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Perceptions of Threat, Correlates of Dread, and Collective Instability: Implications for Cognitive Engagement and Deterrence Strategy

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Abstract

This essay argues that individual and collective perceptions of threat—and their neurocognitive correlate, dread—are key drivers of instability, volatility, and violence, and thus must be understood and engaged as strategic elements of modern cognitive warfare and deterrence. Unlike prior analyses, it integrates neuroscience, narrative theory, and behavioral modeling to create actionable frameworks for identifying, forecasting, and mitigating cognitive and social tipping points. This synthesis offers military and policy practitioners a novel, interdisciplinary toolkit to anticipate and influence population behavior, prevent escalation, and enhance mission readiness in the increasingly complex cognitive-operational environment.

Keywords

Fear, Deterrence, Instability, Neuroscience, Narrative Theory

1. Introduction: Individual and Collective Perceptions of Threat and Neurocognitive Correlates of Dread

In contemporary military operations, understanding correlative and causative factors that foster instability, volatility and violence is not merely an academic exercise, but rather is a crucial tactical approach toward strategic mission planning. Among the most viable instigators of sociopolitical upheaval are collective cognitive perceptions of threat and feelings of dread. These emotional cognitions function at both individual and communal levels to motivate communication, shape behavior, and prompt collective action and effects, inclusive of aggression. As such, they represent important, although often underestimated dimensions of risk and threat in the emerging cognitive engagement domain (Giordano and Wurzman, 2011)*.

*For more detailed discussion of engagement(s) in the cognitive domain, and the maturation of the concept and practices of cognitive warfare, see: Annett, E, Giordano, J. (2025) The ins and outs of cognitive warfare. *Strategic Insights*, (4):1 (available at https://inss.ndu.edu/Media/News/Article/4217626/the-ins-and-outs-of-cognitive-warfare-whats-the-next-move/); and Søndergaard, S. (2025) *Cognitive Warfare: NATO Chief Scientists' Report* (available at: https://www.sto.nato.int).

Perceptions of threat often reflect collective narratives, constructs, ideas and ideologies, and can affect personal experience(s) and expression(s), reflect and influence social identity, and affect behaviors toward in- and out-group others (Slovic, 1987). Individual cognitive percepts of dread—particularly that which is linked to existential insecurity or a perceived hostile environment—can be both communicated to and communicated from a collective in which the individual is embedded and can evoke group cognitions of trepidation that motivate aggregate "fight or flight" type response (Liberman and Eisenberger, 2006).

Expectational evaluation of the perceived threat, and anticipated consequences of reaction(s) to it are instrumental toward determining individual and collective responses. In general, decisions are weighed based upon expectational value of relative gain(s) versus relative loss(es) within and across some set of situational and temporal variables Giordano et al. (2016). Threat stressors that are perceived as unmitigable by manipulation/suppression (i.e.—unable to be "fought") can thus result in mobilization-mitigation (i.e.—a "flight" response) (Slovic, 1987). Such can involve changes in cognitive attitudes (i.e.—"mental resource mobilization"), or physical situatedness (i.e.—locale-movement mobilization), both of which can: 1) evoke individual and group vulnerability, volatility, and, if the threat is perceived to be caused or propagated by out-group others, 2) ultimately result in expression of out-group aggression and reversion to violence (i.e.—a "fight" response). In other words, a threat perceived to be too imposing and dangerous to "fight" would characteristically motivate mitigation through "flight"; and perceived threats to "flight" often motivate "fighting-to-flee".

A principal cognitive element of such responses to perceived threat is dread. Dread is a complex emotional state characterized by anticipatory fear of suffering or loss. Neurocognitively, dread engages cerebral nodes and networks participatory in situational assessment, emotional regulation, and decision-making (Richard and Berridge, 2013). These brain networks are responsive to contextual input and can be engaged by perceived threat(s) based upon internalized familial, and more broadly collective constructs of biological, socio-ideological, and economic stability and security. In group settings, dread can become socially communicable via "emotional contagion", which enables emotional states to be disseminated through populations by language, iconographies, semiotics, rituals and various media (Hatfield et al., 1993).

Such propagation is often facilitated by charismatic figures, polarizing narra-

tives, and/or feed-forward and feedback loops within information ecosystems (Sunstein, 1995), resulting in a shared sense of peril based upon a collective cognitive model in which individual and group "life worlds" are viewed as insecure, unpredictable, and perceived as unjust. Collective dread can catalyze population-level behaviors. When the perception of threat becomes severely acute and/or chronic, it can erode social cohesion, undermine trust in institutions, and drive individuals to seek communal security, and collectives to seek safety through physical action to either combat or cognitively or physically flee from the threat source (viz.—"fight" and/or "flight"; see above).

The "dread-threat theory" of Starr (1969), and as subsequently expanded upon by Slovic and colleagues (Slovic, 1987; Slovic et al., 2000a, 2000b, 2000c) describe two major factors, 1) dread, which entails 10 risk characteristics; and 2) uncertainty, which entails 5 risk characteristics, as presented in **Table 1**.

Table 1. Risk characteristics for dread and uncertainty.

Risk Characteristics for Dread
Relative fatality of event
Loss of livelihood incurred by event
Risk of unpleasant death caused by event
Involuntary nature of exposure or being captive to event
Indiscriminate nature of event
Uncontrollability of event and/or its manifest effects
Irreversibility of damage caused by event
Ecological nature of event
Extensive or rapid spread of event and/or its effects
Potential for ongoing risk
Risk Characteristics for Uncertainty
Novelty of threat
Unobservability of threat
Unidentified nature, cause or gravity of effect of threat
Distrust of official sources of information regarding threat
Lack of consensus among experts regarding threat

As depicted in **Figure 1**, these factors and characteristics can be two-dimensionally plotted to present a representation of "menacing context" in which individual or group perception of threat incurs an increasing probability of some action to mitigate dread (Collmann et al., 2016). Thus, an inflection zone of likely action can be forecast based upon the dimensional interaction of these variables, and from this a relative threshold of action-occurrence can be modeled, and utilized to develop assessments of risks, and domains of engagement important for deterring forms of expression (see also, below).

A prime set of exemplary phenomena exists in the realm of public health, where a precarious balance exists between dread, or fear, of disease and compliance with public health messaging. Public health organizations consistently seek to improve the nature and types of public communication to more successfully steer their audience to certain behaviors in the interest of better health. Similarly, security

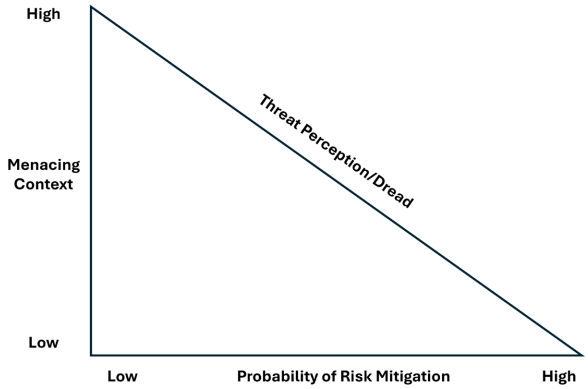

Figure 1. Graphic representation of inversely proportional interaction of menacing nature of conflict, probability of risk avoidance or mitigation and perception of threat and resultant experience of dread. With high contextual menace, a decreased probability of avoidance or mitigation of risk factors increases the perception of threat, and the experience of dread; while increased probability of avoidance or mitigation of risk lessens contextual menace, perceived threat and experienced dread. Details in text.

concerns wish to steer behavior towards public safety. In terms of national health security and preparedness for public health threats, outbreaks, or worse, a perpetrated biological attack, a compliant, educated, and positively responsive public can make the difference between a controlled response to disease (represented by lives saved), vs an epidemic of disastrous proportions (and loss of life). For example, while Ebola never became an outbreak in the US, it offers a vital lesson learned in preparedness communication—a real outbreak could not only have had only poor health outcome, but initiated social instability and its sequela, given the fear generated by just a few cases. In West Africa, dread and distrust of public health officials and their messaging clearly contributed to disease spread (Alexander et al., 2015; Chan, 2014) and was responsible for sporadic incidents of violence (Wilson, 2014).

An emerging solution is the creation of more effective messages based on a fundamental understanding of the underlying neurobiology of how dread is generated among individuals and groups, as well as the neurobiological perception of narratives and risk in decision making and behavior. Throughout evolution, humans have acquired neurological signaling pathways focused on self-preservation; the ability to recognize life-threatening scenarios through neurobiological stimulation of fear is an essential survival mechanism. Two of the most prominent evolutionary fears are that of violent conflict, and infectious disease.

Fear signaling originates in an area of the brain called the amygdala. The amygdala engages networks of the limbic system, hypothalamic-pituitary-adrenal axis and brainstem to trigger the well-known "flight or fight" response (DiEuliis and Giordano, 2017). These physiological responses—such as increased heart rate, respiration, blood pressure, adrenalin levels, and muscle tension—are required to engage a perceived stressful stimulus or flee from it (Giordano, 2013, 2012). Amygdalar activation also engages brain networks involved in assessment and analyses of sensory information including the hippocampus, which subserves memory and experiential learning that are important to recollection of past

threatening experiences and their resolution. Conscious and "emotional" memories activate the prefrontal cortex, which contributes to executive function, decision making, and other higher level thought processes that are constituent to generating responses to various (external and internal) environmental stimuli. Importantly, this circuitry is not unidirectional. Reciprocal interaction of amygdalar and prefrontal cortical networks are involved in modulation of fear responses, i.e. signaling pathways that feedback upon, and mitigate output of the amgydala after threat assessment by the prefrontal cortex can effectively extinguish fear responses. The cerebral networks involved in the emotional generation of fear are diagrammatically shown in Figure 2.

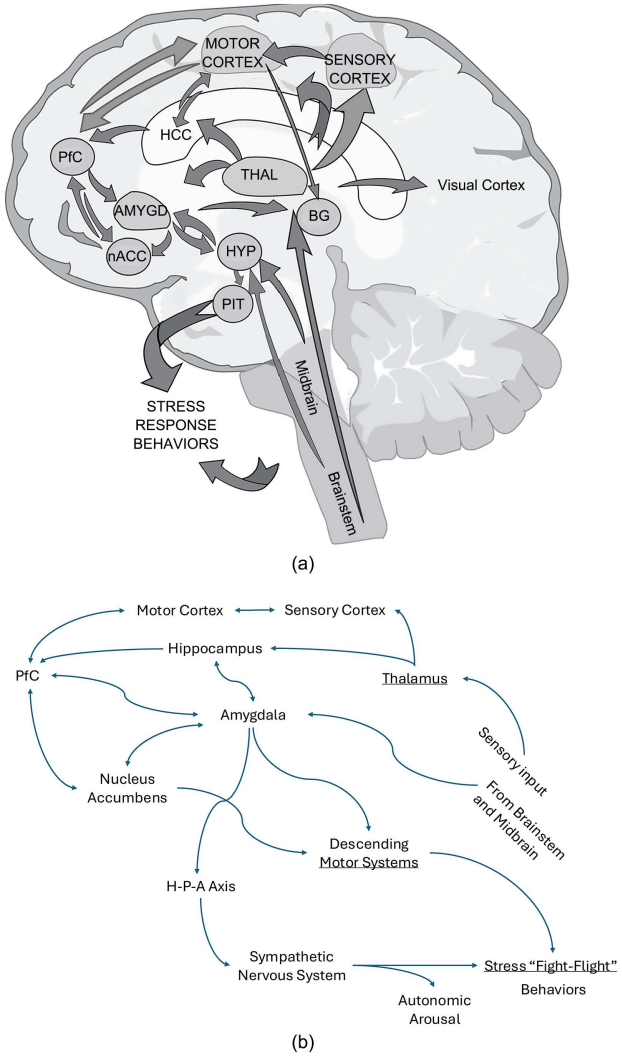

Figure 2. This figure depicts a diagrammatic representation of cerebral nodes, areas and networks interactive in "fight or flight" responses to various risk factors that contribute to threat perception, cognitive/emotional experience of dread, and resultant behaviors. (a) depicts the location of these substrates in the brain (not wholly to scale). (b) provides a schematic (i.e.—flow-chart type) illustration of these neural substrates so as to depict their respective interactions and contribution to cognitive, physiological and behavioral aspects of the flight or fight response (Details provided in text).

The "fear circuitry" of the brain is shaped by genetics, molecular and chemical effects, physiological and anatomic properties of involved nodes and networks; and developmental and environmental effects throughout the lifespan can incur—and activate—predispositions to fear. Moreover, sensory stimuli to the amygdalar—cortical network(s) may not always be overt—unconscious emotional processing can influence subsequent conscious processing and behavior without rational thought (Seifert et al., 2013). The fear response pattern is thus differentially affected and expressed when individuals are exposed to stress, duress, or in an otherwise aroused state; and fear can be exogenously suppressed or enhanced via interventions at the biological, psychological and/or socio-environmental levels. Thus, certain narratives, scarcity of resources, and social instability, can all induce fear. In general, fear and dread responses tend to be evoked by any stimuli that manifest the following characteristics:

1) The threat is exotic and out of the ordinary;

2) There is no basis of familiarity or past experience with the threat (as familiarity increases, there can be memory involvement and other mitigating brain activity);

3) Related to 1 and 2, the threat emerges from that which is recognized as "other", or an outgroup;

4) Risk of death associated with the event or scenario is high;

5) There are no known remedies or actions that could be taken to mitigate the risk of death, OR any remedy or mitigation is a scarce resource, otherwise not readily available, and/or must be competed for.

We have posited that understanding mechanisms and processes of cognition, emotion and behavior are—and will be increasingly—important to developing methods and tools to assess, access and affect these substrates, and their resultant outcomes in individuals and groups. And we have noted that the capacity to influence neurocognitive bases of emotionality, decision-making and behaviors, through various means and approaches, are fundamental to tactics and strategies of cognitive engagement/warfare (Giordano, 2014a, 2014b; Giordano et al., 2013).

2. Case Example: Ebola as the "Perfect Storm" of Threat/Dread

In hindsight, the 2014 Ebola outbreak featured all the above characteristics, and thus inherently had the capability to incite fundamental neurobiological fear responses. The Ebola virus is thought to exist deep in the equatorial forests of Central Africa, where it can infect people who live, hunt or work in the forest or on its fringes. The first emergence of Ebola was in 1976 in Sudan (CDC, 2015) with subsequent sporadic outbreaks of multiple strains occurring since then. The case fatality rates varied by strain but came close to 90% in some outbreaks (note that the average case fatality of Ebola virus disease (EVD) is 50% (WHO, 2016). Despite the efforts of dedicated researchers, Ebola's natural reservoir was never identified at that time. The Forest Region of Guinea, where the current outbreak be-

gan, had had no known prior outbreaks. But it is one of several areas in Africa thought to have the right combination of flora, fauna, bats, temperature and other environmental conditions to favor emergence of EVD. In sum, there are multiple, highly lethal strains with somewhat mysterious emergence ecologies that are not yet fully understood.

Not only is Ebola highly lethal, but the manner in which death occurs is grisly and traumatic: those infected "bleed out" through eyes, nose, mouth, and they vomit and shake uncontrollably. Images in the press depicting blood covered pallets on the floors of cement block buildings conjured fear and those images remained with the viewer. Many Americans learned about "bush meat" (animal carcasses recovered from African forest areas and used for food), because of its potential to harbor Ebola virus, in addition to bats and duikers (Gonzalez et al., 2007). Lastly, despite its initial emergence in the 1970s there was no readily available vaccine, cure, or treatment for Ebola in 2014. An experimental drug called Zmapp, based on monoclonal antibody therapy (Lyon et al., 2014) was initially described in the media as the "Ebola secret serum", of which only a few precious doses were available (Gupta, 2014; Kroll, 2014). Since that time, a vaccine has been developed, as well as additional therapeutics, but the initial fear button had been already pushed. Ebola was portrayed as an exotic disease not fully understood, born in the mysterious deep and unknown forests of central Africa, emerging unpredictably, killing many people who came into contact with it in a horrific manner, and for which there was no readily available antidote.

The Ebola narrative indisputably shaped public views and understanding of the disease threat. From a neurocognitive perspective, narratives factor prominently in individuals'—and collective—thinking and acceptance of ideas. While cognitive processes are often regarded as analytical in function, cognition often engages information more readily in a narrative "default" mode. In brief, this means that humans tend to be more comfortable absorbing information presented in narrative fashion as opposed to that which requires conscious analytics. Narrative mode thinking is fast(er), intuitive, experiential, and based on associations with images, stories, and emotions. In contrast, analytical thinking is slower, deliberative, logical, and more reasoned, using associations with quantitative valuations, and constructs of conscious appraisals (Alhakami and Slovic, 1994). The current ubiquity of rapid social media messaging favors default narrative mode informational acquisition and processing, and "fast", emotionally flavored thinking. Thus, narratives afford potential to powerfully influence individuals' and collectives' perceptions of and responses to information as presented.

For example, recent studies have shown that when reading a novel, patterns of cerebral network activity may be altered, both during reading, and for days afterwards. This phenomenon of altered brain activity following exposure to narratives has been referred to as "narrative transport" (Berns et al., 2013)—the psychological state of being "transported" into a story, and in so doing, experiencing both cognitive and emotional engagement in the narrative, while attention to aspects

of the real world tend to be decreased. during narrative transport, activity in the default mode network ("mind wandering") is reduced, as attention turns from internal thoughts and reflection to sensory processing of the central stimulus (Bezdek et al., 2015).

Interestingly, narratives with high suspense (i.e.—increased uncertainty and anticipatory expectations) are often highly transportive; and tend to promote conformity of ideas, character viewpoints, and behaviors (Hsu, 2008). This can lead to narrative explanation, wherein information is retained as it is portrayed in the story, and this can produce "source location errors" (i.e. once confronted with the informational error, it becomes difficult or impossible to recall wherefrom this information was acquired (Marsh and Fazio, 2006). Evidently, various social media (e.g.—Facebook; X) can contribute to the dissemination of false information which can rapidly be incorporated into more lengthy and broadly distributed narratives.

Some transportive narratives on Ebola preceded the recent outbreak. Suspense novels, such as "*The Hot Zone*" and "*Outbreak*", featured Ebola as a prime plot theme, and touched on pulse points of fear narrative). As well, during the Ebola outbreak, the film *Contagion*, although not focused on Ebola, reappeared on Amazon's top hit list. Not surprisingly, media reports of the Ebola outbreak mirrored the fear narrative, rather than presenting narratives that might have afforded some reassurance in support of calm. Once the first Ebola patient reached the US, the narrative focused on varied fear-inciting topics, including speculations about those infected and their activities in public, border and airport screening security, and models for infectious spread and mortality scenarios that verged on apocalyptic.

Here too, is compelling evidence to fortify the effect and value of neurocognitive functions that could be leveraged via narratives, even in fiction (that is recognized explicitly as such (Doherty and Giordano, 2020). Specific types of calming stories have been shown to increase cerebral (and somatic) levels of the neuropeptide oxytocin-a chemical that has been shown to be operative in evoking feelings of empathy and trust (Zak et al., 2005). Despite this, few calming stories were featured. So although nuanced and careful narratives were presented, as exemplified by purposefully directed efforts, such as "*Ebola Deeply*: *committed to helping the world understand the complex scientific*, *medical and social issues of the Ebola outbreak*" (Setrakian, 2014), such efforts did not gain traction in the overall barrage of rapid social media coverage.

The Ebola dread narrative as it unfolded was not unique; similar historical examples are provided by the narratives focal to both SARS and AIDS epidemics (Des Jarlais et al., 2006). The SARS narrative featured "superspreaders", or those individuals who were "hyperinfective". Priscilla Wald describes this phenomenon as the "outbreak narrative", further stated as "*a formulaic plot that begins with the identification of an emerging infection*" (Wald, 2008). Of note is how outbreak narratives can, and do, have real consequences for routes of contagion, behaviors

of individuals and collectives, and survival rates, and in these ways suggest that the outbreak narrative (rather than the outbreak itself) can shape effects on global economies. This was clearly demonstrated as Ebola narratives evolved in the US. After the initial narrative (initiated in October of 2014 with the first patient in the US) ran its course, media coverage decreased 82% in the following months; the dread narrative had run its course through the US public, and once completed, was not really corrected (Sell et al., 2017; Towers et al., 2015).

3. Neurocognitive Processes of Risk Perception

Inextricably tied to fear and narrative is the human perception of risk. Risks are hazards, probabilities, consequences and/or potential adversities that must be assessed for making existential decisions. Early studies of human risk perception presumed that that risk is rationally assessed via careful examination of extant information prior to making a decision. However, subsequent research demonstrated that publics generally evaluate risk through varied socio-cultural, qualitative means (Slovic, 1987). The growing discipline of neuroeconomics is iteratively contributing to, and complementing other economic models with concepts that incorporate the neurobiology of risk and reward, and the cognitive processes that subserve decision making that is seemingly irrational and leads to unpredictable outcomes (Lowrance, 1976). While the depth of these proposed neurocognitive models is too extensive to discuss here, in simple terms, growing neurobiological evidence supports the existence of two fundamental pathways in which human brains perceive risk: through narrative processes, or through analytical thinking. As described above, narrative or "experiential" thinking tends to be more rapid, intuitive, subconscious, and frequently related to stories, feelings, images and their associations; while slower, "analytical" thinking requires conscious effort and control, and relates risk to reality through quantitative metrics and logic (Slovic, 2000).

The way in which measures of risk are framed frequently determines how risk is perceived, and risk interpretation is strongly correlated to emotion(s), values and heuristics, and is thus inherently subjective. It has been suggested that "objective" risk is an oxymoron, as risk is axiomatically relative to some perceived set of values, rewards, burdens and/or dangers (Kasperson et al., 2000).

Given the association of risk with reward, any acceptance of risk will critically depend upon perception of benefits (versus burdens) incurred. Thus, strongly positive benefits can dampen concern of risks. Yet, this is not a simple cognitive assessment: values and beliefs play significant roles in shaping individual and collective attitudes and behaviors. Values that are considered to be sacrosanct, or those that a person or collective would not violate for any amount of reward, are referred to as "sacred" values (Berns et al., 2006). It is important to note that neurocognitive substrates involved in identity, pleasure, disgust and dread appear to be involved in processing sacred values, while non-sacred values are processed by neural networks associated with reward and logical cost benefit analysis.

Individuals and groups will tend to respond with (moral) outrage when it is perceived that their sacred values have been transgressed and/or violated (Berns et al., 2008). Just as values play a role in cognitive aspects of decision-making, as noted above, so too do beliefs. Behavioral beliefs are focal to ideas about and attitudes toward the issue at hand; normative beliefs are subjective norms as internalized aspects of the standards of a particular socio-culture, and control beliefs refer to individuals' or collectives' perceived behavioral control (i.e.—beliefs of whether there is capability to exercise effect over a situation and/or set of circumstances). Any of these types of beliefs can affect intention, decisional processes, and thus behavioral outcomes.

4. Movement in the Cognitive and/or Physical Domain

Taken together, these aforementioned factors contribute to perceptions of threat, and emotions of dread, which are instrumental to instigating induvial and/or collective response(s). To reiterate, positional movement (whether cognitive or physical) can be seen as a tactical maneuver (i.e.—for immediate coping and survival) toward achievement of strategic security (i.e.—to engender stability and/or flourishing) in the presence of a perceived threat (and in response to experienced dread). En masse positional movement does not occur merely because of perceived kinetic threats; groups move because their collective predictive models of survival—rooted in defensible neurocognitive assessments—signal that remaining (attitudinally or physically) "in place" is not simply dangerous, but untenable (Betts, 2009).

Cognitively, this involves a form of "predictive coding" in which situations are evaluated based upon prior experience, some extant construct of reality, and a generative expectational model of what will happen next (Clark, 2013; Friston, 2018). When an environment becomes unpredictable—due to some technical imposition/disruption, ecological degradation, economic collapse, ideological repression, or conflict, then activation of threat-response systems (i.e.—the neuroendocrine hypothalamic-pituitary-adrenal axis) affects cognitive processes, incurring biased perception of risk that tends to increase impulsivity in both decision-making and behavior (McEwen and Gianaros, 2011). In this context, movement is not irrational, but rather should be considered a neurocognitively motivated, socially legitimized action response that is fortified by narratives that reframe cognitive and/or physical re-positioning as an individually and collectively moral, existential imperative. And if threats—and/or impediments to escape—are believed to be caused by out-group, such cognitions can become volatile, and escalate aggression to evoke violent action (Giordano, 2014a, 2014b).

Collective volatility is marked by rapid breakdown of internal regulation, shifts in norms, and emergence of radical ideologies or leaders (who are often seen/regarded as "saviors", Kruglanski et al., 2014). The social "tipping points" from vulnerability to volatility, and from volatility to violence are often preceded by "cognitive rigidity": a narrowing of attentional focus and moral reasoning, whereby

individuals and groups often become more conformist, intolerant of ambiguity, and more willing to decide upon, accept, and execute extreme solutions (van den Bos, 2009). Importantly, such group volatility can spread, particularly in networked information environments where digital echo chambers reinforce sociocultural identity constructs, and action options (Tajfel and Turner, 1986).

These constructs often frame the in-group as righteous, impugned, and embattled, and frequently identify some out-group as imposing, dangerous, and immoral or illegitimate. The result is a shift from internalized cognitions of vulnerability and volatility to externalized expressions of aggression and hostility. Militant ideologies thrive in such conditions: offering clarity to suppress cognitive insecurity and confusion, agency to counter the experience of powerlessness, and community solidarity to combat (perceived or actual) persecution. The military implication is clear: anticipating and addressing the perceptual roots of (cognitive or physical) positional movement—before kinetic crises emerge—is essential for tactical readiness, strategic foresight and operational planning.

5. Threat and Dread on the Contemporary Global Stage: Exacerbated Exploitation of Strategic Conditions

The contemporary global stage is characterized by the ubiquity and rapid spread of information, relative facility of movement, confluent systemic erosion, persistent antagonisms, and emergent technological asymmetries. Thus, the neurocognitive processes that are often engaged in public health crises, such as those evidenced in the previously discussed Ebola outbreak, can directly scale and translate to population and state levels, and lead to geopolitical instability. Moreover, a progressive disintegration of the liberal world order—once predicated upon cooperative economic interdependence, democratic governance, and normative consensus—has catalyzed a reversion to zero-sum paradigms of state competition (Ikenberry, 2018). Such regressions precipitate and exacerbate perceptions of threat, cognitive dread, and behavioral instability among institutions, populations, and state-level collectives.

This milieu of erosion is neither spontaneous nor uniformly distributed. It is fueled, in part, by the deliberate recalibration of power dynamics by a multiplicity of actor-states—some revisionist, others opportunistic—whose technological capabilities challenge traditional hierarchies of strategic leverage. Where hegemonies once relied upon a relatively stable distribution of technological advantage, the diffusion of emerging (chem-bio; nano, cyber, quantum, as well as nuclear-radiological) technologies have rendered such advantages increasingly transitory (DeFranco et al., 2020; Kello, 2017). The resultant "technology gaps" are active fields of contestation, wherein state (and key non-state) entities engage to disrupt the status quo and establish dimensions of dominance.

These contested spaces are domains of ideational competition, wherein competing models of governance, surveillance, and sociotechnical integration vie for legitimacy (Piketty, 2020). This dynamic is particularly salient in the cyber-envi-

ronment, where information can be weaponized in influence operations, narrative warfare, and cognitive emulation technologies that leverage uncertainty to manipulate perception and decision-making. Compounding this strategic entropy is the fragility that characterizes the traditional power centers of the prior century. Economic inequalities—both inter- and intra-national—act as force multipliers for instability (Rodrik, 2018). Such economic disparities foster perceptions of structural injustice, further inflaming identity politics and fracturing the sociopolitical cohesion necessary for tactical stability and strategic continuity (Nye, 2020).

The cumulative effect is the erosion of epistemic trust, both between nations and within polities—an epistemological fragmentation that further destabilizes global order (Homer-Dixon et al., 2015). Ecological instability adds an accelerant to this volatile mix. Climate-driven resource scarcity, forced migration, and public health crises have direct and indirect effects on strategic constancy (Burke et al., 2018). Ecological stressors heighten competition for viable, sustainable resources, transforming environmental frailty into a venue for geopolitical confrontation. Moreover, these stresses often engage deeply rooted cognitive and cultural narratives, ideologies and identities, priming collective anxieties and motivating populations to radicalization, securitization, and reactive violence (Borghard & Lonergan, 2017).

These phenomena are particularly pernicious given the current escalation in state competition, wherein threat perceptions are increasingly based upon asymmetrical technological capabilities. The ability of competitor and adversary groups to disrupt, deceive, or destabilize without attribution induces a kind of tactical phobia wherein a fear of unseen threats is multiplied by an unbounded battlespace (Cikara et al., 2011). Such cognitive conditions breed an anticipatory anxiety, wherein the mere potential for disruption can provoke pre-emptive dread and/or disproportionate responses to perceived threat(s). This establishes a paradox: efforts to secure order through assertive leverage or technological escalation often aggravate the instabilities they seek to mitigate. Strategic actors, perceiving threat of power erosion, may adopt postures that instigate conflict rather than prevent it. The global system, in effect, becomes a complex adaptive network marked by cognitive fragility and strategic posturing.

6. Implications for Deterrence Operations

Aggression against perceived out-groups is often framed as defensive by those who perpetrate it. This defensive aggression emerges from the interplay between threat detection and estimation, and decisional and actional justification. Simply put, humans are capable of rationalizing violence when they believe it is necessary for individual or collective survival. Understanding this dynamic is crucial for both force protection and strategic influence and deterrence.

Deterrence engages five dimensions that should be interactive and reciprocal in articulation and effect (Giordano, 2024). These are:

Definition of domains in which enterprises and efforts can be identified as tar-

gets for deterrent influence.

Detection of burdens, risks and threats that constitute relevant fields and forces that are to be defined, identified, and targeted. Detection should include quantitative and qualitative metrics

Determination of tactics and strategies of deterrent engagement, and the relative benefit, burden and risks of these approaches. As described in text, such determinations include whether to engage pro- or reactive deterrence, and/or if deterrent methods should be applied non-kinetically or kinetically, and the foci and scope of (disruptive) neurocognitive effects to be achieved in and across defined temporal parameters (see below).

Disruption of identified targets. Disruptive effects should be identified, intentionalized, and implemented in accordance with determinations of short-, intermediate- and long-term sequelae (see above).

Diminution of risk and threat by elimination or reduction of threat sources and resources; note that diminution can involve disruptive as well as destructive elements, activities and effects.

Deterrence can be engaged proactively and/or reactively. Proactive deterrence affords means to exert influence upon identified targets to suppress, if not eliminate capabilities identified to pose current and or near-term risk/threat. Reactive deterrence is directed against a clear and present risk/threat in order to mitigate its effect(s), and/or influence current and future conduct of the same or similar activities so as to reduce the risk/threat that could be incurred. Deterrence operations can be engaged non-kinetically: to influence economics, policy law and/or ecological factors—to leverage power; or kinetically to utilize military and intelligence force to incur disruption and/or destruction either defensively or offensively.

Operations that fail to deter—or intentionally incur—local perceptions of threat and/or dread can become catalysts of violence. Conversely, deterrence operations of strategic communication, civil-military engagement, and narrative countermessaging can attenuate group-level dread and interrupt escalation of volatility and aggression. In accordance with Just War principles, the ethics of such deterrent engagement must be grounded in truth, sensitive to local values, and ultimately aimed at avoiding conflict (viz.—*jus contra bellum*). Under such conditions and contingencies, deterrent influencing of perception represents sound means toward achieving morally justifiable ends (Walzer, 1977). To do so requires cultural insight and competence, neurocognitive literacy, and doctrinal agility. Perception shapes reality in the neurocognitive domain and in cognitive operational applications.

7. Recommendations

Thus, modern military and intelligence deterrence operations must integrate neuroscientific, psychological, anthropological, and economic insight to their tactical engagements and strategic calculus. Toward such ends, we offer the following rec-

ommendations for military engagement in this space:

1) Develop Valid Indicators of Collective Dread—Including social media sentiment, migration patterns, rumor propagation, and shifts in communal behavior.

2) Establish Key Metrics to Predict Inflection Zones and Action Thresholds—As neurocognitively driven responses to systemic instability, and perceived menacing contexts.

3) Mitigate Volatility through Engagement—Using narrative intervention, community-based operations, and identity affirmation to reduce radicalization risk.

4) Prevent Out-Group Aggression—By disrupting pro-bellicose ideologies before they metastasize into kinetic threats/expression.

5) Enhance Operator Literacy and Force-capable Fluency—So that commanders, intelligence units, and civil affairs officers: a) understand how perception, emotion, and narrative shape human behavior under duress; and b) can develop and implement tools and methods to affect cognitive and behavioral variables left-of-bang to prevent escalation of dread, volatility and violence.

8. Forward-Looking Conclusions

Fundamental brain pathways controlling fear, narrative transport, and risk perception all contribute to behavior and decision-making during threat scenarios, as demonstrated during the US' "fear epidemic" in response to the Ebola outbreak. Studying these pathways can also provide potential solutions for how messages might be tailored for better outcomes and more constructive societal responses to public health and security threats. The fear generated an epidemic that never manifested in the US had some unpleasant societal ramifications, but no real adverse public health consequences. However, had a real epidemic manifested, one could envision much graver outcomes.

Thus, we offer the following additional suggestions to assist in the creation of more successful messages.

- Just as both quantitative and qualitative studies are essential to research, facts and stories are both needed to make sense of a threat scenario. Therefore, narratives should be crafted that are factual. Further, in every threat scenario, details are learned over the course of the event that must be imparted to the public. This is compatible with narrative modes of communication, as in the incremental telling of a story. During the H1N1 epidemic, Rick Besser (2010) alluded to this in a sense, by stating "Be first. Be right. Be credible". Being right means providing iterative, factual details as they are learned. Besser emphasized that it is not wrong to express uncertainty about something that is not known, particularly if it can be estimated when its facts can be acquired in the near future.
- Where possible, determine if the narrative is "transportive", as these narratives capture the most interest.
- Narratives should be non-threatening to sacred values, and so familiarity with

the audience's "sacred values" is necessary. Communications should ensure that the message doesn't conflict with sacred values, and if possible, should support them.

In sum, collective perceptions of threat and dread are not abstract concepts; they are biologically real, cognitively and socially contagious, tactically important, and strategically consequential. They mobilize individuals, move populations, fracture societies, and can ignite violence. But they can also be understood, forecasted, and—in some cases—transformed and engaged. For the modern military professional, comprehending these factors, and mastering these dynamics are matters of both mission effectiveness and ethical responsibility. In the cognitive battlespaces of the present and future, it is not enough to win minds and hearts—we must also understand how they break, and how to mitigate if not prevent such occurrence and the volatility it can yield.

Disclaimer

The views and opinions expressed in this essay are those of the authors, and do not necessarily represent those of the US Government, Department of Defense, National Defense University or those organizations and institutions that provide support for the authors' work.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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