neuro-cognitive processes of aggressive ideation and emotion, which can escalate to violent behaviors. The key point emphasized is that in the main, such processes are not necessarily representative of individual or group psychopathology, but rather represent an aspect of human behavior, which while hostile and threatening, can be viewed as an aspect of normal - and definably predictable - human traits. This view enables more accurate insight to possible causes, escalating effects, and means to evaluate, intervene, mitigate and/or prevent the progression of such neurocognitive-to-behavioral events. Current and near-term techniques and technologies of cognitive and social neuroscience, taken in concert with psychological, sociological, anthropological and computational methods, may prove useful in intelligence gathering and analysis, and the development of low- to high-tech approaches aimed at diverting, deterring and preventing ISIL/ISIS' activities.

In **Chapter 2**, Drs. James Giordano and Diane DiEuliis provide a short "primer" on the neurobiological basis of aggression. While this topic has been extensively addressed in other publications, for purposes of understanding aspects of ISIL narratives, discourses and activities, it is necessary to provide a specific view to neurobiological structures and functions operative in cognitive, emotional and behavioral processes of aggression and violent action(s). Although neural networks involved in and controlling aggressive cognitions and behaviors are extremely complex, there are some important takeaways from a general study of the brain in this context. Brain regions and networks involved in the control of cognitions and emotions of anger overlap with, and in some cases are identical to are networks involved in perceptions of threat and emotions of fear. Age differences in developmental maturity and susceptibility of these networks is important to recognize, as a key factor in environmental and social "shaping" of neurobiological mechanisms that may be primed for particular patterns of cognitive and emotional activities underlying dispositions to inter-individual and inter-group aggression. As well, somewhat distinct neurocognitive processes of impulsive versus premeditated aggression are also important to acknowledge, as these involve mechanisms that may be differentially assessed and influenced. Engaging these networks elicits cognitive processes that influence decision making and a

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variety of resulting behaviors. Understanding the structure and functions of these networks is important to identifying key regions and processes as targets for assessment and intervention, using a variety of neuroscientific techniques and tools, together with psychological, sociological and anthropological methods. This suggests a capability to influence those cognitive processes which handle the outcomes of such complex circuitry. Lastly, given the role that environment influences play, purposeful change or manipulation of the environment is one of the most accessible tools one can apply to influencing aggressive behaviors.

In **Chapter 3**, Dr. Nicholas Wright provides a detailed analysis of the neurocognitive aspects of decision making. This insight is important in order to avoid miscalculations and errors and/or lead to unintended results in interactions with adversaries. He notes several key themes that are intrinsic to successful strategies: First, an understanding of the environment is an essential brain function, and socio-culturally-dependent “world view models” are how individuals construct cognitive and emotional impressions of their situations and circumstances are fundamental to the ways that humans perceive reality. Second, individuals’ key motivations are important for both understanding their actions, and for providing potential targets for strategic communication with those individuals, and the groups (if not populations) to which they belong. Finally, the neuro-cognitive phenomenon of “prediction error” provides a basis for *increasing* or *decreasing* the impact of actions. A prediction error framework forecasts effects, and simplifies strategic concepts so they can be operationalized.

Chapters 1-3 provide discussion of the way(s) that the brain functions in response to various environments, the generation of cognitions, world view perception, cognitive and emotional aspects of decision-making, and behavior (including violence). Communicative inputs, provided by visual and auditory stimuli (e.g. - images, sounds, language) are important factors in engaging neuro-cognitive processes of emotion, motivation, decision-making and behavior.

The next several chapters move from the neurobiological mechanisms of neurocognitive decision making and behaviors, to the psychological and decision-making strategies employed by individuals and groups to achieve particular outcomes, with particular emphasis upon how these processes might be utilized by ISIL/ISIS, and thus how they may be engaged as targets for intervention and deterrence.

In **Chapter 4**, Dr. William Casebeer addresses how methods from the neuro-cognitive sciences are best applied in various phases (0-5) of the doctrinal military planning process. Drawing upon work from Emily Falk and co-workers, as well as other research groups’ (e.g. - Gregory Berns; Rebecca Saxe; Paul Zak; Jamil Zaki) current studies, enables a clearer picture to be developed about how various types of communicative messaging can and should be formulated and operationally implemented. Specifically, Dr. Casebeer addresses how neuro-cognitive science and approaches can better inform (a) what messages about a particular group are most effective in highlighting disparities between the interests of the group and the interests of the individual; (b) ways to change interactions between groups so that it becomes less likely bystanders to conflict will support, for example, a terrorist organization; and (c) post-conflict re-establishment of peace and stability, and setting conditions for cultivation of legitimate mechanisms of governance.

In **Chapter 5** Dr. John Shook affords an overview of constructs of religious ideals, narratives and belief stratagems. Shook provides insight to core concepts that offer cognitive and social resonance as both undergirding and over-arching themes, or “meta-constructs”, which can be amplified and fortified with emotional content to evoke radicalism and/or fundamentalism. Dr. Shook proposes that in certain instances, psychological factors, evoked by particular environmental influences can produce a hyper-

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vigilant form of in-group, rule attendance that is typical to particular forms of fundamentalism. Shook terms this Directed Emotion Favoring In-group Ascendancy Needing Triumph (DEFIANT), and describes its key elements as strong suppression of generic emotional concern for people, strong enhancement of specific emotional concerns for special persons related to oneself, and the regard of oneself as urgently crucial for upholding righteous protection of those special persons. Dr. Shook addresses how such ideals create individual and group cognitions of “Singular Sacredness”, which can override more traditional constructs of Just War rationalizations, and discusses how these are operational in ISIL/ISIS’ narratives and actions.

In **Chapter 6**, Dr. Jason Spitaletta outlines psychological warfare, noting that terrorism is a deliberate, purposeful tool in psychological warfare’s armamentarium, which can cause paralyzing fear in the intended targets. Specifically he defines ISIL’s use of gruesome prisoner executions and the subsequent humiliation of the groups those victims represent as an example of this purposeful decision to incite terror. Dr. Spitaletta describes how beheadings, which ISIL has interpreted from the Quran as legitimately authorized for non-Muslims prisoners, is a way in which the organization can reinforce their narrative, while justifying their religious legitimacy. The intentions of these acts are to terrorize and affect the behaviors of those terrorized, and Dr. Spitaletta notes that those who view the beheadings might identify with either the victim, or the aggressor, depending upon their own affinities or in-group bias.

In **Chapter 7**, Dr. William Casebeer presents current neuro-cognitive technologies that can be rapidly developed and/or modified to meet definable operational needs for messaging communication and interpretation. Dr. Casebeer defines system capability, enabling and augmenting technologies, current and near-term maturity of various techniques and technologies, and methods for employing any such tools in distinct tactical and strategic scenarios. In the main, Dr. Casebeer provides a framework for assessing the operational viability of neuro-cognitive technology, such that any approach would need capabilities to:

- (1) monitor and analyze multiple media types in real time,
- (2) combine that analysis with other types of event data,
- (3) automate extraction and analysis of narratives to allow sentiment forecasting,
- (4) connect narrative analysis to social network analysis of populations and group,
- (5) test proposed information operations and counter-narratives with a human-in-the-loop, ,
- (6) allow effective detection, analysis, forecasting, planning and execution of information and environmental shaping actions.

### **In sum, this report:**

- Describes environmental (socio-cultural, economic and political) factors that foster marginalization, vulnerability and repression can induce neuro-cognitive processes of aggressive ideation and emotion, which may escalate to violent behaviors
- Recommends that terms such as deranged, psychotic and evil, need to be strongly re-assessed because they tend to create a false lens through which to view and examine ISIL behaviors

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- Illustrates that ISIL's use of gruesome prisoner executions and the subsequent humiliation of the groups those victims represent are examples of purposeful decisions to incite terror
- Advocates that incorporating neuro-cognitive understanding and knowledge will be important to optimizing intelligence and deterrence efforts
- Advises that increasing messages' impact requires resonating with key psychological drivers and constant creativity to keep their nature unexpected.

## **Chapter 1: Brains and Environments: Neuro-Cognitive Bases of Aggressive Ideation and Behavior, and the Potential Utility of Neuro-Cognitive Science in Assessing and Altering ISIS' Narratives and Activities: Dr. James Giordano (Georgetown University Medical Center).**

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### **Introduction**

Current cognitive neuroscience may afford insights and tools that could be operationalized to: (1) gain understanding of, and (2) potentially affect the psychological foundations and types of narratives and interactions necessary to engage ISIS. Crucial in this approach is the use of cognitive and social neuroscience to provide a deeper comprehension of the variations in behaviors and perhaps (some of) the underlying (psychological and social) intents that seem to give rise to much of the publicized, as well as anticipated activities of ISIS (both in-country as well as upon the world stage). We at SMA have been attending to this by bringing together groups of our own strategic and tactical personnel, and external subject matter experts, who have been involved in projects addressing biological, psychological, and social factors and in some cases, potential determinants of individuals' and groups' cognitive patterns, ideas, beliefs and behaviors. The task at hand is to attempt bridge the biological, psychological and social variables operative in ISIS activities, so as to create an enhanced understanding of - and perhaps interventions to affect - factors contributing to these activities.

### **'Evil' and the "Everyman": The Normality of Aggression**

Toward developing this level of understanding, it is important to note that terms such as *fanatical*, *fundamental* and *fundamentalist* have each and all been used to describe and define the bases for ISIS' activities. I believe in many cases, such terms are accurate and appropriate (for a detailed discussion of religious fundamentalism and its implications for moral psychology, see: Shook, this report). However, I argue that terms such as *deranged*, *psychotic* and *evil*, need to be discontinued – or at least strongly re-assessed - because they tend to create a false lens through which to view and examine these individuals' capabilities, intentions, actions, and behaviors. This impedes approaches to optimally understand and operationally intervene against ISIS' ongoing aggressive and violent efforts, both now and in the future. It is in this light that this section refers to "*evil and the everyman*". Indeed, many of ISIS' activities are not representative of a group of "deranged" individuals, but rather, are the range of behaviors that would be expected for almost any group of humans who are feeling marginalized, repressed, and disempowered. As noted throughout this report, there are a number of cognitive and social neuroscientific studies of human behavior (and also strongly inferential non-human primate behaviors) that enable a deeper view of how particular neurological mechanisms are involved in aggressive cognitive and emotional states that ultimately can generate violent behavioral expressions (for an overview of the neurobiology of cognitive processing, see: Giordano and DiEuliis, this report; as well, an in depth address of neuro-cognitive mechanisms of motivation and decision-making is provided by Wright, this report).



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In ISIS, we perceive groups of individuals (at a variety of levels throughout an organization, both within their country and out-country) who manifest three principal dimensions of cognitive patterns, ideals (or sacred beliefs), and emotional tendencies. First are feelings of severe suppression and repression. This leads to the second - feelings of inequitable vulnerability and marginalization and ideals of re-empowerment; and this incurs the third: intent to be demonstrative, so as to evoke influence and effects across a potential group of recipients who invoke the (perceived) inequalities, inequities and marginalization (i.e. - demonstrative actions by the marginalized against those who are inducing their perceived marginalization). Recent neuro-cognitive research studying dominance effects on individuals and groups, and neuroeconomics' studies of individual and group suppression under conditions of scarce resource allocation support this pattern of effect (see: Wright, this report). I posit that this represents a relatively normal distribution of human behavior. These are individuals who have banded together through common cognitive and emotional traits, and have created a hierarchy of ideals and narratives that represent their identity as defiant against (perceived) positions of externally enforced suppressive/repressive power.

An example of this type of neuro-psychosocial effect can be drawn from the non-human primate literature. Individuals that are fairly low and marginalized in their social hierarchy, who are then denied access to, or equitable provision of what are viable goods and or needs, evidence behaviors of increasing isolation, with intermittent attempts at aggressive social integration, characteristically through some type of usurpation of dominant figures in the social structure. Such actions include surreptitious violence: these acts, while often exceedingly aggressive, are covert, "hit and run" events, because the possibility of retribution is high. Moreover, these individuals will often retreat to a "safe space" from which aggression can then become more overt, but the likelihood of incurring retribution becomes relatively low. In most situations these aggressive acts are attempts at upsetting the dominance hierarchy in a way that is most salient to individuals that are close to or occupy a dominant position. Descriptions of ISIS' behaviors as being "evil" and/or the actions of "psychotic" individuals are fallacious; one need only look at human history to reveal that this is not the case at all. Actions such as public beheadings and/or immolations are representative of culturally ideological statements that seek to evoke symbolic annihilation – a literal and figurative de-capitation and/or vaporization - of those "at the head" of the pack, that is, those who are perceived to be "the marginalizers" and "repressors" (see: Spitaletta, this report).

In the main, the working beliefs and narrative(s) of ISIS describe a situation that they perceive as threatening, marginalizing, and highly susceptible to negative reinforcement and punishment. At the same time, ISIS' narratives are representative of ideals (and "sacred beliefs"), and serve as highly motivated calls to change their stature by aggressively defeating the sources of (their) repression. What is likely to result is an escalation of the underlying cognitions (of marginalization, repression, and aggression) to some engagement of (violent) action. This cognition-to-action situation can be amplified by strong, emotionally resonant narratives and discourses that exacerbate psychobiological responses to situations that (are perceived to) affect the survival and flourishing of the involved individuals and their kith and kin (see: Shook, this report).

This is not abnormal, nor unusual in human social interactions, if and when circumstantial factors incur such "crucible effects". What does this say about the "nature of evil"? Without doubt, an individual who murders an "innocent other" is often characterized as evil. Certainly, we hold the "innocence" of the other as a fundamental factor in this characterization. But it is important to also recognize the nature of the intent and the act. The profundity (i.e. - "evilness") of the act has a dramatic effect upon and for both the individual who is committing it, and those who are the target of (psychological and

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social) effect. Often it is viewed as a symbolic gesture, laden with the iconography necessary to create a deep and broad ripple effect, wherein a “little pebble can produce a big wave”, so to speak (see: Spitaletta, this report). Human history is rife with examples of this type of behavior.

Moreover, if this indeed represents a usual neurobio-psychosocial reaction to, and expression of repression/suppression, it also becomes important to query how these cognitions, emotions and their effects might be used to solicit and recruit others to become part of the “in-group of the (hostile) repressed”. There will always be individuals from an outside group who may be vulnerable to, and aligned with a perceived cause and/or the narratives of an “in group”. Typically, such alignments occur because of three contributory factors: First, is some resonance with the situation of marginalization or the individuals being repressed. Shared feelings of marginalization, repression, and lack of power can be important elements that render consonance with shared beliefs, ideals, and rhetoric that are important to alignment and recruitment.

Second, is that there are individuals who actually may be marginalized or repressed, albeit under differing circumstances, but for whom narratives and rhetoric of empowerment against suppressing forces may be appealing. In other words, there is alignment of feelings of vulnerability, marginalization, repression, and abuse. This fosters a sense of biological, psychological and social alliance with others in similar situations, and may prompt attempt at achieving ‘power in numbers’ and ‘power in action’ through the aforementioned ‘ripple effects’ of overtly symbolic gestures of aggression by the (perceived) “marginalized against the dominant”.

Third, there may in fact be some individuals who manifest psychiatric traits of hostility and/or a misguided sense of repression that see conjoinment with, and participation in a movement such as ISIS as an opportunity to channel their own impulses of aggressiveness and violence under a protective rhetoric and rubric (refer here to the “safe space” effects mentioned above). In reality, I would hold that this latter category is probably far smaller than the former two.

### **The Potential Utility – and Value – of Neuro-Cognitive Science**

It is important to assess how ecological factors (i.e. - environments and the socio-political events that occur in an environment) can induce brain functions that can lead to aggressive cognitions/emotions, and patterns of violent behavioral acts. If we understand neurobiological response(s) to certain ecological factors, then we may be able to develop interventions on psychological and perhaps sociological scales that act at and affect specific brain functions (for brief overview of these neurobiological mechanisms, see: Giordano and DiEuliis, this report). In these ways, we might more effectively tailor the way that individuals and groups are operationally engaged on informational (i.e. - via various media, inclusive of MISO-based approaches) and socio-political levels in order to diffuse and divert the escalation of aggressive and violent events (see: Casebeer; Spitaletta; Wright; this report, and for supporting information, refer to *SMA Reports* April 2013 and February 2013).

Ongoing work in social neuroscience elucidates how the cognitive neurobiology of an individual can be important and embellished to affect the neuropsychology of multi-individual in- and out- group behaviors. Human behavioral and neuropsychological studies reveal that when individuals ally themselves with an ever-growing social group that has similar cognitions, beliefs, and support for “narratives of action”, then exerting those actions becomes facile, and the tendency to engage those actions becomes realized because of the relatively strong protective network that the social group provides.

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In sum thus far, it becomes important to ensure that the context of this discussion is grounded to the realities of what's being observed of ISIS, and what this reflects of the neuro-cognitive science undertaken to date. On point is that ISIS' activities do *not* reflect or represent abnormal human behavior. Rather, it fits well within the distribution of what might even be expected of human behavior given perceived inequities and imbalances of relative power, capability, and influence. Is ISIS beginning to solicit and recruit individuals of like mind? Surely. Are those individuals psychotic and/or "intrinsically evil"? No; or at least certainly not the majority of them.

As we gain insight to the cognitive neuroscience, sociology, and anthropology of fundamentalism, we observe inculcation and reinforcement by narratives and acts, which appeal to and affect both in- and out-groups in which a specific set cognitions, emotions (i.e.- beliefs and feelings), and actions are supportable and sustainable. Is ISIS a group of foundationalists and fundamentalists? Without doubt. And, of course, some of ISIS' rhetoric also appeals to a small population who see themselves as in some way aligning with this mission as a protective "cover" that enables them to enact their own ideas, beliefs and some of their own overtly violent behaviors under a veil of relative protection (see: Shook, this report).

A neuro-cognitive understanding of individuals and groups allows a much more granular approach to potential interventions to divert, mitigate, and/or prevent the escalation of such cognitions, emotions and ultimately behaviors (on a variety of levels from individual all the way to group). The body of this report provides information important to operationalizing this understanding and these approaches. In the main, the goal is to (1) develop a variety of approaches on number of different levels, to (2) employ appropriate narratives to engage particular responses within the ISIS community and to (3) exert influence on their ideas, and beliefs, and mitigate – if not extinguish - the sustainability and propagation of those beliefs and their resulting hostile actions.

### **A Path Forward**

This is not going to be a proverbial quick fix. But in light of the urgency of the problem posed by current and near-term ISIS' acts of aggression and violence, it is important to address what can be done in the short to intermediate term. This may entail a broad palette of approaches, from the use of particular narratives (inclusive of developing the appropriate level of information transfer, and utilization of various media), to how governments respond to ISIS'. We must gain insights to how to best develop and employ HUMINT, SIGINT, and what our group has termed "NEURINT" (neuro-cognitive intelligence achieved through novel applications of neuroscientific techniques and technologies; see: [Appendix 1](#); Giordano and Wurzman in *SMA Report* December 2014; and Wurzman and Giordano, 2014) to obtain meaningful views to the underlying individual and group neurobiological and cognitive patterns that are representative – if not predictive – of escalation to violence.

As we have previously noted (Wurzman and Giordano, 2014; Giordano and Wurzman, *SMA Report* December 2014) existing neuro-cognitive techniques and tools enable acquisition of patterns and types of individual and group information that can be used to model, describe and perhaps predict the effect(s) of various environmental variables upon psychological states and behaviors. We have also noted the potential of neuro-cognitive approaches to affect these variables and alter events. This strengthens the view of neuro-cognitive techniques and technologies as potential "force multipliers" in military and political interventions.

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The internet and other forms of social media provide a strong vector for real time acquisition of information. And the content and the context of that information are variable, and often are intentionally manipulated to evoke cognitive and emotional responses (see: Casebeer; Spitaletta; Wright; this report). It is crucial to acknowledge these representations and perceptions of vulnerability and repression. Moreover, many of the extant ISIS narratives seek to translate perceived vulnerability and repression into anger and aggressiveness, which are espoused to be effective, and rhetorically idealized as heroic and something to be ennobled and emulated. As Spitaletta demonstrates (in this report), there are very different rhetorical styles, and so the mission will be to dissect these styles to elucidate aspects of commonality and variance that may be influential to cognitive and emotional processes that are provocative for aggression and violent actions. To be sure, certain rhetorical concepts can become what Berns et al. (2012) refer to as “sacred” in their narrative resonance (see also: Shook; and Casebeer, this report).

The viability and potential value of neuro-cognitive approaches (particularly if used in a MISO-framework) is the ability to 1) define substrates and mechanisms related to culturally-relevant cognitions and behaviors, and 2) target these substrates to affect perceptions, emotions, behaviors, and tendencies for affiliation. Neuro-cognitive tools and applications should not be viewed or regarded as stand-alone measures. It will be important to mobilize and utilize different types of information and capabilities to develop optimal tactical and strategic approaches to diffuse, mitigate and prevent ISIS recruitment, engagement and growth of aggressive and violent actions on a variety of levels. I opine that this needs to be empirically explored. Ultimately, we must ask: given what we know and the capabilities we have – and the knowledge and capabilities we lack - what can be done to exert maximal effect in shortest amount of time? Let us not forget, the clock is ticking. We must evaluate what works, what doesn't, and why, and use these outcomes to improve multi-disciplinary approaches as a work in progress.

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### **Appendix 1:**

#### **NEURINT -Neural Intelligence: Potentially Novel Engagement of Neuroscientific Techniques and Neurotechnologies.**

There is growing awareness of the critical roles that social identities, cryptic cultural norms, and narratives play in providing contexts of strategic intelligence at the individual and group levels. Furthermore, there is recognition of the neural basis of such effects, operating both upon the subject and the analyst or decision-maker. In this light, we posit opportunities for neuroscientific techniques and technologies (neuroS/T) to be employed to facilitate enhanced understanding of cognitive processing of behavioral and semantic cues that may be present in narratives, and other forms of social engagement (e.g.- media, etc.) that influence recruitment, conjoinment, and which motivate behaviors. We have termed this approach “NEURINT” (i.e., neuro-cognitive or neural intelligence; Wurzman and Giordano, 2014; see also *SMA Report*, December 2014):

- NEURINT accesses interactions between the “story” and the “attribute” (or the “who” and the “what”) represented by an individual’s narrative and biometric data. Important to this approach is the assumption that relationships between biometric patterns and neural activity are individualistic; the utility in understanding these variables is not to identify the “what” of a person (e.g., typing or categorizing, or otherwise reducing according to patterns digital data) but to recognize their contingency (e.g., between the brain, body, and biography).

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- NEURINT collection shifts the process from “reading” (off) the body to one of “listening” (in) to the body by first cross-correlating identified neuro-cognitive mechanisms of experiences and individuals’ biometric pattern. A complementary understanding of the relationships of biometrics (as well as the embodied experiences they reflect) to neurological signals prevents inadvertent “reduction of the story to its attributes.” This dictates that any/all biometric or behavioral indicators collected and analyzed (with the aim to draw inferences about subjective phenomena in target populations) must first be studied using rigorous research methods to establish a neural framework for understanding such phenomena.
- NEURINT analyses are inextricable from influences afforded by social, cultural, and psychological environments of individual analysts, as well as the target subject(s).
- NEURINT does not yield products with predictive validity that can be considered independently. Instead, its outcomes dynamically enhance analysis and utility of both HUMINT and SIGINT/COMINT (of which NEURINT may be considered to be essentially comprised.) This is because the analyst’s own cognitive filters are subject to neuro-cognitive effects of cultural norms and narratives.
- NEURINT, by its contingent nature, engages the analyst in an open process of reinterpretation and expandability.
- NEURINT analysis may be used to provide insight about identity and active narratives in target populations. These may suggest tools, strategies, and/or direct interventions for improving identification, communication, and rapport, which enhance collection and nuance the analyses of HUMINT and SIGINT/COMINT.
- NEURINT may be collected as narratives from electronic sources or as human biometric observations during social interaction or surveillance.
- NEURINT provides an additional layer of context to HUMINT and SIGINT by suggesting which neuro-cognitive systems and processes are engaged at the time of the observed behavior.
- NEURINT might also provide real-time identification of “sacred” narratives being invoked during an interview, which might then specifically guide later interpretation, filtering, and analysis of information.
- NEURINT may be of value to optimize communication with individuals or groups by catering to cognitive styles and/or perceptual sensitivities.
- NEURINT affords an additional tier of insight by systematically relating evidence-supported inferences about the analyst’s cognition and perceptions (i.e., based on biometric signals or possible proxy linguistic indicators) to those inferred from observations of the subject.
- NEURINT could be used to (1) enable strategic and/or tactical engagement with, or manipulation of individuals’ or groups’ psychological state(s) to achieve best advantage in kinetic and non-kinetic deployments; (2) provide insights for development of counter-narratives that exert maximal effect upon target individuals’ and groups’ neuro-cognitive processes; and/or (3) develop information and/or cyber-based approaches to influencing content and effect(s) of various forms of messaging used by target individuals and groups (e.g.- social media, etc.).

At present, specific NEURINT methodologies have yet to be fully developed. However, we posit that their potential is tantalizing. An example of a research program that is aligned with the principal strategy of NEURINT is IARPA’s Tools for Recognizing Useful Signs of Trustworthiness (TRUST) program. TRUST leverages inter-subject variability and dynamic interaction between a sensor and its target to validate a subjective perceptual process for assessing a behavioral trait or tendency in a target.

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While NEURINT research and its enabling technologies require sophisticated equipment, collection and analysis of NEURINT need not assume a highly technical form for operational deployment; this might overcome obstacles such as equipment size and the lack of ecological validity. As well, there has been some operational translation of neuroS/T within intelligence and deterrence initiatives. Extant research and development stands poised for testing and evaluation under a number of field conditions (see, for example Giordano, 2014, for overview of currently available tools and techniques that are, and can be utilized within national security, intelligence and defense initiatives).

Appendix 1 adapted from: Wurzman R, Giordano J. (2014) NEURINT and neuroweapons: Neurotechnologies in national intelligence and defense. In: Giordano J. (ed.) *Neurotechnology in National Security and Defense: Practical Considerations, Neuroethical Concerns*. Boca Raton: CRC Press, pp. 79-114.

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*Multimethod Assessment of ISIL*. (December, 2014).

*Leveraging neuroscience and neurotechnological (neuroS/T) development with focus on influence and deterrence in a networked world*. (May 2014).

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*Topics in the neurobiology of aggression: Implications for deterrence*. (February 2013)

## **Chapter 2: A Concise Overview of Neurobiological Processes Involved in Aggression and Violence: Drs. James Giordano (Georgetown University Medical Center) and Diane DiEuliis (HHS)**

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### **The Neurobiology of Aggression and Violence: A “Users’ Guide” to the Brain**

The study of the neurobiological basis of aggression and violent behavior has been reviewed in numerous scholarly publications (see, for example: Mattson, 2003; Nelson, 2005; Niehoff, 2002; Raine, 2013; Stahl and Morrisette, 2014; Volavka, 1995). Recently, as part of a strategic multilayer assessment, a series of white papers addressed various aspects of the neurobiology of aggression that may be relevant to informing an understanding of individual and group violence, and thus provide insight into potential strategies for deterrence. Since that time, there have been additional advances which are summarized in the overview presented here. The objective is to provide a concise overview that allows a “users’ guide” approach to understanding the structures and functions of the brain that are engaged in cognitive and emotional aspects of aggression and violent behaviors.

Specific regions, pathways and networks of the brain, and the actions and balance of various neurochemicals are involved in the mediation of aggression (i.e. - cognitive and emotional aspects of hostility) and violent behavior. Primary regions include the midbrain periaqueductal gray (PAG) area, hypothalamus, amygdala, and prefrontal, and cingulate cortical areas. It is important to note that these sites and the pathways that course through and interconnect them are not solely involved in aggressive cognition or violent behavior. They are also engaged in other cognitive, emotional and behavioral processes which may influence (i.e. - augment or suppress) the initiation, continuity, tenor, extent and severity of aggression, and the escalation and/or execution of violent actions in various circumstances and under particular conditions. However, it is the timing and coordinated activity within these regions and networks that are important factors in defining the neurobiological bases of aggressive cognition and emotion, and the escalation to violent behavioral outflow.

### **The Neural Pathways Mediating Aggression and Violence**

A general schematic of neural pathways functioning in aggressive cognition and violent behavior is presented in Figure 1 (below).

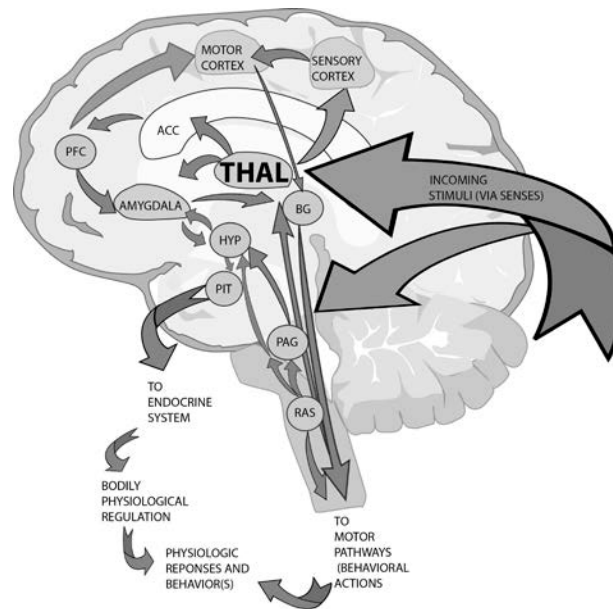


Figure 1: Diagrammatic representation of sites, pathways and interconnected networks in the brain involved with/mediating aggressive cognition/emotion and violent behavior.

Structures represented are not necessarily shown to scale. For details, please refer to text.

**Abbreviations:** ACC = anterior cingulate cortex; BG = basal ganglia; HYP = hypothalamus (note: individual nuclei are not shown); PAG = periaqueductal gray area; PFC = prefrontal cortex (note: prefrontal sub-areas are not shown); PIT = pituitary; RAS = reticular activating system; THAL = thalamus (note: individual nuclei of the thalamus are not shown).

Incoming stimuli from both the external and internal (i.e. - bodily) environment activate autonomic systems of the brainstem (i.e.- the reticular activating system, RAS) to elicit a primary response to various cues and factors. Autonomic activation elicits the release of epinephrine and norepinephrine to initiate an arousal response in a number of physiological systems (including a feedback effect upon key sites and networks in the brain). Pathways from distinct brainstem nuclei project to the midbrain PAG (to induce a priming response that may activate limbic pathways to evoke feelings of agitation), and also to the hypothalamus. Autonomic activation of specific sites within the hypothalamus evokes stimulation of the pituitary gland to engage the adrenal glands to release the stress-mediating hormone cortisol, which alters bodily and brain physiology to evoke the well-known “fight or flight” response.

As well, environmental stimuli engage the thalamus to activate the lateral nucleus of the amygdala. In turn, the lateral nucleus co-activates both (a) the central amygdalar nucleus to engage pathways projecting to the hypothalamus and brainstem to evoke bodily sensations of arousal (and in some cases threat), and (b) the basal amygdalar nucleus to engage the basal ganglia to elicit spinal motor systems to evoke a variety of arousal behaviors.

As part of the limbic system, the amygdala is anatomically and functionally interconnected to another limbic structure, the hippocampus, which is involved in memory consolidation and retrieval. Thus activation of the amygdala can also engage hippocampal networks to solicit memories of situations and stimuli that can be used to “match to sample” for potential comparison (of effects and responses). These limbic circuits are linked to the frontal and prefrontal cortical regions (including the orbitofrontal,



and medial prefrontal cortex). These prefrontal cortical regions and networks function in concert with the (anterior and medial) cingulate cortex in evaluating the pleasant or aversive quality of various stimuli, formulating expectation(s), and are involved in cognitive processes of rationalization, decision-making, and emotionality.

Altered activity of the medial and orbitofrontal areas of the prefrontal cortex appear to subserve particular aspects of aggressive cognition (e.g. - rationalization; shift in emotional content; decision-making), that, when taken together with heightened arousal, agitation and perceived threat (and/or feeling of disgust – see here, Spitaletta, this report) may lead to induction of violent behavior(s).

### **The Neurochemistry of Aggression and Violence**

A number of neurochemical systems have been implicated in the mediation of aggression and violence (see Stahl and Morrisette, 2014 for overview). Pathways of all of the major monoaminergic neurotransmitter systems (i.e. - dopamine – DA; norepinephrine –NE; and serotonin - 5-hydroxytryptamine, 5-HT) project to the aforementioned brain sites that are involved in aggressive cognition and violent behavior. As well, local and projection networks of modulating peptide neurochemicals, such as oxytocin and vasopressin, are also present at these anatomical sites. However, generalizations about the role of various neurotransmitters and neuromodulators are difficult, as these chemicals exert differing effects at distinct sites in the brain, by acting at a variety of receptors, as influenced by neuroendocrine “tone” established by both adrenal (e.g.- cortisol) and gonadal hormones (e.g.- testosterone, estrogen and progesterone; see below).

Nevertheless, current studies indicate that at least initially, norepinephrine (NE) exerts an activating effect upon aggressive cognition in response certain provocative stimuli. However, prolonged NE release in limbic and frontal cortical regions may evoke hyper-vigilance and anxious responses, that suppress aggressive cognition through feelings of agitation and fear. There is considerable evidence that serotonin (5-HT) plays important roles in controlling impulsive aggression in the brain; low levels of 5-HT have been shown in individuals prone to impulsive aggressive behaviors. Variation in expression of genes that control the production of 5-HT, and one of its molecular transporter molecules located on nerve cells in brain pathways subserving aggression has also been demonstrated to play a role in dispositions and susceptibility to violent behavior. Environmental variables can exert an effect upon 5-HT-mediated effects, in that dietary restriction of tryptophan, the metabolic precursor to 5-HT can reduce impulsive and aggressive tendencies in individuals expressing variant forms of the 5-HT transporter gene. Gamma amino butyric acid (GABA), primarily an inhibitory neurotransmitter, has been shown to interact with alcohol to evoke aggressive and violent behaviors (possibly through suppression of prefrontal cortical circuits that function in rationalization and suppression of impulsivity).

Recent studies have paid particular attention to the potential role of the neuropeptides oxytocin and vasopressin. These chemicals have been shown to be important in mediating social bonding, tendencies for affiliation, and aggression. Of note is that oxytocin, while widely regarded to influence affiliative and amiable tendencies, has also been demonstrated to prompt in-group bonding, and protective aggression against out-group individuals.

Gonadal hormones can act within the brain to “prime” molecular receptors for a variety of neurotransmitters, and alter the effects of various nerve chemicals within particular neural pathways, inclining those that are involved in aggressive cognition and violent behaviors. Testosterone has been shown to augment neural activity in the lateral and basal amygdala to fortify arousal and aggressive

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behaviors. As well, testosterone can act at other brain sites to affect the relative “tone” of neural networks, and has been shown to generally increase arousal and inter-individual hostility under certain circumstances. What is particularly interesting is that in specific brain regions, testosterone is enzymatically converted to estrogen to exert these effects. This action of estrogen may also help to explain tendencies for aggressive behaviors in females.

However, a caveat is warranted. While experimental and clinical studies have helped to depict the tentative role(s) and action(s) of these neurochemical substances, simple cause-effect explanations should be avoided, as the actual mechanisms of effect are complex and highly variable. This variability also makes targeting these systems somewhat difficult (as do other more logistical aspects of delivering appropriate level and dose of pharmacological agents necessary to induce specific and desired effects in individuals and/or groups in anything other than highly controlled situations. Yet, an understanding of these systems may be important to developing both more tailored pharmacological and behavioral techniques that can affect the neurochemistry of particular individuals to suppress aggression and violence (Wurzman and Giordano, 2014).

### **Evolutionary-Developmental (Evo-Devo) Aspects: Roles for Genetics and Environments**

Humans have faced resource challenges, predators, and out-group threats for millennia, thereby fostering and fortifying mechanisms (including arousal, aggression and directed violence) that were instrumental to sustaining individual and group survival, dominance and flourishing. Thus these neurological substrates, mechanisms and patterns of neuro-cognitive response have been shaped by environmental forces acting upon, and exerting relative genetic selection. However, evolutionary forces alone, while important in establishing a foundational basis for contemporary human neurobiology, only represents a portion of the formative elements acting upon the ultimate disposition and expression of neuro-cognitive characteristics (that are operative in aggression and violence).

The adage that “ontogeny recapitulates phylogeny” (i.e.- that lifespan development mirrors patterns of evolutionary development) has relative merit in this regard, in that the modern human, while evolutionarily established to possess particular neurobiological mechanisms that render sensitivity to certain factors in the socio-cultural environment, is susceptible to these effects to varying degrees and extent across the lifespan. In other words, evolution provides the building blocks, genetics afford are relative “blueprint” and (socio-cultural) environmental interactions establish the trajectory and extent to which specific neural – and cognitive and behavioral – characteristics will be developed and expressed.

Current research on aggression denotes a critical distinction between affective or *impulsive* aggression, versus predatory or *premeditated* aggression. The former has an established genetic basis as an evolutionary survival behavior (to enable competition for resources, reproduction, etc.) and is typically linked to cognitions and emotions of anger and disgust. The latter however, is aggression with the intent to do harm - a conscious decision made to commit violent acts against others. In the brain, these are mediated by different networks, yet it appears that reciprocally interactive in that one may not be activated unless the other is (at least partially) suppressed. While the behavioral implications of this remain to be fully understood, it is important to understand that neuro-cognitive networks subserving distinct types of aggressive cognition and emotion are differentially involved and activated when initiating particular forms of violent behavior. This may be instrumental to developing approaches

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aimed at selectively targeting these systems to mitigate cognitive, emotional and behavioral components of violence (see: Casebeer, this report).

As well, it is important to note that the human brain develops from back to front (i.e. - caudo-rostrally), and so many of the frontal and prefrontal networks operative in emotional rationalization and impulse control do not mature until the early to mid-20s. In contrast, brain regions and networks involved in drive-states, and impulse-driven cognitions and behaviors are functional far earlier. A number of studies have shown that pre-teens and adolescents are more susceptible to sensory gratification, drive and emotional states, and less capable than adults in executing rational judgments and controlling emotions (including anger, hostility and aggression) and behaviors (including violence). Thus, pre-teens and teenagers are more vulnerable to environmental influences affecting cognition, emotions and behaviors - a notable factor in the recruitment of youths to socio-cultural, political, and/or religious movements, such as ISIL/ISIS.

### Operationalizing Insights to the Neurobiology of Aggression and Violence

An understanding of how these genetic and environmental factors can affect (if not shape) neurobiological systems functioning in aggression and violence is arguably important to develop insight(s) to the role, impact and value of enculturation, familial and social ecologies, story-telling, media, propaganda, and other forms of narrative and semiotic (i.e.- image-based) messaging. Such information can be used to develop more salient and effective approaches to engaging and altering neurobiological mechanisms that are involved in aggressive cognition and violent behaviors. These are discussed in further detail throughout this report (see, for example, Casebeer; Spitaletta, this report).

Terrorism is not a behavior in of itself, rather, it is a tactic used by those who decide to commit violence; violent extremism is considered a broader continuum of behaviors and thinking in which terrorist tactics or other forms of violence may or may not be utilized (Nelson, 2005; Raines, 2014). The ability to prevent, deter, or influence the commitment to the utilization of violence should thus be most effective within the earliest development of the psychological and behavioral process of extremism, which has underlying opposing, but potentially mutable neurobiological components. While it is clear that there is no scientifically accurate means of predicting who may commit a violent act, understanding the basis of aggression may reveal those who are potentially predisposed or poised to extremist types of behaviors, within particular environments or social settings. The latter spheres are more readily manipulated, thus changing those in the face of our neurobiological understandings is likely to be a more viable approach to preventing violent actions or reduce their likelihood in different defense or national security scenarios.

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## Chapter 3: Neuro-cognitive Mechanisms of Motivation and Decision-Making: Dr. Nicholas D. Wright, MRCP PhD (Carnegie Endowment for International Peace (Washington, DC) and University of Birmingham (UK))

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### Summary

A realistic understanding of human decision-making can help U.S. policymakers cause intended effects, and avoid unintended effects, on adversaries and key audiences. Important audiences here include ISIS leadership, members, potential Western recruits and local populations.<sup>1</sup> I discuss four areas:

- (I) The neural phenomenon of “prediction error” provides a tool to *increase* or *decrease* the impact of our actions. A prediction error framework forecasts effects, and simplifies across existing strategic concepts (e.g. surprise) so it can be operationalized without extra analytical burden. Policy options are in Table 1.
- (II) Models of the world in our brains determine how leaders, followers and populations understand the world. The nature of these models creates unavoidable political and strategic realities, for instance ideas of conspiracy and belief systems central to ISIS recruitment. Understanding the models helps identify ways to change them, a process that critically involves prediction errors.
- (III) Understanding key motivations of the “purpose driven-jihadi” helps understand Western recruits to ISIS, who are important in Syria and color how Western-based observers understand the motivations of ISIS. This also identifies targets for strategic communication.
- (IV) Key motivations in local Syrian and Iraqi populations shape the actions these populations will decide to take, and who they will decide to support. Successfully influencing these decisions is central to any U.S. strategy against ISIS.

#### (I) NEURAL PREDICTION ERROR IS CENTRAL TO STRATEGIC SIGNALING

A core insight from neuroscience is that when we make an action, the impact it has on the other’s decision-making is crucially modulated by the action’s associated “prediction error”.<sup>2</sup> This prediction error is simply defined as the difference between what actually occurred, and what the other expected. The bigger the associated prediction error, the bigger the action’s psychological impact.

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<sup>1</sup> Three important general points must be raised here. This paper does not argue for moral equivalence of ISIS and others who are discussed. It does not argue neuroscience is a panacea. Nor does it argue that neuroscience can or should be used alone without the behavioral and social sciences – indeed the strength of the approach underlying this effort is that these multiple sources of evidence reinforce one another.

<sup>2</sup> Prediction errors are central to how humans understand, learn and decide about the world. This section draws on Wright ND, *Neural prediction error is central to diplomatic and military signaling* (2014) in DiEuliis D et al. (Eds) White paper on Leveraging Neuroscientific and Neurotechnological Developments with Focus on Influence and Deterrence, US DoD Joint Staff.

**Prediction Errors Explain Diverse Impacts Across Diplomatic and Military Confrontations**

A simple prediction error framework helps forecast an event’s impact on an audience. Analysts should ask “*how unexpected was the event from that audience’s perspective?*”

An important instance is shown in Fig. 2, where an event can either occur or not occur, and can either be expected or not expected. Strategic bombing illustrates different combinations of these effects. First, an event occurs and was not expected, so has a large associated prediction error. For example, First World War German air raids on London were small-scale, but being so unexpected had a large psychological impact and caused panic. Second, extrapolating from this, influential inter-war airpower theorists suggested powerful and recurrent bombing would psychologically paralyze an adversary causing rapid collapse. However, such recurrent bombing is well expected. For example, in the “Blitz” on London, recurrent bombing exerted far greater destructive power but had far less psychological impact than forecast. Third, an event is expected but doesn’t occur, so this absence itself leads to large prediction error. For example, in the Vietnam War, U.S. campaigns bombed regularly and used pauses as a conciliatory signal.

	Event not expected	Event expected
Event occurs	a) Associated with prediction error	b) No prediction error
Event not occur	(trivial case)	c) Associated with prediction error

Figure 2: Illustrating prediction errors (prediction error = actual event – expected event)

The *nature* of events can also be more or less unexpected; so that the event’s associated prediction error can increase or decrease its impact. Examples of this are shown in Table 1, including domain-specific effects, cross-domain effects, and those related to geography, novelty and first times. This is the case whether actions are kinetic, diplomatic or more traditional messaging.

**“Prediction errors”: Changing Humans’ Models of the World**

Changing others’ mental models of the world (e.g. ISIS’s coherent belief system described below) is central to influencing the “purpose-driven jihadi” and to strategic communication more broadly. Prediction errors are central to the way humans change their models of the world – and methods to change models involve enhancing prediction error. Increasing the impact of messaging requires constant creativity to keep their nature unexpected.

### **Day-to-Day “Prediction Errors”: Producing Predictability and Managing Expectations**

To build acceptance and legitimacy among populations, one must manage “prediction errors” in day-to-day activities with them. This involves:

- (1) Producing predictability:** Predictability is simply the flip side of prediction error. Recent neuroscience work suggests predictability overall is desirable in itself.<sup>3</sup> This concurs with David Kilcullen’s<sup>4</sup> argument that generating predictability is central to successful counterinsurgency (COIN). The foundation of his book "Out of the Mountains" is the "theory of competitive control," where *"populations respond to a predictable, ordered, normative system, which tells them exactly what they need to do, and not do, in order to be safe."*
  
- (2) Managing expectations:** When a population expects something and it is not delivered, this leads to a prediction error. This is why managing expectations to prevent prediction error is critical. We see this in counterinsurgency theory, e.g. as David Kilcullen recently stated<sup>5</sup> a major way *"it can go wrong is you can create expectations for programs which then don't deliver. And that can lead to resentment, which actually ends up empowering the radical group."*

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<sup>3</sup> Karl Friston, "The Free-Energy Principle: A Unified Brain Theory?," *Nature Reviews Neuroscience* 11, no. 2 (2010): 127–38.

<sup>4</sup> David Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerrilla* (Oxford ; New York, NY: Oxford University Press, 2013).

<sup>5</sup> IRRC, "Interview with David Kilcullen," *International Review of the Red Cross* 93, no. 883 (2011).

<b>Understanding the psychological impacts that events have on others</b>	
Core idea: The prediction error associated with actions always affects their degree of impact on the decision-making of audiences. This matters for kinetic or diplomatic actions and messaging.	
1	<p><i>When anticipating an event's psychological impact, ask: "How unexpected is the event from that audience's perspective?"</i></p> <p>For the audience of interest, describe the event's associated prediction error from their perspective and how that changes its impact.</p> <p>Specific instances include:</p>
a.	<p><i>Domain-specific effects</i></p> <p>Actions in certain domains are inherently less well understood and so give larger prediction errors. E.g.: cyber actions, or messages from unexpected media.</p>
b.	<p><i>Cross-domain responses</i></p> <p>Following an action, we tend to expect a response in a particular domain, so a response in a less expected domain causes more prediction error and impact. The domain an audience expects may relate to the original action's domain<sup>6</sup>, previous promises to act in a certain way, or established behavioral patterns.</p>
c.	<p><i>Geography</i></p> <p>Distant responses likely cause more prediction error.</p>
d.	<p><i>Novelty and first times</i></p> <p>These increase prediction error, e.g. Palestinian suicide bombing in the Second Intifada; ISIS beheadings.</p>
2	<p><i>Manipulate predictability</i></p> <p>Signpost diplomatic or military moves beforehand to reduce their impact (e.g. via backchannels); act without warning to increase their impact.</p>
3	<p><i>Anticipate effects of "insider knowledge"</i></p> <p>One's actions likely have greater impact on the recipient than one understands. This matters most when one has much greater "insider knowledge" of one's actions.</p>
<b>When the U.S. receives actions</b>	
Core idea: Prediction errors are unavoidable, so we must manage their effects on <i>ourselves</i> .	
1	<p><i>Manage effects of prediction errors</i></p> <p>Large impacts from prediction error on U.S. decision-makers should be considered when reacting, e.g. reaction to ISIS beheadings.</p>
2	<p><i>Learning</i></p> <p>Prediction errors are the best material to improve our models of the world.</p>
<b>Longer term U.S. aim: Manage day-to-day "Prediction errors"</b>	
1	<p>Reducing the amount of prediction errors that accumulate from all events over time (i.e. increasing predictability; creating order) is central to influential theories for gaining population support in challenging environments (e.g. David Kilcullen as above).</p>

Table 1: Prediction Errors and Policy Options

<sup>6</sup> e.g. in the Vietnam conflict the U.S. response to torpedo boat attacks was to attack that same boat class, see Thomas Crombie Schelling, *Arms and Influence* (Yale University Press, 1966).



## **(II) MODELS OF THE WORLD IN OUR BRAINS: HOW LEADERS, FOLLOWERS AND POPULATIONS UNDERSTAND THE WORLD**

In 2012 Syrian President Bashar al-Assad, embroiled in civil war, in his first public statement for months railed that “the external conspiracy is clear to everybody”.<sup>7</sup> Assad’s is a common theme amongst Middle Eastern leaders. In 1944, London received thousands of unmanned German V-1 bombs that landed with a pattern that didn’t seem random – clustered around the River Thames and the North West – and suggesting very precise aim, even avoiding areas where spies lived.<sup>8</sup> Actually, all the Germans could do was aim at the middle of London. Both very different phenomena relate to how the brain understands the world and predisposes us to see patterns and conspiracies. This matters because it shapes the decision-making of leaders, followers and populations.

The models of the world used by our brains explain many aspects of decision-making. Here we focus on two examples. One is conspiracy theories. With respect to ISIS, key new spiritual authorities driving recruitment for ISIS, such as Ahmad Musa Jibril, fuel perceptions of a Western conspiracy against both Islam and Muslims.<sup>9</sup> Another is the resonance of coherent, clear, rule-based belief systems – such as ISIS’s “prophetic methodology” involving punctiliously following Muhammad’s prophecy and example.<sup>10</sup>

### **Models of the World in Our Brains**

We are constantly bombarded by information. Our brains cope with it by using models of the world to predict what we will experience. These models are so fundamental for all people that we may not realize their importance until they go wrong, for example in schizophrenia.

To illustrate their importance: Why can’t we tickle ourselves? In an experiment, a robot arm stroking my right palm feels ticklish to me. But when I stroke my own palm it isn’t ticklish.<sup>11</sup> This is because my model of the world predicts the consequences of my own actions, so I can focus on other things. What about when the models go wrong? Leading accounts suggest that in schizophrenia individuals’ models can incorrectly predict the consequences of their own actions – and indeed many with schizophrenia can tickle themselves.

The *nature* of these models predisposes us to see patterns and conspiracy in the world. Our models constantly seek to explain how the myriad lower level features of the world are caused by higher level explanations. This hierarchy of higher level causes explaining lower level features is central to leading models of brain function<sup>12</sup>, and reflects the models’ anatomical basis in the brain.<sup>13</sup>

A key type of higher level cause humans must understand is the causes of others’ actions. When we watch human behavior; we don’t see just behavior (the “lower level”), we see beliefs, intentions and desires behind them (the “higher level”). We build a model of the other, an ability called Theory of

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<sup>7</sup> <http://www.bbc.co.uk/news/world-middle-east-16483548>

<sup>8</sup> Thomas Gilovich, *How We Know What Isn’t So: The Fallibility of Human Reason in Everyday Life* (Free Press, 1991).

<sup>9</sup> Joseph A. Carter, Shiraz Maher, Peter R. Neumann (2014) #Greenbirds: Measuring Importance and Influence in Syrian Foreign Fighter Networks, ICSR, King’s College London

<sup>10</sup> Graeme Wood, “What ISIS Really Wants,” *The Atlantic*, February 15, 2015.

<sup>11</sup> Sarah-Jayne Blakemore, Daniel Wolpert, and Chris Frith, “Why Can’t You Tickle Yourself?,” *Neuroreport* 11, no. 11 (2000): R11–16.

<sup>12</sup> Paul C. Fletcher and Chris D. Frith, “Perceiving Is Believing: A Bayesian Approach to Explaining the Positive Symptoms of Schizophrenia,” *Nature Reviews Neuroscience* 10, no. 1 (January 2009): 48–58, doi:10.1038/nrn2536.

<sup>13</sup> Karl J. Friston and Klaas E. Stephan, “Free-Energy and the Brain,” *Synthese* 159, no. 3 (2007): 417–58.

Mind. Humans have extensive neural machinery for this crucial task of determining others' intentions, including brain regions such as the temporo-parietal junction. In fact, we are so prone to engage this machinery that even when we just watch a video of two triangles "coaxing" and "tricking" one another, there is neural activity in the Theory of Mind-related regions.<sup>14</sup> Autistic individuals have problems building these models of others, and have reduced neural activity when watching the same video.

But we must strike a balance: not missing true patterns; but not seeing conspiracy everywhere. Important for this tuning is our control over the environment. With lower control we tend to see more illusory patterns. This is seen in the lab<sup>15</sup> and field. Tribes of the Trobriand Islands who fish in deeper seas that have sudden storms and unmapped waters, have more associated fishing rituals than those who fish in shallow seas.<sup>16</sup>

Of course, "Just because I'm paranoid, it doesn't mean they're not out to get me." Our models of the world also use our prior knowledge about how likely something is to occur to identify what we should see.<sup>17</sup> For example, the prior probability of a foreign conspiracy may be judged more likely in Iran, where in 1953 Britain's MI6 and America's CIA conspired with local networks to overthrow the Government.

So the propensity to see conspiracy theories is a feature of the normal human brain, particularly as in Middle East when there is a lack of control and a prior belief regarding malign guiding hands.

### **Conspiracy Theory: A Natural Element Resonating in Middle East Politics**

Conspiracy theories matter. Not only because key new spiritual authorities driving recruitment for ISIS, such as Ahmad Musa Jibril, fuel perceptions of a Western conspiracy against both Islam and Muslims.<sup>18</sup> But also because ascribing adverse motivations to the "other" can worsen security dilemmas between states, between groups such as Shiite or Sunni, or within multi-ethnic states as in Syria. The propensity to see conspiracy theories may affect politics through leaders who espouse them, or may arise from those outside the leadership as a naturally occurring element around which narratives coalesce. We see both across the Middle East.

Consider Turkey, where the current leadership cites conspiracy. Responding to mass protests in Gezi Park, in June 2013 Prime Minister Erdogan blamed "the interest-rate lobby," "foreign hands," and their domestic "collaborators."<sup>19</sup> Since December 2013, when a corruption probe was launched against Erdogan and his political allies, the Turkish Prime Minister "has lashed out against the probe with claims of 'dark plots' orchestrated by 'foreign influences' that wish to damage Turkey."<sup>20</sup> Other segments of society also generate and spread conspiracy theories. As Joseph Dana writes, "Best-selling books line

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<sup>14</sup> Fulvia Castelli et al., "Autism, Asperger Syndrome and Brain Mechanisms for the Attribution of Mental States to Animated Shapes," *Brain* 125, no. 8 (August 1, 2002): 1839–49, doi:10.1093/brain/awf189.

<sup>15</sup> Jennifer A. Whitson and Adam D. Galinsky, "Lacking Control Increases Illusory Pattern Perception," *Science* 322, no. 5898 (October 3, 2008): 115–17, doi:10.1126/science.1159845.

<sup>16</sup> Bronislaw Malinowski and Robert Redfield, *Magic, Science and Religion, and Other Essays* (Boston: Beacon Press, 1948).

<sup>17</sup> Christopher Summerfield and Etienne Koechlin, "A Neural Representation of Prior Information during Perceptual Inference," *Neuron* 59, no. 2 (July 31, 2008): 336–47, doi:10.1016/j.neuron.2008.05.021;

<sup>18</sup> Carter et al. (2014) #Greenbirds: Measuring Importance and Influence in Syrian Foreign Fighter Networks

<sup>19</sup> Barin Kayaoglu, "Erdogan's Conspiracy Theories Contain a Paradox," *Al-Monitor*, June 18, 2013, <http://www.al-monitor.com/pulseen/originals/2013/06/erdogan-conspiracy-theories-paradox-gezi.html>.

<sup>20</sup> Joseph Dana, "The Underpinnings of a Banana Republic for Turkey?," *Al-Jazeera America*, December 27, 2013

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mainstream bookshops claiming, among other things, that the country's Prime Minister Recep Tayyip Erdogan is secretly Jewish and a pawn in an American plot to take over Turkey.”<sup>21</sup>

In Syria, conspiracy was not a significant theme in Bashar al-Assad’s first decade in office, but has been since he started losing control in the 2011 uprising. He repeatedly suggested events represent a “conspiracy”, part of a “foreign-backed plot against him.”<sup>22</sup>

There are numerous 9/11 conspiracy polls. In 2011 Pew found no Muslim country where over 30% of the population believed Arabs carried out the 9/11 attacks.<sup>23</sup> 75% of Egyptians and 73% of Turks did not believe Arabs carried out 9/11. Only 9% of Turks and 12% of Pakistanis believe Arabs carried out 9/11.

An important question is if leaders believe conspiracy theories or just use them. Are they earnest or expedient? Even if just expedient, leaders must use or at least accommodate such politically powerful narrative elements. But an earnest belief may suggest even more impact on decision-making. Saddam Hussein’s recordings of his private meetings provide unique evidence, which for example indicate he really believed in a Jewish conspiracy.<sup>24</sup> In a meeting “*Saddam and his colleagues discuss the array of adversaries facing them: Iran, Israel, the United States, and the United Nations (probably 1981). Saddam: “It is Zionism, it is Zionism that is guiding them [the Iranians]. Zionism is taking the Iranians by the hand and introducing them to each party, one by one, channel by channel. I mean Zionism – come on comrades – do I have to repeat that every time, I mean is this the time we should end the Iraqi war and in this manner? ... Yitzhak Rabin is not important, the important thing is that we are convinced there is a conspiracy being prepared, and even the [UN] secretary-general is an accomplice in it. ... He is trying to present himself as if he was the lamb, but in fact, he is the Satan and he coordinates [this conspiracy].”*”

### What Can We Do?

Acknowledge that the propensity to conspiracy theory (e.g. of the West against Islam) and resonance of coherent belief systems (e.g. ISIS’s prophetic methodology) will likely always be naturally occurring elements in leaders, followers and populations. They will be tough to break as new information is seen through the lens of the conspiracy theory or belief system. But understanding the nature of the models identifies targets for strategic communication.

- (1) Prediction error is central to the way humans change their models of the world, so it provides a simple guide for policy.** Methods to change models involve enhancing prediction error. Increasing the impact of messaging requires constant creativity to keep their nature unexpected (e.g. Table 1).
- (2) Disrupt conspiracy theories:** These involve seeing patterns in information. Thus one can increase the right type of information, decrease the wrong type, or manipulate information. In online and

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<sup>21</sup> Ibid.

<sup>22</sup> Anthony Shadid, “President Bashar Al-Assad Vows to Crush ‘Conspiracy’ Against Syria,” *The New York Times*, January 10, 2012, sec. World / Middle East.

<sup>23</sup> “Muslim-Western Tensions Persist,” *Pew Research Center’s Global Attitudes Project*, July 21, 2011.

<sup>24</sup> Kevin M. Woods, David D. Palkki, and Mark E. Stout, *The Saddam Tapes: The Inner Workings of a Tyrant’s Regime, 1978–2001* (Cambridge University Press, 2011). Chapter 2 The “Zionist entity”

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other media one can increase cognitive diversity<sup>25</sup> of information by facilitating those with views against the conspiracy theory.

Use solid, trustworthy sources of information. In the media these take years to create (e.g. the BBC). However, an alternative route is through families and networks. Indeed, the first covert CIA mission used Italian Americans to write letters to Italian relatives for the 1948 election.<sup>26</sup> In Afghanistan, the U.S. under-utilized these in favor of other media.<sup>27</sup>

- (3) Break down the clear and coherent ISIS belief system: (a)** This can be made less clear. Reduce moral clarity by exposing potentially morally challenging events. *“Following takfiri doctrine, the Islamic State is committed to purifying the world by killing vast numbers of people. The lack of objective reporting from its territory makes the true extent of the slaughter unknowable, but social-media posts from the region suggest that individual executions happen more or less continually, and mass executions every few weeks. Muslim “apostates” are the most common victims.”*<sup>28</sup> In Afghanistan, Taliban injustices and atrocities, for example described in PSYOP print-media using a photograph of Taliban religious police beating women, or public whippings of women and men, did cause considerable resentment against the Taliban.<sup>29</sup> **(b)** As well as reducing moral clarity, reducing religious clarity can involve ensuring alternative interpretations are not drowned out in debates, although of course great care must be taken.

### (III) KEY MOTIVATIONS IN THE PURPOSE-DRIVEN JIHADI

The motivations of different target audiences differ and so communicating with them to change behavior must also differ. Here we first consider Western recruits, who are important in Syria and who color how Western-based observers and media understand the motivations of ISIS. We ask: why do foreign people from rich countries (vastly over-represented compared to destitute Pakistanis) go to fight with the most barbaric groups? We suggest there will always be a fresh supply of potential recruits for such ventures, all society can do is limit this supply – and right now ISIS is good at pulling in these recruits.

#### **Push Factors: The Mind and Brain Creating the Supply of Men (and a Few Women)**

Many people want a purpose-driven life. Often benign or helpful, this is illustrated by the immense popularity of U.S. Pastor Rick Warren’s book *a Purpose Driven Life*, which has sold over 30 million copies and whose five purposes include: Purpose 1 You Were Planned for God's Pleasure (Worship); Purpose 2 You Were Formed for God's Family (Fellowship); and Purpose 5 You Were Made for a Mission (Mission). However, together with other motivations, an extreme manifestation of this drive can contribute to those Western ISIS recruits who may be described as a “purpose-driven jihadi”. Three drivers are described below.

**Maslow’s hierarchy of needs and the hedonic treadmill:** Psychologist Abraham Maslow described his influential “hierarchy of needs” in the 1940s. As in Fig. 3, he suggested humans were driven first by their

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<sup>25</sup> Cass R. Sunstein and Adrian Vermeule, “Conspiracy Theories: Causes and Cures\*,” *Journal of Political Philosophy* 17, no. 2 (2009): 202–27.

<sup>26</sup> Kaeten Mistry, “Approaches to Understanding the Inaugural CIA Covert Operation in Italy: Exploding Useful Myths,” *Intelligence and National Security* 26, no. 2–3 (April 1, 2011): 246–68, doi:10.1080/02684527.2011.559318.

<sup>27</sup> Arturo Munoz, *U.S. Military Information Operations in Afghanistan* (Rand Corp., 2012).

<sup>28</sup> Wood, “What ISIS Really Wants.”

<sup>29</sup> Munoz, *U.S. Military Information Operations in Afghanistan*. p65

basic need for food, water and warmth – still a struggle for hundreds of millions globally. Then security. Then family. The next stage concerns social recognition, status and respect. The final stage is "self-actualization". "A musician must make music, an artist must paint, a poet must write, if he is to be ultimately happy," wrote Maslow. "What a man can be, he must be." Modern neuroscience and psychology disagree with Maslow's strict order and categories, but concur that basic drives for food, water or security fundamentally affect human decision-making.<sup>30</sup>

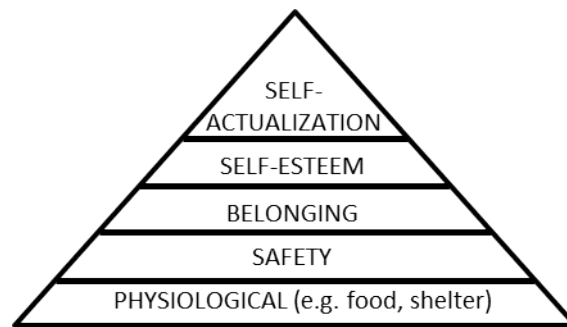


Figure 3: Maslow's Needs' Hierarchy

Humans also want more because we are eternally *materially unsatisfied*. In the rich world, lottery winners don't rate themselves as much happier than others, and people paralyzed by an accident are not much unhappier. On a "Hedonic treadmill", we often become accustomed to each new level of wealth we achieve and so need more.<sup>31</sup>

**An ultimate explanation in their models of the world:** Modern neuroscience also helps describe why humans seek an ultimate cause – why we are *metaphysically unsatisfied*. As described above, we are constantly bombarded by information, and our brains cope by using models of the world to predict what we will experience. Our models constantly seek to explain how the myriad lower level features of the world are caused by higher level explanations. This hierarchy of higher level causes explaining lower level features is central to leading models of brain function<sup>32</sup>, and reflects the models' anatomical basis in the brain.<sup>33</sup> The point is – what is the ultimate cause? As Aristotle suggested, stopping this endless string of ever more fundamental causes requires thinking there is an "unmoved mover".

**Status, glory, excitement and testing oneself:** Humans are powerfully driven to status and glory. "Be the Best" has been the British Army recruiting slogan for two decades. In our celebrity-related Western culture, for those such as the purported Canadian road sweeper in an ISIS recruitment video<sup>34</sup>, this may seem a way for ordinary people to do extraordinary things.

<sup>30</sup> Antonio Rangel, Colin Camerer, and P. Read Montague, "A Framework for Studying the Neurobiology of Value-Based Decision Making," *Nat Rev Neurosci* 9, no. 7 (July 2008): 545–56, doi:10.1038/nrn2357.

<sup>31</sup> Ed Diener, Richard E. Lucas, and Christie Napa Scollon, "Beyond the Hedonic Treadmill: Revising the Adaptation Theory of Well-Being," *American Psychologist* 61, no. 4 (2006): 305.

<sup>32</sup> Fletcher and Frith, "Perceiving Is Believing."

<sup>33</sup> Friston and Stephan, "Free-Energy and the Brain."

<sup>34</sup> <http://videos.nymag.com/video/Canadian-Calls-for-Jihad>

**Pull Factors: What Attracts This Raw Material to ISIS?**

So, there will be a larger or smaller supply of recruits for such an organization – but why are they pulled to ISIS? Why not join the U.S. Army or *Medicins sans Frontiers*?

**Non-material needs and an ultimate explanation in the world:** ISIS provides a clear, simple, coherent model of the world that explains the world and provides purpose. Further, this is understandable and attainable for ordinary people, such as the purported Canadian road sweeper in the ISIS video.

**Recommendations:** As above, break down the model by reducing its clarity and using prediction error to enhance the impact of messaging.

**Status, glory, excitement and testing oneself:** ISIS uses well-made videos offering glory and excitement, much as in Western movies or videogames. It incorporates Islam, which is proven to be successful at inspiring people.

**Recommendations:** Decrease glamour by showing the reality, inconsistencies and unpleasant realities. For example, disillusioned volunteers quoted in *Le Figaro* said: “I’m sick of it. They make me do the washing-up.” or “I’ve done hardly anything but hand out clothes and food. I’ve also cleaned weapons and moved the bodies of killed fighters. Winter is beginning. It’s starting to get tough.”<sup>35</sup>

**(IV) KEY MOTIVATIONS IN LOCAL POPULATIONS**

ISIS must gain support or acquiescence from local groups and populations. Here we focus on four fundamental psychological motivations that matter across key populations, for example key Sunni groups in Iraq (e.g. whose cooperation was critical to the 2007 U.S.-led Surge) and in Syria.

**(1) In-group/out-group:** Humans are driven to form groups (“us”, the “in-group”) that are contrasted against other groups (“them”, the “out-group”). A classic case is “The Robber's Cave” experiment<sup>36</sup> where groups of boys formed tightknit groups in competition with other groups. Biological manipulations, e.g. giving humans the hormone oxytocin, can selectively enhance cooperation with the in-group but not the out-group.<sup>37</sup>

**Recommendations:** Individuals often have multiple overlapping identities, e.g. a Sunni, an Iraqi, a person of a particular clan or profession, a woman. These can be used to both bring local groups together and split them from ISIS. To bring local groups together in Iraq or Syria, one can focus individuals’ attention on a common identity across the groups (e.g. focusing on aspects of identity has been shown in prison populations<sup>38</sup>). To increase division between those local groups and ISIS, one can increase the salience of group membership<sup>39</sup>.

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<sup>35</sup> John Lichfield, “My iPod Has Packed Up. All I Do Is the Washing-up: Jihad Isn’t All It’s Cracked up to Be, Say Disgruntled Isis Recruits,” *The Independent*, December 1, 2014.

<sup>36</sup> Muzafer Sherif et al., *Intergroup Conflict and Cooperation: The Robbers Cave Experiment*, vol. 10 (University Book Exchange Norman, OK, 1961).

<sup>37</sup> C. K. W. De Dreu et al., “The Neuropeptide Oxytocin Regulates Parochial Altruism in Intergroup Conflict Among Humans,” *Science* 328, no. 5984 (June 2010): 1408–11, doi:10.1126/science.1189047.

<sup>38</sup> World Bank (2015) World Development Review, *Mind, Society and Behavior*

<sup>39</sup> Nicholas Sambanis, Jonah Schulhofer-Wohl, and Moses Shayo, “Parochialism as a Central Challenge in Counterinsurgency,” *Science* 336, no. 6083 (May 18, 2012): 805–8, doi:10.1126/science.1222304.

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National identity or nationalism may achieve both here, for example as ISIS destroys ancient ruins that are part of a shared national historical identity. The U.S. did not harness national identity in Afghanistan, where the Taliban became seen as true jihadists defending Islam and Afghanistan from foreign invaders - highly effective among the Pashtun target audiences.<sup>40</sup> This may be partly a missed opportunity, as the Pashtun Wali Shaaker of the Naval Postgraduate School stated “*they constantly allude to the victorious history of Afghanistan, ... but [little] of the literature produced by coalition and U.S. forces appeals to religious and nationalist sentiments of the population in a similar manner.*”<sup>41</sup>

Also key to brining local populations together is that the groups need a plausible, unifying path forward. In Iraq, a plan safeguarding Sunni populations. In Syria, a peace process or roadmap forward.

**(2) Self-interest:** Thucydides, the father of realism, suggested a trio of human drives behind war: self-interest, fear and honor.<sup>42</sup> The next three points deal with each in turn. The importance of self-interest was shown by the switching allegiances of Sunni groups during the 2007 surge, which involved U.S. rewards and threats of punishment.<sup>43</sup>

**(3) Fear:** A security dilemma arises from fear or uncertainty of the other’s motivations and capabilities, where precautionary or defensively motivated measures are misperceived as offensive threats that can lead to countermeasures in kind. Thus, “if outsiders wish to understand and perhaps reduce the odds of conflict” as scholar Barry Posen concludes an analysis of the security dilemma, they must ask “Which groups fear for their physical security and why?”<sup>44</sup>

**Recommendations:** To bring local groups together, focus strategy on projecting resolve and enhancing transparency to reduce uncertainty; confidence building and reciprocating positive actions; and restraining defensive actions that may appear threatening. The U.S., and those it works with, must help reassure local parties.

**(4) Fairness:** Humans are prepared to reject unfairness at substantial cost, and this is rooted in our biology.<sup>45</sup> In a well-known example called the *ultimatum game*, one person gets an amount of money (e.g. \$10) and proposes a split with a second person (e.g. \$9 for himself, \$1 for the other). That other person then decides to either accept the offer (in which case both get the proposed split) or reject the offer (in which case both get zero). Even when receiving an offer of free money compared to getting nothing, humans reject offers under 25 percent of the money around half the time. Brain scanning shows that neural activity encodes the exact degree of unfairness, e.g. in the game described above.

**Fairness can limit influence:** Understanding fairness can help analysts interpret and forecast another’s decisions more accurately. For instance, deterrence analysis that ignores the drive to reject unfairness can’t correctly forecast what is needed to deter an adversary. In the ultimatum game correct forecasting of behavior must include the value of fairness that drives them to reject. When conducting a deterrence operation the social motivation of fairness may drive them to reject restraint, so deterrence fails.

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<sup>40</sup> UK Strategic Communication Laboratories (2010) Kandahar province, in Munoz (2012, Rand)

<sup>41</sup> Munoz, *U.S. Military Information Operations in Afghanistan*.

<sup>42</sup> Donald Kagan, *On the Origins of War: And the Preservation of Peace* (New York: Anchor, 1996).

<sup>43</sup> Losing Iraq July 29<sup>th</sup> 2014, Frontline, PBS

<sup>44</sup> Barry R. Posen, “The Security Dilemma and Ethnic Conflict,” *Survival* 35, no. 1 (1993): 27–47, doi:10.1080/00396339308442672.

<sup>45</sup> This section draws on Wright and Schoff, Enter the Fairness Dilemma, *National Interest*(2014)

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**Recommendations:** Ask “how fair will it be seen from the audiences’ perspectives?”

**Fairness Dilemma:** Here each side is driven to take actions they see as self-evidently right and just, even at high cost to themselves – but which the other side considers unfair, aggressive or risk-taking. One does not have to be afraid or uncertain of the other’s motivations and capabilities; the rejection of unfairness can drive one to act.

**Recommendations:** A strategy of “one step back, two steps forward”. First, looking back, learn from examples of overcoming the fairness dilemma e.g. German apologies or Northern Ireland. The importance of apologies<sup>46</sup> must not be minimized, but they can only ever be half the story. A first step forward is anticipating factors that may exacerbate the fairness dilemma, for example group identities that will not inflame this dynamic. For the second step forward, the parties should develop a *process* that provides a path forward, for example in Iraq a process enabling Sunni-Shiite power-sharing.

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<sup>46</sup>Gi-Wook Shin and Daniel C. Sneider, “History Wars in Northeast Asia,” *Foreign Affairs*, April 10, 2014.



## Chapter 4: Thinking About Influence Across the Spectrum of Conflict: Neurobiological Approaches: Dr. William D. Casebeer (US Air Force, Ret.)

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### Introduction

War and peace alike have both always been in part about the brain. As the organ of human thought and action—and the mediator of how environments, our own cognitive processes, and our genetic inheritance shape our behavior—it must take pride of place in any comprehensive study of the causes of conflict. Despite the historical but sometimes hidden importance of the mind and brain for understanding conflict, as the essays in this volume demonstrate we are only now coming to grips with the upshot of this fact for how we prevent conflict, and prevail in it quickly when it is morally obligatory. Here, I briefly discuss a framework for examining the practical issues involved in using neuroscience to research and develop national security technologies, especially those involving influence. In particular, I review the work of one researcher in the field of the neurobiology of influence—Dr. Emily Falk and her team—to demonstrate how our best science can be used to tutor our techniques for achieving and sustaining peace across all phases of conflict.

### The Primacy of the Brain Across All Phases of Conflict

United States military doctrine identifies six phases of conflict in Joint Publication 5-0 of 2011, which outlines the military's joint planning process.<sup>47</sup> These are broken out as (0—"phase zero") shape, (1) deter, (2) seize the initiative, (3) dominate, (4) stabilize, (5) enable civil authority, and then return to phase zero to "shape" yet again. Shaping consists in taking actions to affect the environment in ways that make threats to security less likely to emerge. Deterring consists in taking actions to prevent agents who desire to threaten security from doing so. Seizing the initiative consists in taking decisive actions to disable an active threat. Dominating consists in using all aspects of military power to achieve victory quickly, while Stabilizing consists in taking actions to return to pre-conflict normalcy. Enabling civilian authority consists in taking actions (such as working with host governments) to reestablish non-military mediated stability and reconstitute governance. These definitions can be debated, especially by theorists and practitioners involved in military operational art, but serve as adequate entry points for considering why understanding the brain is so important for knowing how to achieve effects—and develop technologies required to do so—across all these phases.

In phases zero and one, understanding how the human brain is shaped by facts about the environment (including the social environment) and our genetic endowment is critically important. What kind of environments make it likely that conflict will break out or that peaceful means will likely not be effective in resolving disagreements about core values? Social cognitive neuroscience is especially useful here. In phase two of conflict, being able to analyze the effect of action and information on perception and decision-making is very important; deterrence and influence occur at this

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<sup>47</sup>Joint Publication 5-0, "Joint Operation Planning, 11 August 2011," available at [www.dtic.mil/doctrine/new\\_pubs/jp5\\_0.pdf](http://www.dtic.mil/doctrine/new_pubs/jp5_0.pdf). Accessed December 15, 2013.

confluence, and while rational actor models of this process have been useful they require augmentation and bounding to be maximally useful. Neuroscience is useful here as well. In phase three, understanding how combatants make decisions and how performance is influenced by the combat environment—as well as how we treat injury and recover from and repair the stresses and wounds of war, both physical and psychological—is advanced by incorporating the latest in the neurobiology of decision-making under stress. For phase four and five, understanding de-escalation, trust-building, the relationship between development and conflict resolution, and related questions about the brain and good governance, are all advanced by cognitive and affective neuroscience. Theorists talk about winning hearts and minds, which in many respects is longhand for using technology to shape our brain.

While soldiers, sailors, airmen and marines have always been concerned about achieving effects across all phases of conflict, it has sometimes been more difficult to see how this can be done thoroughly. For the rest of this paper, I will focus on the application of strategic rhetoric and neurobiology to the phases of conflict framework. I end by focusing on research by Dr. Falk which uses the brain as a window into understanding behavior change at the individual, group and population levels.

### **An Example: Strategic Rhetoric and Neurobiology**

For an example of this framework in action, consider phases zero, one and two of conflict. Shaping, influencing and deterring involve in part acts of communication, and acts of communication are often most effective if they are couched in terms of narratives or stories. If I am, for example, to successfully communicate my intention to provide disaster relief during a humanitarian operation that could involve the use of force (so as to reassure the victims that aid is on the way, and so as to deter organizations such as violent non-state actors from attacking the forces provisioning relief), I will need to tell an effective story regarding our forces' involvement in an area. This is an aspect of narrative strategy. In practice, effective narrative strategies will require understanding the components and content of the story being told so we can predict how they will influence the action of a target audience. In other words, we need a sophisticated understanding of “strategic rhetoric.” This is difficult to come by. Nonetheless, even well-worn and simple models of this process, such as that offered by the ancient Greek philosopher Aristotle in his *On Rhetoric*, can be very useful for structuring our thinking.<sup>48</sup>

Aristotle would have us evaluate three components of a narrative relative to a target audience: (1) what is the *ethos* of the speaker/deliverer? (2) What is the *logos* of the message being delivered? And (3) does the message contain appropriate appeals to *pathos*? Consideration of *ethos* would emphasize the need for us to establish credible channels of communication, fronted by actors who have the character and reputation required to ensure receipt and belief of the message. “You have bad *ethos*” in this context is merely another way of saying “You won’t be believed by the target audience because they don’t think *you* are *believable*.” Consideration of *logos* involves the rational elements of the narrative: is it logical? Is it consistent enough to be believed? Does it contain (from the target’s perspective) non-sequiturs and forms of reasoning not normally used day-to-day? Finally, *pathos* deals with the emotional content of the story. Does the story cue appropriate affective and emotive systems in the human brain? Does it appeal to emotion in a way that engages the whole person and that increases the chances the story will actually motivate action? Understanding these processes is in part a

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<sup>48</sup> Aristotle, *On Rhetoric*, 1356b (translated by George A. Kennedy, 1991).

matter for neurobiologists.<sup>49</sup>

Some of these Aristotelian considerations will be affected by structural elements of the story (Is the story coherent? Is it simple enough to be processed? Can it be remembered? Is it easy to transmit? If believed, will it motivate appropriate action?); others will be affected by content (Does the narrative resonate with target audiences? Is the protagonist of the story a member of the target audience's in-group? Is the antagonist of the story a member of a hated out-group?). But all will be affected by the mechanism responsible for receiving and processing them to drive behavior: the brain.

There are many circumstances where strategic story-telling in security contexts is conducive to human flourishing, can be done in a fashion which respects the rights of all involved and is accomplished with either their implicit or explicit consent, and will produce better consequences. A world where we are able to speak truth to the power that others have to exploit the innocent in conflict environments is one where we can use reason to resolve our disagreements instead of force, and clear and effective storytelling is an important part of that process.

### Falk's Findings

How can we make the influence of stories in all phases of conflict usable for someone in uniform? Understanding how persuasive messages and narratives change behavior and spread in social networks and cultures is an important component of actionable insight here. For example, consider the work of Dr. Emily Falk at the Annenberg School for Communication at the University of Pennsylvania. Falk and her team explore how the brain can be used as a window to understand attitude and behavior change at individual and group levels. Their exploration of "communication neuroscience" offers useful insight that can help service personnel explore effective communication across all phases of conflict.

Falk's lab has focused on social influence, understanding brain processes which make it possible for environmental factors and other people to change our behavior. In a 2015 review article, they discuss major brain mechanisms implicated in social influence and which play a part in persuasion, influence, and retransmission of influential messages.<sup>50</sup> They highlight that neural data can be used to complement other methods in understanding social influence, that it can be used to predict real-world behavioral outcomes outside of the neuroimaging laboratory, and argue for combining neuroscience approaches with social network analysis.

Lead author Chris Cascio summarizes overlap between neural systems which play a role in conflict detection, positive valuation, social cognition, and self-related processing. By conflict detection, Cascio et al do not mean identifying when force is being used by someone, but rather the neural mechanisms which are implicated in detecting when our behaviors and attitudes are misaligned with the group or groups to which we belong. Perceptions that we do not share the values of others can lead to distress (we are social creatures, after all), and can cause both attitude and behavior change. The dorsal

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<sup>49</sup> Some neuroscientists accomplishing interesting work in this area include Emily Falk (as discussed in the text), Greg Berns, Read Montague, Ken Kishida, Paul Zak, Jorge Barraza, Rebecca Saxe, Jamil Zaki, Emile Bruneau, Antonio Damasio, Jonas Kaplan, Matt Lieberman and Lucas Parra. It is an exciting and growing field. The last five years especially have seen provocative and revealing work in what I call *narrative neuroscience* emerge.

<sup>50</sup> Christopher N. Cascio, Christin Scholz, and Emily B. Falk. "Social influence and the brain: susceptibility to influence and retransmission," *Current Opinion in Behavioral Sciences*, Vol. 3, June 2015, pp. 51-57.

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anterior cingulate cortex (dACC) is a brain region which is involved in monitoring for conflicts, and other labs have demonstrated that it is possible to down-regulate or reduce dACC activity using transcranial magnetic stimulation, and that doing so reduces conformity to social influence. In other words, if a brain mechanism responsible in part for detecting misalignment and motivating us to change our attitudes and behaviors so they align with the group is “taken offline,” it becomes less likely that social influence will change our behavior in experimental contexts.

On the valuation front, brain systems in the striatum (such as ventral striatum, VS) and ventromedial prefrontal cortex (VMPFC) are responsible for processing reward values in multiple circumstances; our decisions to have a meal now, or enjoy a conversation instead of a walk at this moment, are driven by activity in these systems. It is likely that VS and VMPFC are responsible for generating “social rewards”—that is, the positive valuation our brains apply to knowing that our opinions or preferences align with those of the group. In a nutshell, in many contexts, our brains find social conformity to be rewarding *in and of itself*, in much the same way that we find food or water to be rewarding.<sup>51</sup>

Does knowledge about the operation of these mechanisms transfer outside of the laboratory? In many cases, the answer is: yes. For instance, it would be valuable to know if changes in brain activity in these key regions predict outside the lab behavior. Falk and team have accomplished studies demonstrating, for example, that changes in VMPFC activity during exposure to persuasive message (public service-like announcements) about how use of sunscreen can help prevent cancer predict participants’ attitudes about sunscreen use even a week later outside of the laboratory. These results also generalize from prediction about changes in individual attitudes and behaviors to forecasts about changes in the larger group or population response to the messaging.

The applicability of these findings across all phases of conflict should be clear. If we are to shape the larger environment so that we deter violent non-state organizations, for instance, consideration of how individuals think about their relationship to that group or organization are important—can I understand what messages about a particular group are most effective in highlighting disparities between the interests of the group and the interests of the individual? If deterrence fails, can I seize the initiative and prevail in kinetic conflict by taking steps to change the interactions between groups so that it becomes less likely bystanders to conflict will support, for example, a terrorist organization? After conflict, re-establishing peace and stability, and setting conditions for cultivation of legitimate mechanisms of governance, all require thinking about how our messages and statements send rewarding signals about trust in legitimate authority and about whom we should partner with so as to address the human needs governments aspire to satisfy. Answering these questions with the objective and quantitative measures you can get from well-designed experiments, and having these insights inform strategy and policy, is one way the science of influence can assist across the spectrum of conflict.

## Conclusion

Given the primacy of the brain in driving human action, it is no surprise that neuroscience and its affiliated disciplines (psychology, cognitive science, biology, etc.) have an important role to play in helping us understand and channel conflict. Evaluating how neuroscience can be integrated into familiar constructs such as the notion of phases of conflict is important, as it can open our eyes to options we have for preventing or confronting violence which we may not have considered before.

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<sup>51</sup> See, e.g., Jamil Zaki, J. Schirmer, and J.P. Mitchell, “Social influence modulates the neural computation of value,” *Psychological Science*, 22 (2011), p. 894.

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Fortunately, we don't have to start from scratch, as this volume has borne out—there is ample work taking place in the neurobiology of conflict and influence which can help us use our scientific knowledge and engineering expertise in such a fashion that we can *comprehensively* deal with conflict, not just in phase three.

## Chapter 5: Moral Psychology and Meta-Constructs of Religious 'DEFIANCE': Dr. John Shook (University of Buffalo)

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### Beliefs, Commitments, and Convictions

As philosophical psychology can amply attest, seeking “the cause” or even “a cause” for someone’s chosen conduct is usually speculative at best. A person’s stated account for his or her actions won’t clarify matters much. Any person can self-consciously mount a quick rationalization for anything done, without deeply understanding the underlying complex of motivations actually demanding expression in conduct. One’s “beliefs” turn out to only be what one is willing to admit to others; how one’s true convictions actually determine actions may remain obscure even to oneself.

That is why recited creeds and endorsed ideologies are poor predictors of people’s daily actions. What any doctrine specifically means in a situation calling for action depends mostly on the multi-faceted complexities to that situation, not on the doctrine’s formulaic message. Doctrines upheld by groups don’t reliably inspire consistent actions; a large group may appeal to a doctrine to justify peace-making, or militancy, yet few in that group may display commitment to that doctrine in their own actions. Militants appealing to an ideology point out connections between violence and ideological doctrine, but this can’t be a reliably causal relationship, since many other people share in that ideological endorsement yet they never commit violence (Gunninga and Jackson, 2011).

Whether that violence is sponsored abroad, or spawned domestically, the relationship between ideology and action is complex, multi-factorial, and highly sensitive to contextual socio-cultural dimensions (King and Taylor, 2011; Kleinmann, 2012; Mullins, 2012; Sedgwick, 2012; Stohl 2012). Giving a reason after an action isn’t anything like identifying a cause for an action. Typically, reasons aren’t causes. Psychological convictions can causally motivate patterns of actions in a reliable way, while stated beliefs usually rationalize and excuse actions only after they have been enacted (see Wright; Spitaletta, this report). It is possible, but not necessary, for stated beliefs to correspond to true convictions. Sincerity can occasionally be heard, but it is difficult to verify who is sincere. Sincerity isn’t measured by the loudness or vehemence of repeating the ideological message – that display is more for show and status.

Beneath the public displays of obedience and sincerity, one’s actual commitments are generated and put into action by commitments and convictions, not “beliefs.” The concept of “belief” has lost scientific utility as a singular term. Its normative sense lingers on in religious studies and theology departments where comparing beliefs is easier than arguing over faith. Its descriptive sense is retained by psychologists or philosophers pondering how we retain and use so much gathered information about the world. Habitual manners of getting through daily life are powered by the little dutiful motivations and commitments, the “minor” convictions, about what we are supposed to be valuing, prioritizing, and doing. This multitude of commitments is individually weak – commitments easily override each other from moment to moment, and any distraction or desire can override them as well.

More powerful commitments that typically regulate our choices despite distractions and temptations can be called “moral” commitments. We aren’t always moral, but we do sense our internal moral conscience even as we follow, or deviate from, its urgings. When we entirely break from daily routine,

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when we devote resources to something incompatible with who we think we usually are, that leap requires far greater energies to compel us to re-create ourselves. That kind of motivational energy can be seen as “major” conviction. To the extent that a major conviction makes one persist in resource-depleting and/or hazardous courses of action for the sake of an envisioned good or valuable end, it feels like one is surrendering to an ethical conviction. (Surrender to convictions leading to ends that one doesn’t take to be so good is only surrender to mental compulsion, not ethical conviction.)

When one has persistently devoted vast resources at great personal cost and risk for some envisioned worthy good or supreme end of ‘ultimate’ concern, that conviction has proven to be not only ethical in character but also “religious” in spirit (Dewey, 1938; Tillich, 1957). A religion, on the other hand, is a fairly stable body of commitments by a group (embodied in rituals, scriptures, etc.) to a worldview about “all reality” which determines what is sacred and supremely good for all life. (More precise definitions are highly contestable, but most every attempt includes both the metaphysical dimension and the axiological dimension.)

The vital psychological distinction between “belief” and conviction, and between “religion” and the religious, is crucial for the future progress of psychological and neuro-cognitive inquiry into “the springs of action,” as David Hume labeled them. Faulting a “faith” or an entire religion for anything, much less aggression and violence, is about as unscientific as that tactic should appear. Understanding some of the complexities to moral life as lived in psychological and social contexts will in turn permit asking better questions, and getting more useful answers, about the religious life and its expression in social action. As Giordano; Giordano and DiEuliis; Wright; and Casebeer note in this report, while it is important to understand underlying neuro-cognitive processes, it is unwise to focus exclusively upon the actor’s internal neural state and/or mentality in isolation; the environmental dynamics of intra-group sociality and inter-group contact is vital (see also: McCauley and Moskalenko, 2008; Atran, 2010). The psychology and neuroscience of motivation and conviction can open up vistas into our mental moral life and the religiously lived life.

### **The Moral Capacities: Typical vs. Abnormal**

The moral life as it is mentally lived is quite complex; various kinds of decision processes, each labeled as “moral” cognitions, actually overlap only a little as they handle different sorts of decision procedures about what ought to be done. Three primary modes of moral response have received the most scrutiny in behavioral, cognitive, and neuroscientific research: the utilitarian mode (recommended by the ethics of utilitarianism), the deontic mode (urged by deontological ethics), and the role mode (elaborated by virtue ethics). Investigations in moral psychology are confirming this multi-dimensionality to moral thinking and behavior (Cushman, Young, and Green, 2010; Crockett, 2013). Normal human behavior and neuro-typical moral cognition relies on all three modes to vary degrees, applying one or another, or more than one in concert, depending on the kind of interpersonal situation at hand to be navigated.

In the main, the ordinary role response to a situation involving multiple people:

- attends to emotional concerns for those people having a proper social relationship with oneself
- regards people in social relationships as valuable persons, not to be harmed or violated
- considers the roles of oneself and others in social relationships as important
- seeks a proper response allowing each person to fulfill their expected roles towards each other

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In contrast, there is a hyper-role response to a situation involving multiple people, which:

- attends to emotional connections with people who respect one's own role
- regards people in close social relationships with oneself as valuable persons to be protected
- considers one's own role as potentially or actually crucial for sustaining the whole network
- seeks a proper response confirming and expanding one's important role for the network

However, psychological factors, induced by a variety of environmental/situational effects, can evoke an excessive hyper-role response that I refer to as: *Directed Emotion Favoring In-group Ascendancy Needing Triumph* (DEFIANT); this is characterized by:

- strong suppression of generic emotional concern for people
- strong enhancement of specific emotional concerns for special persons related to oneself
- regard oneself as urgently crucial for upholding righteous protection of those special persons
- consider oneself as rightfully worthy of privileged status as defender of the network

Psychological factors such as these do not spontaneously erupt from the inner recesses of one's mind; as Giordano notes in this report, environmental factors are key.

### **The Social Self, Social Competencies, and Confrontation**

People under the urges of that DEFIANT feeling typically do not release their energies in uncivil ways. The surrounding civic life and cultural heritage has available resources to mitigate aggression. Successfully participating in organized society binds a person into working for common good within decent institutions. Holding family, work, and community roles helps to keep one fulfilled and feeling needed. Many duties accumulate as one enters full adulthood and then middle age. Among cultural resources, religiosity can help alleviate anxiety from perceived underclass status or anger over prejudice and injustice. Political action by non-aggressive means, if political structures are perceived to be legitimate and functional, can be an outlet, as well.

The capacity for embarking on plans to enact DEFIANCE (*Directed Emotion Favoring In-group Ascendancy Needing Confrontational Engagement*) wouldn't grow without the civic/cultural realm's complicity and negligent failure. Where that failure occurs, reinforcing factors get influential opportunities.

- DEFIANT can worsen where the absence of utilitarian goals and remedies leads towards frustration that community welfare can't be advanced by ordinary means.
- DEFIANT can get reinforced where one feels duty-bound to participate in swiftly remedying injustice and rescuing the community.
- The hyper-role mode of DEFIANT can get reinforced where one can't gain a respected role in society by civil means but a heroic role awaits for those fighting for triumph.

The rare people who can nevertheless find the hopefulness and the strength to pursue the greater good by extraordinary public action express DEFIANT through civil expression and nonviolent means. Civil



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Rights movements have sometimes been able to stay mostly nonviolent, though civilly confrontational. However, if that hopeful utilitarian option doesn't take hold, the duty-based and hyper-role modes can bloat and manipulate a person's convictions towards justifying confrontation. Confrontation may take any number of concrete forms, both secretive and public, aiming to confuse, hinder, deflect, obstruct, compromise, or destroy assets (human, material, cyber, etc.) of the target (see: Giordano; Spitaletta, this report).

Belief systems stand ready to manipulate a person's convictions. There are more political, quasi-political, religious, and quasi-religious belief systems than encyclopedias can encompass. Much of DEFIANCE receives reinforcement from cultural and political ideologies having little to do with religiosity. Those ideologies can promise exaggerated roles of importance and status without having to appeal to religiosity at all. That is why many militants don't actually apply their religious lives to the cause and couldn't even explain the religion properly. We focus only on religions here.

The close relationship between religions and morality has been amply confirmed from many interdisciplinary perspectives (Graham and Haidt, 2010). All the same, religions do not uniformly encourage the same kinds of moralities or specific moral duties. That religious variability must be taken into account. Any religion can be moral; any religion can sometimes be immoral as well. Religions are no more "inherently" peaceful than they are "inherently" violent. The modest relationship between strident religious adherence and tendencies towards aggression is detectible, but this effect shouldn't be exaggerated (Blogowska, Saroglou, and Lambert, 2013).

What is necessary for religion-related DEFIANCE is that a person's duty-based and hyper-role modes are enhanced further by focused commitment and religious conviction. But DEFIANCE cannot be aroused by just any religion, and not necessarily by rigorous sects of religions. Religion per se cannot cause DEFIANCE. The key ingredient is just the right sort of religious conviction about the sacred that are connected to the moral duties and roles peculiar to DEFIANT.

### Generic Violence and Sacredness

It simply isn't true that monotheism has a tighter relationship with large-scale violence than other types of religions. Religions throughout recorded history, whether they worship one god or many, have been intimately involved with promoting or tacitly supporting wars of conquest, revenge, and honor, with few exceptions. The examples of entire religions denouncing aggressive war when the rest of society deems it just and patriotic are equally as rare. Smaller denominations and sects are more likely to defy society's judgment. This is seen when pacifist sects turn against a tide favoring war, and it is also seen when militant sects recklessly race ahead of a society seeking peace.

As matter of fact, religious sects classifiable as fundamentalist tend to display characteristics that are more compatible with duty-based and hyper-role modes to produce a personal "moral ethos" controlling one's commitments. Fundamentalist sects do not encourage the sort of experimental questioning and thinking needed for changing society to improve the social good into the future; fundamentalists instead look to imitate a fixed notion of an ideal past society. That is why dutiful adherence and conformity is highly valued, clear lines are drawn between the in-group and out-groups, and allegiance to strict rules is prized (see here: Wright, this report). Where fundamentalist sects can effectively control their social conditions, they distribute responsible social roles in hierarchical structures that typically include authoritarian lines of command.

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Religiosity in general does not display significant tendencies towards strict dutifulness or authoritarianism, but the range of religiosity from conservatism on to fundamentalism does display that tendency (Berns et al., 2012; Piazza, 2012; Young, Willer, and Keltner, 2013). Furthermore, participation in fundamentalist sects is often self-selected. While many are simply born into that kind of religion, many do leave, and many join later in life. Long-time fundamentalists are therefore more likely to be the sort of people who have a temperament that prefers dutiful and authoritarian groups. This correlation has been measured, and it may involve heritable traits (Ludeke, Johnson, and Bouchard, 2013).

In actuality, few fundamentalist sects promote that DEFIANT feeling and rarely encourage DEFIANCE with violence. The previous section explains why: DEFIANCE best inflates under certain deleterious socio-cultural conditions. Furthermore, fundamentalism isn't required for DEFIANCE: a single person, without any encouragement from a sect, can become the "lone wolf" perpetrator of violence. However, if a fundamentalist sect claiming to represent the best interests of a subjugated community persuades some followers that only immediate action can bring protection and justice to that community, the factors for DEFIANCE can come together in the minds of those already susceptible to that message (see: Giordano, this report). Religious DEFIANCE emerges in that matrix, capable of manipulating a religious person's moral ethos further.

- Religious DEFIANCE, narrowly defined, appeals to a person's sense of sacred values and religious convictions, through a well-crafted narrative, to develop a DEFIANT attitude into a moral commitment to commit acts of confrontation, and perhaps aggressive conflict and open violence as well.

Religious DEFIANCE in its violent and warlike manifestations will display variations, depending on the type of sacred values promoted and the moral convictions involved. Again, the way that the moral ethos of a person gets manipulated by the religious narrative heard by each religious person, filtered by their own mindset, has great influence over resulting actions taken. In general, religious DEFIANCE further distorts and exaggerates the moral ethos of a DEFIANT person.

- DEFIANCE allows a rationalization that community welfare is best advanced by near-term confrontation and violence without moral discrimination among individuals targeted.
- DEFIANCE rationalizes one's duty-bound prioritization, over all other duties, of remedying injustice and rescuing the community.
- A hyper-role ethos infusing DEFIANCE rationalizes a heroic role, having authoritarian approval (by an actual person or a figural personage), to assume fighting status for communal triumph.

Religious DEFIANCE can occur within closely-knit communities, loosely networked nodes, or even with lone-wolf perpetrators inspired by mythical figures.

What sort of religious narrative about sacred values and corresponding religious convictions could supply all three kinds of infusions to DEFIANCE? The most efficient and coherent narrative would include all three distorted ethos in a mutually supportive way, blending together to bond them tightly.

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Religious fundamentalist narratives supporting DEFIANCE accordingly tend to dictate what is supremely sacred, depict all duties ultimately deriving from some sacred authority, and teach that one's supreme duty is obeying divine authority. They draw a clear line between persons worthy of respect and those deserving no moral regard at all. They specify how a true believer can play a needed role in carrying out sacred ideals, and when a believer can know when to get DEFIANT. Unless the faithful are carrying out the sacred will, their own right to existence is threatened and they could become in some sense "unreal" from the fundamentalist (or divine being's) perspective, creating an existential crisis of deep anxiety. Relief from that deep existential anxiety is only gained by submission and obedience (Griffin, 2012).

Because of the way that this role of DEFIANCE is rationalized by such a narrative, a person playing a violent role in a commanded war can rationalize the elimination of anyone outside the true community without any moral conscience lingering to question such actions. Such a person could regard that heroic role as a measure of horizontal status among respected peers and communal commanders for social status, and/or regard that heroic role in a transcendent vertical sense in relationship with the divine (Fricano, 2012).

According to this religious narrative, the elimination of infidels may not be wrongful murder, because (1) infidels are not in the true community according to God; (2) infidels have no goodness or right to exist by being separate from God; (3) the elimination of infidels is perfectly right and just when God wills it so; and (4) during war the infidels are eliminated by God's command.

To summarize, religious DEFIANCE can be manipulated towards various kinds and levels of violence through the design of a religious narrative about the sacred and supreme ethical convictions. The hypothetical narrative crafted above, and its extreme monotheistic theology, is but one of many possible variations able to combine religious fundamentalism, dutiful authoritarianism, and heroic role-playing.

### **Religious DEFIANCE and Just War Theory**

It must be emphasized that extreme religious DEFIANCE is quite compatible with extreme political violence for Machiavellian or utilitarian ends. There is no dichotomy between groups appealing only to religiosity and other groups appealing only to power. A typical group engaged in extreme violence will offer utilitarian rationalizations to those needing them, while simultaneously offering sacred rationalizations to those susceptible to such messaging. It may also happen that religious DEFIANCE can be restrained by cold calculations about long-term interests concerning future relations with neighboring nations and peoples.

It should also be emphasized how religious DEFIANCE can be restrained by other staunch traditions upheld in a culture. One example of that restraint is Just War Theory.

Many religious cultures in previous centuries and millennia, all around the world, independently invented ethical standards for the proper conduct of war. Not surprisingly, many converged on some standards heard in the "Just War Theory" of the West. Rules about the permitted means of starting and conducting war, treating defeated combatants, avoiding the killing of noncombatants, and avoiding harm to women and children, are typical features to these standards.

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Islam developed its own version of Just War Theory (Al-Dawoody, 2011) preventing the worse abuses of religious DEFIANCE through counterbalancing its utilitarian, duty-based, and role ethos distortions, by specifically (a) demanding that conducting war should intelligently aim at the long-term good, not just short-term retribution or disproportionate destruction; (2) requiring that only lawful commands from authentic authorities are obeyed; and (3) urging that heroic roles should not be involved with dishonorable acts towards noncombatants and the vulnerable. However, a crafted religious narrative, such as that fundamentalist narrative sketched above, attempts an override of Just War Theory with duty-based, authoritarian rigidity that is sufficient for rationalizing indiscriminate havoc and killing.

### Recommendations for Action

Based upon this information, I offer the following recommendations:

- The principles and traditions of Just War Theory, still alive in every civilization today, should be staunchly promoted and reinforced to global view to lend encouragement to those everywhere trying to restrain sectarian DEFIANCE.
- The defusing and refutation of singularly sacred narratives would be wise, along with the stabilization of societies and governments so that there can be alternative outlets to those feeling DEFIANT.
- Ultimately, watching for the signs of developing DEFIANCE among those reaching a DEFIANT level is necessary, and the social and inter-personal factors encouraging that DEFIANT feeling should be counteracted at the local level.

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## Chapter 6: Terror as a Psychological Warfare Objective: ISIL's Use of Ritualistic Decapitation: Dr. Jason A. Spitaletta (Joint Staff J7 & The Johns Hopkins University Applied Physics Laboratory)

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### Abstract

Psychological warfare exists “along the edge of a nightmare” (Linebarger, 1954 p 1) and thus some consider terrorism its ultimate form (Sedere, Ryan, & Rubin, 2003). The Chinese saying “Kill one, frighten ten thousand” summarizes the objective of terrorism: maximize the psychological effect of politically motivated violence (Schmid, 2005). The use of terrorism is generally a conscious decision on behalf of an individual or group and not the result of individual psychopathology (Kruglanski & Fishman, 2006) and in the case of the Islamic State of Iraq and the Levant (ISIL), terror appears to be among their principal psychological objectives. As Lenin indicated, the purpose of terrorism is to cause terror—an unremitting, paralyzing sense of fear that permeates one’s psyche (Breckenridge & Zimbardo, 2007). ISIL’s uses of ritualistic decapitations are staged to maximize their terrifying effect through shock by exploiting the unconscious fear of castration (Oliver, 2007). ISIL’s rationalization of prisoner beheadings is a selective interpretation of *Surah* 47:4 deliberately taken out of context (Lentini & Bakashmar, 2007). The psychological effect of which is terror on behalf of the witness, potential increases in affiliative behavior on behalf of the in-group, and legitimacy on behalf of the perpetrators. The effect of such tactics is exacerbated by ISIL’s effective messaging that violence is the only path to the caliphate and it’s inevitable incarnation justifies terroristic behavior (Kuznar & Moon, 2014).<sup>52</sup>

### Key points:

- Terrorism is a deliberate, and often highly effective, manifestation of psychological warfare.
- The purpose of terrorism is to cause terror—an unremitting, paralyzing sense of fear that permeates one’s psyche (Breckenridge & Zimbardo, 2007).
- ISIL’s use of violence-related themes describing (often in gruesome detail) prisoner executions and the subsequent humiliation of the groups those victims represent is unapologetic and direct (Kuznar & Moon, 2014).
- While ISIL’s beheadings are a terroristic act of psychological warfare, their interpretation of *Surah* 47:4 provides explicit authorization for the decapitation of prisoners and the beheading of non-Muslim captives, therefore reinforcing ISIL’s narrative (Furnish, 2005; Quiggle, 2015; Moon, 2015).
- Those witnessing beheadings (either live or on videos disseminated via social media) may identify with either the victims or the aggressor based on in-group bias and not necessarily the subjective morality of the act (Schmid, 2005) so those who agree with or hold some affinity toward ISIL may not sympathize with those victimized in the videos.
- The indiscriminate nature of some terroristic tactics often requires organizations to justify and/or explain the purpose of such operations and ISIL, like their Islamic extremist predecessors, use selective interpretations of the Quran absent context to lend a degree of religious legitimacy for their rationalization (Lentini & Bakashmar, 2007).

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## Introduction

Terrorism is a tactic by which a group seeks to impose its will on a selected target audience (Banks, & James, 2006), and this tactic has proven to be one of the more effective forms of psychological warfare (Bos, Spitaletta, Molnar, Tinker, & LeNoir, 2013). Psychological warfare can be defined as “the planned use of propaganda and other actions designed to influence the opinions, emotions, attitudes, and behavior of enemy, neutral, and friendly foreign groups in such a way as to support the accomplishment of national aims and objectives” (Daugherty & Janowitz 1958). Psychological warfare exists “along the edge of a nightmare” (Linebarger, 1954 p 1) and thus some consider terrorism its ultimate form (Sedere, Ryan, & Rubin, 2003). The use of terrorism is generally a conscious decision on behalf of an individual or group and not the result of individual psychopathology (Kruglanski & Fishman, 2006) and in the case of the Islamic State of Iraq and the Levant (ISIL), terror appears to be among their principal psychological objectives.

Terrorism as a psychological action is a tactic and not necessarily a strategy (Merari, 1993); however, ISIL has elevated the importance of such tactics through their narrative that violence is the only way to achieve their objectives (Kuznar, 2014). Terror may not only increase the receptiveness to ISIL’s ideology among some individuals within ISIL’s desired target audience and but also exacerbate preexisting prejudices in the wake of traumatic experiences (Bos et al., 2013). While ISIL’s brutality seems in some way to have contributed to its tactical success (Venturelli, 2014), the use of ritualistic beheadings may ultimately have a negative effect on the robust ability to raise money; a task for which ISIL has shown particular adeptness (Ligon, Harms, Crow, Lundmark, & Simil (2014). Nevertheless, the psychological benefit of terrorist action often outweighs the cost, and thus seems to be a preferred psychological warfare tactic of ISIL.

## Terror as a Psychological Objective

Terrorism involves the confluence of violence and propaganda: the former seeks to modify behavior through coercion, and the latter exerts effect through persuasion (Schmid, 2005). As Lenin indicated, the axiomatic purpose of terrorism is to cause terror—an unremitting, paralyzing sense of fear that permeates the psyche (Breckenridge & Zimbardo, 2007). The Chinese saying “Kill one, frighten ten thousand” summarizes the objective of terrorism: maximize the psychological effect of politically motivated violence (Schmid, 2005) by exploiting mass media (Oliver, 2007). Fear precipitates the acute release of catecholamines and glucocorticoids typical of the human stress response (Grossman, 2009). This response is elicited by four situational characteristics: novelty, unpredictability, threat to survival, and perceived lack of control (Lupien, 2009) all of which have been reported by survivors of terrorist events (Galea et al., 2002; DiMaggio & Galea, 2006). Emotional responses to man-made disasters have been shown to be considerably more intense than responses to naturally occurring phenomena (Breckenridge & Zimbardo, 2007). Terror is also used to support other insurgent techniques and operations, such as propaganda and agitation (Bos et al., 2013). Terrorism has been employed to

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disrupt the socioeconomic or political status quo, punish, retaliate, maintain security, as well as demonstrate strength and provoke (Bos et al., 2013). It is the latter two that seem particularly relevant to ISIL.

Terrorist organizations seek to manipulate two principal audiences: the organization's constituency (in-group) and the enemy (out-group) (Bos et al., 2013). The principal objective with the former is to demonstrate strength, while the goal of the latter is to intimidate (Merari, 1993) and/or paralyze the citizenry and provoke the enemy (Bos et al., 2013). In-group messages stress violent resistance is necessary to accomplish the desired end state (in ISIL's case, the apocalypse (Kuznar & Moon, 2014)), that negation is acquiescent to tyrannical authority, and that the adversary is vulnerable. Out-group messages emphasize the likelihood of future attacks, the identification of all those affiliated with the government (including civilians) with the enemy, and the lack of government control over—as well as the inability of the government to protect—civilians (Gerwehr & Hubbard, 2007). ISIL, for example, not only uses language describing in gruesome detail the brutality of their actions against soldiers on the battlefield as well as prisoners (Kuznar & Moon, 2014) but also uses professional shot and edited footage in their video releases (Barnard, 2015).

Evolutionary studies of human behavior describe the challenges of the young male to establish his masculinity in both short-term and long-term contexts with the former focused on establishing an identity and the latter having evolutionary implications (Tiger, 1969). Exploiting the vulnerable male's struggle for identity as well as the old(er) male's struggle to establish a durable legacy is something ISIL subtly includes in their messaging (Spitaletta, 2014b). The method by which ISIL addresses these vulnerabilities is, however, more terroristic than therapeutic. The neuropsychological effects of such psychological warfare tactics on ISIL recruitment are not understood with any degree of specificity due to the lack of ecologically valid empirical data. Nevertheless, mechanisms may be hypothesized by synthesizing the work of researchers from a variety of relevant disciplines. While a broad ranging discussion on the matter is beyond the scope of this paper (for more see DiEuliis & Cabayan (2013)), focusing specifically on the reaction to terroristic stimuli is appropriate.

Of particular interest is ISIL's use of beheadings. Both al-Qaeda in Iraq (AQI) and later its successor, ISIL, employ ritualistic decapitation not simply to execute prisoners but to debase them (and by extension, their in-group) and intimidate others (Lentini & Bakashmar, 2007; Oliver, 2007; Tinnes, 2015). AQI used beheadings sparingly and ceased the use after Abu Musab al-Zarqawi was advised to by Ayman al-Zawahiri (Lentini & Bakashmar, 2007). The act of beheading has interesting psychological connotations for their use as a psychological warfare tactic. While Freudian interpretations now tend to be lightly regarded, the provocative impact of beheadings as dis-empowering symbology is fortified by a neo-Freudian analysis of the myth of Medusa, considered decapitation as symbolic representation of power emasculation and castration (Quinet, 1990; Oliver, 2007). The intimacy of beheading requires overcoming significant psychological obstacles particularly when done as a means of execution off the battlefield (Grossman, 2009). Ritualistic decapitations are staged to maximize their terrifying effect through shock by exploiting the symbology of "removing the head", and dis-empowering the will to power (regarded by some as a symbolic "castration"; see, for example Oliver, 2007). At the risk of



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extrapolating beyond the data presented by Kuznar (2014) and Spitaletta (2014a), the themes of emasculation (of Muslims at the hands of infidels) and their obligation to overcome such oppression were rife in Adnani's statements. As the theme of the emasculated and disenfranchised male is not unique to ISIL or other violent extremist organizations (Crossett & Spitaletta, 2010), and its ritualized use is suggestive (Tinnes, 2015); however, there is insufficient data to determine whether it is a conscious attempt to induce castration anxiety.

While decapitation may indeed be homage to medieval Islam (Wood, 2015) the intimacy of the act and the human revulsion to perpetrating it (Grossman, 2009) may contribute to the voyeuristic popularity of the videos (Tinnes, 2015). Though ISIL's beheadings are a terroristic act of psychological warfare, it does not necessarily mean they do not hold religious significance. In fact, ISIL's interpretation suggests that *Surah* 47:4 authorizes the decapitation of prisoners and the beheading of non-Muslim captives, therefore reinforcing ISIL's narrative that the practice has its roots in the time of the Prophet (Kuznar, 2014; Furnish, 2005; Quiggle, 2015). ISIL's interpretation of *Surah* 47:4, however, is not necessarily widely accepted but reflects ISIL's *Salafist* worldview<sup>53</sup>, thus reinforcing their narrative (Moon, 2015). Selecting quoting the Quran absent the historiographical context is a common *tactic* amongst Baghdadi, Adnani and their forefathers (Lentini & Bakashmar, 2007). *Surah* 47:4 does advise to "strike at the necks of unbelievers" however, there is ambiguity as to when (during or after combat, *jihad*, etc.) that advice should apply (Moon, 2015). While *Surah* 47:4 is interpreted by ISIL to provide the justification for decapitating prisoners the verse more accurately details the differences between believers and hypocrites; the former who choice to fight is passing a test of God (as God would not require assistance to smite his enemies) and the latter who are sick at heart (Moon, 2015). This aspect of *Surah* 47:4 may also explain ISIL's justification for the beheading of converts to Islam such as Peter Kassig and Maxime Hauchard. Furthermore, later *Surahs* suggest the Prophet Muhammad commanded his soldiers to treat non-Muslim captives as brothers and not to exceed the limits of *jihad* through disproportionate violence (Lentini & Bakashmar, 2007). However, many of these later *Surahs* are abrogated and thus interpreted by scholars like Sayyid Qutb as not applicable (Moon, 2015) and groups like Egyptian Islamic Jihad (EIJ), al-Qaeda, and ISIL adhere more closely to Qutb's construal.

ISIL's Salifist veneration for the days of the Prophet (Wood, 2015) suggests a historical motivation; while Joseph (2001) suggests the limbic system is a contributor. The neuroanatomical explanation suggests that the limbic system's emotional processing conflates the sexual repression of certain organized spirituality and the ensuing sexual frustration whereby the violent act serves as a sexual release in the name of the religion (Joseph, 2001). The conflation of killing and sexual gratification has also been exhibited by individuals who experience combat-induced traumas, often resulting in aggressive behavior and/or violence (Grossman, 2009). Aggression, the externalization of anger (Cox & Harrison, 2008), is a set of behaviors that cause or lead to harm, damage or destruction of

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<sup>53</sup> *Surah* 47 dates to the first year of the *Hijra* and was written while the Prophet Muhammad was in Medina under threat of invasion from the *Qurayshi*. During this period, the Prophet Muhammed was dealing with a challenge heretofore he had not faced; that of the *munafiqiin* (hypocrites) or those who simply claimed to be Muslims for pragmatic reasons such as physical and financial security but . conspired against the Muslim community. Ensuring generations of Islamic scholarship suggests that true believers are anxious to serve God regardless of the required sacrifice while hypocrites are not (Moon, 2015).

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another organism (Siegel & Victoroff, 2009). As Giordano notes (Chapter 1), in certain situations aggression is not an abnormal response, nor is it inappropriate or maladaptive. As discussed in further detail elsewhere in this report (see Giordano and DiEuliis) aggression involves a neural network encompassing the limbic system (specifically the amygdala) and prefrontal cortical areas (PFC) (Murphy, 2003), including the dorsal medial prefrontal cortex (dMPFC) and ventral and orbital medial prefrontal cortices (vMPFC/OFC) (Cocarro et al, 2007). The link between aggression and the limbic-PFC network has been established in research on clinically aggressive populations, including violent offenders with both borderline and anti-social personality disorders, as well as sub-clinical violent offenders (Cocarro et al, 2007).

More specifically, the neural correlates of affective aggression entail emotional reactions that originate in limbic networks and involve the amygdala, to conjoin other limbic structures, including the hippocampus, para-hippocampal gyri, hypothalamus, thalamus, and cingulate cortex (Siegel & Victoroff, 2009). Insufficient PFC activation may prevent inhibition of brain structures located in the limbic lobe and without proper inhibition messages from the PFC; the amygdala can influence behavior in an unconstrained manner (Adams, 2006; see also: Giordano and DiEuliis; this report). This mechanism may be implicated in the subjective experience of terror while viewing beheadings as the act itself triggers castration anxiety and the ensuing physiological arousal may be interpreted as either threatening or revolting.

Related to, and potentially preceding aggression is the subjective experience of disgust (Pond et al., 2012). Aversive stimuli trigger the human stress response (Pond et al., 2012). Disgust is one of the basic human emotions, generally resulting in an aversive reaction to stimuli (Kamboj & Curran, 2006). The emotions of contempt, anger, and disgust are often confounded in experimental literature; however, Gutierrez et al. (2012) differentiate the three as the response to violations of social/community ethics, violations of individual ethics, and violations of divinity ethics respectively. Disgust elicits repulsion and elimination, particularly toward members of an out-group and it, and not anger, transcends aggression to hostility and is a more reliable predictor of violent behavior (Matsumoto et al., 2010).

Disgust comes in two principal forms; concerns with purity/sanctity of the body (e.g. aversive reactions to foul-smelling substances) and moral disgust (e.g. revulsion at the thought of incest and/or cannibalism; Guitierrez, et al, 2012). Moral disgust also exists along a continuum, but is often considered to be a more powerful (e.g. emotionally evocative and behavioral sustaining) form (Pizarro, Inbar, & Helion, 2011). In fact, the subjective experience of disgust can exacerbate appraisal of immoral acts (Pizarro et al., 2011). The neural network subserving disgust engages the cingulate cortex, the nucleus accumbens, and the orbitofrontal and occipital cortex (Klucken et al., 2012), which have also been postulated to have a role in emotion processing, anticipation, and regulation (Klucken et al., 2012).

Of particular research interest to counter-radicalization is the linkage between stimuli eliciting disgust and anger. Anger is an emotional state that can vary in intensity from mild irritation to intense fury, accompanied by physiological changes including elevated heart rate, blood pressure, and hormonal levels (specifically epinephrine, and norepinephrine) (Speilgeberger, 2009). The cognitive dimension of

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anger refers to a set of cognitive appraisals that guide the valence of perceived affective stimuli (Cox & Harrison, 2008) and thus the emotional reaction toward the perpetrator and away from the victim. If anger is indeed the emotional experience ISIL's target audience experiences subsequent to these beheading videos, be it subsequent to fear and/or disgust or not, then it will be difficult to counter without an emotionally provocative counter-narrative.

Anger has a particularly high commitment value particularly when the stimulus is threatening to the ego and/or in-group (McCauley, 2014) so witnessing such brutality may stimulate a desire for revenge (Oatley, 2009) for whatever act of the victim's out-group justified the ritualistic decapitation. Markus & Kitayama (1991) describe revenge as a process with three distinct sequential stages beginning with the victim's perception of a harmful act, followed by the victim's assignment of blame for that harmful act to a specific entity, and ultimately the victim's retaliatory aggression aimed at the blamed entity. Stillwell and colleagues (2008) contend that revenge is an aggressive act with perceived justification in pursuit of equity; however, the ensuing behavior (and the individual calculus of equity) is compromised by the inherent bias of the aggrieved. Observers may identify with either the victims or the aggressor based on in-group bias and not necessarily the subjective morality of the act (Schmid, 2005), so those who agree with or hold some affinity toward ISIL may not sympathize with those victimized in the videos.

Again, there are insufficient data in the case of ISIL to determine whether these forces are at work; nevertheless, they warrant further investigation or at least the acknowledgement that the perpetrators cannot be so easily dismissed as sadistic psychopaths. As Giordano advocates in Chapter 1, there is considerable value in understanding these mechanisms from a more personal perspective to avoid counterproductive targeting. We would be wise to heed Dostoevsky's wisdom that "*...nothing is easier than to denounce the evildoer; nothing is more difficult than to understand him*" (Palermo & Kocsis, 2005).

### Psychological Effects of Terrorism

The psychological manifestation of terror is neither simple nor straightforward; different audiences will respond with various interpretations of terrorist acts (DiMaggio & Galea, 2006). It is therefore difficult for ISIL, or any other organization considering terrorism as a form of psychological warfare, to predict the effectiveness of their operations. Because personality variables affect an individual's perception of threat, the vagaries of perception are the keys to understanding human behavior under stress. It is not the objective character of the threat that determines an individual's behavior so much as his subjective evaluation of the situation. Individuals who have been directly or indirectly victimized by a terrorist attack may go into a state of acute stress.

Symptoms of an acute stress response include recurring thoughts of the incident, irrational fears of previously normal activities, significant deviation from one's daily routine, survivor guilt, a pronounced sense of loss, a reluctance to communicate feelings, and a subjective uncertainty or loss of control (DiMaggio & Galea, 2006). If symptoms persist for more than thirty days after a traumatic event, an individual may have posttraumatic stress disorder (PTSD). Symptoms of PTSD fall into three main

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categories: intrusive memories, avoidant behaviors, and arousal. Intrusive memories, or episodes of re-experiencing the event that disrupt daily life, include flashbacks, nightmares, and/or uncomfortable or disturbing reactions to those memories (DiMaggio & Galea, 2006). Avoidance includes emotional numbing, feelings of detachment, the inability to recall the traumatic event, a general malaise (particularly toward activities previously considered pleasurable), avoiding people and/or places that are reminiscent of the event, and an uncertainty regarding the future. Arousal symptoms include difficulty concentrating, startling easily, hypervigilance, irritability, and difficulty sleeping.

Diagnostic criteria for PTSD include a history of exposure to a traumatic event meeting two criteria and symptoms from each of three symptom clusters (Campise, Geller, & Campise, 2006). The psychological consequences of terrorism are both acute and chronic and tend to increase with proximity to the event. Populations exposed to the attack show higher rates of PTSD and those suffering losses as a result of the attack show higher rates of depression (Galea et al., 2002; Kaled, 2005; DiMaggio & Galea, 2006). These psychological effects can be useful as a means of population control, particularly for groups like ISIL who place great value on demonstrating their will to dominate both physical and social terrain (Venturelli, 2014). In the case of populations traumatized by conflict, this phenomenon is particularly palpable (Staples, Abdel-Atti, & Gordon, 2011).

The psychological effects of terrorism are not simply manifested in individual physiology and psychology but also in a social context. The prolonged isolation or segregation can foster a sense of humiliation or collective loss of self-esteem (Post, Ruby, & Shaw, 2002a; Post, Ruby, & Shaw, 2002b). Terror forces the individual to live under the continual threat (perceived or actual) of physical harm. It is not only the effect of previous terrorist attacks but also the anticipation of future attacks that can induce stress (Banks, & James, 2006) and thus perpetrators of terrorism can prolong the effect of an acute response as a means of population control. If government forces are unable to curb the terrorists' threats, the individual tends to lose confidence in the state whose inherent mission it is to guarantee his safety (Bos et al., 2013).

Terror Management Theory holds that human behavior is mostly motivated by the fear of death and if mortality is made salient, individuals will intensify strivings for self-esteem and will respond positively toward people and ideas that support their worldview and respond negatively toward those people and ideas that undermine that worldview (Crossett & Spitaletta, 2010). If self-esteem is lowered or the validity of a cultural worldview is damaged, death anxiety will increase. Mortality salience exacerbates group defenses and reinforces in-group biases, thus achieving simultaneous higher-order effects on both the target audiences. Individuals evaluate in-group members positively because similarly minded individuals are assumed to support, and therefore validate, their own cultural worldview. In contrast, individuals evaluate out-group members negatively because alternatively minded individuals are assumed to threaten their worldview (Crossett & Spitaletta, 2010).

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The subjective experience of terror is compounding; as threatening acts accumulate or escalate, the degree of terror heightens. A stimulus can be anything from an act of social sanction to threats of physical violence or actual physical attack. The corresponding interpretation of these threatening stimuli is a heightening state of psychological distress. The response may vary from coerced compliance to acquiescence, from physical flight to psychological immobilization and breakdown. The effect of terror upon individuals cannot always be determined from an objective description of the terrorist act. That which threatens or terrorizes one individual may not affect another in the same way.

Essentially, however, the process of terrorism can be viewed in the following manner: the stimulus is the threatening or terroristic act, and the response is the course of action, or inaction. If the perception of the threats leads to disorganized behavior or the inability to take appropriate action, the individual is said to be in a state of terror. Individuals narrow or restrict their span of attention under threat (Bredemeier & Berenbaum, 2008). Becoming hyper-vigilant, they focus their attention on the threat and the threatener, to the virtual exclusion of other stimuli. Thus, hypervigilance leads an individual to concentrate on the demands and suggestions of the threatener and reduces his attention to communications from the government or security forces (Bos et al., 2013). If an individual can perceive no avenue of escape from a threat, he or she develops a sense of helplessness and this sense increases the stress reaction. If the purpose of a threat is to achieve compliance with certain demands, a threat that leaves the individual with no influence over the outcome may backfire. The individual either breaks down and is unable to comply or pursues an opposite, hostile course (Bos et al., 2013).

Human response to threat also varies according to the nature of the threatening situation—whether it is specific or uncertain. Some suggest that threats or threatening acts need not necessarily grow in magnitude for terror to intensify; the mere continuance of threats over a period of time is sufficient to intensify the reaction (Withey, 1962). Others counter that the relative intensity of threat, regardless of whether it is vague or specific, determines whether a person will be able to take effective action (Davies, 1963). Regardless, generating subjective feelings of uncertainty is often a psychological objective of insurgent groups because it supports their narrative that the existing government is powerless and/or lacks legitimacy (Chaliand & Blin, 2007).

When individuals perceive they lack the necessary information to come to a judgment, they tend toward negatively valenced information; this is particularly so in the aftermath of a terrorist incident. Social amplification, particularly when the sources are constrained to one's in-group, further magnifies the negative bias and thus social interaction compounds the terror effect (Bos et al., 2013). Unintentionally, media coverage of acts of terror exacerbates the aforementioned phenomena and thus increases the effect of an attack, therefore incentivizing such tactics. Given the ubiquity and global reach of modern media outlets as well as social media, ISIL benefits from unintentional signal amplification, extending their range and access to additional target audiences.

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Terrorist organizations often seek to cause disruptive behavior by issuing an uncertain, generalized threat and this may be the case with ISIL's recent allusions to the "Army of Rome" (Wood, 2015). The very ambiguity of the situation makes rational decision-making and assessment functions break down and can lead to panic (Smelser, 2011). ISIL, however, does not appear to be either haphazard or arbitrary in their language (Kuznar, & Moon 2014) and thus specific references to locations or peoples are generally routed in ISIL's interpretation of historical and religious context. The more specific the threat, the more fear inducing it is; the more vague the threat, the more anxiety inducing it is, making an individual hypersensitive to ordinarily neutral situations and causing disruptive behavior. Under uncertain conditions, individual cognitive processes are biased toward emotionally evocative events, resulting in an increased estimate of a perceived threat, a tendency toward indecision, and an increase in vulnerability to psychological warfare tactics. In trying to identify the source of the threat and redefine the uncertain situation, an individual is more susceptible to rumors and targeted social influence that exploit these biases (Bos et al, 2013).

### **Rationalizing Terrorism**

The indiscriminate nature of some terroristic tactics often requires organizations to justify and/or explain the purpose of such operations. This rationalization is required for purposes of internal cohesion; the individual required to support and execute such attacks needs appropriate validation from their superiors as well as their accepted sources of authority (Bos et al., 2013). Numerous Islamic extremist organizations that preceded ISIL have confronted similar challenges in simultaneously intimidating enemies, maintaining morale, and keeping their financial support networks intact (Bos et al., 2013). EIJ and later al-Qaeda drew its legitimacy from a Salafist interpretation of Islam viewed through a Qutbist lens (Spitaletta, 2012). EIJ saw its organization not only as the vanguard of Qutb's vision for an Islamic revolution but also as an entity with requisite political and religious authority to declare all those who did not meet their requirements for piety, regardless of what the individuals professed to believe, were apostates. EIJ also declared that all able-bodied Muslims were obligated to dedicate their lives to jihad. Mohammed Abd al-Salam Farraj (EIJ's founder) took this to its logical extension and proposed violent jihad as an obligation of all pious Muslims (Spitaletta, 2012).

Al-Qaeda synthesized Qutbism's sophisticated theological discourse with a nuanced ability to comprehend, co-opt, and exploit modern grievances. This narrative combination resonated with extremists and moderates alike, regardless of whether an individual approved of the means by which al-Qaeda sought to accomplish its goals (Spitaletta & Marshall, 2012). The specific messages within the larger narrative rarely focused on citing authoritative texts (beyond selective interpretations of previous theorists reinforced by Quranic quotes without context), but rather relied on the application of general religious or ethical principles to modern political and social problems (Spitaletta, 2012). Attacks that resulted in the deaths of innocents were justified on the basis that the act was sanctified as religious obligation. Sympathetic Imams often issued fatwas as religious justification to insulate the operatives from moral culpability (Bos et al., 2013).

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ISIL not only rationalizes but also seems to take pride in their use of terrorism. Their use of violence-related themes describing (often in gruesome detail) prisoner executions and the subsequent humiliation of the groups those victims represent is unapologetic and direct (Kuznar, 2014). ISIL closely binds this violent imagery with Quranic references, providing a degree of legitimacy and constituted authority for their selected target audiences (Kuznar & Moon, 2014). ISIL's narrative is not ultraviolence for some psychopathological compulsion but rather a hopeful message that victory in the form of a global Caliphate must be obtained through the use of violence (Kuznar & Moon, 2014).

### Conclusion

A prevailing argument of this paper is that terror is a psychological objective of ISIL, and that ritualistic beheadings are conscious attempts to induce terror; therefore attempts to counter ISIL must consider the psychological perspectives of the various target audiences for whom the acts are committed. Those considerations must be sufficient empathetic to understand not only the reactions of the victims and the innocent witnesses of the atrocities but also of the perpetrators and those they seek to recruit. Efforts like those included in Cabayan & Canna (2014) are an attempt to better understand these psychological aspects. The challenge is operationalizing this understanding to better contest this battle of wills. When facing an adversary such as ISIL, asymmetric advantage lies not necessarily in more sophisticated hardware but in more intelligent application of scientific and technological capability (Spitaletta, 2013).

Appending existing Military Information Support Operations (MISO) processes to include experimental findings in neuropsychology, and cyber psychology along with technological advances from captology will better enable the US to access, assess, and influence (Spitaletta, 2014a) current and prospective members of ISIL. Technological superiority, however, will not overcome historiographical ignorance of the arguments ISIL is making. ISIL's rationalization of ritualistic beheadings perverts Islamic doctrine (Lentini & Bakashmar, 2007) yet these selective interpretations. Efforts to directly combat these misinterpretations by those with the requisite ideological and operational credibility such as those outlined by Speckhard & Shaikh (2014) need to be scalable in order to achieve operational and ultimately strategic effects.

Boyd (1987) advocated isolating adversaries by manipulating their ability to make sound decisions through introducing ambiguity, deception, and novelty, or, in psychological terms the tactical applications of interventions that trigger the human stress response (Lupien, 2009). Lind and colleagues' (1989) prescient thesis of the extension of some of Boyd's concepts seems to be yet again proven, this time in the form of ISIL. An often-used objective of psychological warfare is to sow fear, uncertainty, and doubt (Bos et al., 2013). Through better understanding of the intent behind and neuropsychological effect of ISIL's psychological objectives, the US can combat their psychological warfare strategy with our own.

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## Chapter 7: Countering Adversary Ideological Influence in Conflict Zones - Technology Implications: Dr. William D. Casebeer (US Air Force, Ret.)

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### Introduction

Influence processes are complicated as human behavior salient to national security is driven by multiple factors. A review of the literature, however, indicates that at the least narratives, stories and ideology can serve as a scaffold upon which violent discontent can mobilize. When violence against outgroup members is intentionally targeted at innocent people, it becomes terrorism. Understanding the influence-oriented mechanisms which prevent or make less likely that process of mobilization towards indiscriminate violence is a key security challenge of the 21<sup>st</sup> century, and it is made more complicated by the networked information environment in which most of the world lives.

Fortunately, we are reaching an inflection point where it is possible to develop systems that let us detect, analyze and disrupt the radicalization process. Such as a comprehensive technology suite could allow the US and its Allies to detect and disrupt radicalization processes in multiple media; it is distinguished by its use of human-in-the-loop cognitive testing to allow rapid retailoring of information activity, and will give military personnel entirely new capabilities to understand and influence the information environment. In this paper, I review the operational opportunity for the development of influence science and technology and discuss how it could be used to increase the chances that we use peaceable means to resolve disagreement and give military planners additional non-kinetic options for preventing violence.

Violent non-state movements such as ISIL, al Qaeda, and others leverage cultural expertise and exquisite locally-grounded historical knowledge to form narratives and tell stories which exploit innocent bystanders and cultivate permissive operating environments in which to thrive. Adversary information operations can be effective at convincing their sometimes innocent targets to look the other way—or even actively support—terrorist tactics and strategies by providing people, money, moral and materiel support.

Detecting these ideologically-driven information operations is an important capability; the United States and its allies cannot respond to what we do not sense. More important, being able to formulate a holistic strategy for undercutting the efficacy of these operations is a critical part of a counter-terrorism and counter-radicalization strategy. This will involve developing tools and technologies to formulate and forecast the effect of counter-narratives, supporting information, and larger environmental factors on the future abilities of our adversaries. It is possible to leverage existing technologies, and tools which could be built relatively quickly, to equip the US with a comprehensive “counter-radicalization toolkit” to contest adversary information influence. This “suite” will allow the US to detect, analyze, and understand adversary information operations, and provide “human-in-the-loop” tools to assist in developing counter-narratives to influence the behavior of the audience in ways which

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will prevent them from being exploited by malignant violent non-state actors. Measures of performance and effectiveness will provide feedback to allow rapid calibration of a comprehensive counter-radicalization information campaign.

The proposed system accomplishes this by automating the analysis of multiple forms of media (broadcast, social, etc.), detecting emerging themes which enable violence to take root. Narrative templates connect the automated analysis of content with facts about local circumstance to build models which forecast future population and group-level behavior in light of the information being received and the surrounding environment. These drive a campaign planning tool, which allows the US and allies to shape the political and economic environment to minimize the chances of radicalization and to build effective counter-narratives and alternate schema which trusted voices in the local community can use to change the information environment. The tool suite is connected to behavioral, psychological and physiological monitoring systems which allow rapid tailoring and pilot-testing of narratives in light of the expected audience, to boost the chance they will be heard and considered. This enables the US and its allies to speak truth to the power that violent non-state movements sometimes hold over innocent populations.

Extant tools could be integrated into this suite. For example, Lockheed Martin Advanced Technology Laboratories has mature technologies and processes such as the Integrated Crisis Early Warning System (ICEWS)<sup>54</sup> and the Human Systems Cognitively-Aided Design and Evaluation process, which can be leveraged to build this comprehensive counter-radicalization suite. Some technologies used in the construction of the system are exploratory, but could be turned into operationally useful tools which the military—ranging from strategic planners to combatant commanders, to specialists in information support operations—could use to comprehensively defeat groups such as ISIL. Even if we do not continue to develop these technologies, however, the basic science behind the radicalization process is worth exploring, as it can lead to novel approaches to both transitory and long-standing conflicts that might allow us to understand and address the grievances and concerns of parties to conflict comprehensively and effectively.

### Operational Opportunity

The Final Report of the 9/11 Commission spent a fair amount of time identifying and discussing the ideology of al Qaeda, and made strong recommendations to engage in the “struggle of ideas.” Given that the process of radicalization has an information component, being able to understand and act within your adversary’s information *observe-orient-decide-act* (“OODA”) loop is a requirement for a comprehensive counter-radicalization strategy. Put differently, a grand counter-terrorism strategy would benefit from a comprehensive consideration of the stories terrorists tell; understanding the narratives which influence the genesis, growth, maturation and transformation of terrorist organizations will enable us to better fashion a strategy for undermining the efficacy of those narratives so as to deter, disrupt and defeat terrorist groups.

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<sup>54</sup> For information on this system, see the ICEWS website at [www.icews.com](http://www.icews.com).

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Such a “counter-narrative strategy” will have multiple components with layered asynchronous effects; while effective counter-stories will be difficult to coordinate and will involve multiple agents of action; their formulation is a necessary part of any comprehensive counter-terrorism effort. Arguably, a failure on our part to come to grips with the narrative dimensions of the war on terrorism is a weakness already exploited by groups such as al Qaeda and ISIL; we can fully expect any adaptive adversary to act quickly to fill story gaps and exploit weaknesses in our narrative so as to ensure continued survival. More than giving us another tool with which to confront terrorism, though, narrative considerations also allow us to better deal more generally with the emerging security threat of violent non-state actors and armed groups.

Why think that storytelling has anything to do with terrorism and counter-terrorism? Consider the psychological aspects of terrorism: there are multiple reasons why people choose to form or join organizations which use indiscriminant violence as a tactic to achieve their political objectives, all of them dealing at some point with *human psychology*. People feel alienated from their surroundings; they are denied political opportunity by the state; the state fails to provide basic necessities; they identify with those who advocate the use of violence; they are angered by excessive state force against political opponents; their essential needs are not being met; they feel deprived relative to peer groups elsewhere; and so on. These have all been offered as “root causes” of contentious politics in general, and terrorism in particular.

Our purpose here is not to defend any particular position about root causes (indeed, some of those previously listed have been discredited as theories of terrorism), but instead merely to point out that all these causes have a proximate psychological mechanism—they exert influence by affecting the human mind/brain. If stories are part and parcel of human cognition, we would also then expect consequently that stories might affect how these causes play out to germinate, grow and sustain terrorism and radicalization.<sup>55</sup> Operators need to be able to detect and analyze stories in progress, forecast their effects, formulate and enact alternate stories in a human-in-the-loop fashion, and assess the behavioral impact of their counter-narrative strategy. Our adversaries do this presently owing to their closeness to the cultures in which they operate; cultivating our own capability to do so will allow us to systematically disrupt their operations and leverage the softer elements of national power to prevent the exploitation of vulnerable populations.

### Enabling Technologies and Proposed System

The technologies required to build this suite include the ability to sense, analyze and understand narrative information operations in multiple media, the ability to refine models forecasting group and population behavior in light of detected narratives quickly and with sensitivity to audience variability using cognitive and physiologic measures, and the ability to assess the behavioral impact of information operations. Developments in existing technology suites—discussed below—and recent developments in

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<sup>55</sup> Casebeer, W. D. and Russell, J.A. (2005). “Storytelling and Terrorism: Towards a Comprehensive ‘Counter-Narrative Strategy,’” *Strategic Insights*, Volume IV, Issue 3, March 2005.

the cognitive science of narrative and storytelling, serve as the backbone for this proposed system. It builds off well-established technologies (such as ICEWS, or others), but incorporates novel physiologic and neurobiological sensors so as to provide a unique in the world human-in-the-narrative-loop counter-radicalization information operations test bed.

The proposed system integrates a two-pronged approach to analyzing information operations and their impact. First, technologies required to *detect* narrative information activity would need to be integrated (such as event trending and capture tools which allow you to detect event patterns in multiple media types), then these would feed models which *predict* the impact the messaging might have on sentiment and behavior, and then *evaluate* the actual impact on sentiment and behavior to allow the system to improve its forecasting capability.<sup>56</sup> This capability can then be connected to course of action development and analysis via that information analysis environment, in conjunction with tools from cognitive science and neurobiology such as electroencephalographic (EEG) signals—patterns of brain-generated electrical activity sensed through the use of an array of sensor electrodes placed on the top of the head. These and other cognitive variables can be used to quickly assay the impact of a revised narrative. This allows us to improve models of audience behavior in light of the change to the message or to the environment in which it is delivered.

### System Capabilities

The system operates by combining the best computer science algorithms for parsing structured and semi-structured text from open sources to extract events and sentiment with models which forecast behavioral impact. These models are constantly improved by having representatives of the population one hopes to reach so as to communicate effectively look at prototype messages in a closed-loop monitoring situation where their psychological and physiological reactions serve as proxies for attention, engagement, arousal, empathy for characters, narrative transportation and immersion, and ultimately expected behavioral influence.

The technology suite would have the following general capabilities to:

- (1) monitor and analyze multiple media types in real time,
- (2) combine that analysis with other types of event data,
- (3) automate extraction and analysis of narratives to allow sentiment forecasting,
- (4) connect narrative analysis to social network analysis of populations and group,
- (5) pilot test proposed information operations and counter-narratives with a human-in-the-loop, using the latest cognitive science and physiology,
- (7) allow effective detection, analysis, forecasting, planning and execution of information and environmental shaping actions.

### Significance of Capabilities to Operational Opportunity

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<sup>56</sup> Malinchik, S. (2010). "Framework for Modeling Opinion Dynamics Influenced by Targeted Messages" at *The Second IEEE International Conference on Social Computing*, Minneapolis, Minnesota, August 2010. Retrieved from <http://www.atl.external.lmco.com/papers/1912.pdf>.



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These capabilities enable military strategic planners, combatant commanders, military information support operations personnel, and others to understand the narrative dimensions of the information environment they will operate in and provide planning guidance necessary to allow rapid adjustment of messaging activity, improved mid-to-long-term adjustment of the environment of action via economic and political development, and an ability to understand the second and third-order effects of operations and adversary radicalizing narratives on the military operations environment (even in those rare cases when no particular information action can be taken).

In the military information support operations environment, this tool suite can provide capability that cuts across all aspects of the traditional operational cycle: planning, target audience analysis, series development, product development and design, approval, production/distribution/dissemination, and measures of effectiveness. Traditional tools related to counter-messaging can be brought to bear but in an environment which allows rapid retailoring of them to maximize their effectiveness.

### Enabling Technology

Enabling technologies leveraged here include EEG devices and collection platforms, and from scientific developments stemming from work accomplished (for example) by the City College of New York (the Parra lab)<sup>57</sup>, the University of Southern California (the Damasio lab)<sup>58</sup>, the Massachusetts Institute of Technology (the Saxe lab)<sup>59,60</sup>, and others. This work has confirmed and extended relationships between story structure and content and detectable neural signals linked to behavior change. To take one example, principal components from the EEG signal correlate closely to viewer attention to a media stimulus and also predict whether the viewer will send a tweet about it<sup>61</sup>.

In addition, the target audience will respond not only to messaging, but also to the actions that are taken by our military in the areas where the messaging is taking place. It will be important to make sure that the messages and actions together tell a coherent story. Understanding of how the target audiences responds to the messages and actions together can be analyzed in a "behavior-predictive agent-based model" that includes agent-based models of individuals and groups that are based on knowledge of their decision making strategies designed and validated from inputs from the news, social media, social scientists, psychologists, and neuroscientists. The agent-based models can be combined in a model interaction "backplane," allowing the agents to interact with models that represent their environment, such as whether they have electricity, food, access to water, etc., and the messaging models.

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<sup>57</sup> Dmochowski, J. P., Bezdek, M. A., Abelson, B. P., Johnson, J. S., Schumacher, E. H., and Parra, L. C. (2014). "Audience Preferences are Predicted by Temporal Reliability of Neural Processing," *Nature Communications* 5, 29 July 2014.

<sup>58</sup> Araujo, H. F., Kaplan, J., and Damasio, A. (2013). "Cortical Midline Structures and Autobiographical-Self Processes: an Activation-Likelihood Estimation Meta-Analysis," *Frontiers in Human Neuroscience*, 04 September 2013.

<sup>59</sup> Cikara, M., Bruneau, E., Van Bavel, J.J., and Saxe, R. (2014). "Their Pain Gives us Pleasure: How intergroup Dynamics Shape Empathic Failures and Counter-Empathic Responses," *Journal of Experimental Social Psychology*, 2014.

<sup>60</sup> Bruneau, E., Dufour, N., and Saxe R (2013). "How We Know It Hurts: Item Analysis of Written Narratives Reveals Distinct Neural Responses to Others' Physical Pain and Emotional Suffering." *PLoSOne*, 2013.

<sup>61</sup> Dmochowski, J. P., Bezdek, M. A., Abelson, B. P., Johnson, J. S., Schumacher, E. H., and Parra, L. C. (2014). "Audience Preferences are Predicted by Temporal Reliability of Neural Processing," *Nature Communications* 5, 29 July 2014.

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Tools can be developed which analyze opinion propagation and stabilization in response to external influence campaigns or actions of the military; for example, social network analysis tools and models could represent the network of influence relationships in a society and the opinions of individual members. Connections in the network encode the propensity for individual opinion shifts based on influences affecting each individual.<sup>62</sup> These existing models are primarily at the proof of concept level; however, as advances in technology and the sciences are used to improve the models, enabling the responses to messaging and actions to interact within a population will likely produce a more reliable result than models that produce these responses independently.

The events which feed into narrative templates and drive predictive analyses come from technologies which extract event type, participants and intensity, locations, and times from unstructured open news sources. For example, the ICEWS system can provide a graphic display of events, trends and patterns with drill-down to underlying news stories. Event coding of news stories is one of the core technologies at the heart of that capability.

### Maturity

A variety of technologies are brought together into this potential comprehensive suite. Depending on which piece of technology is under consideration, some capability exists that is already operationally fielded.<sup>63</sup> Other capabilities—such as relationships between certain aspects of human physiology and likely narrative influence on behavior—are emerging findings from the basic sciences which are ripe to be incorporated into the technology suite. Pieces that are relatively immature, such as agent-based models linking narrative structure and content to expected propagation, can be matured relatively quickly.

The principal barriers to making the system usable are doctrinal and only secondarily technological. For instance, it is entirely possible to detect and analyze a story spreading in a particular form of social media, to model its likely effect on behavior, and then to propose and propagate an alternate narrative that has been stress-tested in the human-in-the-loop test bed. However, whether the results of this process can be used quickly are contingent on ensuring that operational commanders have the requisite authorities to quickly act in the information space abroad. There is an industrial base here (primarily in assessing the impact of entertainment, and in informing business operations), and some of the work in the cognitive science laboratories mentioned earlier has used more familiar polling methodologies from this industry to test posited relationships between EEG monitoring and behavior.

### Recommendations for Development

This system could emerge from prototype component development and integration to become fully operational with appropriate investments in (1) the narrative templates which will link sensed

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<sup>62</sup> Malinchik, S. and Rosenbluth, D. (2011). "Paradoxical Dynamics of Population Opinion in Response to Influence of Moderate Leaders," *IEEE Symposium Series on Computational Intelligence (SSCI 2011), Artificial Life*, pp. 148-15, April 2011.

<sup>63</sup>O'Brien, S. P. (2012). "A Multi-Method Approach for Near Real Time Conflict and Crisis Early Warning," in [Handbook of Computational Approaches to Counterterrorism](#), ed. by V.S. Subrahmanian. Springer, 11 December 2012.

events to estimations of the impact of a particular narrative on a population, (2) the agent-based models which could undergird forecasting of narrative influence, and (3) continued investigation of and integration into the full system of neurobiological and physiological behavioral impact measures. The technologies will need to be tested in a controlled environment beginning with a demonstration, and then validated in an operational environment. This process will take several years, but the combined technology readiness level of the technologies—and the gaps that will need to be filled to develop an operational prototype—means a timeframe for operational test and validation of less than five years would likely transition the technology from early prototype to fielded system with demonstrated capability.

### **Methods for Employing the Technology**

The system could be fielded operationally for use in the military decision-making process, with forward-deployed components as well as reach-back to domestic piloting sites. It could support training exercises aimed at the military decision-making process, assisting staff development at training facilities where social media analysis and operations are already tested, but not in a persistent fashion. It can be used at the strategic and operational levels by combatant commander staffs seeking quick intelligence preparation of the environment and rapid turns on the expected information effects of military operations, and by units such as Strategic Command's headquarters (charged with developing and deploying deterrence and influence frameworks). Most easily, it could quickly be integrated into all the existing processes used by groups such as the US Army's Military Information Support Operations Command at Fort Bragg, or the US Marine Corp's Information Operations Center at Quantico, who are already building and deploying information campaigns in support of US and coalition operations. The technology could also be usefully deployed to multinational coalition environments, such as the NATO Cyber Defense Centre of Excellence in Tallinn, Estonia. The suite could also be deployed in other research environments, such as social media laboratories operated by the military at the Naval Postgraduate School, or even by national labs investigating influence and social media, such as Sandia National Laboratories. It would thus serve as a technical driver in supporting the larger whole-of-government exploration of deterrence, influence and information force projection.

Like almost all technologies, there are conversations to be had about ethical, legal and social issues. Existing legal and statutory authorities suffice for the system to be deployed in the environments just mentioned. To be used most effectively and in an agile fashion, information operation decisions will need to be pushed to the lowest levels possible, however. In general, there is a well-developed framework supporting the synchronization of traditional military operations and the information dimension (as in our core joint doctrine). Multiple analysts have already discussed the need for the US military to continue investment in technologies which allow it to prevent violent non-state actor exploitation of the vulnerable (see, for example, Casebeer, in Giordano<sup>64</sup>). The scientific findings that it relies on apply even when individuals understand that information influences their behavior. The

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<sup>64</sup> Casebeer, W. D. (2014). "A Neuroscience and National Security Normative Framework for the Twenty-First Century," in Neurotechnology in National Security and Defense: Practical Considerations, Neuroethical Concerns, ed. by J. Giordano. CRC Press .

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development of the suite may even act as a deterrent to groups such as ISIL who at present think they have information dominance and can operate with impunity in the narrative sphere.

Equipping the US military and its allies with the technology required to engage and defeat ISIL and other violent non-state actors is challenging. Technologies which take seriously the developing literature in the cognitive science and neurobiology of influence would provide us with an important tool that can be used to deter, disrupt and defeat our adversaries in the narrative and information spaces where they currently operate to radicalize individuals and cultivate permissive operating environments. They can be important enablers for a comprehensive and effective counter-terrorism and counter-radicalization strategy. Twenty-first century security challenges demand sophisticated and subtle approaches of the kind enabled by this exploration of how information influences behavior. Its effective use in phase zero, one and two of conflict can save lives, prevent the need for costly kinetic operations, and work in synergy with the use of force when its application becomes a necessity. Importantly, these tools can be used to speak truth to the power that terrorist organizations sometimes have to exploit the vulnerable and innocent—they are enabling technologies which ensure our intent is not misinterpreted, and that peaceful means to resolve political disagreement are given ample opportunity to disrupt the radicalization process.<sup>65</sup>

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<sup>65</sup> See multiple chapters of Thomas, T. S., Kiser, S. D., and Casebeer, W. D. (2005). Warlords Rising: Confronting Violent Non-State Actors. Lexington Books.