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FROM THE EDITOR

To varying degrees, stress is a factor in all our lives, on a regular basis. How we react to that stress and how resilient we are to it differs from person to person and between situations. This issue of *CREST Security Review* brings together research from a range of disciplines and topics to help develop understanding on how we can identify, learn about and apply lessons from how stress manifests and how resilience can be developed.

This issue has benefited from two excellent guest editors, Professor Emma Barrett and Dr Nathan Smith, both based at the University of Manchester. They have pulled together an issue drawn on research from a variety of experts and approaches, from sports and military applications to learning from refugees and network analyses. They provide an overview of the articles focusing on our special topic, in their article on page 4.

Away from our special focus on stress and resilience, we have Jordan Nunan (page 38) writing on techniques to help undercover sources recall information and on page 40 Rosamund Mutton looks at the dangers of underestimating the role women play in violent extremism.

This is our second issue to go out simultaneously in print, online and in our mobile app. We created the mobile app to help widen the audience of people who can access the research we feature. Like the magazine, we've aimed for an experience that is accessible and looks good. We value your feedback on how you find using the new portals (see my email address below).

Don't forget that you can read more about some of the research featured in this issue,



in our Read More section on page 42, and please get in touch if you have ideas of research that you'd like to see featured in future issues. You can email these to me at m.d.francis@lancaster.ac.uk

Matthew Francis
 Editor, CSR.

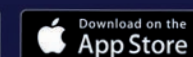
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EMMA BARRETT AND NATHAN SMITH

STRESS AND RESILIENCE IN SECURITY CONTEXTS

Security work is inherently stressful, involving individuals making high-consequence decisions and taking actions in complex and potentially dangerous situations, sometimes while exposed to extreme environmental conditions. Identifying sources of stress and implementing effective coping strategies is crucial to operational success. Understanding how and when hostile actors (terrorists or cybercriminals, for example) experience stress and what contributes to their resilience can inform strategies to undermine their effectiveness.

What exactly do we mean by 'stress' and 'resilience'? When an entity (an individual, team, or organisation) experiences demands that surpass, or threaten to surpass, its ability to cope, it is under stress. The amount and type of stress experienced depends on both the nature of the stressors (the things that cause stress) and the entity's coping resources. These in turn are influenced by factors such as skills, experience, and organisational structures, as well as by individuals' physical and mental states at the time.

There is less consensus about what exactly 'resilience' is: different researchers argue it is a trait that can be developed, a state (something one displays in a particular context), a process, or the outcome of a process. Most agree, however, that resilience is related to adapting to and coping with adversity, and to recovering from challenging experiences.

In recent research we explored stress, resilience, and coping in counter-terrorism operations, identifying key stressors and examining how to support counter-terrorism personnel facing extreme operational demands. Beyond the individual, stress can also exert its influence at the group, organisational, and societal level. Understanding resilience (or lack thereof) at these different levels can contribute to accurate risk assessment and mitigation, effective operational decision making, and the development of appropriate evidence-based and informed policy interventions.

Given the cross-cutting nature of the topic, the articles in this issue focus on stress and resilience in broad terms and diverse contexts, providing new insights and highlighting conceptual developments that may be of particular interest to CSR readers.

Two of the articles look at individual performance and health. Professor Marc Jones discusses the psychophysiological basis of stress, coping, and optimal function based on his research with high performing sport and military personnel. In a complementary article, Dr Mustafa Sarkar identifies the foundations of resilience and how social and organisational environments can be optimised to promote a more resilient response to stress.

Several contributions focus on topics directly relevant to operational settings. Professor Lorraine Hope provides an overview of how stress affects memory and its impact on recall

in high pressure scenarios. Based on their research and their own deployment experiences, Jesper Corneliussen and Anders Kjaergaard discuss conflict resolution, and identify practical strategies for effectively managing social conflict in isolated and extreme teams. Lt Col Alan Ogle discusses readiness and response in remote combat operators, including how individuals can be supported after viewing traumatic imagery. Focusing on hostile actors, Dr Emma Grace presents findings of her research on stress and resilience in al-Qaeda terrorists.

Stress also exerts influence at a group and organisational level. The extent to which organised groups, teams and systems are resilient to stress will determine their effectiveness. Dr Aaron Roberts and Professor Neville Stanton talk about resilient information flow through complex sociotechnical systems based on research conducted in dynamic submarine control rooms. Professor Nick Crossley focuses on the strengths and vulnerabilities of terrorist social networks, highlighting where and why they might be susceptible to disruption. Dr Jason Nurse provides a timely update on cyber-resilience and insider threat, exploring how organisations might respond to targeted cyber-attacks.

Defence, security, and law enforcement work does not occur in a vacuum, and is accompanied by complex human problems, such as the wellbeing of refugees escaping conflict zones, or how to deal with former combatants. Susie Ballentyne provides an overview of her work on stress, resilience, and mental health in Syrian refugees who have settled in Brazil and the UK. We also hear about the work of Dr Natalia Trujillo and Dr Juan Esteban Ugarriza who examine effective reintegration of armed combatants in the context of post-conflict reconciliation in Colombia.

Other topics related to stress and resilience, such as decision making and culture, personnel selection, and team cohesion, have received attention in previous issues of CSR and other CREST publications (<https://crestresearch.ac.uk/news/coping-under-stress/>). However, this is such a rich and important area that it deserves its own issue. We hope you enjoy the diversity of topics covered and that the articles stimulate new ideas for research and practice.



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JESPER CORNELIUSSEN AND ANDERS KJÆRGAARD

CONFLICT MANAGEMENT IN EXTREME ENVIRONMENTS

When everything else can be tense, energy consuming and potentially dangerous, the last thing you want to spend your time on is conflict management. Why? Because it removes focus from important tasks, and the circumstances simultaneously worsen for those involved when you can't escape the situation.

In a confined and isolated environment, the situation could prove highly detrimental to the effectiveness of a team, potentially resulting in fault lines within the team if members choose sides. In principle, the same mechanisms are at stake in every work setting, but the difference in extreme environments is that people often cannot escape the situation and therefore are subject to what we call the 'pressure cooker effect': small details may grow out of all proportion.

In dealing with a conflict situation, the best solution may simply be to try to avoid it. However, when people are together in isolated, confined or even hostile environments over an intensive and extended period, eventually conflicts will occur. Therefore, it is of utmost importance to be able to manage conflicts as smoothly as possible when they happen, in order to focus on what is important: getting the job done.

Whilst people working in extreme environments have often had extensive training prior to the actual operational phase, we have found that frequently the topic of conflict management is neglected or down-played. This is primarily due to two reasons:

1) Leaders or those in charge of high-performance teams simply expect members to be able to solve conflicts because they are highly selected individuals and it is assumed to be a skill that 'just follows'.

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2) The topic is considered as too 'soft' and not as important as other more technical learning skills.

One of the first steps to solving conflicts is to understand the culture of the team and their view on conflicts. This should be done openly. In some teams, conflicts are seen as a natural part of planning and task solving, while other teams view conflicts as disruptive events. One approach is not necessarily better than the other, but the team should be aware of which culture they possess, as the two extremes can offer different advantages and disadvantages.

Seeing conflicts as part of planning and task solving could result in unnecessary energy being spent on discussing participants' different views on a situation, although it may on the other hand also provide a better, more diverse and useful task solution. In teams where visible conflicts are not highly evident, there may be more so-called 'silent conflicts' in which conflicts are not addressed and dealt with. Here an effective conflict resolution is characterised by a sensible result achieved in an efficient manner and with the preservation of good lasting relationships.

Our research within Danish special forces and other high-performance sports teams provides examples of actions that can be taken prior to conflict escalation. It is considered likely that there will be conflicts when in the operational phase; however,

sometimes conflicts can be turning points providing the potential for learning points if people are able to handle it in a constructive way. Furthermore, deciding when to ignore an issue or when to address the particular disagreement is a key aspect of conflict management that requires specific training prior to assignment in an extreme environment.

Our research suggests that it is effective to articulate 'game rules' prior to deployment: to create and have a common language about conflicts and a fixed framework for how and when to deal with them, which in the end makes it easier to achieve positive outcomes when on assignment.

To help prepare, participants could ask themselves and each other questions such as: *What is a conflict? What do we do when we become unclear about something? How do I usually respond to conflict situations when I'm under pressure? How would I like to be met in a conflict?* The personalities of individual participants have an impact on how a situation is interpreted and hence affect the action taken, which should also be a part of the discussion.

Personal feelings can easily interfere with professional conversations and when that happens people will easily get in a defensive position where it is difficult to maintain professional views. Strong attitudes create oppositional situations and increase the likelihood of conflicts.

The importance of appropriate communications on team effectiveness therefore includes conversations prior to assignments about expectations for the upcoming task, specific preferences for actions, together with an understanding of personal goals and ambitions in order to get the team to function smoothly.

Knowledge and reflection about individual's personal conflict management styles can help self-awareness about decisions, including when to confront or back-off. Another way to prevent conflicts is to run-through possible scenarios before deployment. Putting thought into likely issues derived from the specific context can help to prepare individuals better and hopefully give them more tools for dealing with situation-specific conflicts. It is crucial that these discussions occur not once, but as part of a continuous and ongoing dialogue within the team.

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Jesper Corneliusen and Anders Kjærgaard are Clinical Psychologists in the Danish Military Psychology Department. Both have several years of experience from active duty within the Danish armed forces, including working in special units.

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MARC JONES

CHALLENGE OR THREAT: UNDERSTANDING HOW PEOPLE COPE IN DEMANDING ENVIRONMENTS

There are few more demanding working environments than that faced by security and elite military personnel. The situations faced are uncertain, changeable and dangerous requiring accurate decision-making, skilled movement and co-ordinated action.

Understanding how people respond psychologically and physiologically in demanding settings has been the focus of research that myself and colleagues have undertaken over the last 10 years. We have explored the subtle psychological and physiological differences that indicate whether a person is challenged or threatened under demanding conditions, why a person who is challenged performs better, and how social interaction, leadership and lifestyle can influence these responses.

The terms challenge and threat are used to describe psychological and physiological differences that relate to performance. I appreciate that 'challenge' and 'threat' are value-laden terms, but in this context they are simply broad labels given to different physiological and psychological responses which occur in demanding environments. That is, environments where success matters, effort is required to perform well and there is the potential for harm (psychological or physical).

The 'fight or flight' response experienced in these situations is crucial to our research because we measure whether individuals are challenged, or threatened, through assessing cardiovascular reactivity.



When a person feels able to cope we see a challenge response where there is an increase in the volume of blood pumped by the heart and a decrease in the resistance in the blood vessels.

When a person does not feel able to cope we see a threat response where there is little change in the volume of blood pumped by the heart and there is an increase in the resistance in the blood vessels.



Our research programme, and those of others, has identified that cardiovascular reactivity has consistently predicted performance in a range of tasks under pressure. Those people exhibiting cardiovascular responses indicating a challenge state perform better. This is because a challenge response, reflected by these physiological changes, is proposed to reflect a positive motivational approach state with better decision-making, and motor-skill performance.

In our work in competitive sport, another demanding environment, we proposed that three resource appraisals underpin the different challenge and threat responses. First is control. Believing you have control over factors that may affect performance and how you can perform in a demanding environment is important for a challenge state. Conversely, focusing on factors that cannot be controlled, is associated with a threat state.



Second is confidence. The belief in our ability to perform well and execute plans correctly is a crucial element in being able to perform in demanding environments. A high level of confidence is important for a challenge state, and the converse is true for threat. Finally, being focused on what can be achieved – an approach focus – is also important. Individuals who are challenged are focused on what can be achieved while those that are threatened are focused on what might go wrong.

This last point probably does require some unpacking. Planning for all eventualities and what might go wrong is important, and indeed for many people fear of failure is a powerful motivator. What matters though is that these thoughts become motivators to what can be achieved ('It is important I do not fail and because of this I will do X'), rather than a person dwelling and focusing solely on failure and what might go wrong.

These resource appraisals can be developed in a number of ways. For example, and not surprisingly, practice can be a strong determinant. We found in recent work with emergency medicine teams prior to a simulation competition that time practiced as a team was related to self-reported perceptions of challenge, with the teams that practiced the most reporting that they had the highest level of resources to meet the demands of the task. Other ways of developing these resource appraisals include psychological strategies such as mental rehearsal to enhance feelings of control and confidence.

Using these three resource appraisals leaders can prime team-members to respond positively under stress. In our research we found that prior to a demanding task if the instructions emphasised feelings of confidence, control and an approach focus, people responded physically with a challenge state. Indeed, it was sufficient to change three sentences in a 90 second instructional set for this effect to be observed.

As a leader emphasising the qualities your team has (confidence), drawing attention to what they can control (control) and keeping a focus on what can be achieved (approach focus), can help develop a challenge response in demanding environments. Responses may also be influenced by how connected a person feels to a leader and the organisation more broadly.

Many of us have a strong affinity with the organisation to which we belong, and this is not surprising. Membership of groups not

"I was afraid, on many occasions. I've little doubt we all were, but the secret – and perhaps the hardest thing of all – is to control that fear."
Colonel David Stirling DSO, OBE, founder of the SAS.

only provides a sense of belonging but says something about who we are – they provide us with a social identity.

We found in our research that when people receive instructions from a person prior to a demanding task that they see as being from an out-group (i.e., not like them) they respond with a threat response. This illustrates the importance of leaders having a strong relational identity with their team. That is, the members of a team see the leader as 'one of us' sharing similar values, beliefs and experiences.

Interestingly, the work of American military Psychiatrist Jonathan Shay highlights that the sense of belonging is also crucial to how we deal with the aftermath of being in demanding situations. In his concept of moral injury psychological difficulties occurred when there was a betrayal of what's right, by someone who holds legitimate authority (e.g., in the military – a leader), in a high stakes situation. So how we are treated after difficult demanding operations is also key.

Being challenged in demanding work environments is associated with better performance. We facilitate a challenge response through how we think, prepare, and live our lives. In the consultancy work I have done in elite military environments I have also been struck with how in the broadest sense the environment is crucial to performance. For example, how transitions are managed from a demanding work environment to home and how lifestyle factors, such as sleep quality are important.

In leadership roles we can also influence others to respond in a challenge state. As the above quote from the founder of the SAS Colonel David Stirling illustrates, the battle with our emotions in demanding environments is ever-present and continuous but it is possible to control our responses.

Marc Jones is Professor of Psychology at Manchester Metropolitan University. His research is focused on understanding the impact of stress on health, wellbeing and performance, effective leader-follower interactions and behaviour change in individuals and organisations.



LORRAINE HOPE

FROM THE LAB TO OPERATIONAL RESPONSE: EXAMINING THE IMPACT OF STRESS ON MEMORY FOR HIGH-PRESSURE INCIDENTS

Understanding what happened during major critical incidents, from terrorist attacks to riots, not only involves piecing together information from available sources such as phone and audio recordings, CCTV, and body-worn video but also obtaining detailed accounts from response and frontline personnel on the ground.

These 'operational witnesses' are very likely to have been operating in what might be described as a high stress context, particularly when such scenarios evolve in ways that are unpredictable or challenging in terms of establishing control of the situation. How reliable are accounts from memory for such events?

From a psychological perspective stress is associated with perceptions of unpredictability, lack of control, novelty and social-evaluative judgment. Under the right conditions when a situation is perceived as positive, the 'stressor' may be viewed as an achievable challenge which results in increased effort and even enhanced performance. However, if the 'stressor' is negatively assessed, then efforts may be disrupted and performance impaired.

Broadly, stress or negative arousal is thought to increase cognitive load and impair cognitive and perceptual-motor performance on tasks that demand capacity to execute them effectively.

A nice illustration of this off-set is evident in analysis of police shooting accuracy rates. Despite rates of over 90% accuracy in static shooting tests in training or practice environments, research suggests that the average shooting accuracy for real-life use of force incidents falls between 15-50%. Indeed, research using police samples and realistic shooting exercises involving an element of threat, has repeatedly documented negative effects of stress and anxiety on police shooting performance including a reduction in goal-directed attention, increased speed of shooting an approaching suspect and reduced shooting accuracy.

Stress is adaptive. Under conditions of acute stress a fight-or-flight response may be activated involving a complex brain and neuroendocrine response that allows the essentially positive evaluation of the scenario focused on fighting or fleeing (and facilitates the physiological changes necessary to take either of these actions). However, under the same conditions, a negative evaluation could, quite literally, be crippling.

HOW DOES STRESS AFFECT MEMORY?

Research suggests this is a complex question and that the effect of stress on memory depends on a number of factors, including the level of stress experienced, whether stress is encountered at encoding of the memory or when retrieving the memory and what information is being recalled.

Memory for stressful or emotionally arousing events is often enhanced and the effect does not appear to be limited to negative events but also extends to positive events. Therefore, for example, when exposed to a negative experience, people often report memories that are more vivid with higher confidence and reflect an advantage for the negative details.

This is a well-documented phenomenon in laboratory research, is a frequent feature of anecdotal reports and is essentially an adaptive feature of cognition that enables us to remember important information. Neurobiological research suggests that stress hormones work to enhance memory consolidation which is a process by which memories are stabilised after the information has been acquired.

Until recently, it was thought that strong emotional content strengthens all aspects of memory for the event in question making it more likely that the details will be remembered at retrieval. However, new research suggests another possibility: that stress or negative emotion only potentially enhances memory for the negative aspects of the event (but not other aspects) resulting in a more fragmented – or less coherent – overall memory of the event.

This understanding of memory may help explain observations of errors in memory for challenging or evolving events in accounts of operational witnesses who find themselves in unpredictable, dangerous environments and may experience varying degrees of emotional arousal or stress responses.



In contrast to many laboratory studies, research examining the effect of arousal on cognitive performance in applied operational training settings has highlighted cognitive and memory difficulties.

For example, one set of studies examined memory performance of soldier participants who had been exposed to high levels of interrogation stress, including physical confrontation, in an intensive survival school training exercise. The ability of the soldiers to recognise a target individual, playing the role of an aggressive captor who had physically confronted and threatened them for over 30 minutes, was impaired. Memory performance for the stressful aspects of the training exercise was also impaired and susceptible to misleading post-event information. For example, 27% of soldiers falsely reported that their interrogator wielded a weapon.

In other words, rather than showing enhanced memory for the experienced events, these participants showed poorer recall and recognition than colleagues who experienced a less stressful version of the same event.

It is worth noting that memories for stressful operational events do not necessarily reflect increased errors. Instead, a number of studies have shown that less information overall tends to be recalled about stressful events – in other words, statements can reflect some notable omissions of information.

In a large firearms training exercise involving a simulated escalating armed robbery incident, research found that although responding officers typically provided accounts that were highly accurate (>90%), a significant number of statements omitted what might be considered relevant information about the behaviour of the perpetrators.

How can we account for the discrepancy between research suggesting that stress should result in better memories for events and demonstrations of impaired performance in more applied contexts? The likely explanation is (at least) two-fold.

First, despite reliably manipulating stress levels, laboratory tests typically induce only mild to moderate stress levels. While mild-moderate levels of stress may enhance memory, at least for some aspects of an event, higher levels of stress are likely to disrupt hippocampus function and impair memory performance.

Second, tests conducted in simulated 'real world' contexts are more involved, interactive and typically involve participants responding in an operational capacity, which places additional cognitive demands in terms of decision-making and response identification.

To date, only one study has attempted to directly examine the effects of operational response role on memory for an incident. In a simulated armed hostage-taking scenario, officer participants were assigned an active witness role (requiring them to respond as they would while on duty) or an observer role. Active responders, who experienced higher heart rates during the scenario than the observers despite the deliberate restriction of actual physical movements, provided significantly fewer correct overall details in their accounts of the incident. Interestingly, both active and observer officers made interesting and meaningful recall errors with 18% reporting that the perpetrator pointed a weapon at officers in the final phase of the scenario – in fact, the handgun remained in the waistband of the perpetrator's trousers throughout.

In sum, stress can both help and hinder memory performance. In many contexts, the accuracy or otherwise of our memories for stressful events is not terribly important – that we recover optimally from our exposure to that stress and return to good psychological health despite our experiences. However, evaluators of accounts provided by officers or other operational witnesses following stressful challenging incidents should be aware that memory may be impaired for details of the incident and that errors do not necessarily reflect a deliberate attempt to deceive, cover-up or deflect blame.

IS IT POSSIBLE TO IMPROVE ABILITY TO REMEMBER STRESSFUL EVENTS?

Operational training often focuses on physical, technical and tactical performance and sometimes neglects the effects of factors such as stress or anxiety – and, critically, the effect of

such factors on subsequent ability to provide detailed and accurate debriefs or reports.

Training with threat-induced anxiety and high realism scenarios should provide 'operational witnesses' an opportunity to experience how physiological arousal impacts on their own response performance and affords an opportunity to improve and build resilience under such conditions – including the development of strategies to improve subsequent memory performance.

Professor Lorraine Hope is Professor of Applied Cognitive Psychology at the University of Portsmouth. Her research focuses on the development of evidence-based tools and techniques that aid in eliciting accurate and detailed information in security, policing and intelligence contexts.

EMMA GRACE

BOUNCING BACK: STRESS AND RESILIENCE IN AL-QAEDA TERRORISTS

The revival of al-Qaeda as Hamza bin Laden rose in the leadership ranks indicated an intergenerational transmission of resilience to stress associated with involvement in terrorism. Being raised in terrorist camps and hideouts in Sudan, Afghanistan, and Pakistan, and detained for several years in Iran, Hamza was exposed to stress associated with terrorism throughout his developmental years.

Based on al-Qaeda leaders' observations that they had communicated to Osama bin Laden, Hamza has also developed a remarkable resilience while he had been homeschooled in exile by his mother who had a doctoral degree and professional experience in child psychology. Owing to his resilience, Hamza was determined to carry over his father's destructive mission, as indicated in his declaration of revenge.

STRESS OF INVOLVEMENT IN TERRORISM

Previous research has identified four types of stress associated with involvement in terrorism in al-Qaeda members: security stress, a stress of enforced idleness, diversity stress, and incarceration stress. Terrorists conceptualised security stress

as a result of exposure to spying aircraft, advanced surveillance technologies, and infiltration of spies. Stress of enforced idleness occurred in response to a long-term deprivation of activity owing to the nature of covert terrorist operations. Diversity stress was experienced in multicultural settings by both local and foreign terrorists owing to psychosocial differences between them. Incarceration stress caused by a fear of being tortured or otherwise abused during imprisonment was described as "a psychological crisis, ... tension, and being occupied with the thought."

Based on an analysis of 'Bin Laden's Bookshelf' – documents recovered from bin Laden's Abbottabad compound following his capture, I have investigated al-Qaeda's conceptualisation of resilience to these types of stress.

RESILIENCE TO STRESS OF INVOLVEMENT IN TERRORISM

Hamza has encountered all four types of stress but it did not deter him from terrorist activity. On the contrary, he expressed frustration in a letter to his father that, because of his detention, he could not take part in al-Qaeda operations. The factors that shaped Hamza's resilience to stress were deep emotional attachment to his father whom he perceived as a role model, inspiration and care from his mother, affection to his wife and children, mentorship from al-Qaeda elders, social support from al-Qaeda members, strong religious beliefs, and finding meaning in his stressful experiences as predestined to prepare him for jihad and martyrdom.

Similarly, other al-Qaeda members attributed their resilience to stress to making meaning of stressful experiences through strong religious beliefs, willingness to endure hardships, self-sacrifice, guidance from leaders who fostered a learn-and-adapt attitude, and social support from fellow members.

Resilience to stress was at the core of al-Qaeda's training that aimed to prepare its members spiritually, militarily, and psychologically. Further, al-Qaeda's stress management

strategy was based on preventing exhaustion and burnout from work overload that would lead to what they termed the "unrest mind", which in turn would weaken faith and deter motivation for jihad.

Moreover, al-Qaeda trained its members in security-enhancing behaviours to foster their resilience to stress. Al-Qaeda's training was based on maintaining a balance between external and internal loci of control. External locus of control was encouraged through religious coping with stressors that were unavoidable.

At the same time, Osama bin Laden was a strong proponent of internal locus of control. He attributed security failures to human errors and believed that some members are simply not fit to perform operations despite the training provided and their religious devotion. Apparently, al-Qaeda leadership believed that developing resilience through training and experience is not enough and that resilience depends on certain personality traits.

NEUROTICISM AND RESILIENCE TO SECURITY STRESS

Emotional stability is a personality trait that correlates with resilience. In a large twin study on resilience and personality traits, Amstadter, Moscati, Maes, Myers, and Kendler (2016) found that neuroticism was the strongest predictor of resilience, considering both genetic and environmental factors, thus, suggesting that persons with higher emotional stability are more resilient to stress.

Similarly, Oshio, Taku, Hirano, and Saeed (2018) in a meta-analysis of 30 studies on resilience and personality in the general population supported that low neuroticism correlates with resilience to stress. Although there is a lack of consensus amongst terrorism researchers regarding any personality traits or a psychological profile specific to terrorists, the most important personality characteristics that al-Qaeda valued in recruits were associated with low neuroticism and described as emotional stability, calmness, patience, and self-control.

Given the value of these traits, it is unsurprising that Hamza had been often praised by al-Qaeda leaders for his calmness, patience, and discipline, contrary to his half-brother Saad who was blamed for his impulsivity and reckless behaviour, to which his death was attributed. More generally, those al-Qaeda members who expressed emotional instability would be removed from military operations and management positions and assigned other work.

INTROVERSION AND RESILIENCE TO THE STRESS OF ENFORCED IDLENESS

Contrary to the correlation between resilience and extraversion in the general population, al-Qaeda conceptualised resilience to the stress of enforced idleness in terms of introversion because introverted members were more capable of maintaining quietness and secretiveness. When confined to isolation and idleness for operational security, terrorists who were introverted would spend their time learning and introspecting, whereas those who were extraverted would underestimate the risks and commit security errors because of their need for external stimulation and communication.

AGREEABLENESS AND RESILIENCE TO DIVERSITY STRESS

Agreeableness has the weakest correlation with resilience in the general population, in comparison to other personality traits in the five factors model. However, al-Qaeda fostered agreeableness to increase its members' resilience to diversity stress. Foreign terrorists, who were expected to appreciate the hospitality of local supporters, were advised to use silence to express their disagreements with local hosts. Those foreign members who could get along well with local hosts adopted new linguistic and behavioural patterns, whereas those who could not adjust were called 'loiterers' because of their visibly distinct behaviour and were considered a security threat. They were more likely to return to their home countries.

RESILIENCE TO INCARCERATION STRESS

Incarceration stress appeared to be most challenging for terrorists. In previous research, terrorists contended that torture in prisons led to mental illness and suicide due to suffering; thus, they preferred to be killed rather than captured. Osama bin Laden criticised such an attitude as he believed that capture could be avoided with proper behaviour modifications.

Al-Qaeda tried to improve resilience to incarceration stress through conducting captive training, maintaining communication with imprisoned members, paying ransom to release them, and financially supporting their family members. While in prison, al-Qaeda members were encouraged to use their time for self-reflection and to strengthen themselves with faith.

Prison programmes that aimed to 'deradicalise' and 'disengage' terrorists appeared futile, at least in Egypt, Libya, and Saudi Arabia, as al-Qaeda members either tried to deceive the authorities through abiding by conditions of programmes to be released or openly opposed such programmes. Once released, most members returned to terrorist activity.

Al-Qaeda builds its resilience to stress through the skilful management of human resources to accurately match personalities with operational responsibilities and the harnessing of social structures and support, such as family and comrade relationships and senior-youth mentorship, through which intergenerational transmission of terrorist goals and experiences persists. These findings are important to consider when planning counterterrorism operations such as intelligence collection, infiltration into terrorist groups, as well as desistance and disengagement interventions for incarcerated terrorists.

Al-Qaeda's extreme faith-based political ideology serves as a framework that underpins the major components of its resilience. However, as previous research on how terrorism ends showed, religious terrorist organisations survive longer but they never win. This inability to win stems from al-Qaeda's lack of insight into the fact that its ideology is dystopian and its goals are unachievable in a modern world. Counterterrorism interventions need to continue dismantling al-Qaeda's ideology that underlies its resilience.

Being resilient does not necessarily help terrorists to achieve their political goals, but it retains their functional capacity to unceasingly threaten public safety. Disrupting intergenerational transmission of resilience in terrorists would require developing disengagement interventions, specifically, for children of terrorists. Future research is needed to investigate the possibility and ways of integration of children of terrorists into society. Both Hamza and Saad bin Laden named their sons after their father, Osama, hoping that they will carry on in his path; disrupting this transmission to yet another generation remains a challenge.

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NICK CROSSLEY

STRENGTHS AND VULNERABILITIES IN (COVERT) NETWORK STRUCTURE

How terrorist groups structure themselves has a major impact on how vulnerable they are to disruption as well as how effective they are in meeting their aims. Nick Crossley highlights some of the strengths and weaknesses in variations of terror and criminal social networks.

We often refer to criminal and extremist groups as 'networks' and it is increasingly common to try to map, measure and analyse these networks using the techniques of formal social network analysis. Early academic work on such networks tended to assume that the desire to avoid detection and apprehension would lead to the network being structured in particular ways and, according to some, to a trade-off between the demands of secrecy or security on one side and those of efficiency on the other.

However, empirical studies point to variation in network structure in practice, reflecting different strategies of maintaining secrecy as well as the very different conditions in which covert networks take shape, the many different contingencies which their members must negotiate and the difficulties of shaping a real world network according to a preconceived plan.

In light of this it makes sense to reflect upon some of the ways in which network structures can vary and the different strengths and vulnerabilities of these structures. However, in doing this we should recognise that we are discussing ideal types, only approximated in practice, and that properties of social networks do not automatically or necessarily have the effects to which I refer, given the intelligent, inventive and adaptive nature of their human nodes, and the complex nature of human social relations. Here I discuss two axes of variation: centralisation-decentralisation and density-sparsity (see Figure One).

In the simple case a social network is highly centralised when a large proportion of the people in it ('nodes' in network

science-speak) are directly connected to a small number of 'hub nodes'. Centralisation makes the network less vulnerable to the damaging effect of a loss of nodes, even a relatively high proportion of nodes in a big network, if such losses are random. This is because hubs hold the network together when even a sizeable proportion of nodes are removed, and yet hubs comprise only a tiny proportion of all nodes in the network, so they are very unlikely to be affected by random factors removing or disabling nodes. In addition, centralisation can contribute to resilience in covert networks, at least if hubs hold authority, because they can maintain a close eye on other network members, imposing and enforcing security protocols across the whole network, which will protect it.

However, centralised hubs tend to be visible in a network and this makes them vulnerable. Communication always leads back to them and most other nodes in the network are in a position to compromise them. Hubs will likely be the focus of disabling efforts but removal of a hub (through arrest, for instance) may not disable a criminal network, as others will take their place, learn from their mistakes and the network will bounce back determined to avenge their loss. Removal of nodes is not random in the case of criminal or extremist networks. Rivals and police and security forces will deliberately seek out central figures in a network.

Decentralisation in a network enables important figures (however they may be defined) to remain more concealed and less vulnerable when others are compromised. However, it also makes efforts to direct activity within the network more difficult.

The movement of resources is typically slower; information can become distorted when passed through many hands; and coordination is more difficult to achieve. Furthermore, an increase in the number of exchanges required to move resources or information around a network itself increases the risk of detection. Every exchange runs the risk of inviting attention or interception.

Network density refers to the number of connections in a network, considered as a proportion of all possible connections. High density is often taken to be conducive to the generation of higher levels of trust, cooperation and mutual support in networks, if only because it increases mutual surveillance between network members and enforcement of norms by way of sanctions. This can increase the resilience of the network by reducing the risk of defection and enforcing security protocols. Where people do defect, however, this will be more damaging as they have information about and contact with a higher proportion of others in the network. Recruiting a single person as an informant will afford the police and security services access to a significant proportion of the network because that person will be connected to a high proportion of others. Militant and criminal networks are often dense when they draw upon strong pre-existing connections, such as those of family, neighbourhood or church.

Mindful of the risk which ties to others may pose to their own security, individuals involved in illegal activity may seek to minimise their connections to and dependence upon others, leading to the generation of sparse networks. This may increase security for individual nodes, as only a small number of others in the network are able to compromise them, but at a potential cost to efficiency. Resources will take longer to flow through the network and with a greater risk that they will be damaged or compromised on route. In addition, because less constrained by the network, nodes are more vulnerable to defection and security-threatening departures from procedure. Research on the UK suffragettes suggests that their network became sparser as their militancy increased.

Cell structures, in which nodes form dense clusters, which are, in turn, only sparsely connected to one another, offer some of the advantages of both high and low density (they are dense at the local level but sparse at the global level). However they can be difficult to engineer, except perhaps in the periphery of a network. Insider accounts suggest that attempts to implement a cell structure within the Provisional IRA during the early 1970s were often thwarted by the existence of pre-existing relationships between members of different cells, for example.

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Figure 1: Variations in Network Structure

AARON P. J. ROBERTS AND NEVILLE A. STANTON

GO WITH THE (INFORMATION) FLOW? HOW TO DEVELOP MORE RESILIENT SOCIOTECHNICAL SYSTEMS

What is 2 + 2? This question is relatively simple for most children, let alone adults. The cognitive effort required to generate a solution for a simple sum (2+2) is relatively small. It is, therefore, reasonable to expect that such processing can be completed inside the mind of an individual.

However, when generating a solution to a significantly more complex mathematical problem, individuals will often utilise supportive technologies, such as a calculator. It may also be beneficial to divide the work into sub-components, so that a team of mathematicians may contribute to the overarching aim of providing a solution. This can increase efficiency and timeliness, particularly if the allocation of tasks maximises the skills and training of individuals within the team.

At this level, processing is no longer completed solely in the mind of an individual. Instead, cognition is distributed across multiple agents in a system, these can be both human and technological.

In complex sociotechnical systems, the utilisation of supportive technologies by teams of operators increasingly becomes a necessity rather than an option, as data and information processing requirements are so large.

In order to promote shared understanding at the level of the team in these environments, the transition of data to information to knowledge at the level of the individual (e.g., Human-Machine-Interface) is as critical as the co-ordination or flow of information between human operators (e.g., verbal and non-verbal communication). To investigate how such systems might be optimised it is important to conduct research from a sociotechnical perspective. This can reveal how technologies, human operators and interactions between the two might be optimised to create systems that are more resilient to changing demands and operational requirements.

THE COMMAND TEAM EXPERIMENTAL TESTBED (COMTET)

A submarine control room is an exemplar of a complex sociotechnical system. It requires a command team to process and synthesise vast amounts of data from disparate sensors such as sonar and periscope, utilising various technological support. The ComTET project is a program of work tasked with documenting contemporary submarine command team

operations and the completion of multiple studies to provide evidence-based recommendations for future design concepts.

To achieve such aims a mid-fidelity submarine control room simulator was constructed at the University of Southampton. The work we have completed to date has included examination of system performance using the Event Analysis of Systemic Teamwork (EAST) method. This network approach has provided insights into patterns of communication between operators in the control room, the type of information getting passed and the connectivity between sub-tasks being completed.

Examination of contemporary ways of working has revealed bottlenecks of information flow across the control room. This resulted in a temporal lag for the transition of critical information between operators in the control room and a loss of information as it was passed between multiple operators, leading to a reduction in overall task productivity. We found this to be particularly evident in high demand scenarios when the command teams had more vessels (which had less predictable behaviours) to process.

This finding has promoted a data-driven re-design of submarine control room configurations, ways of working, workstation interfaces and task allocation using a variety of Human Factors methods. A series of further studies have revealed that new designs did indeed reduce information flow bottlenecks which improved command team capacity and overall productivity.

We made a number of key recommendations which included: co-locating operator's dependent on each other for task relevant information; the design of more intuitive interfaces, with the capacity to overlay data from multiple sensors, aligned with relation to operationally relevant information; and the design of control rooms of the future that are more adaptable with regard to configuration, information presentation and crewing. These recommendations can create greater system resilience as command teams can react to specific operational demand, increasing overall productivity.

ACROSS DOMAINS AND MODALITIES

Neville Stanton has examined sociotechnical systems across many domains including energy distribution, driving, emergency services and various military domains. In recent work he extended the EAST method to a case study based on UK Royal Navy training that uses Hawk jets to simulate missile attacks against ships. He examined how breaking 'links' in social, task and information networks revealed risks within the sociotechnical system in this simulation.

This provided understanding of resilience and susceptibility to operational risks from a systemic rather than taxonomic perspective. It further highlighted the importance of effective information transition across the system with the vast amount of information passed between operators being verbal in nature.

Aaron Roberts has examined the cognitive function of Authorised Firearms Officers during the completion of simulations involving weapon discharge. It was found that the demand of such encounters led to changes in cognitive function which resulted in more effective processing of visual information but a decline in the capacity to process information that is phonological in nature.

A decrease in phonological capacity can lead to less complex, more monosyllabic and potentially more error prone use of

language. The modality of information presentation typically differs within sociotechnical systems across many domains.

It is important that sociotechnical system design and the development of accompanying training and policy considers the capacity of operators within the context of the wider system at the time that high impact decisions are made. In many domains there is a high reliance upon verbal communication to develop knowledge at the level of the team. Examination of alternative means of saliently communicating critical information (e.g. visual, haptic and olfactory) could improve system resilience, particularly during highly demanding situations when the capacity to talk and listen can be diminished.

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JASON R.C. NURSE

CYBER RESILIENCE: WHAT IS IT AND HOW DO WE GET IT?

In today's world, cyber-attacks seem as routine as the common cold. In the security industry, many live by mantras such as, 'it is not a question of if you will be hacked, it is a question of when' and 'assume that you have already been breached.' With these words in mind, the key considerations therefore are: how should organisations respond and what factors are essential to be resilient in the face of a constantly evolving threat landscape.

Our world is driven by technology. It supports personal and organisational interaction and is a core source of innovation, enterprise and defence. The benefits of technology are, however, not without their concerns. One of the largest of these is the prevalence of cyber-attacks and the reality that as digital technologies and cyber-physical systems become more ubiquitous, such attacks can have a much wider reach.

A cyber-attack on an organisation might not only cause a few systems to be offline, it can impact the surrounding supply chain, a government's infrastructure or even lead to a loss of life. As a result of these issues, there has been a significant push for cyber security research and practice to aid in combating the threat. Primarily, this has focused on protective, detective and reactive security measures. If we ascribe to the mantras above, which are held by many security professionals in the field, then reactive security controls and cyber resilience more broadly, is critical to the continuity of an organisation.

CYBER RESILIENCE: WHAT IS IT?

Resilience is the capability to quickly react and recover from challenges or difficulties. Cyber resilience extends the notion of resilience to cyber-related incidents (deliberate attacks or accidental mishaps). It seeks to explore and define ways through which organisations can create systems, business processes and services that are able to rapidly 'bounce back' after a cyber-attack.

This can be taken one step further to regard true cyber resilience as bouncing back to a stronger position than the organisation was in prior to the attack. The idea in this case is that a resilient enterprise would thoroughly investigate the incident and learn from it, and therefore that incident and others like it, would not be successful in the future.

While cyber resilience has been discussed for some time, particularly in the military and Critical National Infrastructure (CNI) domains, there is still not a clear consensus on exactly how to achieve it. What is agreed however, is that there are several key principles which should be adopted and customised to each enterprise's security context. These are Prepare, Absorb, Recover and Adapt.

Preparation is crucial and relates to developing preventative measures and defining an appropriate response plan for a range of potential cyber incidents. In cases where prevention fails, an organisation should seek to *absorb* the attack through layered security approaches which draw on technical, procedural and human elements. Incident *recovery* is responsible for ensuring business and mission continuity during and after an attack. This is the area often most linked to resilience itself, but it is actually only a part of the resilience puzzle. Finally, technology and cyber-attacks change and evolve, so in order for organisations to be cyber resilient they must *adapt* constantly. This will be necessary with consideration of the systems used, the security postures assumed, and in the trial and adoption of new types of security technology (e.g., artificial intelligence in cyber security).

BETTER CYBER RESILIENCE THROUGH AN ENHANCED UNDERSTANDING OF CYBER-HARMS

One current area of research which has a great deal to offer the topic of cyber resilience is that of organisational 'cyber-harms'. The term cyber-harm describes the damage occurring as a result of an attack perpetrated wholly or partially through digital infrastructures, and the data, information, applications and devices that these infrastructures are composed of.

While the notion behind cyber-harm is not new, what is novel is the conceptualisation by new research of the variety of harm types that can arise from a cyber-attack. These have been characterised by way of a taxonomy of cyber-harms, with the five main categories as follows: Physical or Digital harm (e.g., exposure of confidential data), Economic harm (e.g., disrupted

missions or operations), Psychological harm (e.g., confusion or anxiety faced by customers or employees), Reputational harm (e.g., damaged defence or enterprise brand) and Social and Societal harm (e.g., negative impact on the nation).

The enhanced understanding of harms that may result from cyber-incidents is extremely valuable because it forces organisations to broaden their thinking on what they need to protect against, and thus better appreciate the comprehensive nature of cyber resilience. Currently, when most organisations reflect on cyber risk and its management, the focus is on direct harms to themselves (e.g., disruption of services) or their customers and suppliers (e.g., loss of confidential or private data). However, the connectivity of modern-day systems means such a limited view is no longer sufficient, given that the harm emerging from cyber-attacks can easily propagate and aggregate.

One interesting case example is the malware and denial-of-service attack on a Ukraine powerplant in December 2015. This was one of the first incidents that demonstrated the importance of incident recovery and resilience in the cyber-physical systems CNI domain. Through a series of carefully crafted attacks, hackers were able to seize direct control of power systems from official operators, and eventually cut power to an estimated 225,000 people in one of the coldest months of the year.

While all of the details of this case have not been revealed, there are undoubtedly questions around the plant's prevention and response defences, as well as whether there was a full consideration of the harms to consumers without power at

such a time. A Prepare-Absorb-Recover-Adapt approach that incorporates, and thus reasons about, the full complement of cyber-harms could have helped planning for this case. In particular, it would have supported an adequate scoping of how a malware attack could impact internal and external operations, and how such a vast number of cyber-harms could propagate and mount over short periods of time. Here, harms can be witnessed in not only the internal environment, but psychologically (in terms of individuals who faced hardship) and societal (lack of trust in connected CNI systems). This and similar analyses can be applied across a wide range of current and future cyber-attack cases.

As we look towards creating organisations, infrastructure and systems that can effectively withstand cyber-attacks, cyber resilience will become an even more significant consideration. Any factors that can further inform and enhance the resilience process will provide organisations with a greater advantage in preparing for attacks and recovering quickly when they arise. We believe that cyber-harm is one of such factors and that its integration can provide the pathway for a more holistic form of cyber resilience, where organisations are well-prepared for responding to all types of attacks and harms.

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MUSTAFA SARKAR

DEVELOPING RESILIENCE FOR SUSTAINED SUCCESS

Why is it that some individuals are able to withstand pressure and attain peak performances, whereas others succumb to the demands and under-perform? The study of resilience aims to address this question.

Over the past decade or so, the importance of developing resilience has been recognised across a range of pressurised performance domains. For example, the United States Army invested \$117 million in a scheme to build American soldiers' psychological resilience. In 2013, on World Mental Health Day, it was reported how building resilience into business enhances both employee wellbeing and performance.

In the past few years, the British Government has invested the equivalent of over half a million dollars in building school children's resilience. It is with these developments in mind that I aim to provide individuals with sound information about developing resilience that is immediately applicable to their work. Specifically, I present a program of mental fortitude training for persons wishing to develop resilience for sustained success.

To begin with, I describe what psychological resilience is. I then outline the main aspects of the training program and discuss its application to enhance performers' ability to withstand and thrive on pressure. This article summarises how it is possible to facilitate a holistic and systematic approach to developing resilience for sustained success.

WHAT IS PSYCHOLOGICAL RESILIENCE?

Put simply, psychological resilience refers to the ability to use personal qualities to withstand pressure. As numerous researchers have pointed out, the meaning of the word resilience has evolved somewhat from its Latin origin of *resilire* translated as 'to leap back', to its current psychological-related usage of having a protective effect that involves individuals maintaining their functioning.

The term 'robust resilience' is used to refer to its protective quality reflected in a person maintaining their well-being and performance when under pressure, and the term 'rebound resilience' is used to refer to its bounce back quality reflected in minor or temporary disruptions to a person's well-being and performance when under pressure and the quick return to normal functioning.

In line with both traditional and contemporary meanings of the word resilience, training in psychological resilience – otherwise known as mental fortitude – should be both proactive (i.e., robust

resilience) and reactive (i.e., rebound resilience) in nature and target performers before, during, and after stressful or adverse encounters. Because people's mental characteristics and outlook changes over time, so too does their psychological resilience. Psychologists and others can, therefore, seek to influence – and hopefully enhance – people's mental fortitude.

THE MENTAL FORTITUDE TRAINING PROGRAM

Over the last few years, there has been a burgeoning interest in evidence-based programs and interventions to develop resilience in the workplace for both performance and well-being. One such approach that has started to be used across a range of pressurised performance domains (e.g., elite sport, business) is a program of mental fortitude training. Underpinned by resilience-related theory and research, the mental fortitude training program focuses on three main areas – personal qualities, facilitative environment, and challenge mindset – to enhance performers' ability to withstand pressure (see Figure 1).

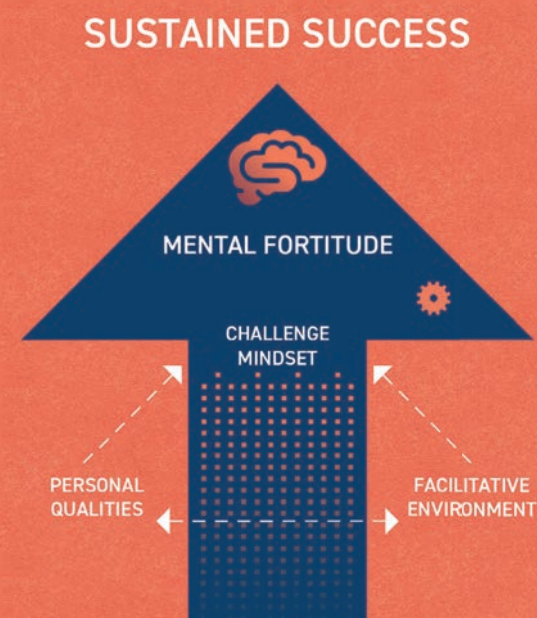


Figure 1. A mental fortitude training programme for sustained success (Fletcher & Sarkar, 2016)

PERSONAL QUALITIES

The cornerstone of this resilience training program is, not surprisingly, an individual's personal qualities, which can be described as the psychological factors that protect an individual from negative consequences. In the resilience training program within the area of personal qualities, we differentiate between personality characteristics, psychological skills and processes, and desirable outcomes that protect an individual from negative consequences. In any moment of time, these personal qualities will likely be tested by stressors and adversities and/or supported by social and environmental resources (see 'Facilitative environment', below).

It is important to note that the relevance and importance of these qualities varies across contexts and time. For example, in the elite sport domain, demonstrating resilience to training-related stressors will likely necessitate a different combination of personal qualities than those needed to withstand competition-related stressors.

Another point worth reinforcing is that personality characteristics are less amenable to change than psychological skills, both of which underpin desirable outcomes. Hence, in terms of the developmental potential of psychological resilience, there are aspects of an individual's psyche that are more malleable than others. Based on this observation, we refer to an individual's 'resilience bandwidth' as an indication of his or her natural developmental trajectory compared to his or her point of highest potential with psychosocial intervention.

With these points in mind, the aim of mental fortitude training is to optimise an individual's personal qualities so that he or she is able to withstand the stressors that they encounter at any given moment. This aim is, of course, aspirational because any individual, no matter what his or her psychological make-up is, will succumb at some point (his or her 'breaking point') to (extreme) adversity and hardship. It is, therefore, imperative to look beyond an individual's personal qualities to the wider environment in which he or she operates.

FACILITATIVE ENVIRONMENT

Although psychological resilience is, by definition, a fundamentally cognitive affective construct manifested in individuals' behaviours, it is profoundly influenced by a wide range of environmental factors. Such factors may originate from social, cultural, organisational, political, economic, occupational and/or technological sources; therefore, any psychological resilience training program should, as much as practically possible, consider the broader environment within which individuals operate.

A setting or context that fosters the development of psychological resilience is referred to as a facilitative environment. Since person-environment interactions are highly complex, it is helpful to identify cross-cutting properties that span environmental factors. In terms of developing resilience, the concepts of challenge and support are of fundamental importance.

Challenge involves having high expectations of people, and helps to instil accountability and responsibility. The provision of developmental feedback is important to inform about how to improve and, in the context of the present discussion, develop resilience. Support refers to enabling people to develop their personal qualities, and helps to promote learning and build trust.

The provision of motivational feedback is important to encourage and inform about what has been and is effective in developing resilience. Based on the notions of challenge and support, the environment that leaders create can be differentiated between four categories: low-challenge-low-support; high challenge-low support; low challenge-high support; and high challenge-high support.

In the mental fortitude training program, these quadrants are labelled as stagnant environment, unrelenting environment, comfortable environment, and facilitative environment respectively (see Figure 2). Each environment is characterised by different features, but for resilience to be developed for sustained success, a facilitative environment needs to be created and maintained. If too much challenge and not enough support is imposed then the unrelenting environment will compromise well-being; conversely, if too much support and not enough challenge is provided then the comfortable environment will not enhance performance.

CHALLENGE MINDSET

Arguably the pivotal point of any resilience training program is for individuals to positively evaluate and interpret the pressure they encounter, together with their own resources, thoughts and emotions. Largely predicted by (the combination of) an individual's personal qualities and his or her immersion in a facilitative environment, the ability to evoke and maintain a challenge mindset is of crucial importance in developing resilience. The focus here is on how individuals react to stressors and adversity, rather than the environmental events themselves. As Shakespeare wrote in Hamlet: "There is nothing either good or bad, but thinking makes it so."

The mental fortitude training program places emphasis on helping individuals to positively evaluate and interpret the pressure they encounter, together with their own resources, thoughts and emotions. Central to this is changing negative appraisals into positive or constructive thinking. For those who due to their personalities, background, or surroundings tend to look on the dark side, this can be very difficult.

This is why psychological skills and processes need to be practiced regularly and why the environment needs to facilitate this development through an appropriate balance of challenge and support. Fundamental to changing this mindset should be individuals having an awareness of any negative thoughts that make them more vulnerable to the negative effects of stress, and realising and accepting that they have a choice about how they react to and think about events. Interestingly, this has been one of the main approaches used by the US Army to build American soldiers' resilience.

Drawing in part on cognitive-behavioural therapies, the key to dealing with negative thinking is to regulate one's thoughts. Although the aim is to engender and maintain a positive evaluation of pressure and a challenge mindset, it is important to recognise that we are all human and will at times engage in negative thinking.

Indeed, it may be that automatically initiating the thought regulation strategies in a habitual fashion proves too difficult at times to begin or maintain. In these circumstances, individuals are at risk of becoming trapped in a state of distress characterised by prolonged worry and rumination.

Individuals should be accepting and non-judgmental about any negative thoughts so that they can begin, when they are ready, to adapt how they respond to such thoughts and beliefs. An important message for those wishing to develop a challenge mindset is that this occurs at multiple levels of cognitive-affective processing, involving positive evaluations and interpretations of the pressure individuals' encounter, together with their own resources, thoughts, and emotions.

CONCLUDING REMARKS

In conclusion, this article has outlined a mental fortitude training program for developing resilience for sustained success. Although it is based on a wide-ranging evidence-base, the effectiveness and efficacy of the intervention has not been comprehensively evaluated using research designs that maximise internal and external validity. This training program, therefore, represents a 'work in progress' that will undoubtedly be further refined and adapted, particularly with respect to how best to optimise both performance and wellbeing across different pressurised domains. In the meantime, the programme aims to facilitate a holistic and systematic approach to developing resilience for aspiring performers.

Dr Mustafa Sarkar is a Senior Lecturer in Sport and Exercise Psychology at Nottingham Trent University. His research focuses on individual, team, and organisational resilience in elite sport and other high performance domains (e.g., business). Dr Sarkar also works closely with teams and organisations on creating environments and cultures to develop resilience for sustained success, including the Premier League, the United States and Netherlands Olympic Committees, Hockey Wales, and Cricket Scotland.

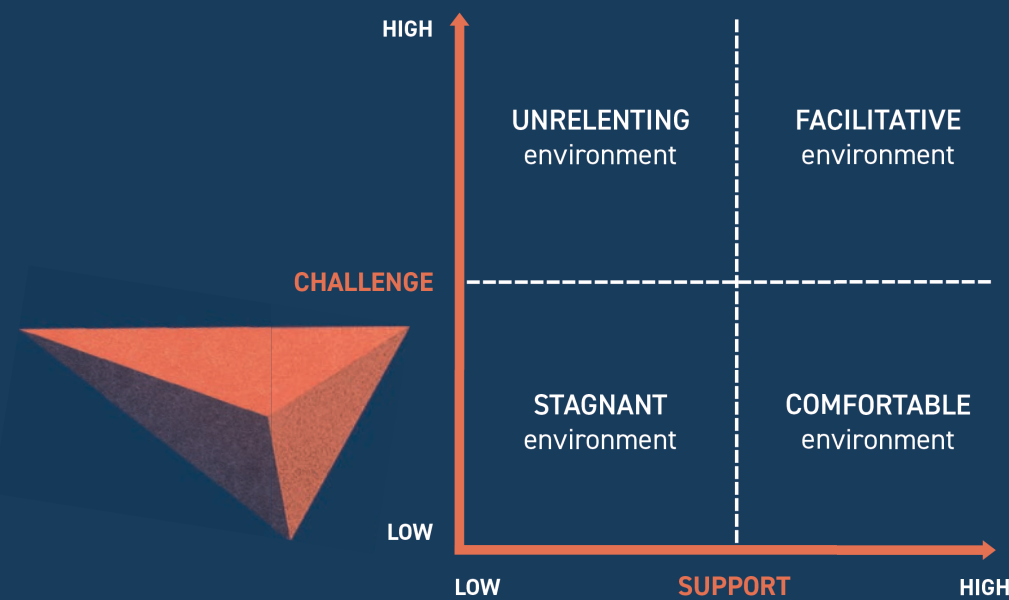


Figure 2. A challenge-support matrix for developing resilience (Fletcher & Sarkar, 2016)

SUSIE BALLENTYNE

REFUGEE RESILIENCE: WHERE SHOULD WE BE LOOKING?

Over the past thirty years there has been a growing focus on the needs of displaced people that recognises the psychological impact of humanitarian disasters. The seismic displacement of refugees from Syria in particular has meant mental health and psycho-social needs have been re-prioritised as equitable to those of food, security and physical health. But assessing these needs is complex, and understanding the impact of how to go about exploring and questioning refugee experiences has significant implications for those working in this field.

One approach is Mental Health and Psycho-Social Support (MHPSS). This works on the basis that by identifying the effects of stress and finding ways to strengthen resilience, refugee communities are better protected and better able to function. For countries such as the UK looking to positively accelerate integration and maximize protection, understanding this MHPSS approach is key. Research consistently shows that the greater the post-migration stress refugees experience, such as securing work or seeking legal advice, the lower the levels of psycho-social wellbeing. With this comes not only a greater possibility of re-surfacing pre-migration trauma, but it also risks a spiral of ineffective intervention.

Registering, interviewing and assessing those whose mental and psycho-social needs are not recognised risks fundamental misattributions and misunderstandings about the nature of refugees. Practitioners in the asylum system, local authorities or policing need to ensure their approach yields rich and accurate psycho-social accounts so that interventions around risk management, protection and community resilience are valid and meaningful to those they look to protect.

ASSESSING MENTAL HEALTH AND PSYCHO-SOCIAL SUPPORT (MHPSS)

One approach, put forward by the WHO and UNHCR, integrates the collection and assessment of psychological needs through a 'tool kit' which ranges from interviews with key informants, through to household questionnaires and participatory assessments. But whilst this approach gets to what the psycho-social problems of displacement may be, it risks overlooking how and why these needs operate. Inferring assumptions based on standardised risk factors undermines the significance of how individuals actually experience and manage the stress they face. Further, the need for expediency can lead to psycho-social problems being over generalised with cultural and contextual factors being either neglected or diminished. In working with refugees or asylum seekers, assessments and interviews require a far richer and more nuanced approach.

THE INFLUENCE OF SOCIAL IDENTITY

Recent developments within social identity research suggests an approach that may improve practitioners' understanding of refugee wellbeing. Research has consistently demonstrated how the social categories we use to make sense of who we are not only shape how we experience stress, but also determine the degree to which we feel we have the resources to cope with it.

Researchers have demonstrated that those identities which we feel are important and define us at a particular moment in time significantly influence how we appraise a situation as being stressful. These same identities also give us an important sense of how we may adjust or overcome these problems. For example, the social identity of 'refugee' may bring into sharp relief problems that only refugee communities face, whilst also offering solidarity through the meaningful relationships and resources they collectively provide.

STORIES, STONES & SOCIAL IDENTITIES

In exploring this approach through my own research with Syrian refugees settling in Brazil and the UK, social identity has been central within refugee experiences. Using a narrative in-depth interview approach, I have introduced the technique of Wearmouth's 'Talking Stones' in which stones are used to enable the interviewee to project elements of themselves, or their experiences, into their personal accounts as key markers.

Encouraging this form of factual story-telling is an effective way to unearth the important social and meaningful aspects of a person's life, and it is an approach particularly well suited to represent the multiple nature of people's identities, particularly for those in transition. Asking refugees to speak about their experiences as a narrative account, rather than rate the impact of certain pre-determined problems, allows the factual experiences and complexities they have encountered to emerge naturally.



Using stones in interviews has not only helped refugees to articulate aspects of their life that may be too difficult or painful to share, but it has allowed them to represent a range of significant actors and influencers: themselves, the interviewer, particular groups and specific events. By doing so it represents these factors in relational ways, bringing to light subjective experiences that are easily overlooked in more generalised accounts.

In one example, a Syrian refugee mapped out his experiences through clusters of stones that represented both those groups that provide vital information and psycho-social support, and those that presented a continual threat and challenge. He then drew a boundary to show where he felt the 'frontiers' of his life were. For example, when asked how he felt about other Arabs in his community, he quickly selected a piece of sea glass. Arabs in Brasilia, he argued, were like shards of glass, 'they hurt' and they have no place on his side of the boundary. Using these stones, rich insights into the lives and stresses of refugees can come to the fore, often contradicting those we may erroneously hold about cultures we do not truly understand.

Accounting for the influence of the interview itself is also significant; such interviews do not stand outside refugee encounters but are a fundamental part of their lived experience. Using this technique, interviewees could also indicate where I, as the interviewer, stood in relation to their world, with whom they felt I aligned, and how, over the course of our interviews, this relationship changed.

Working with refugees in this way presents considerable ethical and methodological challenges ranging from the recognition and management of important power dynamics between interviewer and participant, through to safeguarding all those who choose to take part, and the information they share. But overall, working with refugees in this capacity requires that their psycho-social

health is prioritised; it is essential to not only ensure that the interview methods and approaches are sensitive and appropriate to the context, but also do not put refugee wellbeing at further risk.

To ensure engagement is participant-led and wellbeing is prioritised, interview with refugees should aim to:

1. Minimise the risk to the person involved, both in terms of their security and their psychological health. Sharing sensitive and, at times, traumatic experiences can put the person at greater risk, both physically and psychologically.
2. Allow the experiences of the person to be invited in such a way that they are prioritised over any pre-determined idea of risk, stress or coping. Generalisations about what certain groups find stressful or adverse can easily lead to costly, misplaced or even disabling interventions.
3. Allow for the influence of the practitioner's identity to be accounted for. Refugees are a vulnerable population who are easily exposed to, and disadvantaged by, power disparities.
4. Foreground personal meanings, culture and context within the accounts given. Particular experiences must be contextualised so that interventions can be designed with the advantage of knowing 'why' and 'how', not just 'what'.
5. Support participant wellbeing. Practitioners should always question the impact their work has on vulnerable populations.

Susie Ballentyne is a PhD Candidate at Sussex University. Her research examines the relationship between social identity and resilience among refugee communities.

NATALIA TRUJILLO AND JUAN E. UGARRIZA

THE DEEP EFFECTS OF ARMED CONFLICT: INTERVENING IN THE COMPLEXITIES OF POST-CONFLICT RECONCILIATION

Those exposed to armed conflict, as victims or combatants, are typically subjected to extremely stressful situations such as massive displacement, forced recruitment (some while under-age) and a long string of human rights abuses. Colombia constitutes an archetypical case of a society that has been massively and chronically exposed to a wide array of armed conflict experiences. But many peacebuilding initiatives have also taken ground.

A recent example comes from negotiations between the Colombian Government and the paramilitary confederation known as the AUC, between 2003 and 2016, and the peace process with the Farc guerrillas between 2012 and 2016, both of which led to massive demobilisations and the start of ambitious peacebuilding programs, some of which are still active today.

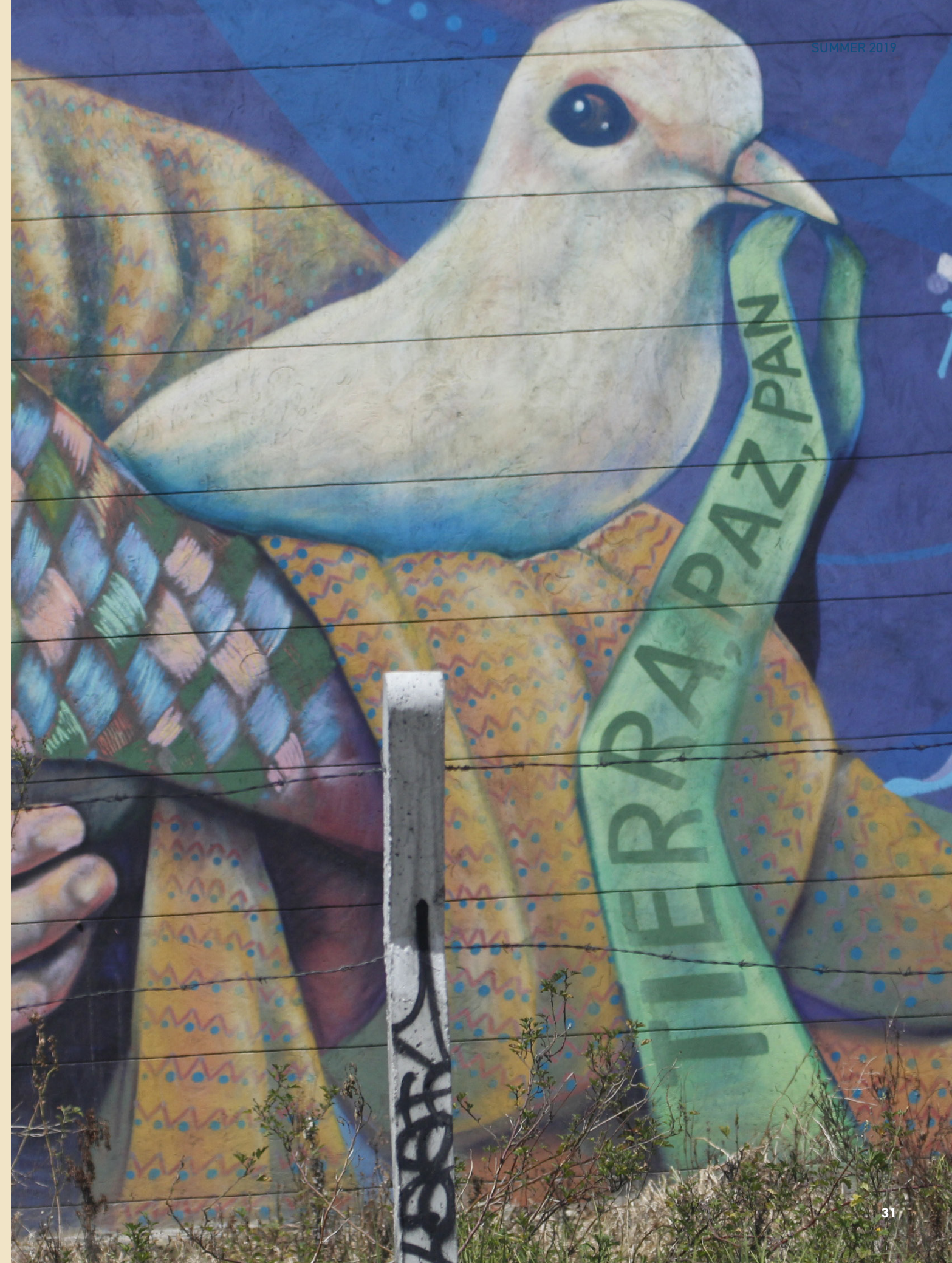
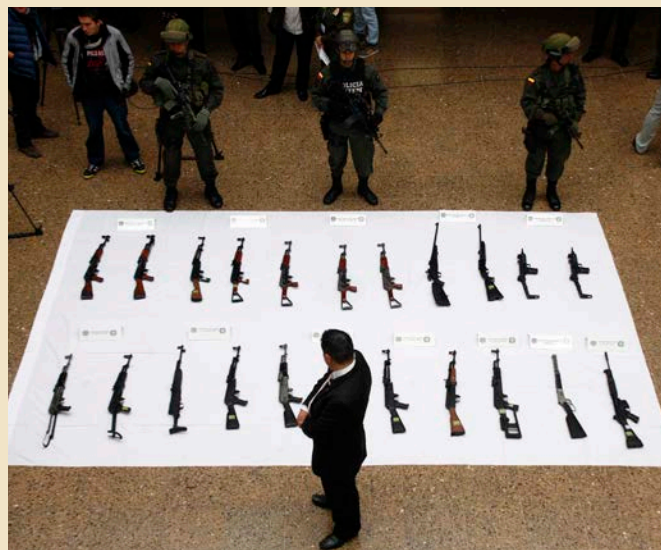
Those peace agreements opened unique opportunities for peacebuilding initiatives, led by state authorities or by civil society, aimed to alleviate the negative impacts of protracted violence, such as:

- Reducing the gap between public services offered by state institutions in armed conflict-affected rural areas and major urban centres
- Re-establishing social capital among affected communities through reconciliation strategies
- Strengthening public policies for reintegration of former combatants to civil life where, by promoting personal and occupational abilities it is expected to (a) limit recidivism into criminal activity, and (b) promote safer and more peaceful environments for communities where they reside
- Attending war victims in terms of individual and collective psychosocial assistance and reparation measures

While the depth of Colombia's legal and institutional resources for focusing on both victims and ex-combatants can be hailed as amongst the most robust in the world, translating successful cases of reintegration or victim reparation into tangible and replicable programs remains elusive. In fact, accumulating evidence demonstrate the persisting high level of societal divisions between communities, victims and former combatants in post-conflict societies long after conflict has ended, such as in South Africa, Northern Ireland, Rwanda, DRC Congo, El Salvador and Guatemala.

The Colombian case is no different. A series of peace accords signed between armed groups and Governments since 1989 have not translated into harmonious relations between former combatants, victims and receiving communities. Moreover, war-related antagonisms have translated into prejudice and distrust experienced on a daily basis in post-conflict contexts, which have translated into social and ideological cleavages and polarisation.

Within the context of complex interactions between macro-level policies and individual-level attention to war-exposed populations, we first mapped out the key social, biological, and psychological factors that render war victims and ex-combatants apart from less violence-exposed segments of society. With that goal in mind, we have explored the adaptive behaviour and disposition of individuals with different degrees of chronic exposure to conflict (CEtC) for the last ten years.



In particular, our line of research has focused on characterising how the processing of emotions, cognition, disposition and behaviour are reorganised in people's minds as a result of exposure to heavily stressful and traumatic situations that are directly linked to armed conflict. In the case of ex-combatants, for instance, we have hypothesised that particular combat experiences will modify emotional recognition processes; behavioural responses associated to regulatory systems for aggression, and even attitudes and dispositions towards ingroups and outgroups such as former allies or antagonists.

In collaboration with the Colombian Agency for Reincorporation and Normalization (ARN), we have tested and implemented a series of procedures and methodologies aimed not only to enhance government-led intervention activities, but also to systematically collect data for the purposes of testing our hypotheses about the deep effects of armed conflict. Some of our results have led to the formal incorporation of our empirically-tested methods and procedures to the official ARN reintegration strategies.

One result from our decade-long research program is the identification of how exposure to armed conflict-related extreme situations forces people's neural networks in ways that increase their self-sense of insecurity, and reduce their ability to regulate their aggressive behaviour. However, these individuals do not necessarily lose their ability to re-adapt some brain mechanisms to positively deal with new social interactions, in the context of a post-conflict setting.

For instance, former combatants show an enhanced brain response to faces, when compared to non-combatants. Thus, they seem to 'read' facial expressions in a shorter time and with similar precision. In this context, faster face-reading patterns might be a crucial opportunity to later help them to improve efficacy during the analysis of social cues. In fact, former combatants' more assertive behaviour through specific social interactions, in comparison with individuals with no combat history, are a key aspect that should be not only acknowledged but also taken advantage of in the contexts of interventions aimed to produce reintegration and/or reconciliation outcomes.



CAN WE IMPROVE REINTEGRATION PROCESSES THROUGH PSYCHOLOGICAL TRAINING?

In the absence of valid evaluative research, we cannot establish the causal effects of the official reintegration program's activities on emotional, cognitive and behavioural re-adaptation in former combatants.

In order to start filling that gap, we have collaborated with the ARN to test a specific emotional recognition strategy, in the hope of observing post-intervention reductions in aggressive behaviour, and improvements in social skills. Here, we focused on training individuals to better recognise emotional visual expressions and social clues, so they could perform in a more adaptive manner during social situations.

For measuring purposes, we created both baseline and follow-up evaluations of those receiving the training in addition to their regular official programmes, as well as those former combatants who did not receive it. We identified that, in comparison with conventional intervention, this added training module helps us explain increased levels of emotional recognition – such as properly distinguishing emotions in human faces – and higher average 'think twice' responses before potential displays of aggressive behaviour.

Despite the effectiveness of such social cognitive training strategies, the future direction of research lies on personalising the contents of the given training, based on the individuals' own baseline profile. We believe that the absence of this approach might be preventing the implementation of more cost-effective strategies that could increase the effectiveness of the current reintegration program.

In the near future, we envisage that such approach will not only strengthen subjects' basic social skills, but also will prepare them for community-based activities aimed to restore perception of safety and social capital. We predict that restoring trust within communities, and reducing intergroup polarisation, are key steps to change the current status quo of fear, intergroup avoidance, and prejudices. Ultimately, ex-combatants' exposure to positive

community-based experiences should lead to more tangible reintegration outcomes.

Interdisciplinary academic networks are crucial to develop this approach. For instance, it is critical to have the involvement of researchers coming from the health and social sciences, especially those who work collaboratively in projects tackling stigmas and prejudices.

The Colombian context of post-conflict complexities is not unique. Hence, we anticipate that our current findings from this setting can potentially be adapted to other countries facing similar challenges. Acknowledging the deep effects of conflict, and then addressing them through tested techniques, already taking us one step towards overcoming the daunting task of rebuilding societies after war.

Dr Natalia Trujillo is Professor of the Mental Health Group in the Faculty of Public Health at the Universidad de Antioquia, in Colombia. Her current research is focused on biopsychosocial frameworks to support social reintegration of actors in the Colombian conflict. Dr Juan E. Ugarriza is an Associate Professor in the Faculty of Jurisprudence at the Universidad del Rosario, Colombia, where his research concentrates on reconciliation and reintegration in post-conflict communities.



ALAN OGLE

REMOTE COMBAT READINESS AND RESILIENCY

Advances in technologies have enabled intelligence collection and combat engagement from great distances. Decisions made by even junior military personnel can have direct influence on who lives or dies on the battlefield, a level of responsibility found in few other careers. The magnitude of the potential consequences arising from these roles, as well as their very nature, lead to many challenges to optimal human performance.

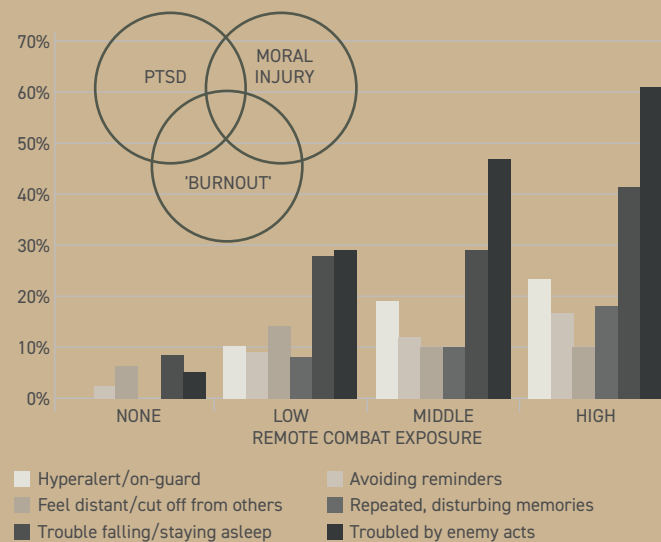
MISSION HAZARDS

Multiple health and human factors challenges have been identified in combat-engaged remote warfare units. Stress, sedentary working conditions, rotating shifts, and rapid transitions between combat operations and home life (in essence deploy and redeploy daily, with no end date) can take their toll. These challenges can lead to mental and physical health problems, degraded performance, occupational 'burnout', and loss of highly skilled, highly specialised employees.

A recent study of US intelligence personnel found that exposures to remote warfare events can also have negative psychological impacts. Rates of exposure to very graphic events was notably high, and analysts with greater amounts of exposure reported more symptoms of traumatic stress, moral injury, and other personal impacts.

480 ISRW Survey: In your duties, how many times have you...	One+ time	10+ times
Seen an enemy blown up or burned alive	76%	49%
Seen/listened to a civilian blown up or burned alive	43%	12%
Witnessing a person or persons deliberately murdered	47%	16%
Seen/listened to a person or persons tortured	34%	9%
Observed/listened to attacks on friendly forces	44%	18%
Saved the life of a Service Member or civilian	30%	10%

Psychological impact of remote combat/graphic media exposure among US Air Force intelligence personnel. Military Psychology, 2018. <https://doi.org/10.1080/08995605.2018.1502999>.



This study also assessed strategies that remote warfighters found helpful to prevent and mitigate negative impact and perform well.

LEADERSHIP ENGAGEMENT

Remote warfighters reported less distress and were appreciative of supervisors and leaders who understood the challenges of their duties, credibly cared, and checked on their wellbeing on a regular basis. In a military context, these are part of Operational Stress Control (OSC) leadership. OSC includes additional measures to prevent and mitigate hazards where possible, optimise working conditions, and develop skills in psychological first aid (PFA; initial 'front line' assistance and triage to care when needed). Developing OSC skills is recommended for leaders at all levels.



MISSION RESILIENCY ROUTINES

It is possible to surge performance for short durations, however sustaining remote warfighters through months and years of service requires a broader, life-cycle minded approach. The following are positive actions for health and performance sustainment:



- **Exercising** regularly, preferably three to five times per week consistent with abilities, is important for both physical health and stress relief. Recreational and team activities can add benefits of social interaction and enjoyment.



- Shortages in sleep can quickly lead to fatigue-related errors, potentially costing lives. The majority of us need 7-8 hours of **restorative sleep** daily. Maintaining good sleep routines is essential, particularly for those working night or rotating shifts.



- **Good nutrition** can be challenged by availability of healthy options, depending upon work location and hours. Proactively planning and preparing healthy meals ahead of time, such as before the start of a work week, can be very helpful.



- **Balance work with positive activities.** Frequent exposure to war, death, pain, and human tragedy can cause decreased positive emotions and impact worldview. It is important to plan and engage in positive activities, healthy recreation and relationships, and other steps to maintain work-life balance.

MISSION PERFORMANCE

Participation in combat can be momentous and terrible, especially with lives at stake and the demands to do one's best for the mission, for teammates, and oneself. Remote warfighters are not generally at physical risk, however they are fully alert to the importance of getting it right. Being able to 'switch on' during mission is essential, whether for hours of tedious surveillance or moments of crisis actions.



- **Purpose and warrior mindset** speak to understanding the nature of the work, being grounded in purpose, and committing to best performance. On mission this includes learning as much as possible about the area of interest, background, and objectives for the day.



- **Teamwork**, cohesion, and good communication supports performance as well as connectedness to identify and assist each other through challenges.



- **Stress countermeasures** help to remain in a zone optimal for thinking clearly and communicating effectively. Training and practice of 'tactical breathing' is a very useful technique towards keeping heart rate and physiological arousal optimal to perform under pressure.

HEALTHY DECOMPRESSION ROUTINES

1. Verbal and Emotional Processing

Talk out stress with your crew, supervisor, mentors

2. Work out stress hormones

"Exercise reduced levels of the body's stress hormones, such as adrenaline and cortisol. It also stimulates the production of endorphines, chemicals in the brain that are the body's natural painkillers and mood elevators." - Harvard Health

3. Get good sleep and recovery/restoration time

4. Positive activities and healthy fun outside of work

5. Use of resources - Counsellor, medic, chaplain etc.

POST-MISSION

The tempo of operations can vary widely, with many missions being routine, even boring. There can be benefits, though, to having available options to assist personnel following particularly difficult shifts.



- **After action debriefing** can be beneficial. This can be a brief, informal team discussion of a shift's events, highlighting praise and opportunities for improvement, which also allows leaders and co-workers to cross-check and support each other. Stress debriefing may be helpful following particularly difficult missions, possibly with assistance of a resiliency support professional.



- **Using mentors, supervisors, and trainers** to review and improve performance.



- Remote warfighter should maintain '**detox discipline**', that is, working through and resolving combat stress as a routine to prevent accumulation. Developing good **decompression routines**, or activities one finds helpful to process stressful operational events, to transition between work (combat) and home 'compartments', to reset and restore body and mind.

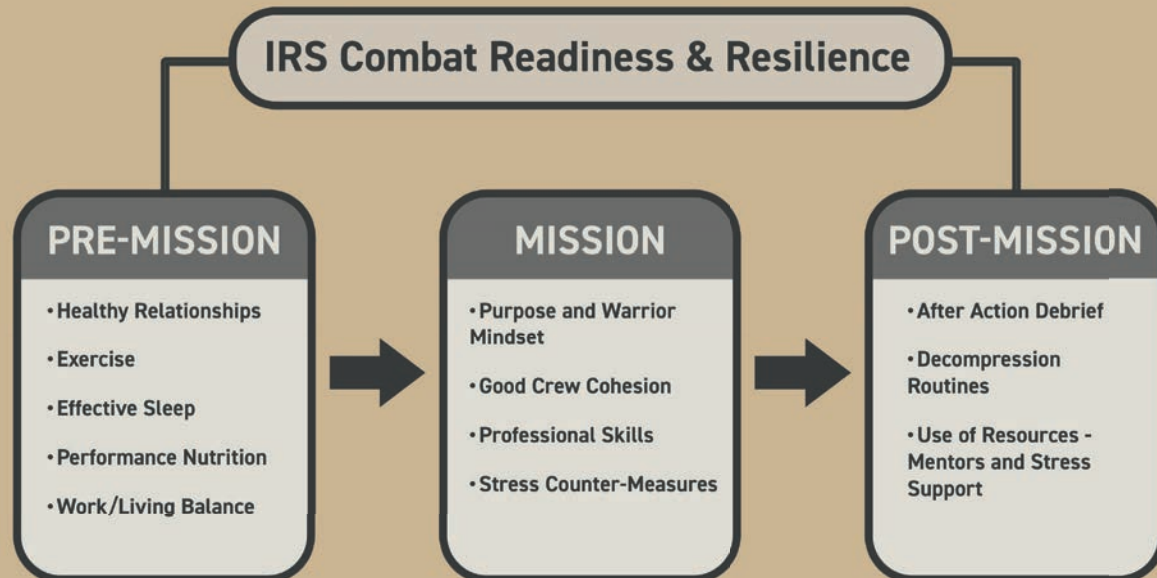
ORGANISATIONAL HEALTH PROGRAMME

US remote warfare units have found significant health and mission-performance benefits from having embedded mental health, medical, and spiritual support professionals. These staff have sufficient security clearances and mission knowledge to provide effective, mission-attuned resiliency support services, and consult with leaders for health protection and performance optimisation issues.

As the capabilities for remote warfare continue to grow, so does the need for proactive actions to support resiliency and performance of remote warfighters. The lessons learned from supporting these personnel also provides useful insights for supporting resiliency in other stressful occupations.

Lieutenant Colonel Dr Alan Ogle is the wing psychologist for the 480th Intelligence, Surveillance, and Reconnaissance Wing of the US Air Force. He has a doctorate in clinical psychology and completed a postdoctoral fellowship in combat operations and aviation psychology. He has led interdisciplinary teams in service of clinical care, combat stress mitigation, high risk training safety and mission effectiveness.

IRS Combat Readiness & Resilience



JORDAN NUNAN

INCREASING ACCURATE RECALL IN HUMAN SOURCES

The time that human sources spend gathering vital intelligence on behalf of law enforcement, security and intelligence services is precious. Every deployment carries inherent risk. Human sources need to be given the best chance possible to remember as much as they can, and to report those memories in full to ensure that the risks are addressed, and opportunities exploited. CREST Doctoral researcher Jordan Nunan is investigating ways to increase human source's ability to recall information by giving them specific instructions relating to memory

The collection, analysis and assessment of intelligence is a vital element of law enforcement and national security investigations. Intelligence is relied upon to generate investigative leads and to formulate accurate assessments. It forms the basis of investigative decisions, assessments of threat and decisions on intervention and resourcing. It is therefore essential that intelligence is as accurate, detailed, and timely as possible.

One way of collecting intelligence is through the use of Covert Human Intelligence Sources (CHIS), better known as 'agents' or 'informants'. Informants are one of the most significant information gathering assets there are and their intelligence is crucial to keeping the UK safe. Informants are recruited by law enforcement and intelligence agencies because they either already know information that can assist investigations or assessments, or because they are able to gain access to such information, usually through their existing network of contacts.

In cases where informants are able to gain access to information on behalf of a government organisation (such as the Police or MI5), they must be authorised under RIPA (Regulation of Investigatory Powers Act 2000). This Act enables informants to be tasked to discover required information, or to attend specific events for the purpose of reporting. The process by which informants are tasked to do this is usually via a meeting with their handler – the person who is responsible for the intelligence operation. I wondered whether this meeting could also be used by the handler to provide their informant with specialised techniques designed to help them remember the information as accurately as possible.

In order for an agent to accurately tell their handler something, they have to correctly remember it. However, in order to accurately remember it, they have to accurately encode it in the first place. So, to enhance an agent's recall ability, I sought to increase their encoding ability by designing a technique that leverages the evidence-base on human memory.

Memory is context dependent. We know that the best way to try to remember something is to remember what you were doing

at the time the event occurred and the memory was encoded; this is why 'retracing your steps' often helps when you lose your keys. The goal of my research has been to help my laboratory participants to focus on the context (surroundings, objects, people, actions and conversations) while their memory encoding was occurring. Then, by matching this process at retrieval through the use of prompts, I hypothesised that more accurate memories could be recalled.

To test this, my participants were randomly allocated to three groups. One group were given no memory prompts at all, the second group were told to remember as much as they could, and the third were given contextual prompts (i.e., pay attention to the surroundings, objects, people, actions and conversations). All of this was delivered before the to-be-remembered event had happened. The participants then completed their task and returned to the lab to be interviewed by their 'handler'.

My results showed that significantly more correct information was reported by participants who were given the contextual prompts at tasking and again at interview, compared to those that received no prompts at interview.

Interestingly, the most beneficial way to remind participants of the context at interview was by the delivery of a free recall instruction (i.e., "please tell me everything you remember"). Additionally, I found that once the free recall phase was completed, the participants' accuracy decreased during the prompts phase (i.e., "think about the surroundings, objects, people, actions and conversations").

I suspect this was due to co-operative participants wanting to provide more information, although this was not tested during the research. However, this has interesting ramifications for interview strategies with co-operative sources, as these results imply that once a memory has been recalled and verbalised, accuracy may reduce if further prompts are given.

Care should be taken when using this research in practice as this is only one study, and it has only been tested in the laboratory on a university population. However, my research demonstrates the value of understanding the problem from the perspective of the end user, and designing practical solutions based on the established evidence base. So, if you wanted to increase the chances of accurate recall, prompting context at tasking and using a free recall at interview would seem like a sensible thing to do.

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Jordan Nunan is a doctoral student at the University of Portsmouth. His research concerns the collection of Human Intelligence (HUMINT) and developing an evidence base for Source Handler interactions with Covert Human Intelligence Sources (CHIS).



ROSAMUND MUTTON

UNDERSTANDING THE ROLES WOMEN PLAY IN VIOLENT EXTREMISM AND WHY IT MATTERS

Assumptions made about female members of Islamic State can lead us to underestimate or misunderstand the threat they may pose when returning to their home countries. Rosamund Mutton argues we need to remember female extremists have agency too, and suggests how we should understand the variety of roles they play.

The requests of Shamima Begum, Hoda Muthana, and Lisa Smith, who migrated to join the Islamic State (IS), to return to the UK, the US and Ireland respectively sparked widespread public debate. From a gendered perspective, these requests are significant. These three women demonstrated IS's previous ability to appeal to a wide range of individuals, but perhaps more importantly, they embodied the variety of roles performed and the diversity of experiences had by women.

The agency of women associated with violent extremist (VE) groups should be recognised because they engage in a range of role performances, contribute to group outcomes and hold differing levels of membership status.

Consequently, women seeking to return from IS pose a range of challenges, and face challenges themselves, that the gendered nature of assumptions prevalent within both academia and policy practice unintentionally overlook. A broader understanding and a change in attitude towards women associated with VE groups is required to cultivate informed knowledge.

THE ROLE OF WOMEN IN IS

Female participation in IS is marked by a perceived inferiority of women to men. This is in part informed by how IS enforces its belief that men and women are fundamentally different, with strict gender boundaries informing ideology and practice.

Membership status is a key example of this. In contrast to men, women did not have to pledge allegiance, suggesting that membership status was denied to women. However, that said, the act of migration was instead considered an informal demonstration of a woman's commitment to IS. Owing to the female-specific challenges faced when attempting to migrate and join IS, such as disobeying parents or travelling without a male guardian (mahram), migration was accepted in lieu of a pledge.

Furthermore, the apparent non-engagement in illegal activities while residing with IS fuels a perception that women have not

contributed to the fulfilment of IS's intended aims. Unlike male IS members, the majority of whom are assigned roles that are explicitly proscribed under terrorism laws such as combatant or propaganda producer, female IS members are assigned domestic roles.

These roles adhere to IS's essentialist norms of femininity, with women primarily participating as wives and mothers. Bearing and raising children was crucial to IS's state-building project that sought to establish their 'Caliphal' state. Supplementary roles such as recruitment; professional services including teaching, medicine or engineering; or involvement in the social police force (the al-Khansaa Brigade), may also have been performed alongside primary roles.

Acting as a wife or mother in association with or as a member of a proscribed group is as yet to be made illegal, hence the argument that women in IS just participated as wives and mothers. This reduces the roles performed by women to a conceptualisation of motherhood that is very different to the one held by IS.

To understand female participation more clearly, these roles need to be understood from IS's perspective. For IS and its members, wives and mothers are integral to the continuation of IS's existence. In addition to physically producing new members, mothers pass on IS ideology and grievances to their children, with the intention of indoctrinating them as future group members. Additionally, wives are expected to encourage their husbands to participate in jihad and obtain martyrdom.

Referring to female IS members as just wives and mothers diminishes the potential threat they could pose were they to return. The sharing of IS ideology and grievances could theoretically continue to be performed once a woman has returned to the West. To dismiss female IS members as not dangerous on the basis that they did not perpetrate violence, and to fail to take seriously the potential threat women may pose as incubators of IS ideology, would be to misjudge the situation.

CHALLENGE MALE NORMALCY OF 'THE TERRORIST'

A more informed understanding of the relevance wives and mothers have for IS should be accompanied by a change in attitude towards female participation in VE. Active participation in terrorism is conflated with, and often limited to, an individual's use of violence, thereby discounting non-violent forms of participation as unimportant, despite the necessity of supporting roles in maintaining and sustaining a group. This implicitly genders actors of violent extremism as male, making it more difficult to understand female actors' participation. It should be acknowledged that although women rarely participate in violence, they do engage in activities that contribute to the functioning of VE groups.

Male normalcy and female exceptionality of 'the terrorist' could be challenged through ceasing to refer to female IS members as 'jihadi brides'. This term negates female agency and perpetuates stereotypical narratives that further construct female terrorists as the exception. It implies that women who migrated to join IS from the West were 'misled victims'; 'unknowing' or 'lured' and thereby diminishes responsibility for their actions. The prevalence of such perspectives, based upon stereotypical assumptions, impedes the development of a more accurate understanding.

CONCLUSION

The prevailing attitude which constructs women as the exception in VE combined with the failure to understand the importance of women to IS prevents an informed understanding about women who participated in IS activities. While former female members may not have undertaken traditionally defined terrorist activities, they did perform roles which contributed to sustaining and maintaining IS. In order to identify appropriate interventions and responses to returning women, the range of roles, experiences and motivations of these women needs to be understood.

The only way to conceive of women as actors with agency is to challenge feminised assumptions which exclude non-violent roles as forms of VE activity. Rather, female participation in both non-violent and violent roles should be viewed as indicative of women as VE actors. Responses to returning women should be carefully informed and proportionate to the activities each individual undertook.

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Rosamund Mutton is a CREST-funded PhD student at Lancaster University. Her research is on female participation in violent extremism.

WANT TO READ MORE ABOUT SOME OF THE RESEARCH THAT OUR CONTRIBUTORS MENTIONED IN THEIR ARTICLES? TAKE A LOOK BELOW. WE'VE FLAGGED UP THOSE THAT ARE OPEN ACCESS AND GIVEN LINKS TO ONLINE VERSIONS WHERE THEY ARE AVAILABLE

EMMA BARRETT AND NATHAN SMITH – UNDERSTANDING STRESS (P4)

Emma Barrett and Nathan Smith. 2017. 'Decision Making under Stress'. *CREST Security Review*, Autumn 2017. Available at: <http://www.crestsecurityreview.com/article/decision-making-under-stress>

Emma Barrett and Nathan Smith. 2019. *Performance and Coping Under Stress in Security Settings*. 18-033-01. Lancaster: Centre for Research and Evidence on Security Threats (CREST). Available at: <https://crestresearch.ac.uk/resources/coping-under-stress-report/>

Nathan Smith and Emma Barrett. 2019. 'Psychology, Extreme Environments, and Counter-Terrorism Operations'. *Behavioral Sciences of Terrorism and Political Aggression* 11 (1): 48–72. Available at: <http://bit.ly/2ZrWkOr>

JESPER CORNELIUSSEN AND ANDERS KJÆRGAARD – CONFLICT MANAGEMENT IN EXTREME ENVIRONMENTS (P6)

Jesper Corneliusson, Gloria R. Leon, Anders Kjærgaard, Birgit A. Fink, and Noah C. Venables. 2017. 'Individual Traits, Personal Values, and Conflict Resolution in an Isolated, Confined, Extreme Environment'. *Aerospace Medicine and Human Performance* 88 (6): 535–43. Available at: <http://bit.ly/2Ml3nwo>

Anders Kjærgaard, Gloria R. Leon, and Birgit A. Fink. 2015. 'Personal Challenges, Communication Processes, and Team Effectiveness in Military Special Patrol Teams Operating in a Polar Environment'. *Environment and Behavior* 47 (6): 644–66. Available at: <http://bit.ly/2ZnIMUJ>

MARC JONES – CHALLENGE OR THREAT: UNDERSTANDING HOW PEOPLE COPE IN DEMANDING ENVIRONMENTS (P8)

Jim Blascovich, Mark D Seery, Carrie A Mugridge, R. Kyle Norris, and Max Weisbuch. 2004. 'Predicting Athletic Performance from Cardiovascular Indexes of Challenge and Threat'. *Journal of Experimental Social Psychology* 40 (5): 683–88. Available at: <http://bit.ly/2MHlbb2>

Marc Jones, Carla Meijen, Paul J. McCarthy, and David Sheffield. 2009. 'A Theory of Challenge and Threat States in Athletes'. *International Review of Sport and Exercise Psychology* 2 (September): 161–80. Available at: <http://bit.ly/2L2SN0S>

Ben MacIntyre. 2016. *SAS: Rogue Heroes – the Authorized Wartime History*. London: Penguin Random House.

Mark Seery. 2011. 'Challenge or Threat? Cardiovascular Indexes of Resilience and Vulnerability to Potential Stress in Humans'. *Neuroscience & Biobehavioral Reviews*, Resilience and Adaptive Aspects of Stress in Neurobehavioural Development, 35 (7): 1603–10. Available at: <http://bit.ly/2L4Qgn4>

Jonathan Shay. 2014. 'Moral Injury'. *Psychoanalytic Psychology* 31 (2): 182–91. Available at: <http://bit.ly/2Uby4Gi>

Matthew Slater, Martin J. Turner, Andrew L. Evans, and Marc V. Jones. 2018. 'Capturing Hearts and Minds: The Influence of Relational Identification with the Leader on Followers' Mobilization and Cardiovascular Reactivity'. *The Leadership Quarterly* 29 (3): 379–88. Available at: <http://bit.ly/2ZwLitE>

Martin Turner, Marc V. Jones, David Sheffield, Jamie B. Barker, and Peter Coffee. 2014. 'Manipulating Cardiovascular Indices of Challenge and Threat Using Resource Appraisals'. *International Journal of Psychophysiology* 94 (1): 9–18. Available at: <http://bit.ly/349xclV>

Martin Turner, Marc V. Jones, David Sheffield, and Sophie L. Cross. 2012. 'Cardiovascular Indices of Challenge and Threat States Predict Competitive Performance'. *International Journal of Psychophysiology: Official Journal of the International Organization of Psychophysiology* 86 (1): 48–57. Available at: <http://bit.ly/3zceWiY>

Martin Turner, Marc Jones, David Sheffield, Matthew Slater, Jamie Barker, and James Bell. 2013. 'Who Thrives Under Pressure? Predicting the Performance of Elite Academy Cricketers Using the Cardiovascular Indicators of Challenge and Threat States'. *Journal of Sport and Exercise Psychology* 35: 387–97. Available at: <http://bit.ly/2Hwtq5v>

LORRAINE HOPE – FROM THE LAB TO OPERATIONAL RESPONSE: EXAMINING THE IMPACT OF STRESS ON MEMORY FOR HIGH-PRESSURE INCIDENTS (P10)

Carey Marr, Melanie Sauerland, Henry Otgaar, Conny Quaedflieg, and Lorraine Hope. 2018. 'The Effect of Acute Stress on Memory: How It Helps and How It Hurts'. *The Inquisitive Mind*, 2018. <http://bit.ly/2ZsKVyM>

EMMA GRACE – BOUNCING BACK: STRESS AND RESILIENCE IN AL-QAEDA TERRORISTS (P14)

Ananda Amstadter, Arden Moscati, Hermine H. Maes, John M. Myers, and Kenneth S. Kendler. 2016. 'Personality, Cognitive/Psychological Traits and Psychiatric Resilience: A Multivariate Twin Study'. *Personality and Individual Differences* 91 (March): 74–79. <http://bit.ly/32dYLSa>

Martha Crenshaw and Gary LaFree. 2016. *Countering Terrorism: No Simple Solutions*. Washington, D.C.: Brookings Institution Press.

Paul Gill and Emily Corner. 2017. 'There and Back Again: The Study of Mental Disorder and Terrorist Involvement'. *The American Psychologist* 72 (3): 231–41. Available at: <http://bit.ly/2HwtHpc>

Emma Grace. 2018a. 'A Dangerous Science: Psychology in Al Qaeda's Words'. *Dynamics of Asymmetric Conflict* 11 (1): 61–71. <http://bit.ly/2Zw6moW>

———. 2018b. 'Lex Talionis in the Twenty-First Century: Revenge Ideation and Terrorism'. *Behavioral Sciences of Terrorism and Political Aggression* 10 (3): 249–63. <http://bit.ly/2Uco5lQ>

Atsushi Oshio, Kanako Taku, Mari Hirano, and Gul Saeed. 2018. 'Resilience and Big Five Personality Traits: A Meta-Analysis'. *Personality and Individual Differences* 127 (June): 54–60. [Available at: http://bit.ly/2ZxOHLt](http://bit.ly/2ZxOHLt)

Ali Soufan. 2017. 'Hamza Bin Ladin: From Steadfast Son to Al-Qa'ida's Leader in Waiting'. *CTC Sentinel* 10 (8). <http://bit.ly/2ZwLSBg>

AARON ROBERTS AND NEVILLE STANTON – GO WITH THE (INFORMATION) FLOW? HOW TO DEVELOP MORE RESILIENT SOCIOTECHNICAL SYSTEMS (P20)

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Aaron Roberts and Jon C. Cole. 2018. 'Naturalistic Decision Making: Taking a (Cognitive) Step Back to Take Two Steps Forward in Understanding Experience-Based Decisions'. *Journal of Applied Research in Memory and Cognition* 7 (1): 70–81. Available at: <https://eprints.soton.ac.uk/418983/>

Aaron Roberts and Neville A. Stanton. 2018. 'Macrocognition in Submarine Command and Control: A Comparison of Three Simulated Operational Scenarios'. *Journal of Applied Research in Memory and Cognition* 7 (1): 92–105. Available at: <https://eprints.soton.ac.uk/419006/>

Aaron Roberts, Neville A. Stanton, and Daniel Fay. 2017. 'Land Ahoy! Understanding Submarine Command and Control During the Completion of Inshore Operations'. *Human Factors* 59 (8): 1263–88. Available at: <http://bit.ly/30lnWf5>

Neville Stanton and Aaron Roberts. 2018. 'Examining Social, Information, and Task Networks in Submarine Command and Control'. *IEEE Transactions on Human-Machine Systems* 48 (3): 252–65. Available at: <http://bit.ly/2Pky1OF>

Neville Stanton, Paul M. Salmon, and Guy H. Walker. 2015. 'Let the Reader Decide: A Paradigm Shift for Situation Awareness in Sociotechnical Systems'. *Journal of Cognitive Engineering and Decision Making* 9 (1): 44–50. Available at: <http://bit.ly/2Mj2vYf>

Neville Stanton and Catherine Harvey. 2016. 'Beyond Human Error Taxonomies in Assessment of Risk in Sociotechnical Systems: A New Paradigm with the EAST "broken-Links" Approach'. *Ergonomics* 60 (2): 221–33. Available at: <https://eprints.soton.ac.uk/407898/>

JASON NURSE – CYBER RESILIENCE: WHAT IS IT AND HOW DO WE GET IT? (P24)

Ioannis Agrafiotis, Jason R. C. Nurse, Michael Goldsmith, Sadie Creese, and David Upton. 2018. 'A Taxonomy of Cyber-Harms: Defining the Impacts of Cyber-Attacks and Understanding How They Propagate'. *Journal of Cybersecurity* 4 (1). Available at: <http://bit.ly/2zyvwuc>

Igor Linkov, Daniel A. Eisenberg, Kenton Plourde, Thomas P. Seager, Julia Allen, and Alex Kott. 2013. 'Resilience Metrics for Cyber Systems'. *Environment Systems and Decisions* 33 (4): 471–76. Available at: <http://bit.ly/2zW9QAB>

Jason Nurse. 2019. 'Cybercrime and You: How Criminals Attack and the Human Factors That They Seek to Exploit'. *ArXiv:1811.06624 [Cs]*, May, 662–90. Available at: <http://bit.ly/347ocDZ>

SUSIE BALLENTYNE – REFUGEE RESILIENCE: WHERE SHOULD WE BE LOOKING? (P30)

John Drury. 2012. 'Collective Resilience in Mass Emergencies and Disasters: A Social Identity Model'. In *The Social Cure: Identity, Health and Well-Being*, edited by Jolanda Jetten, Catherine Haslam, and S. Alexander Haslam, 195–215. Hove; New York: Psychology Press.

Ian Gough, Allister McGregor, and Laura Camfield. 2007. 'Theorising Wellbeing in International Development'. In *Wellbeing in Developing Countries: From Theory to Research*, edited by Ian Gough and J. Allister McGregor, 3–43. Cambridge, UK: Cambridge University Press.

Catherine Haslam, Jolanda Jetten, Tegan Cruwys, Genevieve Dingle, and S. Alexander Haslam. 2018. *The New Psychology of Health: Unlocking the Social Cure*. 1 edition. New York: Routledge.

Halit Hulusi and Louise Oland. 2010. 'Using Narrative to Make Sense of Transitions: Supporting Newly Arrived Children and Young People'. *Emotional and Behavioural Difficulties* 15 (4): 341–51. Available at: <http://bit.ly/2L4FNaU>

Jolanda Jetten, Catherine Haslam, and S. Alexander Haslam, eds. 2011. *The Social Cure: Identity, Health and Well-Being*. 1 edition. Hove ; New York: Psychology Press.

Richard Lazarus and Susan Folkman. 2000. *Stress, Appraisal, and Coping*. New York: Springer Publishing.

Kenneth Miller and Andrew Rasmussen. 2010. 'War Exposure, Daily Stressors, and Mental Health in Conflict and Post-Conflict Settings: Bridging the Divide between Trauma-Focused and Psychosocial Frameworks'. *Social Science & Medicine*, Conflict, violence, and health, 70 (1): 7–16. Available at: <http://bit.ly/30lXsKG>

Stephen Reicher and S. Alexander Haslam. 2006. 'Rethinking the Psychology of Tyranny: The BBC Prison Study'. *The British Journal of Social Psychology* 45 (Pt 1): 1–40; discussion 47–53. Available at: <http://bit.ly/2HyouwT>

Sarah Scuzzarello. 2015. 'Narratives and Social Identity Formation among Somalis and Post-Enlargement Poles'. *Political Psychology* 36 (April): 181–98. Available at: <http://bit.ly/2LlQOUX>

Michael Ungar. 2005. 'Introduction: "Resilience across Culture and Contexts"'. In *Handbook for Working with Children and Youth: Pathways to Resilience Across Cultures and Contexts*, edited by Michael Ungar. Thousand Oaks: SAGE Publications. Available at: <http://bit.ly/2L4RazY>

Janice Wearmouth. 2004. '"Talking Stones": An Interview Technique for Disaffected Students'. *Pastoral Care in Education* 22 (2): 7–13. Available at: <http://bit.ly/2MJYl2h>

NATALIA TRUJILLO AND JUAN ESTEBAN UGARRIZA – THE DEEP EFFECTS OF ARMED CONFLICT: INTERVENING IN THE COMPLEXITIES OF POST-CONFLICT RECONCILIATION (P32)

Andrés Quintero Zea, Lina Sepúlveda-Cano, Mónica Rodríguez Calvache, Sandra Trujillo, Natalia Trujillo, and Jose Lopez. 2017. 'Characterization Framework for Ex-Combatants Based on EEG and Behavioral Features'. In *VII Latin American Congress on Biomedical Engineering CLAIB 2016, Bucaramanga, Santander, Colombia, October 26th -28th, 2016*, 205–8. Singapore: Springer. Available at: <http://bit.ly/2PkGm4Q>

Mónica V. Rodríguez-Calvache, Andrés Quintero-Zea, Sandra P. Trujillo-Orrego, Natalia Trujillo-Orrego, and José D. López-Hincapié. 2017. 'Detecting Atypical Functioning of Emotional Processing in Colombian Ex-Combatants'. *Tecnológicas* 20 (40): 83–93. Available at: <http://bit.ly/2PjBkFz>

Sandra Trujillo, Stella Valencia, Natalia Trujillo, Juan E. Ugarriza, Mónica V. Rodríguez, Jorge Rendón, David A. Pineda, José D. López, Agustín Ibañez, and Mario A. Parra. 2017. 'Atypical Modulations of N170 Component during Emotional Processing and Their Links to Social Behaviors in Ex-Combatants'. *Frontiers in Human Neuroscience* 11. Available at: <http://bit.ly/2Lea7iv>

Sandra Trujillo, Natalia Trujillo, Jose D. Lopez, Diana Gomez, Stella Valencia, Jorge Rendon, David A. Pineda, and Mario A. Parra. 2017. 'Social Cognitive Training Improves Emotional Processing and Reduces Aggressive Attitudes in Ex-Combatants'. *Frontiers in Psychology* 8 (April). Available at: <http://bit.ly/2ZmgTNz>

Juan Ugarriza and Didier Caluwaerts. 2014. 'Deliberation in Contexts of Conflict: An Introduction'. In *Democratic Deliberation in Deeply Divided Societies: From Conflict to Common Ground*, edited by Juan E. Ugarriza and Didier Caluwaerts, 1–8. London: Palgrave Macmillan UK. Available at: <http://bit.ly/2Ubj1Bi>

ALAN OGLE – REMOTE COMBAT READINESS AND RESILIENCY (P36)

Alan Ogle, Reed Reichwald, and J. Brian Rutland. 2018. 'Psychological Impact of Remote Combat/Graphic Media Exposure among US Air Force Intelligence Personnel'. *Military Psychology* 30 (6): 476–86. <http://bit.ly/2ZkKfv4>

ROSAMUND MUTTON – UNDERSTANDING THE ROLES WOMEN PLAY IN VIOLENT EXTREMISM AND WHY IT MATTERS (P40)

Paula Ruth Gilbert. 2002. 'Discourses of Female Violence and Societal Gender Stereotypes'. *Violence Against Women* 8 (11): 1271–1300. Available at: <http://bit.ly/2UBREak>

Judith Lorber. 1994. *Paradoxes of Gender*. New Haven: Yale University Press.

Ester Strømmer. 2017. 'Jihadi Brides or Female Foreign Fighters? Women in Da'esh – from Recruitment to Sentencing'. GPS Policy Brief. Oslo: Prio. Available at: <http://bit.ly/30Gd81m>

Carol Tavris. 1993. *The Mismeasure of Woman: Why Women Are Not the Better Sex, the Inferior Sex, or the Opposite Sex*. New York: Touchstone.



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