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Research Paper

Defence and security perspectives on the operationalization, measurement, and training of resilient performance under stress

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ABSTRACT

Using a qualitative design, the aim of the current research was to examine specialist defence and security personnel's perspectives on the operationalization, measurement, and training of resilient performance. Specialist personnel working in defence and security settings often have to perform under high levels of demand. To date, few studies have examined the nature of resilient performance in these settings based on in-depth perspectives from personnel themselves. A sample of 17 participants were recruited comprising eight military, three intelligence, and six police firearms personnel. Semi structured interviews were conducted with participants. A qualitative descriptive approach was used. Seven themes were identified, these included: markers of resilient performance (theme 1), enablers (theme 2), and disablers (theme 3) of resilient performance, dynamic resilient performance processes related to resources (theme 4) and demands (theme 5), measuring resilient performance (theme 6), and training resilient performance (theme 7). This paper is the first of its kind to openly report perspectives of resilient performance from those involved with specialist groups within the defence and security community. Findings from this work can aid progress in the study of resilient defence and security performance that helps meet the needs of end-users.

1. Introduction

Defence and security operations are demanding performance environments (Pulakos et al., 2000). When operating in these environments, specialist personnel who take part in sensitive and complex operations often encounter a range of unique physical, psychological, and interpersonal demands (Smith & Barrett, 2019). As a result of the demands they face, there is a risk that the performance of these personnel might be degraded (Taverniers et al., 2010). This degradation can have significant consequences for the safe and successful completion of missions, and for specialist groups in particular, potentially wider organizational, strategic, and political implications. Understanding factors that enable such personnel to respond resiliently and maintain their performance in the demanding environments they operate in is critical (Nindl et al., 2018).

The biopsychosocial basis of resilience makes it an appealing construct in the context of defence and security work, especially when considering the physical, psychological, and interpersonal demands faced by personnel (Nindl et al., 2018). Psychological resilience is intimately tied to experiences of adversity, stress, and pressure (Fletcher & Sarkar, 2013). Despite its potential value, the study of psychological resilience in defence and security environments has largely been limited to issues of mental health (e.g., van der Meulen et al., 2020). Moving forward a recent systematic review identified various biological, psychological, and social factors that might hold relevance for the resilience and performance of personnel (Jones et al., 2022).

2. Psychological resilience and performance in defence and security settings

Resilience is best studied by examining variations in relevant markers (i.e., units of measurement) and competencies (i.e., displayed behaviours) following adversity or stressor exposure (Kalisch et al., 2017; Sarkar & Fletcher, 2014). Jones et al. (2022; p. 2) defined

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'resilient performance' as "the maintained or improved execution of competency under situational duress". Context matters in the selection of markers and competencies representing resilience outcomes (Gucciardi et al., 2021). Prior work with specialist defence and security groups identified numerous markers and competencies, such as technical skills and indicators of personal and interpersonal functioning, that could be used to assess resilient performance (e.g., Picano et al., 2006; Pulakos et al., 2000). Jones et al. (2022) summarised these into physical (e.g., persistence), tactical (e.g., marksmanship), cognitive (e.g., vigilance), and team (e.g., communication) categories of performance. Examining variations in markers and competencies within each of these categories before, during, and following exposure to stressful demands can be used to assess whether someone is performing resiliently (i.e., is function in the area being examined maintained or enhanced under stress).

Identifying factors that shape variations in markers and competencies of performance under stress is important for understanding and enhancing resilient performance. Resilience factors are variables that influence the impact of stressors on contextual indicators of functioning (Fritz. et al., 2018). These include both stable dispositions (e.g., personality) and more malleable skills (e.g., mental skills), and external structures (e.g., social support networks). Jones et al. (2022) referred collectively to these factors as resilient performance enablers, defined as relatively stable, personal and environmental variables that have an enduring impact upon a person's functioning. In defence and security research, commonly studied variables that most closely represent resilience factors, or resilient performance enablers, include hardiness (Bartone et al., 2008), mental toughness (Gucciardi et al., 2021b), and personality traits such as conscientiousness, agreeableness, and openness (Skoglund et al., 2020). Several of these variables have previously been examined as predictors of performance. For instance, (Gucciardi et al., 2021b) reported that higher levels of mental toughness were associated with an increased likelihood of passing a demanding military assessment and selection course.

Situational processes are crucial to resilient performance (Fletcher & Sarkar, 2013; Gucciardi et al., 2021; Kalisch et al., 2017, 2019). Kalisch et al. (2017) illustrated this point by using an example of cognitive emotion regulation capacity as a factor that facilitates effective in-the-moment emotion regulation in stressful situations. Jones et al. (2022) referred to processes as situation-specific variables influenced by enablers, but also shaped by a person's immediate context, the demands they are facing, and the resources they have available. A number of physiological and psychological processes have been linked to the resilient performance of defence and security personnel, including biomarkers, such as Neuropeptide-Y (NPY) and Heart Rate Variability (HRV), psychological resources such as perceptions of control, confidence, and connection, and the use regulatory skills including goal-setting, activation control, self-talk, and imagery (Jones et al., 2022).

Based on the findings of their systematic literature review, Jones et al. (2022) proposed a resilient performance framework for defence and security that aligns categories of enablers, processes, and outcomes. That framework holds promise for potentially informing efforts to understand, monitor, and train resilient performance. However, at this point, there are still many gaps in collective understanding, especially when it comes to the applying that framework, or indeed any other, to support practice within specialist defence and security groups. For instance, while there has been some progress on identifying enabling resilience markers and competencies, to date, focus has been on a relatively homogenous set of variables, typically those associated with physicality and effortful behaviour (e.g., hardiness, mental toughness, grit). Many other factors (i.e., global-contextual variables) and processes (i.e., situational variables) are likely to contribute (both positively and negatively) to physical, tactical, cognitive, and team aspects of performance when operating under stress (Nindl et al., 2018).

Whilst there are numerous studies that could be connected to issues of resilient performance in defence and security settings, a recent review suggests that this literature is fragmented with the variety of measures used to assess resilience and performance hindering conclusions that can be drawn (Jones et al., 2022). Jones et al. attempted to organize the existing literature into a conceptually coherent resilient performance framework. In the present study, we sought to explore the face validity and applicability of that framework. We were particularly interested in what end users thought about the included elements and capturing their perspective on how resilient performance might be measured and trained. We used a qualitative design to capture detailed perspectives of resilient performance from the viewpoint of Defence and Security Personnel (DSP) themselves. We interviewed personnel involved in high-readiness groups who are regularly involved in front-line operations on the nature and development of resilient performance in their settings. Given the theoretical and conceptual focus and the unique participants we believe the present study has the potential to produce novel insight with significant applied stress management and performance implications for these types of groups.

Our overarching research question that guided the research was *'How is resilient performance operationalised, measured, and trained in specialist defence and security settings?'*

3. Methods

The UK Ministry of Defence Research Ethics Committee approved the study (reference number: 1090/MODREC/20).

3.1. Study design

We used a qualitative description method in this study (Sandelowski, 2000, 2010). Qualitative description is particularly appropriate when the goal is to provide 'straightforward descriptions of experiences and perceptions' (Doyle et al., 2020; p. 444). Although it requires flexible research practices, the goal in qualitative description is not to transform data beyond recognition from its original form (Ormston et al., 2014). Instead, it is concerned with understanding individual human experience in its unique context and portraying that experience in the way that it has been described. Descriptive qualitative research is aligned with a pragmatic philosophy (Neergaard et al., 2009). With this in mind, the decisions we made during data collection, analysis, and interpretation were all guided by the goal of the research, which was to report on the perspectives of DSP in relation to how they understood resilient performance in their setting. An interview script was developed based on the findings of the earlier literature review (Jones et al., 2022) and used to guide the interviews. This interview script was developed by the research team with input from a technical expert from the defence funders.

3.2. Participants

Participants included eight military, three intelligence, and six police firearms personnel ($N = 17$). All participants were currently serving or recently retired (<2 years). On average, participants had 19.41 years (Range = 8 - 30 years) of experience serving in operational, training, and human performance job roles. We decided to recruit both operational and training and support personnel, to gain a range of perspectives into context-specific aspects of resilient performance. Consistent with the qualitative description method and requirements of the defence funder, purposive and maximum variation sampling was used so that the participants adequately represented the end-user stakeholders, provided heterogeneity of perspective, and were considered suitably qualified and experienced practitioners able to provide high-quality input to the project (Palinkas et al., 2015; Ritchie et al., 2013).

3.3. Procedure

Prior to conducting interviews, potential participants were approached via email and given details regarding the study and a copy of the participant information sheet and consent form. Interviews were conducted online using video conference software and followed a semi-structured format (see Table 1 for the interview guide). The semi-structured approach allowed us to explore relevant topics beyond the guide as and when they arose. Each interview lasted approximately 60 mins. Due to security restrictions interviews with participants could not be recorded. Three members of the research team were present for each interview. This included a lead interviewer, designated note taker, and technical expert from the defence funders. Written notes were made by the designated note taker and, post interview, were merged with any other notes collated by other members of the interview team. Significant key words and phrases were captured and constituted the main source of data. Participant recruitment was ceased when multiple members of the research team judged that the data corpus provided appropriate 'informational power' (Malterud et al., 2016) and were noting repetition in participants' answers.

Table 1
Open ended interview question schedule.

Question
• Could you confirm your gender and your years experience including in your current role?
• Would you say your work is predominantly described as being in the military, police or intelligence domains?
• Are you currently working or have you recently retired?
• In our review we found that resilience was typically explained as: The maintained or improved execution of competence under situational duress (stress). To what extent does this approach/way of looking at resilience cover how you understand resilience in your working environment?
• Other approaches to resilience described being mentally tough/psychologically hardy. Do you feel that these approaches/concepts have relevance to resilience in your working environment?
• Is there anything you feel these theories and models have missed in regard to resilience in your working environment?
• In our research we found that resilience was typically thought to affect performance in the following areas:
• Skilled motor performance (e.g., shooting accuracy).
• Physical endurance
• Persistence
• Attention
• Decision-making
• How does this relate to what you have seen in your working environment?
• Are there any other ways in which you think resilience plays an important role in performance in your working environment?
• What do you think are the best ways of measuring performance in your working environment?
• Findings from our review suggest that resilience is typically measured in the following ways:
• Self-report questionnaires (e.g., mental toughness, stress is enhancing mindset)
• Blood samples (e.g., cortisol, testosterone)
• Saliva samples of biomarkers (e.g., cortisol, testosterone).
• Hair samples (e.g., hair cortisol).
• Heart rate and heart rate variability.
• Observation of resilient behaviours (e.g., POW interrogation).
• Do you feel these approaches are effective ways of measuring resilience (ensure each main way of measuring resilience is discussed).
• Which ways of measuring resilience do you think will be most acceptable to the groups you are familiar with?
• Which measures do you think could be completed in relation to training?
• Which, if any, measures do you think could be completed in relation to operations?
• The following resilience training programmes have been shown to be effective: Psychological Skills Training Programmes; Mindfulness Training Programmes; Virtual Reality Training. How effective do you think these would be in the groups you are familiar with?
• How best do you think resilience training programmes can be delivered (if at all) in the groups you are familiar with?

3.4. Data analysis

Aligned with the underpinning methodology, we used a qualitative reflexive thematic analysis to analyse the data from the interviews (Sandelowski, 2000). We followed standard processes including collating and sorting the written data, applying initial codes to the data, adding comments and reflections, identifying similar phrases, patterns, and themes, elaborating generalisations and the links between them, and finally, linking generalisations to an existing body of knowledge, constructs, and theories (Doyle et al., 2020). At each stage, we held discussions as a research team to question our interpretations and adjust and refine our analysis. Following approaches used in qualitative description research, and consistent with a pragmatic approach, the themes we identified were eventually defined and named based on the study aims, prior research, and importantly, with respect to the terminology used by the DSP we interviewed.

3.5. Reflexivity and rigour

We practiced reflexivity throughout the research process. After each interview we talked as a team about the types of responses we were getting and our approach to questioning. During the analysis phase we thought critically about how our thoughts, actions, and decisions might have shaped our interpretation. The lead author of the work (NS) was the primary analyst. Through reflective practises, he identified that he had a favourable bias towards process and emergent resilience perspectives (compared to trait perspectives of resilience). To avoid overly influencing the analysis, NS regularly discussed the raw and analysed data with the wider research team who adopted the role of 'critical colleagues' (Smith & McGannon, 2018) enabling collaborative reflexivity (Braun & Clarke, 2019). At regular intervals, NS and the wider research team were reminded to be curious about how practitioners understood and talked about the concepts and to focus on responses using a reliable psychological process. We sought further opportunities for collaborative reflexivity and rigour by creating time for external stakeholder discussion and input, independent peer reviewing of our work, and by sharing our findings with delegates at several meetings and events. Together, these practises contributed to the reliability and validity of our interpretations and the development of an evidence-based model of resilient performance that has face validity was deemed applicable to their work by DSP end users.

4. Findings and discussion

4.1. Overview

Based on our analysis we identified seven overarching themes in the data. We organized our findings in the model presented in Fig. 1. The themes included in the model are markers of resilient performance (theme 1), enablers (theme 2), and disablers (theme 3) of resilient performance, dynamic resilient performance processes capturing resources (theme 4) and demands (theme 5), measuring resilient performance (theme 6), and training resilient performance (theme 7). Firstly, participants outlined their thoughts regarding the definition of resilient performance presented to them.

4.2. Defining resilient performance

Consistent with recent theorizing and operationalizations of resilience (Gucciardi et al., 2021), participants thought the definition of resilient performance proposed by Jones et al. (2022) was relevant to their work (i.e., "the maintained or improved execution of competence under situational duress"). However, participants also emphasised the importance of thinking over longer periods and being cognisant of both acute momentary and more enduring aspects of performance. Relevant to this point, the idea of consistency and being able to maintain the

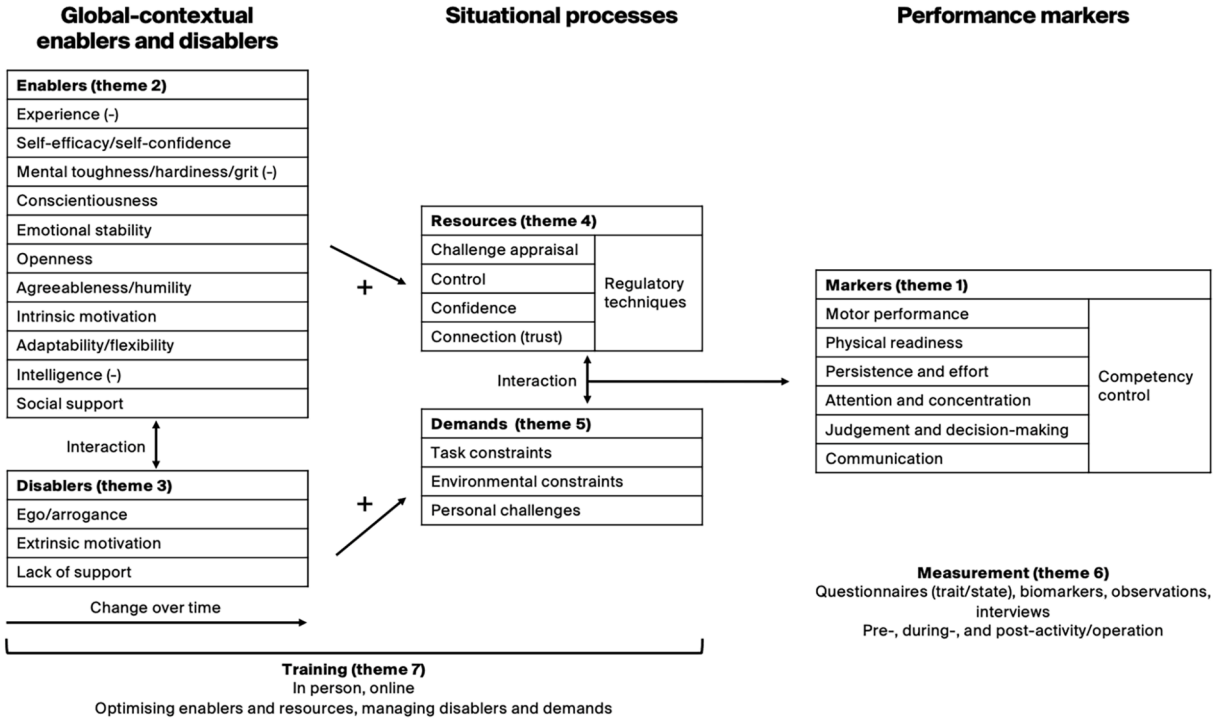

Fig. 1. Thematic Map.
Note: + indicate basic proposed relationships variables based on interview discussion. Dashed vertical line demarcates that the enablers/disablers exert their effects from outside of the immediate performance context in a more distal/global-contextual, with right of the line indicating a performance.

execution of competencies over weeks, months, and potentially years was also considered indicative of being a resilient performer. This extended view is potentially more accurate and accounts for one-off performance breakdowns, that, when viewed in isolation, might be used to label someone as 'not resilient' but when studied over time, might offer a different perspective. Ultimately, this longer-term outlook considers the dynamic temporal aspect of what it means to perform resiliently. Within such time windows, personnel might demonstrate various types of resilient performance profiles, including dynamics reflective of recovery, maintenance, or enhancement (Galatzer-Levy et al., 2018). This extended view might also be appropriate for identifying when someone might not be performance resiliently, represented by consistently performing below previously achieved (and sometimes expected) standards.

4.3. Markers of resilient performance (theme 1)

Participants converged on the idea that performance markers (reflected in competencies) related to physical readiness, persistence and effort, skilled motor function, attention and concentration, judgement and decision-making, and communication were all, to a greater or lesser degree, important for specialist defence and security work. Interviewees, highlighted that performance in these areas could be broken down further (e.g., working memory contributing to decision-making, active listening contributing to communication) like has been done in competency frameworks for high performing populations in military and other operational settings (Buckle et al., 2015; Pulakos et al., 2000). These markers (and sub-markers) could be used to monitor and assess resilient performance.

The utility of specific markers for assessing resilient performance was largely determined by the operational tasks being undertaken. Participants highlighted that this might change across an operation. For instance, someone might need to go from a condition of attention and concentration to then make a swift judgement and execute a fine motor skill. Alternatively, they might have to quickly adjust between a condition of high physical effort to an attentive and concentrated state. Competency control and the ability to switch and execute against different performance markers (and sub-markers) may represent a kind of adaptive flexibility (Boulton & Cole, 2016). These findings emphasize the importance of thinking about context in the selection of resilient performance markers and recognizing that different markers of functioning are likely to become more or less indicative of how a person is functioning at different times (Gucciardi et al., 2021). This might be true within a discrete operation, following a demanding training course, or when looking at performance and functioning over time.

4.3.1. Enablers (theme 2) and disablers (theme 3) of resilient performance

A variety of enablers and disablers of performance were identified. Participants underscored the importance of experience for being able to perform under stress. There were numerous accounts of how encountering stressful situations, especially those combining physical and psychological demands, gave the participants an understanding of how to perform effectively in similar situations in the future. Several interviewees referenced the importance of robustness, and in particular robust self-efficacy or confidence, as being a foundational component of resilient performance. Gaining experience through overcoming adversity aligns closely with research into how past performances act as a key source of self-efficacy (Sitzmann & Yeo, 2013). These findings are broadly consistent with earlier military research that points towards markers of experience as indicators of suitability for high-stress roles (Picano, 2012). Despite the largely positive impact of experience, a small subset of participants discussed that too much experience could potentially lead to an overinflated sense of ego or complacency that was detrimental or disabling to performance.

Military personnel generally agreed that mental toughness and psychological hardiness were personal enablers that would contribute to resilient performances, especially when related to physical tasks. However, some participants from intelligence and policing contexts mentioned these terms as being somewhat outdated, potentially contributing to negative outcomes over longer periods (e.g., burnout),

and reflecting pervasive gender stereotypes (Caddick & Ryall, 2012). This finding suggests a person-environment-time interaction, where certain variables may transition from being an enabler to disabler in different contexts and when viewed over extended periods.

Several participants highlighted the importance of conscientiousness for performance. Conscientiousness was perceived as enabling due its impact upon planning, preparation, and goal achievement, which, in turn, made an individual a better operator. Being emotionally stable, or least able to regulate emotional experiences, was also considered adaptive. Most participants talked about the importance of openness and being receptive to new experiences and learning opportunities. An aspect of personality and character that permeated all interviews was humility. This seemed to be related to an individual's agreeableness and how compatible they were with others in a team. In contrast to agreeableness, being selfish and arrogant was considered a disabler of resilient performance. Conscientiousness, emotional stability, openness, and agreeableness have been linked to suitability for high-performing military roles and roles in other similarly challenging occupations (Bartone et al., 2018; Landon et al., 2017).

Interviewees discussed the importance of motivation and being intrinsically driven to want to continually learn and improve, which reflect a robust motivation quality linked to persistence, effort, and other adaptive outcomes (Carbonneau et al., 2012). Interestingly, some participants talked about not wanting to let themselves or their teammates down as an important motivating factor. While this may seem like an external motivation, these drivers came across as deeply internalised and thus key reasons for continuing to strive for high performance. Lack of motivation, or doing things for the wrong reasons (e.g., for external validation or an escape from something) were considered disablers of performance (Fletcher & Sarkar, 2016).

Many participants mentioned the importance of being adaptable and flexible. As an individual difference factor, being adaptable and flexible is likely to reflect the ability to identify, regulate, monitor, and adjust approaches to manage the impact of stressful demands upon performance (Bonanno & Burton, 2013). Adaptability has been demonstrated as a predictor of resilience in specialist military and other similar high-performing populations (Bartone et al., 2018; Boulton & Cole, 2016; Gucciardi et al., 2021).

Participants cautiously highlighted the role of mental ability in being able to maintain resilient performance under stress. These comments touched on practical aspects of intelligence, such as being able to engage in effective self-management, self-reflection, and being in tune with the emotions of others (Fraher et al., 2017). There was some suggestion that being 'too intelligent' could potentially be detrimental, especially if it leads to excessive rumination. This is consistent with other suggestions that, to a degree, certain factors are likely to be positive contributors to performance but may then become detrimental at extreme lower or upper limits (Bartone et al., 2016).

Participants acknowledged social factors, and specifically the role of leaders in cultivating quality relationships. One participant noted that a shift had occurred away from the stereotypical harsh approach from instructors, toward a softer approach and learning how operators "tick". In demanding environments, high levels of social support are critical for adaptability and sustained performance (Bartone et al., 2018). When there is consistently high demand but limited support, environments can become unrelenting and have a degrading impact upon personnel. Related to social support, and aligned to prior research findings, participants talked about the value of informal peer networks (Williams et al., 2016), mentorship provided by experienced personnel (Bartone, 2006), and having a sense of balance between work and home life (LaCroix et al., 2021).

Participants talked about global-contextual enablers and disablers changing over time. Given how these variables are conceptualised (i.e., relatively stable), change is unlikely over days and weeks. However, over months and years, it is possible that such factors could fluctuate. Indeed, there is evidence that even relatively stable variables, such as those related to personality, can change after significant life events (Leon et al., 2011). Monitoring enabling and disabling factors over time might be informative, and possibly even a pre-requisite, for understanding one's capacity for resilient performance.

4.3.2. *Dynamic resilient processes: resources (theme 4) and demands (theme 5)*

Participants made a distinction between enablers and disablers and situational factors. They talked clearly about dynamic resilient processes that were more proximal situational determinants of being able to maintain performance in stressful situations. The notion that there is an underlying process that influences resilient performance is well aligned to existing stress, coping, and performance theories (Bakker & de Vries, 2021; Meijen et al., 2020) and resilience work that is ongoing in specialist defence and security populations (LaCroix et al., 2021; Ledford et al., 2020). Two critical processes were identified in the present work: resources and demands.

Four psychological resources were pinpointed, which were well-aligned to earlier findings. Psychological resources are considered immediate antecedents of performance. First was challenge appraisals of stress. Challenge appraisals have been identified as a key situational process involved in resilience and performance (Fletcher & Sarkar, 2013). When stress is perceived as a challenge, individuals are more likely to adopt an approach-focus to dealing with and overcoming demands. Next, was feelings of control. When individuals perceive a sense of agency, they are more likely to see a situation as something they can influence. Locus of control is often discussed in relation to resilience and has previously been linked to resilient functioning in military cohorts (Schok et al., 2010). Closely tied to control was a discussion of confidence. Again, confidence is often associated with performance and has been linked to effective functioning in military settings (Arthur et al., 2015). Participants talked about using regulatory strategies like goal-setting, self-talk, visualisation, and breathing techniques to build and optimise feelings of control and confidence in stressful situations. Finally, there was social connections. This was predominantly related to feeling a sense of trust and support with others in a team. Such interpersonal experiences allowed individuals to focus on their own functioning without having to anticipate and worry about what other people were doing.

Participants made the links between more distal enablers and disablers and situational resources. For instance, they talked about how conscientiousness, because of how it shapes planning and preparation behaviour, might have contributed to enhanced feelings of control in a performance context. How experience and trait self-confidence might foster situational perceptions of confidence. Or, how humility and agreeableness might help engender trust and connections between people when operating under pressure. This is consistent with other work that has discussed similar paths between more global and more situational psychological experiences in high-stress domains (Smith & Barrett, 2019). Related to this point, interviewees talked about 'using' regulatory techniques (i.e., coping and performance optimisation strategies) to protect or build psychological resources. They differentiated between being skilled in techniques and using them in situ. This speaks to an enabler-process bridge, where global-contextual factors shape situational processes, which then impact upon functioning (Kalisch et al., 2017).

Demands were identified as emanating from task and environmental constraints as well as being shaped by personal disablers. They were not considered to be inevitably bad, because some demands were seen as exciting and a challenge but were a potential drain upon resources. Resource-depleting hindrance demands, those things that typically had an adverse impact upon performance, included excessively high workloads, high levels of risk, uncertainty, poor diet, tiredness and fatigue, and recent problems in one's personal life. Conversations around demands and resources very much pointed towards an interactive process that would likely change over time and be dependant on individual,

contextual, and situational variables (Demerouti et al., 2001). For instance, during an operational tour the interaction between individual, contextual, and situational variables might change considerably over time, where early on in a tour, an individual might be functioning very effectively but over time their capacity to withstand demands and perform resiliently might be reduced. As with many resource-demand theories, efforts to protect and promote psychological resources such that an individual perceives a positive resource-demand balance is likely to be advantageous (Bakker & Demerouti, 2017).

4.3.3. Measuring resilient performance (theme 6)

Quantifying resilient performance is important for being able to study, track, and hopefully enhance functioning. In general, participants encouraged mixed method investigations incorporating a variety of measurement approaches including self-reports, physiological assessments (e.g., from blood, saliva, or wearable devices), and structured observations. Participants emphasised that questionnaires should remain short, in the region of 15–20 items, and any measurements collected should not be disruptive to tasks being completed: this was especially important in operational settings. From an applied perspective, participants wanted to be able to self-administer and take responsibility for gathering and interpreting data. Several of the participants emphasised the potential value in collecting more qualitative information. They thought this might provide deeper insight to factors influencing operators' performance.

In addition to collecting situationally referenced data, participants discussed the importance of longer-term monitoring. This might include regularly capturing information on enabling/disabling factors and the experiences that people have been exposed to. Where detailed information is being collected this would need to be balanced alongside security issues of storing and logging that data.

4.3.4. Training resilient performance (theme 7)

There was general agreement that training should primarily focus on methods aimed at building situational resources. This finding highlights the importance of identifying key situational processes that bridge the gap between global-contextual enablers and disablers and performance. It was emphasised that developing skills that target these situational resources (e.g., mental skills training) so that individuals can do things to optimise their performance under pressure would be helping. Training focused on team dynamics, especially around trust-building and communication behaviours, and transition, rest and recovery was also considered important (Pattyn et al., 2022).

Broadly, a mixture of in-person and self-directed online learning was thought to be a viable model for a resilient performance training package. A fully online offering was not appealing, but the opportunity to do additional learning in one's own time was deemed to be beneficial, especially for those deployed at short notice or located remotely. Almost all participants commented that material should be contextualised and include practical elements. Using more advanced digital technologies (e.g., virtual or augmented reality) was discussed, but logistical and financial considerations were highlighted. For such training to be sustainable, participants voiced that it would have to be compliant with security policies and delivered in a way that can be taken forward at a low cost and without outside support.

5. General discussion

This work aimed to examine perspectives on the operationalisation, measurement, and training of resilient performance in specialist defence and security settings. To our knowledge, this paper is the first to openly report on perspectives of resilient performance from individuals involved in specialist military, intelligence, and law enforcement work. Participants generally agreed that critical competency or performance markers indicative of operating effectively in defence and security contexts in specific situations and over time include physical fitness, persistence, execution of motor skills, attention and concentration, judgement and decision making, and communication. Future work may focus developing a detailed competency framework (e.g., like international space agencies have done for high performing astronauts; Landon et al. 2017) and mapping these competencies onto discrete defence and security activities.

This research points towards key global-contextual enablers and disablers of resilient performance. Future studies should examine enablers and disablers in parallel to determine the magnitude and unique contribution of their performance effects. The identification of potentially modifiable enablers, which could be targeted for training and enhancement, should also be examined more closely. Although most of what was discussed focused on individual functioning, the importance of the team was highlighted. There is some evidence that individual and team resilience dynamics operate synergistically (Chapman et al., 2021). Examining these multi-level effects in future empirical studies will help unpack how individual and team-level factors interact to impact performance at both levels.

Situational processes were identified as proximal determinants of resilient performance. Future studies could benefit from recent methodological and analytical advances (e.g., Gucciardi et al., 2021) that provide the tools to both collect and model the effects of different types of situational process data (e.g., physiological, psychological and social) on markers of performance. To undertake these types of studies, participants encouraged a pragmatic low-burden mixed method approach, including using self-reports, physiological data, observations, and interviews.

Training resilient performance should primarily focus on what can be done to build situational resources (i.e., challenge appraisals, control, confidence, and connection). Training content that targets both the resilient performance enabler and process level was considered to be valuable. Approaches detailed in recent military intervention studies may provide a useful guide for work on this topic going forward (Mattie et al., 2020). In terms of delivery, combining face-to-face delivery with and supplementary online within a practical and contextualised package was desirable.

6. Limitations

Despite reaching a level of informal power, and participants talking to a number of similar issues, it is important to acknowledge potential limitations of the present approach. The reliance on hand-written notes as data and the purposive sampling approach may be considered limitations. However, conducting research with hard-to-reach populations requires pragmatism. The analytical approach used was appropriate to the data and we took steps to capture heterogeneity of perspectives through diverse recruitment within the end user communities. In terms of the findings, multiple members of the team participated in both the interviews and analysis. Although one member of the team (NS) led these activities, involving others in the process as 'critical colleagues' provided an opportunity for critical insight by stimulating debate and the chance to explore alternative explanations of the data. This process helps reduce the likelihood that the biases of a lone investigator would overly influence the study outcomes, but it cannot be ruled out given all members of the team have been involved in previous research on this topic (e.g., Jones et al., 2022). The interview approach also relies on participants being able to verbalise their experiences (drawing upon a range of memories) in a way that accurately captures what is a relatively complex person-environment interaction. Although the interview team used a range of prompts to probe and access insights, there may be other important elements that participants were unable to recall in the moment. Therefore, while this work moves understanding forward it may still not tell the complete story of resilient performance in defence and security settings. The second key limitation is that experiential accounts like those gained from the present interviews often do not capture sub-surface biological and physiological dynamics. For instance, in

this study we gained limited additional insight on biomarkers that might underpin resilient performance in defence and security settings. Given our participants were not necessarily experts in stress physiology, this was anticipated at the onset of the study. Nevertheless, this is an important issue that may need to be revisited again in the future. Finally, it should be noted that the current work is situated within a UK based security and defence context, therefore caution should be taken in extending findings to other cultural settings. Despite potential limitations, the unique sample and explication of various factors and processes and their potential relations, and considerations related to measuring and training resilient performance, highlight the value of the work.

7. Conclusions

Overall, this study provides valuable end-user perspectives on the operationalization, measurement, and training of resilient performance in specialist defence and security settings. It builds on recent conceptual and empirical work providing additional clarity on global-contextual enablers and disablers, situational processes, and markers of resilient performance. Findings also offer insight to issues of measurement and training. Together, these findings can be used to inform future theoretical and applied research and practice related to issues of resilient performance.

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Data availability statement

Due to security restrictions surrounding the sample the supporting data is not available.

CRediT authorship contribution statement

Nathan Smith: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft. **Marc V. Jones:** Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft. **Elizabeth Braithwaite:** Conceptualization, Methodology, Writing – review & editing. **Lucy I. Walker:** Writing – original draft, Writing – review & editing, Project administration. **Andy McCann:** Conceptualization, Writing – review & editing. **Martin Turner:** Conceptualization, Writing – review & editing. **Danielle Burns:** Writing – review & editing, Project administration. **Paul Emmerson:** Writing – review & editing. **Leonie V. Webster:** Writing – review & editing. **Martin I. Jones:** Writing – review & editing.

Declaration of Competing Interest

The authors report there are no competing interests to declare.

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