

Fostering personal resilience in the Royal Air Force: A Study of Force Development and Adventurous Personal Development Training.

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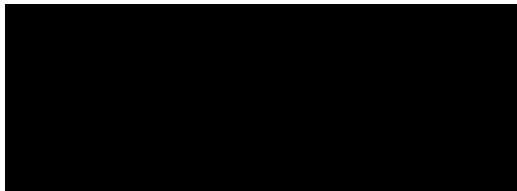
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Resilient individuals and organisations are defined by their exemplar hardiness, positivity, determination and resilient attitudes in achieving goals through collective initiative and purpose. The RAF embodies this resilient ethos through its flexibility to adapt and 'bounce-forward' instead of 'bouncing-back' in its organisational and personnel's resilience. This cannot be achieved without the essential support, training, education and reinforcement of the RAF's Whole-Force, consisting of regular, reservists, civil servants, contractors and by extension, RAF dependants and spouses.

This training, education, support and reinforcement is delivered by a vast community of specialists that quietly sacrifice a great deal to ensure the collective resilience and education of RAF personnel. Among those specialists are the RAF's Force Development Instructors and Officers who facilitate, educate and impart the underpinning theory of resilience education through FD/APDT activities in austere, risk-to-life environments globally and away from their families for a large part of their careers. They live and breathe the fundamental transfer of biophilic, isomorphic learning and tacit-knowledge from FD/APDT to conceptual skills and resilience when conducting military primary roles in austere environments.

The resilience, dedication, dark-humour, banter and constant optimism when faced with these stressors is an inspiration and I am humbled to be a part of this highly specialised community. My sincere thanks to Air Vice Marshal James, Air Officer Commanding, No 22 Group for agreeing to fund this research, Group Capt Smith, Wing Commanders Tonkin and Goodwin at the Robson Academy of Resilience, for allowing me to conduct the research and Squadron Leader John Dunn, Flight

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Supporting every service-person (no matter their rank), stands a resilient family unit (slightly ad-libbing, but it's true) and I am fortunate to be graced with such a supportive family that have instilled in me the virtues of military life. Although he wore a different colour, my father, Army Major (Retired) John Riley and mother, Mrs Freda Riley (also happily retired), have my eternal thanks for their unfaltering belief in both mine and my sister's life-journeys. Thank you all for your guidance, direction and support but this thesis would not have been completed without the love and support of my children, Kieran, Cai, Cian, Mia and grand-children, Sophia and Henry who have endured my countless absences during the completion of this thesis, global expeditions, operational deployments, courses and demanding but rewarding RAF career. Thanks guys, I know it's been tough, and I'll work hard to regain some Dad and Grandad points!

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Per Ardua ad Astra- 'Through adversity to the stars'

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GLOSSARY OF TERMS

AE - Adventure Education.

ANS - Autonomous Nervous System.

AP - Air Publication.

AQ - Adversity Quotient.

BRTC - Basic Recruit Training Course.

CDRS- Connor Davidson Resilience Scale.

CHD – Coronary Heart Disease.

CIMIC- Civil Military Co-Operation.

CNS - Central Nervous System.

CPD - Continued Professional Development.

CSE - Core Self Evaluations.

Defence - Refers to the MOD, UK Defence and Security Institutions.

DHPC - Defence Human Performance Centre.

EI - Emotional Intelligence.

FD - Force Development.

FD/APDT - Force Development/Adventurous Personal Development Training.

FFM - Five Factor Model.

IDE(1) - Individually Designed Experiences.

IDE(2) - International Defence Engagement.

IOT - Initial Officer Training.

JDN – Joint Defence Note.

JDP - Joint Doctrine Publication.

JSP - Joint Service Publication.

MBT - Mind Body Training.

MOE - Measurement of Effect.

MST - Mission Specific Training.

PTSD - Post Traumatic Stress Disorder.

RAF - Royal Air Force.

RAR - Robson Academy of Resilience.

REP - Resilience Education Pathway.

RISE - Respect, Integrity, Service, Ethos.

RRC - Robson Resilience Centre.

RSES - Response to Stressful Experiences Scale.

SERE - Survive, Evade, Resist, Extract.

SMARTT - Stress Management and Resilience Training Team.

SME - Subject Matter Expert.

SPEAR - Social, Personal, Emotional Resilience.

TCP - Technical Co-operation Partnership.

TFRF - Total Force Resilience Fitness.

TL - Transformational Leadership.

TRiM - Trauma Risk Management.

Conflicting interests.

The researcher is a Royal Air Force (RAF) Training Officer, Force Development specialist with 23 years of experience in managing and delivering Force Development/Adventurous Personal Development Training (FD/APDT) programmes and this Doctor of Philosophy has been part funded by the RAF.

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ABSTRACT

Resilient airmen and women are pivotal strategic game-changers in the RAF's next generation contribution to the United Kingdom's Defence Strategy. Resilience is the ability to learn and bounce forward from adversity, thus developing an increased personal resilience baseline to cope with future challenges. Whilst providing these strategic capabilities, RAF personnel must remain physically, spiritually, socially and psychologically resilient. In addressing this force resilience tetrad, contextualised Force Development and Adventurous Personal Development Training (FD/APDT) interventions contribute towards RAF participant's resilience development. This thesis provides participant responses of RAF FD/APDT participant's (n=237) perceived resilience, before and immediately after, a five-day RAF FD/APDT intervention with focus groups (n=33) conducted six months later. The initial data from the sequential explanatory mixed-methods research (Connor Davidson Resilience Scale (CDRS)-25 questionnaire and focus groups) confirmed perceived resilience development for psychological, physical, social and spiritual resilience factors identified within the CDRS-25. Evidence from follow-up focus groups suggests that resilience is further enhanced over time, with greater perceived resilience growth positively affecting resilience across the four domains reported after six months. Findings from this research further outlines the requirement for a through-career resilience educational pathway for RAF personnel to reinforce longitudinal resilience behaviours and attitudes. The enhanced personal and organisational resilience combined with the improvements in primary role efficiency developed through FD/APDT, is proposed as a key enabler for the RAF's Whole Force socio-cultural resilience enhancement, to empower RAF personnel to meet the demands of 'next generation' RAF resilience requirements.

Keywords.

Royal Air Force, Force Development, Adventurous Personal Development Training, adventure training, resilience, Defence, military, Future Force Resilience, operational effectiveness, Resilience Education Pathway, career development, next generation resilience.

CHAPTER 1 – INTRODUCTION

a. Background.

In an address to the UK House of Commons Health Committee, the Chair of the General Medical Council, Professor Stephenson (2015) recognised the UK military's investment in developing its personnel's resilience through a commitment to the training and education of service-personnel prior to combat operations. However, he does not allude to how this resilience training and education is evaluated. More importantly, the UK military has developed multiple comprehensive training interventions to promote resilience, but there are limited supporting studies to validate the training intervention's effectiveness in dealing with predictors of over-stressors such as enhancing self-confidence and self-efficacy throughout a service-person's career. This requirement for validating resilience training interventions for use within the military is essential, given that "1 in 8 (12.7%) of UK Armed Forces personnel were seen by military healthcare services for a mental health related reason" (UK Armed Forces Mental Health Annual Report, 2020, p.5). More concerning for the RAF, is that the RAF was "significantly higher compared to the other 3 services" (UK Armed Forces Mental Health Annual Report, 2020, p.6).

Where military resilience research is exemplary (Stephenson, 2015), is in identifying resilience policy and line manager training for predictors of Post-Traumatic Stress Disorder (PTSD) depression and over-stress. This is evidenced through the plethora of resilience training programmes (Bowles and Bates, 2010), especially after deployed operations. It is weak per contra, when quantifying the efficiency of the resilience training interventions (Adler *et al.*, 2015). This thesis aims to address this issue in part by researching Force Development and Adventurous Personal

Development Training (FD/APDT) as a training intervention to develop resilience and primary role effectiveness in RAF personnel.

For the purposes of this thesis, resilience is the ability to learn from and bounce forward from adversity or life stressors. This resilience learning will in turn, develop an increased personal resilience baseline to allow individuals to better cope with future stressors. When considering the requirement to develop and evaluate resilience enhancing programmes, with the proposed outcomes of military FD/APDT programmes, there is significant linkage within the two concepts. This is further apparent as military FD/APDT is defined as “contextualised training that, by design, progressively develops individual’s mental and physical resilience in preparation for their front-line role and prepares them appropriately for operations, when combined with Mission Specific Training” (Joint Service Publication 822, 2017, p.61). This resilience development from FD/APDT is suggested as developed through the use of safely managed risk activities such as (but not exclusively) rock climbing, parachuting and mountaineering to elicit coping strategies that are transferred into the participant’s primary roles and developed throughout their careers/life. This requirement for a resilient force is further outlined by the MOD’s Future Force Concept (2017, p.14).

Deterrence and our freedom of action in contested domains, demands a resilient future force at both an individual and organisational level. The resilience of our force will not be an ability to rigidly sustain its form, but instead its capacity to endure shocks, adapt and win. Creative thinking, robustness, redundancy and reversionary modes will enable our freedom of action, accepting that it will be impossible to predict, plan or prepare for every contingency.

Validating and developing resilience training interventions within the military such as FD/APDT, is essential for the conduct of military operations. Resilient individuals

within organisations that promote resilience are more able to cope with the stresses and demands of their primary roles (Lamarsh, 1997; Brown, 2000; Atkinson, 2011; Mauno *et al.*, 2013; Shellman and Hill, 2017; Venegas *et al.*, 2019). Cooper (2005), McGowan and Murray (2016), Shamian (2016) and Sharp and Jennings (2016) provide evidence that resilient individuals collectively create resilient teams across a wide spectrum of industries. All organisations require high levels of resilience and is specifically important within healthcare, education, business and the military. This view is further endorsed by Stoltz (2000), the Affinity Research Consortium (2011), Xing and Sun (2013) and Weidlich and Ugarriza (2015).

In addition, Chang *et al.* (2012) identifies the positive outcomes related to a resilient workforce as increased job satisfaction, better job performance, increased attachment to organisation and higher life satisfaction. There is also support within the literature for resilient employee's contribution to resilient organisations, with Duckworth *et al.* (2007) and Davidson, Ewert and Chang (2016) identifying multiple similarities within resilience research for factors required by individuals to develop personal and workforce resilience.

To develop this workforce resilience and achieve the associated benefits to the organisation, Conger and Xin (2000), Bellary *et al.* (2014) and Cooley, Burns and Cumming (2016) note an increasing number of organisations that promote ad-hoc FD/APDT interventions. This is despite not fully understanding the programme's purpose or role in promoting resilience growth within their workforce, the questionable rigour of the programme's efficiency (Barrett and Greenaway, 1995) and cost-benefit analysis (Asfeldt and Beames, 2017).

Sibthorp (2003) outlines that despite positive findings of resilience factors developed through FD/APDT from studies by Cason and Gillis (1994), Hattie *et al.* (1997) and Hans (2000), there is less faith in the understanding of how, why and if these developments occur (Atwater and Yammarino, 1992; Clark, Clark and Campbell, 1992; Brooks, 2003; Zink and Dyson, 2009 and Brown, 2010). Despite this conjecture, FD/APDT programmes are increasingly popular as resilience training interventions (Wagner and Campbell, 1994). These adventure education, outdoor pursuits, outdoor education, experiential education programmes are claimed to be specifically designed to develop psychological, spiritual, physical and social resilience and wider conceptual skills, through the integration of resilience development concepts and FD/APDT's proposed transfer of learning. For the purposes of this thesis, the collective nomenclature for these programmes will be FD/APDT.

Whilst FD/APDT programmes are identified by Hattie *et al.* (1997), Neill (2004), Paisley *et al.* (2008) and Harun and Salamaddin (2014) as credible training interventions for conceptual skills (including resilience) development in participants, Atwater and Yammarino (1992), Clark, Clark and Campbell (1992), Brooks (2003), Zink and Dyson (2009) and Brown (2010) question the degree of positive effects. In both challenging and supporting the use of FD/APDT programmes in the transfer of conceptual learning, Conger (1993; 2002) and Sibthorp (2003) agree that more evidence is required. This evidence is specifically required for the programme design, student antecedents (Ewert, 1989), theory-practice gap (Lave, 1996) in FD/APDT, the role of the facilitator and the impact of continued reinforcement of learning (Harper, 2010).

With these multiple variables linked to the perceived success of FD/APDT programmes, Scrutton and Beames (2015) argue this issue surrounding FD/APDT's utility in developing resilience is unlikely to dissipate any time soon. Rhodes and Martin (2014) further acknowledge the pressing requirement to evidence research to substantiate the claims of FD/APDT researchers and providers. This is of further specific significance for this thesis in the substantiation of RAF FD/APDT's claims in the purported development of RAF personnel's resilience.

These contesting stances generate discussions surrounding the popularity of FD/APDT programmes with Local Authorities, industry and the military and have encouraged multiple strands of research (Barrett and Greenaway, 1995; Neill, 1999; Rickinson *et al.*, 2004; Bobilya *et al.*, 2010). Most notably with interest surrounding the question of how the interventions purportedly develop participants conceptual social-construct skills (teamwork, communication, conflict resolution and leadership) and specifically for the purposes of this thesis, the plethora of resilience traits/syndrome/behaviour developmental claims (Hattie *et al.*, 1997).

Further variables identified by Zink and Burrows (2008) are place, space, activity, process and ways of being as key differentiators of FD/APDT programmes with contextualisation, student variables, programme design and facilitation factors as fundamental tenets of this contextualisation. This limited guidance is a consequence of the dearth of research findings on which to base the design of FD/APDT interventions. This restricts the literature to accurately reporting short-term resilience growth research with any certainty (Beightol *et al.*, 2012; Hill, 2012; Scrutton and Beames, 2015; Mutz and Muller, 2016). Consequently, this lack of in-depth understanding of the impact of FD/APDT on resilience development, limits the

FD/APDT research field's propensity to grow and create a through-life reinforcement of resilience and conceptual skills growth.

Jones (1996) and Smith *et al.* (1997) call for a focus on the programme design to reflect work-based isomorphs with Davidson *et al.* (2016) citing Individually Designed Experiences (IDE1) as a founding factor in FD/APDT. Despite subjective discussions surrounding this form of experiential education and action-based learning, there is a requirement to confirm if psychological, physical, social and spiritual resilience attributes are developed through FD/APDT programmes; especially within a military context and specifically, the RAF's FD/APDT scheme.

b. RAF Force Development and Adventurous Personal Development Training.

The RAF's FD/APDT scheme utilises interventions during phase 1 (basic), 2 (trade) and 3 (career) training and productive service career points at Robson Resilience Centres (RRC) or Main Operating Bases (MOB) and the RAF Eagles Scheme. The Eagles scheme consists of 25 separate, one day to two-weeks FD/APDT programmes designed around significant historical events in the RAF's history. The activities participated in span a plethora of FD/APDT activities including, but not exclusively, mountain biking, climbing, skiing, parachuting, mountaineering, caving and scuba diving. The effectiveness of this FD/APDT within the military workplace after participation in the intervention, requires research to support or challenge these FD/APDT claims and is the main purpose and aim for this thesis.

The scheme's outputs are completed in an arduous outdoor environment to align the FD/APDT concept as a medium for facilitation, to meet the aims of the RAF's

Generic Performance Statement (GPS). Although currently under review by the RAF, the GPS aligns the conceptual, moral and physical skills required of a RAF Officer or Airman/woman against a generic, through-career framework. Whilst the development of these conceptual, moral and physical skills is not formatively assessed, Air Publication 3342 (2016) mandates that all RAF personnel are to attend five days of FD training every three years as part of their continued professional development (CPD) and formal military training. The learning gained from these interventions is facilitated by trained RAF Force Development Instructors (FDI) who are qualified to deliver FD/APDT activities to tri-service (RAF, Navy and Army) personnel.

One of the GPS requirements identified for Airman/Officer development, highlights the importance of resilience under the theme 'Physical and Mental Stress' outlined by Joint Service Publication 898 (2016) as fundamental for any service person. In developing resilience, the wider civilian FD/APDT interventions are identified as being underpinned by the promotion of neurogenesis, psycho-neuroimmunology, neurophysiological, and cognitive behavioural psychological growth, in order to develop coping strategies for adversity (Gass, Goldman and Priest, 1992; Jones, 1996; Burke and Collins, 2004; D'Amato and Krasny, 2011; Moffett, 2012; Sibthorp and Jostad, 2014 and Sherman and Morley, 2015).

These strategies are applied, enhanced and enacted during a service person's career and military operations, for the application of Airpower. That is the theory, but there is limited research data or baseline evidence that the FD/APDT intervention immediately (including short term) or longitudinally develops RAF participants' resilience. Moreover, the training proposal is that transferable skills learned in an

austere hazardous environment within the FD/APDT programme, are then theorised as having the same tacit knowledge and psychological capital transfer of learning into participant's primary military roles or operational theatre (Quinault, 1992; Rhodes and Martin, 2014; Roger, Loy and Brown-Bochicchio, 2016). This seems promising for the military application of FD/APDT but not without evidence to build bridges across the theory-practice gap. Whilst Allan, McKenna and Hind (2012) provide research supporting FD/APDT programmer's claims in developing psychological, physical, social and spiritual resilience, civilian FD/APDT researchers on both sides of the argument call for additional research into the effect of FD/APDT programmes on career and life-long resilience development (Brooks, 2003; Rhodes and Martin, 2014).

In aligning research literature with the FD/APDT's desired outcomes, the concept advanced is that the Airman/woman's human operating system matures through a hermeneutic spiral of resilience growth at a neurobiological level. In turn, individual's cognitive behavioural responses to adversity will also develop to make them more resilient to stressors (Stoltz, 1997). These responses are developed through situational and environmental mastery (mindfulness), thus enhancing their ability to operate within adverse environments or situations.

As the Airman/woman's exposure to higher levels of adversity or stressors develops throughout their career by virtue of rank promotion and additional responsibilities, so too must the level of resilience training and education. This will gradually increase through specifically designed FD/APDT as part of the holistic RAF training system. However, the validity of these FD/APDT programmes in developing resilience requires further analysis to substantiate these positive psychological, physical, social

and spiritual resilience growth claims (Overholt and Ewert, 2015). Due to the dearth of knowledge and lack of organically developed RAF research, the military must draw from civilian literature to apply empirical evidence to its FD/APDT designs. This is essential when analysing resilience growth through FD/APDT within an educational context and not within a mental-health or rehabilitation context, especially when viewing the immediate, short and long-term benefits claimed by FD/APDT providers.

Indeed, most of the military FD/APDT research originates in the United States and focuses on the improvements made in resilience concomitants in the field of mental health (Ewert and Yoshino, 2011; Vella, Milligan and Bennett, 2013; Wagenfeld, Roy-Fisher and Mitchell, 2013). In particular, it is concerned with the treatment of PTSD and stress after military operations. To the best of the researcher's knowledge, there have been no UK-based military, RAF specific studies on the use of RAF FD/APDT in enhancing resilience and resistance to over-stressed pre-determinants, i.e. the development of personal resilience to cope with workplace stressors. This is in part due to the embryonic use of FD/APDT's alignment to psychological, physical, social and spiritual resilience growth within the RAF. Furthermore, there is an underpinning requirement for this thesis to capture FD/APDT's impact on the participants' perceived resilience. Moreover, due to the short-term perceived conceptual developments after FD/APDT interventions (Ward and Yoshino, 2007), the role of longitudinal follow-up of FD/APDT learning, in particular resilience, requires attention (Rickinson, 2004).

As an organisation, the RAF has not conducted any initial research on RAF FD/APDT's outcomes in the development of participants' resilience from which to

determine longitudinal outcomes. This thesis acts as the initial research to determine short-term FD/APDT outcome baselines, for further future longitudinal research aims for RAF FD/APDT.

c. Situating the researcher in the context of the research.

The claims of RAF FD/APDT's role in the development of participant's conceptual skills including resilience, has always been undermined by the lack of research within this highly specialised field. Therefore, in order to advance both the RAF's understanding of the proposed transfer of learning within wider academia's knowledge of FD/APDT interventions, the researcher feels strongly that this area of personal and professional interest must be examined in greater detail. The findings from this research will inform the RAF FD/APDT stakeholders on how to enhance the delivery of their FD/APDT scheme, for increased effectiveness and transfer of learning for RAF personnel's resilience.

As an experienced FD/APDT facilitator, RAF Training Officer and FD/APDT specialist and researcher, this research thesis provides the nexus at which these areas combine to deliver baseline research findings for FD/APDT's purported effectiveness in developing personal psychological, physical, social and spiritual resilience. The researcher has positioned himself between the practical RAF FD/APDT deliverers and the RAF FD/APDT theory/policy that both sit within the Robson Academy of Resilience, to provide further understanding of the 'conceptual bridges' in the transfer of learning between practitioners and the proposed theory.

d. Research aim and question.

The aim of this thesis is to contribute new knowledge to the RAF's understanding of the immediate and short-term (six-months) outcomes of a five-day RAF Force Development and Adventurous Personal Development Training (FD/APDT) intervention for participant's psychological, physical, spiritual and social resilience development. The purpose of the study is to provide research insights to inform RAF and Defence strategy regarding use of FD/APDT interventions for through-career resilience development for personnel and to inform the possible development of FD/APDT interventions for this usage.

To achieve the research aim, the research question is:

1. What are the immediate and short term outcomes on RAF personnel's perceived psychological, physical, spiritual and social resilience after participation in a five-day RAF Force Development and Adventurous Personal Development Training (FD/APDT) intervention?

e. Introduction summary.

This thesis acts as a starting point in understanding the relationship between RAF FD/APDT's theoretical conceptual delivery and practical application. At a tactical (Airman/woman), operational (RAF) and strategic (Defence) level, the effectiveness of the FD/APDT concept and the wider force development interventions purported as essential to personal resilience growth, requires research. This is essential if the RAF is to develop its comprehension of the FD/APDT phenomenon and its proposed linkages to enhanced role performance and organisational resilience development.

The timing for this research is crucial as the RAF moves into a measurement of effect (MOE) phase for the Robson Academy of Resilience (RAR) FD/APDT specific output. The Academy was created as an organisational Headquarters within the RAF's Number 22 Group (responsible for training) to develop resilience education and practical training interventions for RAF personnel. The role of FD/APDT in contributing (in part) to effective resilience training for next generation RAF personnel, supports the RAF Project Astra initiative to “fundamentally change how we train and educate our people to maximise their resilience, flexibility and effectiveness” (RAF Project Astra Briefing notes, 2020, p.5).

Due to the lack of past research on resilience development through FD/APDT within the RAF, it is essential to review the available civilian literature from the theory of resilience, theoretical issues surrounding resilience development, military application and contextualisation of resilience interventions, training and education gaps and the use of FD/APDT programmes in developing resilience. This knowledge will allow the RAF to understand FD/APDT's role as a resilience intervention for future HQ RAR implementation within Project Astra's future RAF vision. Furthermore, the thesis will also consider RAF FD/APDT's utility within a career, through-life RAF Resilience Education Pathway (REP) and how FD/APDT (as a training intervention) in the RAF could, in part, support Defence's intent to deliver success on operations.

Our Armed Forces rely on the skills, commitment and professionalism of our people. We place heavy demands on them. Recruiting, training and retaining the right mix of capable and motivated Service personnel is essential to deliver success on operations (National Security Strategy and Strategic Defence and Security Review, 2015, p.32).

The thesis also provides guidance for future research in the use of FD/APDT programmes within a military socio-cultural specific context for RAF personnel and

contribute to the wider civilian academia knowledge. The study will assist practitioners from both a civilian and military context to influence the wide spectrum of industries that use FD/APDT to develop workforce resilience.

**CHAPTER 2 - LITERATURE REVIEW OF RESILIENCE AND FORCE
DEVELOPMENT AND ADVENTUROUS PERSONAL DEVELOPMENT TRAINING
(FD/APDT)**

Section 1. Introduction to chapter.

This literature review presents the following aspects:

1. Outlines the background for civilian FD/APDT designs through their military beginnings and the structure of contemporary thinking within FD/APDT.
2. The review expands on FD/APDT's founding principles into the key concepts of human resilience growth, neurogenesis, psycho-neuroimmunology, neurophysiological, and cognitive behaviour psychology, with accompanying definitions to develop an understanding of how these concepts are engrained in FD/APDT resilience education.
3. Synergises the key domains of resilience (psychological, physical, social and spiritual) development through the FD/APDT literature review for RAF/military application and presents the foundations for the development of the original contribution to knowledge by this thesis. Synergy is achieved through the presentation of resilience concepts, the development of resilience education programmes, their tactical, operational and strategic military application and gaps in knowledge that underpin the requirement for this thesis.
4. The review concludes by analysing FD/APDT as an intervention for psychological, physical, social and spiritual resilience and the variables affecting

FD/APDT that both promote and undermine its utility as a measurable resilience development medium, for the RAF and Defence.

Section 2. FD/APDT as interventions for military resilience and conceptual skills development.

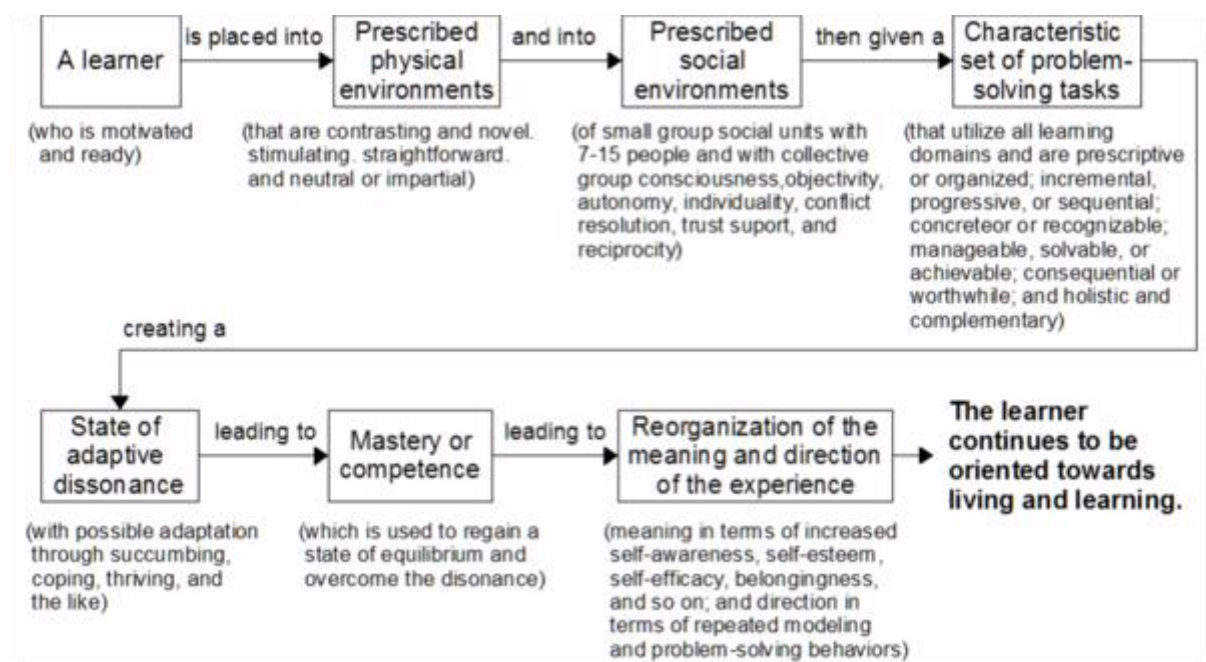
When reviewing the literature surrounding FD/APDT programme's efficacy and utility in developing resilience, it is essential to consider the background and underpinning principles of the FD/APDT phenomena. Contemporary FD/APDT pedagogy, practice and philosophy is considered by Warren (2005), Stott and Ustin (2012) and Quay (2012) to have been founded on a post-Hahnian (Kurt Hahn, Outward Bound founder, 1876-1974) construct that was devised to aid both Royal Navy and merchant seamen/boys to survive at sea through pre-exposure to the associated risks.

Roland, Wagner and Weigand (1995) describes the one-month course devised by Hahn as focused on developing the participant's inner resources to deal with the adversity expected at sea and called this course 'Outward Bound' named after the terminology of the sailors as they left the harbour. Whilst not the first person or organisation to elicit arduous exposure to outdoor environments to develop the social fabric of cultural groups, Kurt Hahn is widely accepted as the founder of FD/APDT; albeit originally derived for military (sailors) purposes (Neill, 2006).

In moving this perception forward, Outward Bound (2018) assesses that Hahn's original vision was to address the six declines of modern youth that he attributed to his perception of apathetic youngsters. These were the decline of fitness, initiative and enterprise, memory and imagination, skill and care, self-discipline and

compassion through the four antidotes (fitness training, expeditions, rescue services and projects) that either singularly or collectively still form the basis of many FD/APDT programmes today. Neill (2006) maintains that Hahn's principles were developed primarily by philosopher William James in the 1920s who believed that men needed an activity or enterprise that could enable them to train within the moral equivalent of war (James, 1968) to develop "Christian manliness" (Boys Brigade, 2018). In capturing this ethos, the Outward Bound model provided linkages from programme outcomes to an enduring contribution to quality of life enhancement to participants as outlined in Figure 1.

Figure 1. The Outward Bound Process Model (Priest and Gass, 1997, p.140, in Neill, 2006).



Prior to Outward Bound, the Scouts, Boys Brigade and British Exploration Society (BES) were already delivering FD/APDT programmes, developed by ex-(or serving) military individuals (Neill, 2006). This military influence manifested itself in many of the organisation's founding principles, underpinned by semi-military disciplinary

constructs. Comparisons for the Hahnian construct of outdoor education identified in Figure 1 and the construct of RAF FD/APDT outlined in the introduction chapter, demonstrates strong similarities for the founding principles of developing conceptual skills through exposure to risk, for the benefit of personal resilience and organisational effectiveness; hence, FD/APDT's purported utility as a resilience intervention. In support of this broadly accepted theory, the nature of the training was to build character (McCulloch, 1991, in Cook, 1999, p.158) and an opportunity to contribute positively to society and demonstrates linkages between military ethos, resilient culture and the founding principles of contemporary FD/APDT (Neill and Dias, 2001, Quay, 2012). After WW2 and society's new freedoms, the onus placed on FD/APDT turned to exploration to make up for lost youth and the "tragedy inflicted on countries through the wars" (Barrett and Greenaway, 1995, in Cook, 1999, p.158).

Although often challenged as ineffective, the broad spectrum of research within FD/APDT has evolved to create a comprehensive, social studies field to develop educational contributions for FD/APDT. These are cited by Smith *et al.* (1992) as outdoor, adventure, camping, somatic awareness, educating, humanistic, play, recreation, and experiential education. In broadening these educational themes, FD/APDT's founding philosophy has not changed, but the perception of FD/APDT as the panacea for the "deepest and most longstanding problems with education itself" (Quay and Seaman-Ware, 2015, p.232) leaves FD/APDT open to conjecture unless its claims are substantiated (Hwang, 2009; Scrutton and Beames, 2015). From a military perspective, the use of FD/APDT in developing resilient personnel and strengthening military socio-cultural group cohesion seems a logical approach when reviewing the literature linkages.

Table 1 outlines the synergies of resilience factors identified between military resilience and FD/APDT research to demonstrate the linkages of the two areas of research. Most of the proposed synergies are highly valued by the RAF and wider military as essential for military service life. Conversely, the synergising of learning theories with resilience research to create an output, with the right programme design, instructor, student’s motivation and environment, can be theoretically developed through several training interventions and is not the sole domain of the FD/APDT practice in the researcher’s opinion.

The most notable synergies of reoccurring traits, demonstrate the reasoning behind the use of FD/APDT in developing resilience in military personnel. For example, military researchers who note the importance of resilience factors within military personnel, such as Sinclair and Britt (2013), identify self-schemas that could be paired with the work of Hattie *et al.* (1997), who identified that FD/APDT interventions developed self-schemas. The linkage presented is that military FD/APDT could therefore in theory, develop military resilience factors.

Table 1. Synergy of military and FD/APDT resilience theory literature.

Military resilience research	Central Synergies identified within the literature	FD/APDT resilience research	Resilience domain categorisation
Sinclair and Britt (2013).	Self-schemas.	Hattie <i>et al.</i> (1997).	Psychological, spiritual,
Sinclair and Britt (2013).	Resilience.	Neill (2004).	Psychological, physical, social, spiritual,
Hall (2011). Hannah, Sweeney and Lester (2007).	Positive mindset.	Fox and Avramadis (2003).	Psychological, spiritual.
Siebold (2001). Gilbar, Ben-Zur and Lubin (2010). Easterbrooks, Ginsburg and Lerner (2013).	Social cohesion.	Collins (2004).	Social, spiritual

Hammermeister <i>et al.</i> (2009). McCrory, Cobley and Marchant (2013).	Self-Schemas (self-esteem, self-assuredness, self-efficacy and self-confidence).	Gatzemann, Schweizer, and Hummel (2008). Goldenberg (2005). Schuman and Sibthorp (2014). Jostad (2014). Cooley, Burns and Cumming (2016). Fuller, Powell and Fox (2017).	Psychological, spiritual, social.
Brewer (2014). Meland <i>et al.</i> (2015). Black (2015). Crisp, Hastings-Tolsma and Jonscher (2016).	Mindfulness Mastery (Coping strategies and mindfulness of stressors).	Mutz and Muller (2016).	Psychological, spiritual.
Bartone (2007). Hystad <i>et al.</i> (2011). Subramanian and Vinothkumar (2011). Sinclair and Britt (2013).	Hardiness (control, commitment and challenge, mental toughness, Able to handle ambiguity).	Howell (2007). Allan, McKenna and Hind (2012).	Psychological, spiritual, social.
Maddi (2007). Carston and Gardner (2009).	Dispositional Optimism (Positive affectivity, Positive cognitive adaptations).	Allan <i>et al.</i> (2012).	Psychological, spiritual.
Eid and Morgan (2006).	Positive approach to adversity and positive cognitive re-appraisal, acceptance.	Sheard and Golby (2006). Passarelli, Hall and Anderson (2010).	Psychological, social.
Sudom, Lee and Zamorski (2014). Coulter (2014). Courtney (2015).	Stress resilience.	Shellman (2011). Beightol <i>et al.</i> (2012).	Psychological, physical, social, spiritual.
Limbert (2004). Ballard (2006). Sinclair and Britt (2013). Birdie and Jain (2014). Nakkas, Annen and Brand (2016).	Active coping strategies.	Dolgin <i>et al.</i> (2014). Koperski <i>et al.</i> (2015).	Psychological, spiritual.
Eid and Morgan (2006). Hall (2011).	Physically robust and fit.	Plante <i>et al.</i> (2006). Andre <i>et al.</i> (2017).	Physical.
Sinclair and Britt (2013).	Psychological capital.	Sibthorp and Arthur-Banning (2004).	Psychological

a. Contemporary FD/APDT.

The array of resilience theories and relabelling of old concepts is a challenge for FD/APDT stakeholders, to ascertain manageable resilience factors. To bring these ideas together for the purposes of this thesis, these resilience factors have been designated into four resilience domains; psychological, physical, social and spiritual resilience based on the historical early influences, underpinning principles of FD/APDT, comprehensive literature review categorisation of resilience domains identified within Table 1 and past research. Consideration was given to include emotional resilience, but the researcher felt this would sit within psychological resilience instead of a standalone resilience domain.

FD/APDT is credited with developing a broad array of traits and factors within the psychological, physical, spiritual and social domains (Harmon, 1978, in Attarian, 1996, p.41). This has been achieved through the use of FD/APDT across multiple research groups including the military (Carless, 2014), college students (Beightol *et al.*, 2012), industry management groups (Reynolds, 2009) and wider social groups to generate these resilience domains. Achieving this resilience development within the FD/APDT, remains a key intervention outcome but can elicit development in other conceptual skills such as teamwork, military skills, leadership and communication. The different perspectives of programme design and implementation within FD/APDT now causes some consternation amongst sceptics of the FD/APDT phenomenon and could be construed as FD/APDT's inability to understand its own business in developing these domains (Kass and Granzol, 2012, in Smith and Walsh, 2019).

With the challenge of defining FD/APDT into a single common nomenclature used across the field, the different terminology for FD/APDT, outdoor adventure, adventurous training and outdoor education demonstrates some coherence to the concept of FD/APDT. Nevertheless, this attempted conceptualisation also highlights the field's inability to identify the correct terminology from which providers and practitioners can build pedagogically sound programme design foundations (Rickinson, 2004). This further limits FD/APDT's defence of its proposed outputs when closely scrutinised, unless credible evidence is available to support its FD/APDT conceptual skills developmental claims of promoting and enhancing participant's resilience. However, there is agreement within the comprehensive FD/APDT literature reviewed for this thesis, that the outdoor experience should form a lived experience (Ord and Leather, 2011), FD/APDT should also provide substance beneath these varying labels under the FD/APDT heading such as outdoor education, adventure education and adventurous training, to deliver a life-enhancing experience (Berman and Davis-Berman, 2005).

When considering this issue of a life-enhancing experience that will enable enhanced resilience and ability to cope with stressors, care must be taken in critiquing this literature. Brooks (2003) and Seaman (2008) warn of the vested interest by FD/APDT providers in eliciting the positive research claims of FD/APDT stakeholders and their refusal to acknowledge the knowledge-practice gap weaknesses in FD/APDT design. Furthermore, concerns are raised within the claims of FD/APDT researchers, many of whom work within the outdoor industry and are advocates of the conceptual skills growth through FD/APDT and/or have received funding to conduct research by outdoor organisations; indeed, the same can be construed of this thesis. This has the potential to undermine the credibility of current

research if not critically evaluated before moving new concepts of contemporary FD/APDT and resilience forward.

Section 3. The use of FD/APDT in developing conceptual skills and psychological resilience.

a. Use of risk to develop resilience domain factors through contemporary FD/APDT.

As the contemporary FD/APDT transfer of learning theory has developed, the exposure to adverse stressors and risk are considered essential for the development of resilience within FD/APDT (Varley, 2006). In contrast to the concept of a lived experience, Hopkins and Putnam (1993) outline the contemporary approach within FD/APDT for the "use of risk" (Varley, 2006, in Rhodes and Martin, 2014, p.280) as the stimulus associated within FD/APDT, to elicit personal growth as one of the main successes of FD/APDT for the insightful transfer of learning. To align theory with practice, Allan, McKenna and Hind (2012, p.15) adopts a scientific approach in crossing the theory-practice gap by drawing from the psychology of resilience theory, in supporting the claims of resilience growth through neurogenesis that is purportedly stimulated by participation in FD/APDT, stating:

The fundamental paradigm of stress and recovery contends that a balance of neurobiological processes help realign psychosocial equilibrium in the short term and over time. Through progressive, repeated exposure to custom-built outdoor challenges, the concept of brain resilience may provide a scientific platform for understanding the mechanisms of achieving meaningful, authentic and healthy outcomes. It could also help to begin to illuminate a section of the black box of adventure processes.

Whilst Clough *et al.* (2016) agrees that much of the literature associated with the concept of risk within FD/APDT is critical to its popularity, the current research literature does not reflect on the impact of the lived experiences during the programme. It further does not provide evidence that risk is the main stimulus for purported growth during or after FD/APDT. For example, the sense of achievement and mastery of either the activity or environment, social cohesion, novel learning environment, enjoyment and new activities are also identified as stimuli for resilience growth within FD/APDT but their collective interaction in creating the stimuli is not fully understood (Baldwin *et al.*, 2004, in Sheard and Golby, 2006, p.189). Prior to "contemporary research on experiential education", Ewert (1989, in Meyer, 2003, p.354) states that for FD/APDT to be successful, it must involve;

1. The emergence of a shared meaning. The phenomenon of shared meaning is one that must evolve over time, and a shared experience is a crucial first step.
2. A spirit of cooperation. The addition of the value of cooperative efforts is complementary to competitive and individualistic behaviours already common in many organisations.
3. A high level of engagement. Risk and excitement of real-life activity raises attention and enjoyment levels above purely verbal or visual learning.
4. Dealing with dissonance or uncertainty. Risk, fear, and dissonance play an important role in the learning of new skills and the applying of old skills to new situations.

Within a military context, this group exposure to cooperate during controlled risk and inferred hardiness, is a fundamental isomorphic tenet of FD/APDT (Sheard and Golby, 2006) that elicits the tacit knowledge and positive stress responses required for personnel to operate under stress in unfamiliar environments (Gass, 1993 in Bell, 2003, p.41). This demonstrates the psychological, physical, spiritual and social resilience required for military personnel that synergises with the FD/APDT resilience

factors identified in Table 1. The UK military Joint Services Publication Number 419 (2016, p.3) outlines the UK military's interest in this concept of resilience growth through exposure to risk during FD/APDT as:

Mandated, military training which, through exposure to challenges and controlled risk, enables service-personnel to develop the fortitude, rigour, robustness, initiative and leadership necessary to deliver the resilience that military personnel require on operations and during other military tasks.

In further considering the use of contemporary FD/APDT for military resilience, Hicks (1996) states that experiential learning, including FD/APDT, has long been recognised as among the most effective means of acquiring professional education and training. The number of organisations that adopt the conceptual skills growth theories within their training and education frameworks is growing in popularity and not just a fad (Puchan, 2005). But there is contention that many of these organisations do not understand the proposed outputs of the FD/APDT intervention and are not aligned to any specific organisational required skill-set of the employees, which limits their potential to achieve their aims (Ewert, 1989; Sibthorp, 2003). In contrast, the use of FD/APDT to develop conceptual skills growth in both individuals and groups is well documented according to Malick and Stumpf (1998), Paquette *et al.* (2014) and Allison *et al.* (2018).

To expand on this point, in a review of 97 FD/APDT programmes, Hattie *et al.* (1997) found the most notable conceptual skill development purportedly enhanced through the reviewed programmes were elements of self-schema growth, specifically self-esteem, essential for resilience, that aligns with the psychological, spiritual and social resilience requirements of military resilience factors outlined in Table 1. The development of these elements is further supported by Gass, Goldman and Priest

(1992), Lipsey and Wilson (1993), Cason and Gillis (1994), Sibthorp (2003), Harrison (2004), Joseph and Linley (2006), Bobilya *et al.* (2010) and Beightol *et al.* (2012) identifying high correlations between resilience growth factors and FD/APDT. Conversely, in similar studies on self-schema and resilience growth through FD/APDT, Cytrynbaum and Ken (1975) found no significant changes in participants' self-esteem that could be attributed to student antecedents (Sibthorp, 2003). The overall results for research conducted by Hattie *et al.* (1997) noted the successful development of self-schemas but outlined the requirement for additional research into the correlations between resilience growth and FD/APDT.

In addition, literature surrounding the resilience and conceptual skills purportedly learned through FD/APDT focuses on the isomorphs, tacit knowledge and active coping strategies developed through the experiential education programme that are affected by psychological, physiological, spiritual and social variables (Krouwel and Goodwin, 1994; Clements, Wagner and Roland, 1995; Jones, 1996, in Oswick and Grant, 1996). These resilience factors demonstrate the inter-reliance of all four domains of resilience identified in Table 1 in achieving success within resilience interventions. When coupled with the biopsychospiritual homeostasis (Richardson, 2002) neuroplasticity, neurogenesis, psychoneuroimmunology, cognitive psychology and neurophysiology growth factors, the literature provides support for the use of FD/APDT in resilience development; although without absolute certainty as to how adaptations occur, especially in the military. With commonly used phrases such as 'may enhance', 'could benefit' and 'requires further investigation' appearing regularly within the literature, alongside positive comments, there is significant room for improvement.

b. FD/APDT transfer of resilience learning models into the workplace.

The transfer of resilience learning through FD/APDT into the workplace, links to the research aim by assessing the short-term outcomes of personal resilience and research participant's perceived transfer of learning through training into primary roles. Indeed, the multiple theories of conceptual transfer of learning, reliance on anecdotal evidence (Baldwin *et al.*, 2004, in Sheard and Golby, 2006, p.189) and student's perceptions of learning development, contribute to the complexities of understanding 'why' these changes happen (Houge-Mackenzie, Son and Hollenhorst, 2014).

To develop this understanding of 'why' these changes happen, Rickinson's (2004) review of 150 FD/APDT research articles categorised learning through FD/APDT as cognitive, affective, inter-personal/social, physical and behavioural. Whilst this may look promising for the use of FD/APDT, Huey *et al.* (2014) proposes the need for a structured intervention design and consideration of activities but more importantly, addresses the current affecting factors within FD/APDT course design and activities outlined within the current research and this thesis' literature review.

In Burke and Collins' (2004) inconclusive evaluation for the transfer of learning of conflict resolution from FD/APDT, they proposed that procedural (tactical-high fidelity or knowing how) and declarative (strategic-low fidelity or knowing that) knowledge were of importance during FD/APDT's transfer of learning. They noted that providers focused more on the activity than the reflective or behavioural components of the programme with a lackadaisical approach of 'it works because it works' (Burke and Collins, 2004; Collins, Sibthorp, and Gookin, 2016).

Burke and Collins (2004) concluded that declarative knowledge, pertinent for this thesis' FD/APDT low-fidelity activities, would be more applicable for the student's success in applying the learning outcomes of the FD/APDT, in keeping with the practical element of Gestalt theory of learning (Wertheimer, 1912, in Ellis 1938) to apply insightful learning. However, the Gestalt theory of learning is contested by Klint (1999) who argues that FD/APDT providers can only describe (but not understand) the process. This concern further limits the field's ability to move forward in its knowledge base from describing to understanding the FD/APDT phenomenon (Tozer, Fazey and Fazey, 2007).

Moreover, this insightful learning attitude to understand the application of FD/APDT transfer of learning, will disseminate throughout their immediate social demographic (Berman and Davis-Berman, 2005) to create a resilient community of practice, dedicated to achieving the same goal. In the RAF's case, this remains the delivery of Air Power and the Defence of the UK airspace. As these immediate communities develop their resilience and interact with other organisational groups, this resilience and culture of insightful learning will permeate throughout the organisational fabric of the RAF. As the principle construct behind FD/APDT, the transfer of learning to elicit this lasting, insightful learning has been further supported by research conducted by Gass (2004), Goldenberg *et al.* (2005), Gassner, Kahlid and Russell (2006) and Sibthorp and Jostad (2014). Furthermore, Meyer (2003) noted that some degree of at least psychological, if not physical, similarity between the training activities and the desired organisational skills is necessary to promote transfer of tacit knowledge and bridge the gap between experience and learning.

However, as Daniel (2010, in Bobilya *et al.*, 2010, p.94) states "few researchers have compared what participants intend to transfer and what they do transfer to their home environment" and this extends to the cognitive behavioural changes that supposedly occur through FD/APDT. In the RAF's case, this 'home environment' is their primary role within their respective units. This view is contested in leadership efficacy findings research by Rhodes and Martin (2014) during five and twelve-day FD/APDT military leadership programme that found enhanced leadership behaviours four months after the course.

In evidencing the transfer of learning into the workplace, research by Rhodes and Martin (2014) demonstrated the transfer of enhanced leadership behaviours specifically attributed to the training intervention and workplace requirements, but still does not demonstrate the FD/APDT programme's longitudinal or life-enhancing claims. Significantly though, within Rhodes and Martin's (2014) findings, was the congruence between participant's unprompted descriptions of change, e.g. themes of dealing with challenging situations and positive attitude, and the learning outcomes, e.g. controlling behaviour, communication, decision-making under stress and applying peak performance psychology, respectively. This suggests outcomes from the course, while moderate in extent, are in line with the New Zealand Army Leadership Centre's intended outcomes for whom the FD/APDT was designed in Rhodes and Martin's (2014) study. The implications are that similar conceptual facets of resilience and themes of dealing with challenging situations and positive attitude, are comparable and imply that FD/APDT programmes also positively affects resilience within military participants over time.

To establish this understanding, it is first important for the reader to note the challenges associated with low-fidelity training, little technical procedural relevance to the job, interventions such as FD/APDT. This is further challenging considering that Seaman and Rheingold (2013) states that Bobilya *et al.* (2010) are the only researchers to provide evidence-based research into the 'knowledge-ability' and efficacy of FD/APDT; there may be a reason for this as Harper (2010) challenges the notion of evidence-based research in FD/APDT as creating a false idol. This false idol claim may come from a lack of understanding about the transfer of learning and concerns about quantitative data that some researchers require before validating the FD/APDT phenomenon. As FD/APDT is deemed as low fidelity, declarative low fidelity can bring together groups to solve organisational problems based on individual skill sets and thus develop group and personal resilience in achieving workplace tasks and duties.

This is why FD/APDT is popular according to Burke and Collins (2004). The ability for this insightful learning to be transferred to another situation, workplace, primary role and operational environment, is central to the proposed transfer of learning through FD/APDT according to Broderick and Pearce (2001). The literature highlights FD/APDT's transfer of learning concerns and the facilitator's role when considering their ability and training to elicit the learning from the group. This is further compounded if facilitators are unable to contextualise learning from FD/APDT interventions into the student's workplace. This inadequate training could fail to capitalise on general facts that can be applied to a specific setting (Burke and Collins, 2004) through schema, script frames or knowledge structures to link the 'knowing of and knowing in' practice (Billett, 2001; Desmond and Jowitt, 2012; Roth *et al.*, 2014b).

This proposed insightful learning would also allow for the participants to apply thoughts and processes learned from the FD/APDT into their workplace (Sibthorp, 2003). This theme repeats itself routinely throughout the literature with Klint (1999) agreeing with this inability of providers and students to understand how the transfer of learning occurs (Asfeldt, Hvenegaard and Purc-Stephenson, 2014; Scrutton and Beams, 2015) or the "leap of faith" described by Mazany, Francis and Sumich (1995, in Burke and Collins, 2004, p.679). Furthermore, Masten's (2001) concept of 'ordinary magic' or elemental mystery (Harris, 2012, in Rogers, 2016, p.2) or to just "trust the journey" (Asfeldt and Beames, 2017, p.72) to explain the transfer of learning in FD/APDT, does not carry weight when scrutinised against the question of if or how the transfer of learning takes place.

In order to develop the resilience constructs identified within the resilience research literature, organisational resilience training (Patterson and Kelleher, 2005) must provide opportunities for telic (serious) and paratelic (playful) tacit knowledge transfer and be rich in contextualised resilience exposure (Shooter, 2010). This will elicit the desired resilience understanding proposed by Davidson, Ewert and Chang (2016) that is further supported by Edwards' (2006) agreement that contextualised learning is essential in adult, lifelong learning.

To enhance the programme's transfer of knowledge effectiveness, Kinsella (2001) and Waite (2007) assert the importance of reflection during FD/APDT to provide the opportunity for reviewing personal learning and growth to continue the hermeneutic spiral of resilience education. This is important for the reflexive transfer of learning from the FD/APDT intervention to personal resilience growth. This period of reflection and reflexivity is a key component to assess the proposed transfer of

learning for this thesis and the effect of the FD/APDT on their workplace transfer of learning and resilience development. This contextualised training programme design to elicit the transfer of learning is echoed through the literature in order to develop multiple conceptual skills; including resilience. Indeed, the RAF's usage of FD/APDT for much of its resilience and conceptual skills development is an opportunity to train within James' (1910) moral equivalent of war; albeit developing the RAF 'war-fighter spirit' (RAF, Generic Education Training Centre, 2005). Whilst this evidence supports FD/APDT, Klint (1999), Brookes (2003) and Baird (2010) raise concerns that challenge the immediate and purported benefits of FD/APDT in developing significant conceptual or insightful learning transfer into the workplace.

Claims that these traits have improved are “flat earth” findings; either neo-Hahn outdoor adventure education has stumbled onto a means to make human behaviour more predictable than decades of social psychology research has been able to demonstrate or such claims must cast serious doubts on the research projects that generated them (Brookes, 2003, p.126).

Furthermore, FD/APDT is credited as providing these desired adverse situations stimuli with subjective controlled risk and therefore can be utilised as a viable training intervention for resilience training. But as Medina (2008, in Allen *et al.*, 2012, p.6) argues, "the complexity and individuality of resilience has roots in the genetic construction and malleability of the human brain". Although all human brains possess standard neuroanatomy, each adapts to reflect the demands of past and prevailing environments, so that even the "brains of identical twins become wired differently in response to the same stimuli" (Medina, 2008, in Allen *et al.*, 2012, p.3). This presents challenges for the design and assurance of resilience and FD/APDT training programmes as a 'one fit for all' (Beard and Wilson, 2006) approach to training.

On the transfer of training from FD/APDT, Meyer (2003) specifically discusses the impact of identical elements and stimulus variability on the transfer of training back to the organisational setting. The notion of identical elements addresses the physical and psychological similarity between the stimuli and response elements in the training and actual organisational settings. It is generally proposed that greater similarity between the two settings maximises the transfer of training (Baldwin and Ford, 1988).

Here, it is suggested that the use of several different examples of the concept to be learned and training intervention relevance (identical elements and stimulus variability) increases participant's understanding and ability to apply the concept in a new situation (Baldwin and Ford, 1988). This is an underpinning reason for the RAF to cite FD/APDT as a suitable training medium according to JSP 419 (2016); Air Publication's 3349, Leaflet 1275 (2016) and Air Publication 9012 (2017) for RAF personnel's career resilience development.

Paisley *et al.* (2008) attempts to draw together the multiple affecting factors of FD/APDT into structure orientated mechanisms, instructional, student, student and instructor, environmental and social but makes no reference to the significance of the relevance of the activity-orientated mechanism. In applying Paisley's *et al.* (2008) mechanisms within FD/APDT, Thomas (2008; 2010) posits that contemporary FD/APDT must have a defined purpose for the activities used to create outcomes and not use the same activity to elicit all conceptual learning including resilience. Although outside the scope of this thesis, these mechanisms are considered within RAF FD/APDT alongside stakeholder's experience in programme design, but they are not consciously measured or evaluated to understand what outcomes these

mechanisms or affecting factors have on the FD/APDT's ability to promote resilience development.

These affecting factors have been identified within the literature as the facilitator, student, programme design, contextualisation, activities, aims, transfer of learning, environment, reinforcement and isomorphs, tacit knowledge (Sameroff and Rosenblum, 2006; Paisley *et al.*, 2008; Thomas, 2010) and have immediate applicability when devising military FD/APDT programmes. In supporting this approach, Hill (2012, p.18) states that "change can take place in three areas for educators: first, in philosophy, values and understanding, second, in infrastructure, resource use and programming, and third, in teaching and learning strategies. It is at the nexus of these three areas that the most effective pedagogical change can be found". Sibthorp (2003) asserts that the inter-relationship of other affecting variables such as the individual, social environment, physical environment, task structure, the course and facilitator, remains poorly documented by empirical studies and their effect remains unsubstantiated.

c. Facilitation of FD/APDT learning.

Nelson and McFadzean (1998), Kirkpatrick (1998) and Thomas (2010) cite the role of the facilitator as a critical factor in delivering the programme's desired outcomes. However, the literature is lacking in its identification of the training offered to facilitators in dealing with the vast subjective variables experienced within the student's or facilitator's ontological framework that will impact on the programme's success. Whilst the literature provides lists of competencies, there is no prescriptive toolkit for FD/APDT facilitator competencies (Northridge, 1994; Medina, 2001;

Paisley *et al.*, 2008; Thomas, 2011; Patton, Parker and Neutzling, 2012; Sibthorp and Jostad, 2014; Salinitri, Wilhelm and Crabtree 2015).

To emphasise the broad variability of facilitator competencies, the National College of School Leadership (2012) identifies self-awareness, emotional self-awareness, accurate self-assessment, self-confidence, social awareness, empathy, contextual awareness, self-management, emotional self-control, achievement orientation, adaptability, relationship management, developing others, co-facilitation skills, group management, enquiry strategies, designing learning experiences, knowledge and understanding, learning facilitation and leadership impact. Haskins and Clawson (2006), Paisley *et al.* (2008), Maxwell (2009), Catano and Harvey (2011) and Richardson *et al.* (2014) focus mainly on the specific competencies required of successful facilitators, presenting similar competencies such as communication, respect, rapport, social awareness and openness. Hayashi and Ewert (2006) focused on the emotional intelligence (EI) and transformational leadership (TL) ability of facilitators, perceived as crucial over-arching traits for FD/APDT programme facilitators when considering student's needs and expectations in the teaching and learning process (Yew and Yong, 2014).

When theorising these vast facilitation traits, FD/APDT literature presents a variety of learning theories essential for consideration for the facilitation of learning that adds further challenges in assessing the utility of one over another. In addition to experiential learning theory, the author has identified the most prevalent theories of learning as Dual Coding Theory (Paivio, 1971), Socio-cultural Theory (Vygotsky, 1978), Reflective Practice Theory (Schon, 1983), Congruence Theory (Schön, 1983), Self-Regulated Learning (Zimmerman, 1984), Constructivism (Grundy,

1987), Self-Efficacy Theory (Bandura, 1997), Social Cognitive Theory (Bandura, 1997), Cognitive Load Theory (Sweller, 1988), Social Practice Theory (Bourdieu, 2000; Lave, 1996), Information Processing Theory (Miller, 2003) or Cultural-Historical Activity Theory (Roth, 2014a), which place the student-facilitator relationship at the fore of the theories concepts and success. In the researcher's opinion, these theories emphasise the importance of an effective facilitator for the RAF FD/APDT and is an important consideration during this thesis' research as the facilitator will be a central figure in contextualising the transfer of learning and the perceived effectiveness of the FD/APDT intervention. The effectiveness of the facilitator is a key component for the development of existing and future RAF FD/APDT interventions, facilitator training and education for consideration in future longitudinal research.

Despite the essential student-facilitator relationship highlighted in the literature, many FD/APDT programmes are designed around organisational learning requirements (Argyris and Schön, 1978) without considering this relationship, proposed student learning theories, student requirements or the philosophical beliefs of the educational institution. This includes community, social or religious beliefs that undermine the validity of the FD/APDT intervention and credibility of the facilitator. These critical considerations would influence the transfer of learning outcomes for this research as a non-credible FD/APDT programme, delivered by a non-effective facilitator, will not deliver the same student experience as a credible, contextualised FD/APDT programme delivered by an effective facilitator. However, to ascertain these proposed variables, the RAF must first understand its current baseline for the FD/APDT intervention for developing resilience. Once this baseline is understood, then training interventions can be developed for the affecting variables of FD/APDT,

measuring each in turn such as programme design and facilitator competencies, against any proposed changes in the FD/APDT's effectiveness in developing resilience.

Although a convincing array of interlocking or contesting theories, these theories within FD/APDT are described by Ord and Leather (2011) as barriers to learning as they create confusion as to which theory is the most effective. Russell, Gillis and Lewis (2008) use the theories to bind the loose-programme designs surrounding FD/APDT and add substance to the large qualitative and subjective individualistic learning that occurs. Most prevalent of the theories within FD/APDT programme delivery are Social Cognitive Theory (Bandura, 1977, in Schuman and Sibthorp, 2014, p.197) and Experiential Learning Theory (Dewey, 1938; Kolb, 1984; Hopkins and Putnam, 1993; McCarthy, 2016) that appears consistently as a founding learning theory within FD/APDT. Experiential Learning Theory is the most favoured explanation of 'how' students learn within their social environmental constructs through FD/APDT as argued by Hattie *et al.* (1997), Malick and Strumpf (1998), Broderick and Pearce (2001), Williams, Graham and Baker (2003) and Hedlund *et al.* (2003).

However, the reliance of FD/APDT on experiential learning in Figure 2 and the learning experience cycle (Hopkins, 1993; Holman, Pavlica and Thorpe, 1997; Vince, 1998 in Akella, 2010, p.103) raises concerns in the inability of the theory to contextualise the FD/APDT experience in the participant's lives. The facilitator can only compartmentalise the experience (Brown, 2008) and is further compounded by theory that is not understood by practitioners (Baird, 2010).

Figure 2. Experiential learning. Kolb and Kolb (2005, p.195 in Zull, 2004, p.69).

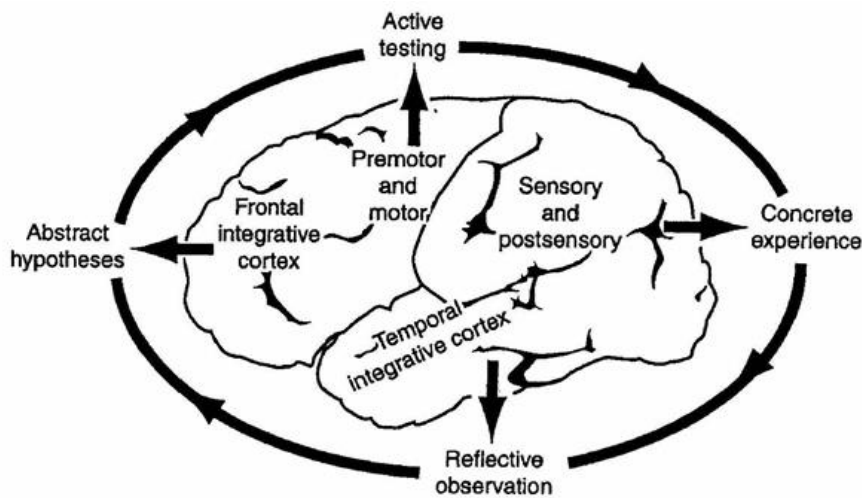


FIGURE 1

The Experiential Learning Cycle and Regions of the Cerebral Cortex. Note. Reprinted with permission from (Zull 2002).

Gass and Priest (2006) and Garner (2010) further highlight concerns, citing that many professionals have questioned whether these facilitation models truly benefit individuals and their respective organisations (Mack, 1996, in Gass and Priest, 2006; Hovelynck, 1998, 2003; Rongen, 2004, in Gass and Priest, 2006).

For the student to have a meaningful learning experience (Taniguchi, 2005) that immediately relates to their lives, the facilitator must understand the context from which to facilitate for these students (Brown, 2004). This allows the facilitator to move "beyond teacher-student rhetoric to enhance deep learning within students" (Spegel, 1996, in Brown, 2004, p.162) and Brandi *et al.* (2014). Argyris and Schön, (1978) with Dewey (1972) argue that structuring the learning around the organisational or student's philosophical framework promotes immediate student-buy-in. These factors are significant within this thesis as the facilitator's ability to contextualise the learning, could also impact on the student's transfer of learning to the workplace.

Furthermore, understanding the organisational philosophy of the FD/APDT students and how (Flor, 1991; Hubball and West, 2008) they learn, is argued as critical in imparting slow-knowledge (Knapp, 2010) that develops over time to meet the contextualised learning aims of the FD/APDT programme. This 'slow knowledge to sound evidence' gap could be seen within the literature as the missing piece for validating the efficacy of FD/APDT.

In promoting this 'slow knowledge to sound evidence', Heidegger (1997, in Roth, *et al.*, 2014b, p.521) asserts that many facilitators do not understand the "knowing-what-for and knowing-in-order-to" concept when delivering FD/APDT and critically, the context of learning. With these past research concerns over the inability of facilitators to move FD/APDT conceptual learning forward, the literature presents a sound argument for the investment of FD/APDT facilitator education (Institute for Outdoor Learning, 2017) to ensure FD/APDT programme success. Knapp (2010) supports the previous opinion that this issue can be addressed by the contextualisation of the facilitators who understand the organisation's philosophical framework and sociological foundations. Furthermore, they can codify the conceptual learning (Romme and Damen, 2007) and build conceptual bridges to cross the theory-practice gap to implement the transfer of learning through interpersonal and intrapersonal skills (Hayashi and Ewert, 2006; Baird, 2010; Harper, 2010).

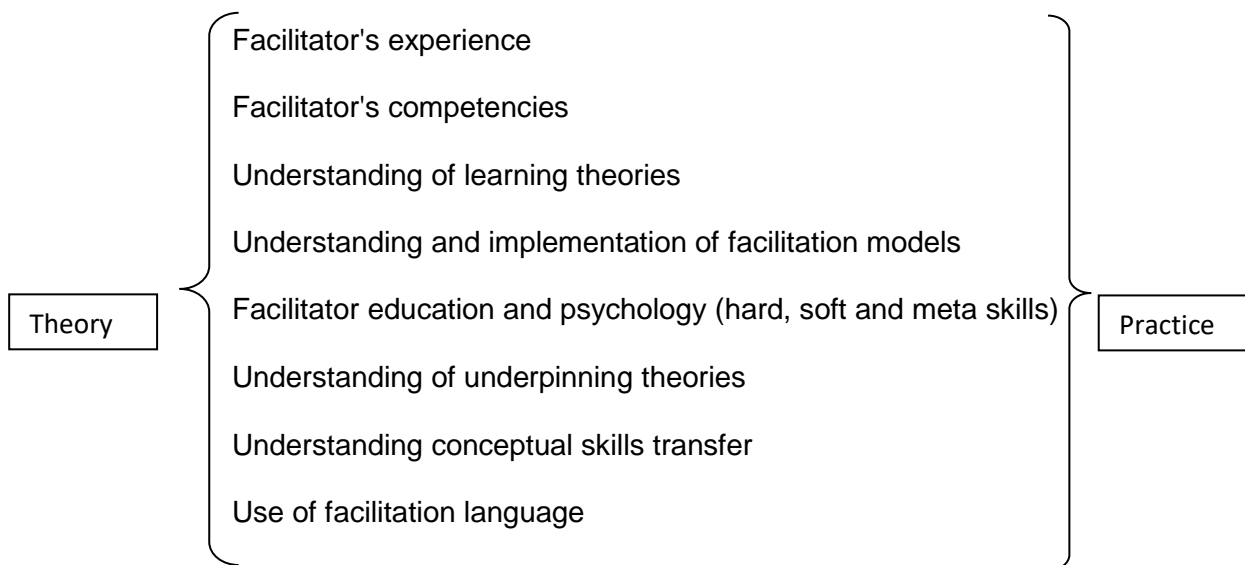
In contrast and despite this requirement, Thiagarajan (1999, in Greenway, 2004, p.48) states:

After 15 years of field research, "I did not find consistent, common behaviours among these facilitators. Further, even the same facilitator appeared to use different behaviours with different groups, even when conducting the same activity. To make matters worse, the same

facilitator sometimes used different behaviours with the same group within the same activity at different times”.

When considering this approach and broader concerns with the theory-practice gap, Deslauriers *et al.* (2016, p.310) cites that "since a great deal of research on experiential learning programmes neglect to make ties between programme outcomes and educational theory, there is a gap in knowledge regarding how students experience a programme". It could be argued that any transfer of learning failing is dependent on the facilitator's inability to bridge the theory-practice gap, through their understanding of contextualised learning theory implementation of the FD/APDT transfer of learning/resilience growth theories. Facilitator variables of the theory-practice gap can be collated into themes in Figure 3. These themes emerge from the literature to create metaphorical bridges that can only be generated by the facilitator.

Figure 3. Metaphorical conceptual/contextual bridges in FD/APDT and the role of the facilitator.



Thomas (2011) discusses the convergence of facilitator education (technical, intentional, person-centred and critical facilitator) to formulate multiple facilitator models or opportunities for development. These are identified by Brown (2010) and Neil (2006) as required to cross these metaphorical bridges and emphasises the importance of successful facilitation within this thesis, during conceptual skills and psychological, physical, social and spiritual resilience education for the effective transfer of learning into the participant's primary role. Table 2 outlines these facilitation models and their role in understanding the proposed impact that a facilitator has on the transfer of FD/APDT learning within the workplace. The table also outlines the literature field's efforts to quantify or validate these models' efficacy in the transfer of learning within experiential education/FD/APDT.

Table 2. Facilitation models in FD/APDT.

Model	Researcher	Theory
Mutual Learning Model.	Schwarz (2002).	Cohesive approach to learning by student and facilitator to address transparency, curiosity, informed choice, accountability and compassion.
Unilateral Controlling Model.	Schwarz (2002).	Achieving goals through controlling the group. Can be deemed constructive in bridging theory and practice gap.
Pyramid Model of facilitation.	Hunter, Laursen and Seymour (2007).	Provision of a tiered approach to levels of intervention and supporting learning environment.
Living Frame of Facilitation.	Hogan (2002).	Framing facilitation for the here and now.
Balanced Facilitator Education Model.	Thomas (2011).	Technical Facilitator Education approaches which are skills based and formulaic whereas Intentional Facilitator Education approaches are purposively grounded in theory. Person-centred Facilitator Education approaches are still intentional, but they emphasise the attitudes, personal qualities, or presence of the facilitator. Finally, Critical Facilitator Education approaches seek to raise an awareness of the political nature of facilitation (Thomas, 2011, p.3).

Six generations of facilitation model.	Priest and Gass (1997).	Letting the experience speak for itself (1940's). Speaking for the experience (1950's). Debriefing or funnelling the experience (1960's). Directly frontloading the experience (1970's). Framing the experience (1980's). Indirectly frontloading the experience (1990's).
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If these theories are combined with the facilitation of learning theories, facilitator competencies and FD/APDT specific facilitation models, it is the researcher's opinion that without the facilitator's comprehension of their own positioning and application of theories, the facilitator will not be able to capitalise successfully on the student's contextualised transfer of learning. This transfer of learning will occur through a complex interplay of the theories of learning instead of a single concept through the use of low fidelity activities to elicit the conceptual skills associated with successfully completing FD/APDT tasks with risk to life consequences. The student's successful completion of tasks by overcoming fear through coping strategies, self-talk and positive reframing of the risk to elicit positive outcomes, embodies the holistic concept of FD/APDT's transfer of conceptual skills learning, that are then enacted during the participants' primary role, operational deployments and military career.

d. Student variables.

Student variables and approach to the FD/APDT programme will affect the perceived efficacy of the programme in meeting its aims, according to Bobilya and Akey (2002), Sibthorp *et al.* (2008, 2011, 2014) and Jostad (2013). These variables have been cited as attitudinal, motivation, implicit theories (mindset), social acceptance, programme engagement and intentional activity (Caluori, 2014) and are a key consideration for this thesis.

This is due to the changeable behaviour that can manifest as a result of how the student may perceive they are required to react during the intervention, peer or superior pressures to complete tasks, organisational demands such as participation in an FD/APDT programme for promotion or their belief in the efficacy of the programme. These will have an impact on the student's behaviour, with Cooley, Burns and Cumming (2016) highlighting the student's attitude, self-efficacy, and instructor's perceptions, further supported by Ezer, Gilat and Sagee (2010, p.402) as being "likely to be important areas of measurement when assessing skill development during outdoor adventure education (FD/APDT)". Using the term "likely" draws an assumption on the non-committal approach to FD/APDT student variables from which to formalise a definitive and agreed list, from which programme designers can embrace or challenge student's behaviours.

The complex interplay between the student-facilitator variables, FD/APDT programme's proposed outcomes and mechanisms of learning is essential in understanding FD/APDT, as studies by Gass, Goldman and Priest (1992), Francis *et al.* (1995) and Hattie *et al.* (1997) demonstrated. These studies showed the positive relationship between FD/APDT and conceptual learning, teamwork, leadership styles and self-schema concepts, but were also unable to identify how learning occurred for each person involved. Shivers-Blackwell (2004) explored the positive relationships between FD/APDT and conceptual learning to develop the theory that FD/APDT yielded different outcomes with different participant characteristics, e.g. gender and diversity configurations. This research was limited due to concerns with using specific social groups to explain generalisations of research findings in FD/APDT.

Whilst the social cohesion (Alliger *et al.*, 2015) and student's engagement with the programmes are vital concomitants of FD/APDT programme's proposed transfer of learning, Davidson *et al.* (2016) found that precursor confounding variables will affect the student's approach to perceived resilience growth, through their past exposure to FD/APDT or cognitive familiarity with FD/APDT activities. For example, it can be assumed that military trainees who may have been members of youth movements such as the British Expeditionary Society (BES), Boys Brigade, Boy Scouts, Girl Guides or completed the Duke of Edinburgh awards, are more likely to be comfortable in the outdoor environments during military FD/APDT than a student who is experiencing both the outdoor environment and practical activity for the first time. In this context, FD/APDT programme design must address group variables to ensure resilience growth, but as Bonnano (2012) notes, even in the face of severe stressful learning experiences many individuals remain asymptomatic to the proposed outcomes of the intervention.

Sameroff and Rosenblum (2006) note that the social context may be a better predictor of resilience. If the social environment is perceived as resilient and the FD/APDT social-group seen as a mechanism to train this resilience, this could be perceived as a research bias (Fiennes *et al.*, 2015) on behalf of the participant's desire for group acceptance. Proposed student resilience development through wanting acceptance into the resilient socio-community could explain how and why FD/APDT students embrace the concept of social acceptance within this resilient group; both during the FD/APDT intervention and the wider RAF. This can have both positive, the group develops resilience and negative, potential contamination of FD/APDT's effectiveness, connotations such as the group or individual feels they have developed resilience as a result of participation in the intervention.

Indeed, the use of social groups to elicit both individual and group insightful learning is cited by Hartenberger, Lorenz and Lützkendorf (2013) as key to the success of FD/APDT and could address the vast subjective issues and psychosocial factors such as self-esteem, self-confidence, enhanced locus of control, improved conflict resolution and problem solving skills, increased group cohesion (Cason and Gillis, 1994, in Sheard and Golby, 1996, p.190; Hattie *et al.*, 1997; Neill and Richards, 1998; Hans, 2000). This positive effect from FD/APDT in developing cohesive factors in a military socio-cultural group has also gained traction with critics within the literature for the process of FD/APDT's transfer of learning (Brown and Fraser, 2009; Brown, 2010). These critics challenge the efficacy of FD/APDT and facilitators in meeting individual student's needs, but align with Lave's (1996) perception that learning is social (Richards, 2014; Richardson *et al.*, 2014; Davidson, Ewert and Chang, 2016).

Indeed, research studies show how the outcomes achieved are attributed more to the group experience of challenge, than to the actual activities of the course (Sutherland and Stroot, 2010; Goldenberg and Soule, 2011). Students are more likely to connect with the programme, embrace the learning outcomes and benefit more if the outcomes are directly relevant to the student's lives (Daniel *et al.*, 2014). The successful implementation of the FD/APDT programme in both fidelity and efficacy, must address the fundamental groundings of the student's ontology, social variables, learning style, personal and group motivations, perceptions of risk, self-efficacy, individual and group aspirations and intrinsic or extrinsic reward (Seaman and Gass, 2004; Howden, 2012).

In advancing the concept of resilient communities through resilient members, Austin (2009) describes the role of the individual's sense of place as an essential factor for student's growth within FD/APDT. This is supported by research from Sibthorp (2003); specifically, the student's intimacy with the natural process, community and history of one's place (Austin, 2009). This is an essential concept when considering resilient military social community gains through FD/APDT programme's sense of place, further advancing the community and sociological resilience growth claims purported through FD/APDT.

As an opportunity to foster the development of a community among students, the literature purports that FD/APDT offers new recruits an opportunity to immediately engage with their new military social community and contextual awareness of the FD/APDT intervention. The RAF currently endorses this practice with new recruits on the Basic Recruit Training Course (BRTC), Initial Officer Training (IOT) (phase 1) and Trade Training (phase 2) but without validating the outcomes of the FD/APDT programme or the concept of their sense of place growth (Austin, 2009) through FD/APDT as part of their cultural immersion. More importantly, Jacobs and Archie (2008) noted that the sense of belonging to a community or socio-cultural group, positively impacts organisational retention that is further endorsed through studies by Newton, Becker and Bell (2014). Vasterling *et al.* (2015, p.527) noted that "soldiers reporting lower levels of unit support were more than twice as likely to separate from service as those reporting higher levels of support from their military peers and leaders".

According to Caluori (2014, p.7), this group cohesion, "can help the steeling effect against stress and that finding an individual and collective identity can help us gain

perspective, to better manage stress, so we do not experience the Firehouse Effect” or over-demands on the brain. Whilst easy to align the growth of these communities through FD/APDT, there are a plethora of military and socio-cultural affecting variables that are inherent in military sociological groups that are not addressed within FD/APDT literature.

A number of studies into student perceptions of FD/APDT's purported successful transfer of learning, highlighted the empowerment placed on the students to complete tasks (Hopkinson and Hogg, 2004) and could be perceived as a 7th phase of Priest and Gass' (1997) 6 generations of facilitation model. This student empowerment and self-discovery is supported by Sibthorp and Arthur-Banning (2004) but draws criticism from McKenzie (2000) for FD/APDT's assumptions regarding the transfer of learning and programme efficacy. Specifically, how FD/APDT provides a physical and mental challenge to stimulate students to ensure student buy-in to an authentic experience (Sibthorp, 2003). The literature further provides the central theme that the answer is fundamentally grounded in the student's ontology, social variables, learning style, personal and group motivations, perceptions of risk, self-efficacy, individual and group aspirations and intrinsic or extrinsic reward (Seaman and Gass, 2004; Howden, 2012).

This experience is consistent with Marsh's (1999) findings that FD/APDT providers with a self-development philosophy, achieved a reasonably high effect size, whereas for FD/APDT providers without such a philosophy, participant changes were negligible. These findings lend credibility to the possibility that the organisational mission and culture is a critical programme factor, and this could explain the strong

effect sizes that have been reported in previous organisationally focused FD/APDT (Hattie *et al.*, 1997).

e. Programme design.

Hoffman and Berg (2014) purported that their research demonstrates outdoor environments are key sites for the intersection of education and practice in evolving professional identity, further supported by outdoor environmental research by Fernandez-Rio (2015). Furthermore, Ewert and Yoshino (2008, 2011) state that augmented challenges from activities within adventure programming have been associated with enhanced resilience, with Baldwin and Ford (1988, in Meyer, 2003, p.353) accentuating the “importance of training design in the transfer of training” within FD/APDT.

The literature proposes that the use of the outdoor environment provides context to the concept of external stressors in a perceived risk-to-life environment. This is conducted to elicit the resilience adaptations required within civilian and military contexts, with learning by experience (Foran, 2005), role modelling and observing (Schoener, 2001), exposure to wilderness (Hendricks and Miranda, 2003) and identifying the significance of the objective (Gass, 2004) cited as ways of contextualising. Also outlined as essential factors of programme design success and crucial to experiential education programmes, were reflection sessions (Brookfield, 1988; Maxwell, 2009) and debriefs (Fernandez-Rio, 2015). These were used to allow free discussion on the learning outcomes of the intervention (Sheard and Golby, 2006; Passarelli, Hall and Anderson, 2010; D'Amato and Krasny, 2011; Boyes and Potter, 2015; Rogerson *et al.*, 2016; Zhou and Wang, 2019).

The most crucial factor in any FD/APDT programme is the biophilic (connectedness with nature) design of the programme (Wilson, 1984) and its efficacy in meeting its proposed outcomes. However, Sibthorp (2003, p.81) posits that there are few quality studies available to guide practice and that programming decisions “remain largely an enigmatic process based on gut instinct, past experience, and borrowed or untested philosophical understanding or belief”. Whilst Knowles (1990, in Haskins and Clawson, 2006, p.860) believes adults “learn best when learning is in response to their specific and immediate concerns”, it is the novel setting within FD/APDT and the unique experience that allows the transfer of learning according to Richards and Peel (2001), D'Amato and Krasny (2011) and Patton, Parker and Neutzling (2012). These sources suggest that rarely does an FD/APDT programme immediately relate to a participant's workplace.

According to Clark, Clark and Campbell (1992, p.210), "step-by-step techniques and formulas are of little use. Rather, one must detect patterns, make creative connections and formulate in-the moment theories of action". This is further supported by Schon's (1983) reflection in action concept to elicit immediate experiential learning. The answer according to Clark, Klesges and Neimeyer (1992) lies in the declarative knowledge or having the isomorphs or understanding of what action to take in what situation that is key to the success of FD/APDT. In concert with this concept, Pavlin, Svetlik and Evetts (2010) outline the importance of the transfer of learning within a business context as essential, if the facilitators and FD/APDT programme are to succeed. Flor (1991) argues that the experiential learning processes, challenge and reflection, a co-operative group environment, consensual decision-making, a novel setting, dissonance, unique problem-solving situations,

uncertainty, risk-taking and the use of metaphors, are fundamental learning mechanisms.

Within the same thread of fundamental learning mechanisms, Gass (1985, in Bobilya *et al.*, 2010, p.94) outlines the use of metaphoric, specific and non-specific transfer of learning, but Meyer (2003) focuses on the difficulty in measuring the success of the preferred metaphoric, isomorphic and non-specific transfer of learning through FD/APDT. Moreover, the literature questions how single-hit, short-term FD/APDT programme design factors still promote learning later in life, that differ from other conceptual skills and resilience development programmes. This is also a significant consideration for RAF FD/APDT design, given that the RAF relies on these five-day interventions to develop conceptual skills including resilience without follow-up, or as part of a considered through-career resilience strategy. Instead of focusing on this element, Hattie *et al.* (1997) showed that course outcomes are the primary motive for FD/APDT providers and not the mechanisms of learning that draws into question the validity of FD/APDT programme design. In Rickinson's (2004) review of research on outdoor learning, Neill (2006) identified five factors that would promote stronger outcomes within FD/APDT.

1. Longer, more sustained outdoor experience programmes.
2. Well-designed preparatory and follow-up work.
3. Use of a wide range of carefully-structured learning activities and assessments linked to the school/organisation.
4. Recognise and emphasise the role of facilitation in the learning process.
5. Develop close links between programme aims and programme practices.

In contrast to civilian FD/APDT providers, military facilitators have designed the FD/APDT programme to meet the needs of the military students and have the propensity to add greater value to the FD/APDT programme; although there is

limited military specific research to support this theory. Indeed, knowing the participant's social constructs, psyche, commonality, shared sense of purpose, socio-community practices, sense of humour and military language (Holman and McAvoy, 2005; Goldenberg and Prosolino, 2008, in Outward Bound Trust, 2013; Hoad, Deed and Lugg, 2013) ensures an effective military FD/APDT programme. Furthermore, when considering the unique resilience stressors faced by military personnel within modern warfare, military facilitators can engage with students (by using their own experiences) within FD/APDT. This is achieved through the mutual understanding of "demanding missions, extreme climates, sleep deprivation, cultural dissonance, physical fatigue, prolonged separation from family and the ever-present threat of serious bodily injury or death" (Mastroianni *et al.*, 2008, in Cornum, Matthews and Seligman, 2011, p.4).

As these stressors can lead to a variety of negative health consequences both physically and mentally (Bartone, 2007), it is essential that military FD/APDT providers elicit protective mechanisms for the resilience traits, factors and behavioural, socio-cultural, constructs that have been identified as affecting resilience behaviour and actions. The literature demonstrates that FD/APDT cannot address the fixed immovable personality traits, but could address positive behavioural patterns to elicit positive responses and attitudes to the stressor when contextualising the learning outcomes (Smeyers, 2008; Lamb, 2015).

If, according to some researchers such as Hattie *et al.* (1997), such observed positive attitudinal/behavioural changes that arose from FD/APDT were likely to decay over time, then the changes would likely be at their highest level immediately after the intervention and should disappear if no reinforcements were given to the

FD/APDT participants upon return to their organisation. On the other hand, other researchers report positive effects up to 18 months after the original FD/APDT programme's experiences (Ibbetson and Newall, 1996; Priest and Gass, 1997; Hattie *et al.*, 1997).

f. Defining resilience and contemporary theories.

This section outlines the multiple concepts of resilience and its proposed development through as a result of stress or adversity. When considering stress, resilience and the possible implications for PTSD or mental health issues, it is essential for the reader to understand the linkages between increased stress, reduced or enhanced resilience and how these two factors may affect PTSD or mental health issues. Whilst these three areas are significantly different concepts, it is the researcher's opinion that they have absolute linkage and that more resilient individuals will cope better with stressful situations and thus reduce their risk of becoming psychologically, physically and spiritually overrun as a result these stressful demands. This concept of stress, resilience and coping is outlined in Table 3's concept of bouncing forward from stress and adversity to reduce post trauma stress. This understanding is essential for the reader to begin merging the concepts of FD/APDT with military application for resilience development as the thesis outlines the evidence to address the research aim and question.

Whilst Russo *et al.* (2012) notes an increased interest in the phenomenon of resilience over the past decade, Schetter and Dolbier (2011) states there is no unifying definition of resilience. However, Masten and Obradovic (2008), Lamond *et al.* (2008), Burns and Anstey (2010), Bonnano (2012) and Beightol *et al.* (2012) present resilience as the ability to bounce back to an individual's resilience baseline

or maintenance equilibrium from adverse situations (Dhabhar, 2009; Burns and Anstley, 2010; Alliger *et al.*, 2015). This ensures that an individual can “deal with the stressors under adverse situations” (Tugade and Fredrickson, 2004, in Skomorovsky, 2013, p.223).

Iwasaki *et al.* (2005) proposes that resilience and bounce-back/forward is developed through positive adaptations during stress. The ability to bounce forward after overcoming adversity, develops the concept of individual resilience growth to cope with future similar demands (Loeffler, 2018). These positive adaptations are derived from a mix of socio-cultural, attitudinal, psychological, biophysical, social, spiritual and behavioural factors. However, Nourian *et al.* (2016) defines this growth as navigating through life's hardships using endurance, finding strength and engineering the difficulties. In addition, Hu, Zhang and Wang (2015) describes resilience through either trait outcome or process orientations. In expanding this key point, it is worth highlighting that resilient individuals who bounce back/forward through their personal resilience will purportedly (through socio-cohesion) influence the resilient behaviours of the social group; especially within a military context (Skomorovsky, 2013).

Within these psychological, physical, social and spiritual resilience factors, contesting groups of resilience researchers emerge within the literature. These groups posit that resilience is either exclusively within the person (Villisana *et al.*, 2016), a product of hereditary theory (Amstadter, Myers and Kendler, 2014), epigenetics (Grafton, Gillespie and Henderson, 2010; Janov, 2015), or a human factor response to a stressor or a social context construct (Skomorovsky, 2013; Mayordomo-Rodriguez, 2015). These singular theories do not provide specific

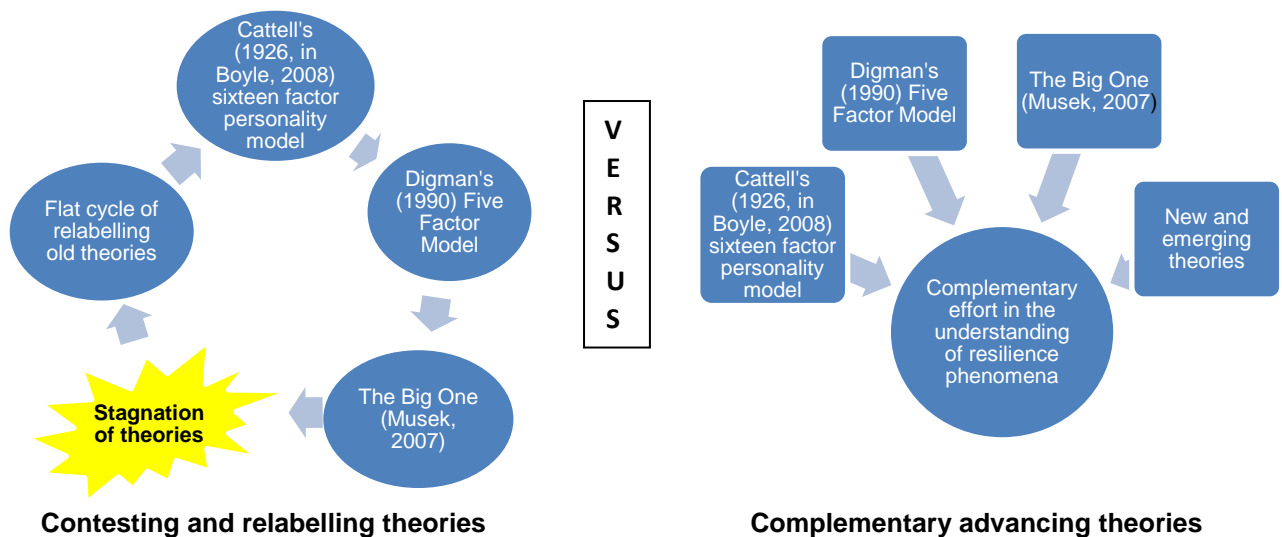
answers on how resilient individuals are purportedly developed, created or born (Amstadter *et al.*, 2014) and offer little understanding of the inter-action or attempt to complement underpinning theories of resilience. These theories do not cater for the plethora of adverse situations that an individual will experience during their life (Karatoreos, 2013). Consequently, resilience is described as either a set of heritable traits, an outcome of stressful life transactions, or as a process-construct reflecting an interaction between trait attitudes and behaviours within life experiences (Ahern *et al.*, 2006).

These linear approaches to resilience development theory are challenged by other researchers who argue resilience occurs through a blending of the singular concepts of resilience and experiences (Werner and Smith, 1992 in Cicchetti, 2002; Cederblad, 1996; Gravitt, Long and Hutchison, 2015; Aburn, Gott and Hoare, 2016). These stressors are viewed as either a challenge or opportunity and affected by personality, hardiness, emotional stability, extraversion, openness to new experiences, conscientiousness, agreeableness, locus of control, self-efficacy and self-assuredness. This is further advanced within Digman's (1990) concept of the Five Factor Model (FFM) of personality traits as a baseline from which the personal psychological and cognitive behaviours occur but similarly does not cater for the vast subjectivity of personality variables that creates variance in the definition of the FD/APDT phenomenon.

Whilst some researchers lean towards Goldberg's (1990) Five Factor Model (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) of personality, from which to develop cognitive behaviours, Block (2010) raises concerns over the cloudy measurement of the factors and frustration at

the non-consensual understanding of researchers for the 5 factors. When considering the field's efforts to narrow down specific personality traits, the literature moves from Cattell's (1926, in Boyle, 2008) sixteen factor personality model, Digman's (1990) Five Factor Model and The Big One (Musek, 2007). With no room left for narrowing down the personality traits, the literature demonstrates that the field must either refine these theories or consider their application as a collection of complementary, not competing theories. Figure 4 presents the researcher's view on the contesting versus complementary theories of personality that has influenced the resilience literature.

Figure 4. Contesting relabelling versus supporting complementary advancing theories.



This is due to similar personality traits that contribute to the construct within each theory existing within the other competing theories. Researchers also focus on the dark triad of Machiavellianism, narcissism and psychopathy (Paulhus and Williams, 2002; Jakobwitz and Egan, 2006; Jones and Neria, 2015) in efforts to differentiate between positively and negatively healthy personality traits. Sinclair and Britt (2013) also offers opinion of specific resilience traits, but considers resilience as an

outcome of traits, whereas Bellenger-Browning *et al.* (2010) offers specific traits for consideration as markers for collectively identifying an individual as resilient.

Many researchers agree that life experiences, training and measured exposure to stressors will influence the neurophysiological, psycho-neuroimmunological and cognitive responses to the stressors (Hall, 2011; Gravitt, Long and Hutchison, 2015; Mutz and Muller 2016). In developing the human operating system (Stolz, 1997) Gross (2002), Ochsner and Gross (2005) Carlson *et al.* (2012) purport that both instructed and habitual reappraisal of negative stressors into positive behavioural responses, will reduce negative emotional experience, behavioural expression and physiological responses.

Bellenger-Browning (2010) believes the reliance on any one genetic or biological factor is premature and whether biological factors associated with resilience are the consequence or the cause of being resilient, and requires further research to understand these factors' role in resilience development. However, physiological benefits of resilience are cited as the reduced impact of adrenaline and cortisol on the cardiovascular system during stress, resulting in reduced blood pressure, (Rainforth *et al.*, 2007) and adaptive cardiovascular responses (Mauss *et al.*, 2007; Memedovic *et al.*, 2010). This has demonstratively positive effects on reducing coronary heart disease (CHD) and reduced anterior insula activation during anxious anticipation (Carlson *et al.*, 2012). This reduction in the physiological responses to stress will also positively affect the psychological responses and thus result in positive, responding affective cognitive behaviour.

i. Neuroscience and cognitive behaviour.

Whilst the resilience research moves from cognitive behaviour outcomes to microscopic, neurobiological, long-term neurogenesis in response to a stressor, current research identifies the resilience research field's drive to synergise these multiple cognitive behaviour theories with neuro-scientific (cognitive neuroscience) evidence. Smith and Lane (2016) raise concerns about the role of neurogenesis and consider that emotional reactions will elicit the cognitive response that Franklin, Saab and Mansuy (2012) determine could occur through an individual's separate neuro-scientific, socio-cultural or hereditary factors.

In addition to these multiple resilience theories, Ziemssen and Kern (2007) and Briones (2007) propose that the body reacts to emotions through hard-wired, Autonomous Nervous System (ANS) responses developed through neurological dendrite growth to create stressor responses. This occurs as part of the ANS, Central Nervous System (CNS) and Immune System (IS) reciprocal relationship before the conscious mind can make a decision during extreme adversity (McEwan, 2000). Whilst the research into neurogenesis is perceived as advancing the understanding of resilience growth at a bio-chemical level, this research does not explain the multiple subjective socio-cultural, spiritual and life experience variables. Cumming *et al.* (2005, in Jones and Tanner, 2015, p.977) and Russo *et al.* (2012) believe these variables contribute to holistic resilience development and why resilience cannot be physically measured, only inferred (Cosco *et al.*, 2017).

This synergy of neuro-scientific research and socio-cultural factors represents contemporary thinking on resilience growth according to Abel (2016) and demonstrates the embryonic emergence of an interdependence or coalition of

theories. Indeed, the theories of resilience growth, creates social-science community credence to the subjective resilience theories, albeit with ontological and epistemological differences in the social and natural sciences, in identifying the collective factors of resilience growth (Olsson *et al.*, 2015). Further neuro-scientific research by Daskalakis *et al.* (2013) focuses on the neuroplasticity of the brain to change behaviours and the sensitivity of the neuroendocrine system and Hypothalamic–Pituitary–Adrenal (HPA) Axis in response to stressors, citing early life exposure and positive adaptations as key to building resilience to environmental stressors in later life.

To add context to these later-life positive adaptations to stressors, Daskalakis *et al.* (2013, p.1858) describes a chronological and synergistic ‘Three-Hit Concept’ of vulnerability and resilience which Roth *et al.* (2014a) expands as genetic predisposition, early-life and later-life environment. In furthering this synergy of neurogenesis and cognitive theories, Stoltz (2000) advances the research of Maletic-Svatic, Malinow and Svoboda (1999) in neuroscience that demonstrates the growth of neurological dendrites. This growth is posited as occurring through neuropeptide Y (NPY) growth during adversity stimulus in order to underpin his theory of the Adversity Quotient (AQ) that matures throughout life. The associated literature (Bracha and Maser, 2008, p.93) further supports the theory that stimulated dendrite growth allows communications through neurons to create a "hypervigilance, escape, struggle, tonic immobility, evolutionarily hardwired acute peritraumatic response sequence" to a stimulus.

Dabhar (2009) concludes that whilst these response sequences may be a hardwired, primal instinct response to a life-threatening stressor, long-term exposure to acute

stressors can lead to detrimental chronic stress. Moreover, the theories of acute and chronic stress responses (Ziemssen and Kern, 2007; Briones 2007) do not consider social or additional support factors that both internally and externally develop hardwired responses instead of just an immediate reaction. In enhanced stressful situations, the responses created from these reactions to stimulus will cause autonomous fight, flight or flow state. This primal instinct acts as an over-riding response (Proctor, 2016) that could be considered a construct of a survival instinct (Ulrich-Lai and Herman, 2009) in response to adrenaline and not as a construct of a learned response to stressors. In addressing this environmental acute stress response for fight or flight, Ewert, Davidson and Yun (2016) contests that the effect of stress will be reduced depending on the individual's perception of the stress or perceived danger in accordance with Ursin and Eriksen's (2010) Cognitive Activation Theory (CAT).

ii. Hardwiring stress responses and conscious mastery.

Whilst the literature moves from the neurological theories of resilience development, through to the cognitive behavioural constructs, into resilience traits, Rushto *et al.* (1986), Roy *et al.* (1995), Duckworth *et al.* (2007), Mosing *et al.* (2009), Liu *et al.* (2013), Kiecolt *et al.* (2013) and Lo Bue (2018) identify resilience traits, discussed in section 4 to this chapter, that purportedly positively affect coping against adversity. This coping refers to the ability of the individuals or social group to withstand stressors, for personal and group efficiency. Whilst useful to label traits, Burton, Pakenham and Brown (2012) concludes that once these conceptual resilience traits are understood, the individual is consciously aware of the requirement to reinforce them through contextualised training interventions and resilience trait education.

Through further exposure to controlled adversity to deal with stressors, hardwired responses could then be developed. This development is proposed through trait dispositional mindfulness as argued by Laurent *et al.* (2015) and Kadziolka, Di Pierdomenico and Miller (2015) and conscious hardwired responses to stressors adapted throughout adulthood (Stoltz, 1997) in accordance with the theory of through-life neurogenesis.

The argument advanced within this thread of the literature is that the conscious response or dispositional resilience to the stressors, allows resilience traits to grow and consciously develops reduced negative responses to stressors such as panic or inability, to consider higher order impacts of the reaction. In advancing this concept during conflict resolution, Mallidi (2015) cites the requirement for a measured and mutual resolve through calm analysis of the situation. This calm analysis is extremely prevalent in military training according to Gayer *et al.* (2009) to ensure protection against psychological determinants of stress and develop combat flow (Frey, 2012).

In contrast, Burke and Collins (2004) believe these responses are based on procedural knowledge or the right action for the right situation, developed during contextualised training scenarios and not through neurogenesis or hardwired responses. This stress appraisal, mindfulness or mastery (Russo *et al.*, 2012; Ihme, 2018) and consideration of the physiological and psychological reactions to the stressors, will allow the trained and resilient individual to understand and counter these actions on an individualised level. This individualised level will occur as a result of resilience training (FD/APDT for the purposes of this thesis) and personal socio-cultural experience (positive and negative) of similar situations. This mastery is

essential to operate effectively in stressful situations according to Pidgeon, Ford and Klaassen (2014), Johnson *et al.* (2015), Goldhagen *et al.* (2015) and Thomas and Taylor (2016).

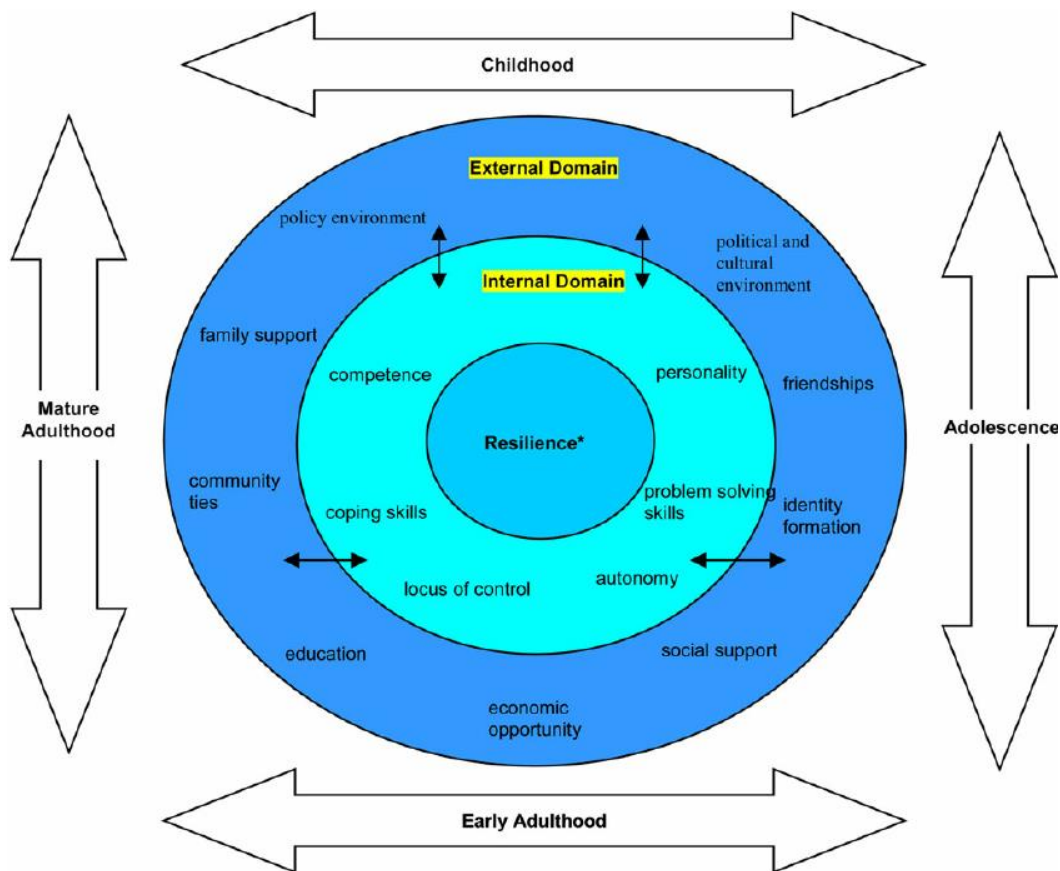
In support of the concept of mindfulness and situational awareness, Cassidy and Long (1996) cite problem solving, confidence and control, approach style, avoidance style, helplessness and creative style in addressing stressful situations. However, as argued by Neal (2008), if resilience is perceived as a state of being or inner strength of mind, then Yung *et al.* (2016) advances the concept that we should be able to control our state of mind through Mind Body Training (MBT) interventions or self-regulatory mechanisms (Cuadrado, Tabernero and Briones, 2014). Whilst a utopian perspective of mastery over adversity, mindfulness interventions have provided positive evidence to support their integration, but limited research of the mindfulness to deal with immediate, life threatening stressors or risks that do not allow mindfulness cognition and therefore mastery to occur.

Whilst the singular view of resilience growth is perceived as either within the person, a human factor response to a stressor or a social context construct, Ungar (2015) proposes that it is the holistic resilience behavioural adaptations (through life experiences), learning and mindfulness (with neurogenesis) required to create the hardwired responses. Whilst the concept of a hardwired brain is often used in the literature, in studies on nutrition and exercise, Ottersen (2010) found the malleability of the brain demonstrates that it is soft-wired and affected by external factors, proposing this is essential when considering changes to resilience throughout life. If a brain is hard-wired, then there is no growth or change in affecting responses and invalidates theories of neurogenesis. When considering this soft-wired malleability of

the brain and not contradictory to the neuro-science evidence, Tusaie and Dyer (2004) believe there is merit in combining all elements of resilience growth theory when establishing a collective understanding of the determinants of resilience development.

Despite the differences in the theories of resilience presented within the literature, each of the opposing groups of resilience theorists have common ground in understanding how resilience is developed and are beginning to underpin and mutually support each other's theories to cross this multidimensional divide (Almedom and Glandon, 2007). As Ungar (2015) identifies, the cohesion of these theories supports a concept of resilience growth in childhood resilience studies, further supported in adult studies by Schetter and Dolbier (2011) and evidences the malleability of the brain for through life resilience growth. Through the literature review of resilience, it is the researcher's opinion that psychological, physical, social and spiritual resilience growth occurs throughout life as a progressive process of adversity outcomes, across internal and external influencers and that protective factors operate interactively across these resilience domains. Tsourtos *et al.* (2014, p.66) outlines this concept in Figure 5.

Figure 5. Psycho-social Resilience Interaction Model (Tsourtos *et al.*, 2014, p.66).



This is through bio-psycho-spiritual-social factors to create positive behavioural responses (either hardwired or under a soft-wired construct) that are consciously nurtured and trained to develop resilient behaviours and attitudes. This demonstrates a movement towards a multifactor approach to through-life resilience growth theory, proposed through FD/APDT.

Section 4. Post-trauma/stressor resilience growth and bounce-back/forward.

In transferring the understanding of resilience theory into growth schemas and despite no "gold standard" in the measurement of resilience (Windle, Bennett and Noyes, 2011, in Maltby, Day and Hall, 2015, p.1), the synergy of the literature

surrounding resilience definition, development and military contextualisation in the earlier sections of this literature review, formulates a notable resilience development process. Indeed, Overholt (2015) discusses Richardson's (2002) Metatheory of Resilience and Resiliency and the growth from biopsychospiritual homeostasis or resilience baseline to individual growth through positive adaptations induced by a disruptive event, with Karatoreos (2013) citing positive adaptation, psychological resilience trait growth, as key to survival.

It is the researcher's perception that these adaptations present as a six-stage process outlined in Table 3 that permeates through the literature. These progressively interlink to create a central process of how post-trauma, stressful and potential risk to life experience resilience develops and bounce back/bounce forward occurs. This is essential to holistically understand how resilience adaptations and growth occurs.

The six-stage resilience growth process identified through the literature has been developed by this thesis' researcher as:

1. Individualistic psychological and physiological resilience traits *developed through*:
2. Socio-cultural, humanistic and environmental factors *creating*:
3. Resilience constructs and strategies *through*:
4. Exposure to stressors in adverse situations *thus creating*:
5. Positive protective responses and adaptations *whilst promoting*:
6. Resilience trait growth *and* bounce back/forward.

Whilst not a missing link, this linkage to synergise the field's research is highlighted as a major gap for understanding the holistic bounce-forward concept of resilience

through FD/APDT in the research field. Pertinent to this thesis, is the resilience development journey, i.e. the process of achieving success through adversity and progressive resilience to stressors, through to the bounce-forward factor that remains the critical point for the research aim. This is to identify what outcomes the FD/APDT intervention has on the participant's resilience development.

Table 3. Bounce-forward concept of resilience development.

(1) Individualistic psychological and physiological resilience factors.	
Liu <i>et al.</i> (2013).	Self-esteem mediated the relationship between resilience and life satisfaction. Affect–self-esteem sequentially intervened between resilience and life satisfaction. Positive and negative affect mediated between resilience and psychological distress. Self-esteem mediated the relationship of resilience and psychological distress. Affect–self-esteem serially mediated between resilience and psychological distress.
Arias (2016). Duckworth <i>et al.</i> (2007).	GRIT, perseverance, hardiness, resilience, ambition, self-control, and need for achievement.
Kiecolt, Aggen and Kendle (2013). Mosing <i>et al.</i> (2009). Roy (2006). Roy <i>et al.</i> (1995). Rushton <i>et al.</i> (1986).	Dispositional optimism, self-esteem, mastery and altruism. Neuroticism and interpersonal dependency as negative risk factors.
Bellenger-Browning (2010).	Positive appraisal, spirituality, active coping, self-efficacy, meaning/learning and acceptance of limits.
Sheard and Golby (2006).	Hardiness, mental toughness, self-esteem, self-efficacy, dispositional optimism, positive affectivity.
Tugade and Fredrickson (2004).	Humour, creative exploration, relaxation, and optimistic thinking.
Sinclair and Britt (2013).	Cognitive flexibility to see stressors as challenges and opportunities instead of threats and tolerance to ambiguity.
Goldberg (1990).	Five Factor Model lexical questions; openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism.
Deuster and Silverman (2013).	Physical fitness.
Lambert, Fincham and Stillman (2012).	Positive framing of negative stressors.

Salim, Wadey and Diss (2015).	
(2) Socio-cultural, humanistic and environmental factors	
Shilo, Antebi and Mor (2015).	Occupational and institutional.
Lim and Han (2016). Maguen <i>et al.</i> (2008).	Situational.
Azari, Dandeker and Greenberg (2010).	Cultural stressors.
Davidson, Ewert and Chang (2016). Cicchetti (2002).	Social communities and support framework.
Hamaoka <i>et al.</i> (2010).	Community of practice.
Morgan and Bibb (2011).	Line Management, peer and family factors.
Matthew <i>et al.</i> (2015).	Psycho-education and training.
Tol, Song and Jordans (2013).	Psychosocial impact of resilience.
Jones (1996).	Previous exposure to similar stressors.
(3) Create resilience constructs and strategies	
Davidson, Ewert and Chang (2016).	Resilience, Empowerment, Restoration, Achievement, Social Support (RERAS). Resilience, empowerment, restoration, achievements and social support.
Bellenger-Browning (2010).	Active coping style, physical exercise, stress inoculation, acceptance, reappraisal, cognitive explanatory style, cognitive flexibility, moral compass/spirituality, social support, positive outlook and relationship to post-traumatic growth.
Mak, Ng and Wong (2011).	Positive cognitive triad: positive views towards the self, the world, and the future.
Carlson <i>et al.</i> (2012).	Cognitive reappraisal or thinking about an event in a manner that modifies its affective impact, is a common emotion regulation strategy aimed at modulating the emotional response before it fully manifests (Gross, 1998).
Werff <i>et al.</i> (2013). Buhle <i>et al.</i> (2014).	Neuroimaging measures.
Johnson <i>et al.</i> (2011).	Response to Stressful Experiences Scale (RSES). Positive outlook. Spirituality. Active coping. Self-confidence. Learning and making meaning. Acceptance of limits.
McAdams and Pals (2006).	Characteristics adaptations - core self-evaluations, hardiness, psychological capital.

Luthans (2002).	Psychological capital (PsyCap) of hope, resilience, optimism and self-efficacy.
Kessler <i>et al.</i> (2013).	Conflict resolution.
Bauman <i>et al.</i> (2001).	Importance of strategies such as reframing, cultivating a positive frame of mind, remaining active and seeking information.
Matthew <i>et al.</i> (2015).	Mastery of challenging stressors.
Zuckerman <i>et al.</i> (1996).	Control belief.
Dubowitz <i>et al.</i> (2016).	Increased adversity threshold.
(4) Exposure to stressors in adverse situations	
Hattie <i>et al.</i> (1997).	Outdoor learning.
Beard and Wilson (2006).	Experiential learning.
Michie (2002).	Situational stressors.
Neil (2009).	Risk to life activities.
(5) Positive protective responses and adaptations	
Stoltz (1997).	Psychoneuroimmunology, neurophysiology and cognitive psychology.
Hughes (2012).	Recall, confronting fears and optimistic outlook.
Levone, Cryan and O'Leary (2015).	Neurogenesis.
Burke (2004). Gass <i>et al.</i> (1992). Jones (1996).	Tacit knowledge, coping strategies, isomorphs, sympathetic nervous system and parasympathetic nervous system.
Henderson <i>et al.</i> (2012).	Psychosocial stress reduction.
Ewert, Davidson and Yun (2016).	Bio-chemical responses in amygdala and insula to cortisol, epinephrine and adrenaline.
Henderson <i>et al.</i> (2012).	Mindfulness development.
Franklin, Saab and Mansuy (2012).	Neural activation.
Dudley <i>et al.</i> (2011).	Epigenetic modulation.
Buhle <i>et al.</i> (2014). Goldin, <i>et al.</i> (2009).	Cognitive reappraisal.
Resnick <i>et al.</i> (2011).	Increased physical resilience.
Collins, Sibthorp and Gookin (2016).	Ability to solve wicked problems.
(6) Resilience traits growth and bounce back/forward	
Luthans (2012). Stoltz (1997). Russell (2015).	Bounce back (<i>or rebound</i>).
Min, <i>et al.</i> (2012).	Return to resilience baseline.
Luthans (2012). Stolz (1997).	Support mechanisms for bouncing back.

Hayek (2012).	
Chess (2008). Claburn (2004).	Adapt and overcome.
Lazarus (2003). Seligman and Csikszentmihalyi (2000).	Positive psychology movement; obstacles into opportunities.

Considering the vast spectrum of resilience theories, a cohesive approach to the understanding of resilience has utility (Werner and Smith, 1992; Cederblad, 1996; Gravitt, Long and Hutchison, 2015; Aburn, Gott and Hoare, 2016). This requirement for a more cohesive approach to the understanding of resilience, demonstrates a past inability to move resilience concepts forward (Krasny, Lundholm and Plummer, 2010) and further outlines the requirement for this thesis to research how the RAF could move resilience and FD/APDT theory forward and enhance programme effectiveness. The outcomes of a key proposed resilience development intervention such as FD/APDT therefore requires scrutiny to measure programme effectiveness.

This underpinning theory of FD/APDT programme effectiveness requires further evaluation. This evaluation will provide additional credence to the loose literature theories surrounding resilience (Russell, Gillis and Lewis, 2008) and is of key consideration for this thesis in establishing resilience intervention effectiveness. The literature reviewed and these concepts do support Ungar's (2015) theory of a bio-psycho-sociological-ecological interdependence on resilience growth and aligns with Sinclair and Britt (2013) concept of groupings or themes of resilience traits. Whilst not in the scope of this thesis to challenge individual claims of resilience development theories, the thesis provides evidence of the short-term effectiveness of FD/APDT in progressing the interdependence of psychological, physical, social and spiritual resilience.

a. Contextualising resilience in military personnel.

Despite the vast literature and resilience trait research, notable reoccurring traits and themes emerge in both civilian and military resilience research that could be considered as the most pertinent traits and protective responses, that re-occur consistently through the literature. These have been developed under 1 of the 4 main resilience domains identified for this thesis outlined in Table 4 below and draws comparisons between the resilience factors outlined in FD/APDT and military resilience research in Table 1, that tie the three main areas of research together for the thesis (military, FD/APDT and resilience).

Table 4. Resilience themes and domains.

Resilience theme	Resilience sub-theme	Resilience domain
Self-schemas	self-esteem, self-assuredness, self-efficacy and self-confidence	Psychological
Mindfulness mastery	coping strategies and mindfulness of stressors	Psychological
Hardiness	control, commitment and challenge, mental toughness, able to handle ambiguity	Psychological and Physical
Dispositional optimism	positive affectivity, positive cognitive adaptations, positive approach to adversity and positive cognitive re-appraisal, acceptance	Social and Spiritual
Stress resilience	Positive approach to stressor	Psychological, Physical and Social, Spiritual
Active coping strategies	Self-talk, positive reappraisal.	Psychological, Physical and Social, Spiritual
Social support	Friendships, unity of effort, joint goals, unified purpose.	Social, spiritual
Physically robust and fit	Physical fitness	Physical
Psychological capital	Hope, optimism, resilience, self-assurance.	Psychological and Spiritual

These traits fall under psychological, physical, social and spiritual resilience which form the four domains of resilience research for this thesis identified within the literature, but much of the literature renames labels for the same trait. For example, dispositional optimism has been termed in wider literature as positive affectivity, positive cognitive adaptations, positive approach to adversity, positive cognitive re-appraisal, hope and resilience against stressors. This arguably demonstrates the inter-linkage of resilience language, traits, cognitive behaviour and sub-factors that the resilience literature still battles with accurately defining.

Indeed, research by Maddi (2007) on soldiers, executives, athletes, and students that found hardiness predicts success, adaptive coping and wellbeing. In addition, Hall (2011), Gravitt, Long and Hutchison (2015) and Mutz and Muller (2016) believe hardiness will develop psychoneuroimmunology, bio-neurological homeostasis and neurogenetic growth. This suggests both a causal and co-habitual link from physiological resilience coping methods to psychological (Jacobs *et al.*, 2011) and by extension, social and spiritual resilience. This requires further expansion for the reader to understand the interlinkages and importance of these resilience domains for the military specific participants used within this thesis' research.

b. Existing and future occupational military stressors.

In extremis, military stressors cited by Campbell and Nobel (2009) and Gibbons, Hickling and Watts (2012) include danger, fear of death, deprivation, loss of colleagues and friends, war, operational stress and tempo. These volatile threats present significant personal and organisational requirements for the development of psychologically, physically, socially and spiritually resilient military personnel when

dealing with risk-to-life stressors (Britt, Castro and Adler, 2001; Shok *et al.*, 2010; Sinclair and Britt, 2013; Deuster and Silverman, 2013; Sudom and Lee, 2016).

Military personnel could not function for long durations under these stressors, no matter how effective their training is, and are not exposed to these extreme stressors daily; other than on kinetic operations. Di-Nola (2008) and Easterbrooks, Ginsburg and Lerner (2013) identifies that service-personnel and their families are exposed to adversity more often than the civilian population. This is further supported by the work of Woodworth (2015) on military spouse stress. Woodworth's (2015) research advances the view of resilient military families, that includes the serving RAF person, creating resilient military communities in line with Sapirstein's (2006) concept of social-community resilience, but without substantial RAF specific research to support this theory.

Equally, during military deployments, Woodworth (2015, p.54) cites military life or family stressors experienced by spouses as "being far away from family, long separations, lack of intimacy, constant transition, inconsistent work schedule, not knowing/out of the loop and the concerns of stress on military children". With the risk to life occupational (Sameroff and Rosenblum, 2006; Daskalov, 2018) stressors coupled with the concerns of military family members, compounded by the stress of leadership and command, Skormovsky (2013, p.5) proposes that resilience within the military becomes part of the "necessary and engrained resilient culture and psyche of an individual, Unit and Service". In echoing the military situational factors affecting resilience growth, Ridenour, Yorgason and Peterson (2009), Azari, Dandeker and Greenberg (2010) and Matthew *et al.* (2015) cite the external factors

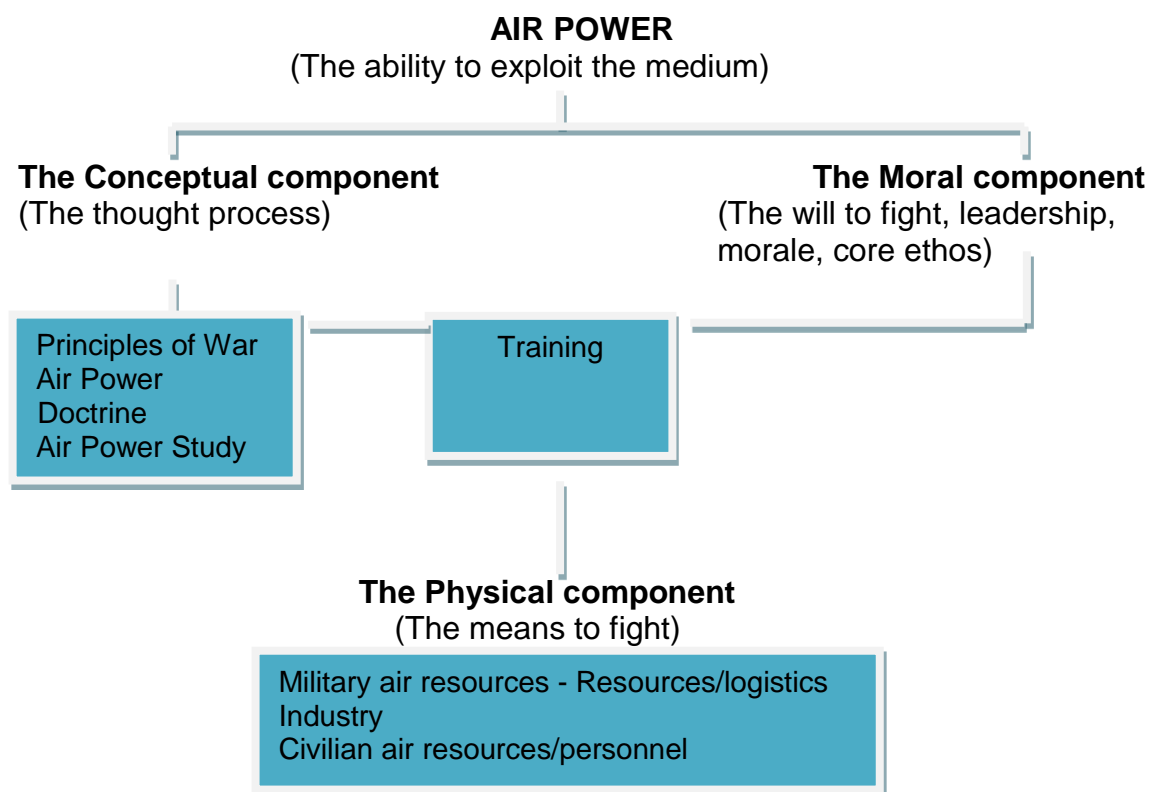
as situational resilience or dealing with in the moment taxing issues, organisational demands, social support, risk, environmental and peer/social acceptance.

In capturing these military resilience demands, the military Technical Co-operation Programme (TCP, 2012) that consults on international Defence science and technology matters from specialists within the United Kingdom, United States of America, Canada, Australia and New Zealand, cites resilience as the "sum total of psychological processes that permit individuals to maintain or return to previous levels of well-being and functioning in response to adversity" (TCP, 2012, in Sudom and Lee, 2016, p.1). The unique nature of the environment in which the stressor occurs, requires specialised training interventions to develop coping strategies to operate under stress and then bounce-back to normal functioning. This explains why the UK military emphasises the high level of resilience required from both military personnel and extended military communities and why interventions such as FD/APDT are deemed critical to develop this resilience. The service-person's ability to bounce forward (Sapirstein, 2006) is fundamental in progressing resilience baselines (Masten and Obradovic, 2008) and enhancing resilience in military personnel, families and communities.

This self-reliance to bounce forward from exposure to life-threatening stressors, to an "ever increasing personal resilience baseline" (Carver, 1998, in Schetter and Dolbier, 2011, p.638) is purportedly developed through regular exposure to stressors, lived experiences and military service to develop resilience (Brown 2011; Simmons and Yoder, 2013; Griffith and West, 2013). Furthermore, a resilient culture's osmotic growth will be achieved through its member's (resilient service-personnel) individual psychological, physical, social and spiritual resilience

development. This is identified by Gravitt, Long and Hutchison (2015) as a key component, specifically, moral component of materiel, belief and credibility, to the successful execution of a military Air or Joint operational campaign (Joint Doctrine Publication 01-05, 2005, p.25) as outlined in Figure 6.

Figure 6. Personal resilience within the moral component of Air Power (Joint Doctrine Publication 01-05, 2005, p.25).



The moral component will have been refined through the career exposure to a hermeneutic spiral of stressor-response-positive adaptation to bounce-forward, argues Nourian *et al.* (2016) through contextualised military training interventions to "bulletproof the psyche" (Thomas and Taylor, 2016, p.312). Resilience growth emerges within "contextualised training that, by design, progressively develops an individual's mental agility and physical robustness/resilience in preparation for their

front-line roles and prepares them appropriately for operations" (Air Publication 3379, Leaflet 1275, 2016, p.2). When combined with Mission Specific Training (MST), the resilience training aims to prevent the psychological injuries of war (Sinclair and Britt, 2013). The results of these claims have yet to be validated beyond the current literature and can only be substantiated through wider research to quantify the training intervention's efficacy in developing resilience. Therefore, validated or contesting the proposed use of FD/APDT in contributing towards the immediate and short-term development of both resilience and the moral component of Air Power, remains a key element of this thesis.

c. Military personnel resilience: Core self-evaluations, hardiness and psychological capital.

To clarify desired psychological resilience traits specifically identified within service personnel, Sinclair and Britt (2013) discuss Composite Trait Models that resonates with Simmon's (2013) work on resilience traits. Eliciting psychological resilience trait syndromes from Goldberg's (1990) Five Factor Model (FFM) and wider literature, Sinclair and Britt (2013) devised three areas of interest for military psychological resilience studies; Core Self Evaluations consisting of self-esteem, self-efficacy and locus of control; Hardiness consisting of control, commitment and challenge; and Psychological Capital consisting of hope, optimism, self-efficacy and resilience.

With no differentiation within the literature between civilian and military populations regarding psychological resilience responses to stressors other than higher risk of PTSD, military resilience research does address the different military stressors with higher risk to life repercussions of their actions, when faced with adversity, i.e. in war (Vyas *et al.*, 2016). Whilst aligned to military resilience requirements, there is no

difference in these concepts to civilian resilience requirements; although more prevalent for the enhancement of these themes for application in war. This requirement for resilience is further prevalent during both conventional (symmetrical) and hybrid (asymmetrical) warfare; the latter of which has been the main focus for military commanders for the past 20 years and the recent format of conflicts in Syria, Afghanistan and Iraq.

In outlining the irregular nature of hybrid warfare and the associated additional resilience requirements of military personnel during this challenging mode of warfare, Daskalov (2018, p.198) defines hybrid warfare as:

Hybrid threats incorporate a full range of different modes of warfare, including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder. Historically, many wars have had both regular and irregular components. However, in most of the cases, those components occurred at different stages, theatres or formations. In hybrid wars, those forces emerge in the same force at the same time and in the same battle space.

In a manpower constrained RAF that faces conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion and criminal disorder occurring at different stages, theatres or formations, in the same force at the same time and in the same battle space, requires resilient RAF personnel trained to cope with these demands. Therefore, existing military resilience training interventions designed to enable RAF personnel to deal with future hybrid warfare challenges, requires specific learning outcomes and evaluation of their effectiveness in developing military specific resilience traits. FD/APDT's effectiveness in preparing current and next generation RAF personnel in meeting the

challenges to personal resilience required for future warfare, is considered through this thesis and presented within the conclusion and recommendations chapter.

Notably, military resilience research demonstrated a concerted effort to develop preventative and protective resilience factors against the stressors of operations (hybrid, conventional and asymmetric warfare) and primary roles. However, despite these efforts, Simmons and Yoder (2013, in Crabtree-Nelson and DeYoung, 2017, p.45) states that "research to address variables thought to bolster resilience in active duty military personnel is lacking". Despite the civilian literature perspective that exposure to adversity will improve resilience, Leardman *et al.* (2009) and McAndrew *et al.* (2013) noted that military personnel with perceived low resilience baselines, resulted in an immediate decline in both mental and physical functioning after combat deployment. This raises the issue of what environmental or personal factors have created a perceived low resilience baseline and how could these be mitigated against within military resilience training?

Whilst these resilience factors are identified by researchers, the literature does attempt to provide a collective view of resilience as a state of psychological well-being that will adapt according to stressors pertaining to domain, work-related or role specific and situational contexts. These adaptations are argued by Mancini and Bonnano (2009, in Sinclair and Britt, 2013) as derived from the totality of a variety of risk and protective factors. These experiences form a personal latent resilience baseline that is significant for this thesis and military personnel, in understanding the growth of resilience through existing RAF resilience development interventions such as FD/APDT and the potential impact on this resilience as exposure to stressors increases throughout a person's RAF career.

d. The resilient Airman/woman.

Air power is the most difficult of military force to measure or even to express in precise terms. The problem is compounded by the fact that aviation tends to attract adventurous souls, physically adept, mentally alert and pragmatically rather than philosophically inclined (Air Publication 3000, 2009, p.13).

Whilst identifying the 'so-what' of achieving these resilience factors of RAF specific personnel, it is the desired benefits to service personnel of developing fundamental underpinning service capability and operational effectiveness that steers the literature (Air Publication 3379, Leaflet 1275, 2015) surrounding RAF resilience development. The founding core skills of respect, integrity, service and ethos (RISE) in the RAF is an acronym that combines the resilience requirements of psychological, physical, social and spiritual resilience skills to deal with career stressors and operations. These are: operating out of their comfort zone, accepting and addressing risk management, war-fighter spirit, stamina, endurance and willingness to persevere in the face of adversity. Although, to the researcher's best knowledge, there have been no studies to date to determine the training intervention's efficiency, that underpins the development of these statements for RAF personnel.

To add further importance to the requirement for this resilience, is FD/APDT's ability to provide positive behaviours and reduce malign responses to stressors that may positively enhance resistance to pre-determinants of PTSD. Although the military research literature surrounding resilience focuses on the use of interventions for the treatment of PTSD, little attention has been afforded to the education of instructors and participants of resilience interventions throughout RAF Airmen/women's careers, until recently. This has been addressed in part through Air Publication 9012's (2017)

resilience direction but is limited in its application. The use of Trauma Risk Management (TRiM) (Greenberg *et al.*, 2008), Stress Management and Resilience Training Teams (SMARTT), Social, Personal, Emotional Resilience (SPEAR) and other military resilience education programmes/models play a fundamental role in the avoidance of over-stress with efforts to identify stressors and develop coping strategies.

However, these interventions have limited focus on the contextualisation or continued reinforcement of resilience training, to develop these resilience literature themes. Indeed, the RAF's SPEAR programme is contested as novel with "no evidence that resilience based training had any specific benefit to the health and well-being of UK military recruits" (Jones *et al.*, 2019, p.1). This contextualisation of training is essential according to Edwards (2006) and Ruiz-Mallen *et al.* (2010) if the pillars of mental resilience identified as mental control, emotion regulation, coping, self-efficacy, sense of purpose, positive affect and social support (Precious, 2014) and Airmen/women's resilience traits are to be reinforced through contextualised interventions, including FD/APDT, and immediately applicable to mitigate against work-life stressors.

The issue of gender variables and resilience within military specific populations requires consideration for military FD/APDT resilience training intervention stakeholders to appreciate that participants will have differing resilience baselines. This may also temper the claims of FD/APDT or any resilience training intervention's ability to develop all male and female participant's resilience baselines on-par with a required and acceptable RAF norm. To highlight the issue of gender variables that affect training intervention outcomes and the military population, the US Marine

Resilience Survey conducted from 2008 to 2012 by Baker *et al.* (2012) found that respondents with a low score in measures of functional health and well-being prior to operational deployment, were consistent with population norms. In assessing the gender differences of stress related disorders, Hoge, Clark and Castro (2007) believes that the exposure to risk is more likely to be a determining factor of stress related disorder, than gender.

Therefore, if FD/APDT can develop resilience through the controlled exposure to risk, then this could, in theory, reduce negative responses to stress, promote high-stress resilience and decrease the risk of a stress disorder in both males and females. Bergh *et al.* (2015) argues that men with low-stress resilience will be more affected by stressful events and more likely to suffer chronic stress with potential physiological consequences. This is concerning for military resilience practitioners due to the high percentage of males (89.4%, in 2019) as the largest demographic of the UK military (UK Armed Forces Quarterly Personnel Report, 2019).

Aligned with this study and civilian research, Hamilton *et al.* (2013a; 2013b) believes that low scores of health and wellbeing, both physical and psychological and cognitive vulnerabilities, especially negative cognitive theory and helplessness are markers of vulnerability to stress and negative response to stressors. In addressing these vulnerabilities, research findings by Polusny *et al.* (2011) showed that pre-exposure will not affect vulnerability, but contrast findings by Breslau, Peterson and Schultz (2008) and Breslau and Peterson (2010) in the understanding of pre-exposure antecedents to stressors mitigating vulnerability to stress disorders. Notable resilience studies of active military personnel (Morgan and Bibb, 2011; Griffith and West, 2013; Gould *et al.*, 2015) focused on the design of training

programmes to address the 'so-what' issue of the research findings. They proposed that without a clear direction, the field of resilience and military training will only continue to go around in circles (Adler *et al.*, 2013). This thesis aims to provide this required clarity on resilience and military training in FD/APDT's use as a resilience intervention.

e. Developing a resilient military culture and community of practice as a result of resilience interventions.

In mitigating against the determinants of stress, possible stress disorders and through identifying and developing desired resilient traits, the UK military engenders an ethos of a resilient community unique to occupations involving risk to life stressors, relying on unit cohesion and mutual support. Further to these resilience traits, are uniquely military factors that affect the individual's resilience, developed primarily through the theme of military sociology (Siebold, 2001 and Hayes, 2012, in US military personnel; Woodward and Jenkins, 2011, research on UK military identities; Vuga and Juvan, 2013, in Slovenian military personnel).

In creating both unit cohesion and military identity, Cuardado *et al.* (2014) refers to the acculturation of recruits and service personnel into a resilient military or warrior culture (Stanley and Jha 2009; Hendricks-Thomas, 2016) that positively influences future unit and socio-cultural cohesion, whole-force resilience, war-fighter spirit and creates a force multiplier. Greenglass, Fiksenbaum and Eaton (2006) identify these as essential for supporting resilience development, echoing the requirement in the literature for a social support network in developing resilience traits. In advancing the concept of resilient communities (Sameroff and Rosenblum, 2006; Smith, 2013) and the warrior culture, Easterbrooks *et al.* (2013) outlines resilience as a by-product of

our environment and a strong sense of belonging to a supportive community with a shared mission and values.

To create this resilience and socio-cultural cohesion, the United States Air Force (USAF), (McGene, 2013) cites eight domains of Total Force Resilience Fitness (TFRF) as medical, nutritional, environmental, physical, social, spiritual, behavioural and psychological with Siebold (2001, p.140) differentiating between “institutionalised or occupational factors”. These are pertinent points for this thesis’ research as there is no comparable UK RAF resilience TFRF and is reliant on other country’s research such as the USAF to understand how research has been narrowed into an Air Force specific TFRF. This is the approach taken for the narrowing down of extensive literature review themes of resilience into manageable domains or concepts for research within the RAF.

Many variable and situational factors presented within the literature affect the resilience of a community, not least the perceived psychological, physical, social and spiritual resilience of its members. To contextualise the role of resilient individuals in developing resilient organisations, Mowbray (2012, p.7) characterises a resilient individual as:

Having enthusiasm for life and work, the capacity to see the future and go for it, the capacity to cope with threatening events without experiencing disabling distress, an attitude towards life and work that is positive, full of energy and determination, have the capacity to see the options and to adapt effectively to meet and overcome challenges.

In the same vein, Mowbray (2012, p.41) cites a resilient organisation as:

Abuzz with high level performance, a capacity to respond effectively to internal and external pressures faster and more effective than their

competitors, a capacity to renew themselves rapidly, a capacity to determine their own destiny, a capacity to be ambidextrous, deliver effective and efficient products and services at the same time as adapting to changes in their environment.

These quotes demonstrate the linkages between a resilient individual and their contribution to a resilient organisation. Despite the theme of positivity in addressing stressors and a commitment to the warrior culture by remaining resilient for organisational, team and personal aims, many service-personnel inadvertently experience self-imposed stress, even if they are suffering from stress-disorders (Stanley and Jha, 2009). This compounding variable relates to the inappropriate stigma (Crowe, Averett and Glass, 2016) within a warrior culture attached to non-resilient personnel.

Although the concept of resilient communities is evident through the military sociological literature, the maintenance of this community can only be influenced by the actors within it and must be continuously “nurtured, supported and able to reflect and share experiences through discussions or formal debriefs” (Mitchell and Everly, 1996, in Harris *et al.*, 2002, p.223). This is a fundamental point for this thesis on how the FD/APDT intervention could become a pivotal factor in RAF personnel’s through-career resilience education and explored in the data analysis and discussion chapter of this thesis.

Indeed, the RAF’s motto, *Per Ardua ad Astra*, ‘through adversity to the stars’, states the organisational intent to remain resilient, but this must be maintained through a resilient culture, language, ethos and social-cohesion that is underpinned with peer, subordinate and superior’s collective training, education, understanding, reduced stigma and mutual respect to endear this culture.

Despite efforts to identify the characteristics associated with resilience and the different variable traits identified within contrasting, although intertwined, theories, Burton, Pakenham and Brown (2010) believe there is little research on interventions to promote resilience in adults. In contrast to this opinion, Robertson *et al.* (2015) systematically reviewed 14 resilience training studies over 11 years (2003 to 2014) and identified 4 broad categories of dependent variables similar to the psychological, physical, social and spiritual theme of this thesis, noting that resilience training programmes were a viable intervention to develop personal resilience and subject's positive mental health.

1. Mental health and subjective well-being outcomes.
2. Psychosocial outcomes.
3. Physical/biological outcomes.
4. Performance outcomes.

These contrasting views do share some similarities and present a collective agreement that the effects of each type of resilience training intervention should be developed. When considering the development of resilience through training, there is no agreement on the most effective type of resilience training intervention. This is due to the multiple variables that impact on resilience, which draws into question the effectiveness of RAF FD/APDT for the purposes of this thesis' research aim.

Lee, Sudom and Zamorski (2013) and Sudom, Lee and Zamorski (2014, p.378) found that an intensive coping-skills training programme was effective in "reducing depression and anxiety symptoms and promoting healthy coping behaviours among military personnel and that future research should examine the best resilience training method". In support of this theory, in order to identify the most

effective resilience training interventions, Robertson *et al.* (2015) and Beard and Wilson (2006) concludes that there is no single 'one-fit answer' and the training and technology must be designed around the contextualised requirements of the recipients (Knowles, 1990, in Haskins and Clawson, 2006, p.854). Furthermore, when assessing these perspectives of the incoherent design structure of resilience training programmes, there are limited attempts to reinforce or develop programmes as careers progress.

Indeed, Vakili *et al.* (2014, p.1) states that "training programmes that would strengthen mental resilience prior to a traumatic event, are only starting to emerge and that the development of effective resilience programs remains unclear".

In short, the literature offers some insight to the effects of short-term and long-term resilience training interventions but few correlate exactly to the workplace outputs perceived enhanced productivity as a result of the resilience training interventions (Maddi, 2007; Sudom and Lee, 2016). This perceived resilience development and resulting enhanced productivity is explored through this thesis' research and used to explore the future application of FD/APDT within the RAF.

f. Through-career resilience development.

Whilst a positive correlation between the development of resilience, as a result of military training conducted throughout an individual's career and through-life resilience may sound positive, it does create a problem for the RAF. This is demonstrated by the requirement for a through-career reinforcement of resilience education, instead of standalone, short-term resilience training interventions that purport unsubstantiated claims to develop the plethora of conceptual skills, in both a military and civilian context. If these training interventions are not correctly validated

and their effects not evidenced, then resilience educators will continually deliver resilience development interventions with unsubstantiated or inconsistent results (Adler, Castro and Britt, 2015) and based on flawed constructs.

In considering the design requirements and issues surrounding the proposed efficacy of resilience training interventions, not just FD/APDT, but resilience training as a whole, Leppin *et al.* (2014) identifies that there have been no systematic reviews of resilience specific training to date. Therefore, resilience training literature could be perceived as lacking credibility when used in developing preventative factors for dealing with adversity or stressors. The use of statistical data in measuring the effectiveness of resilience training interventions is perceived as further flawed, when considering the importance of the student's perceptions of the effectiveness of the training (Berlinger and Wu, 2005).

Within a military context, resilience literature has not been able to identify how these multiple strands of resilience training, education and delivery stakeholders are able to contribute to the collective and prescribed resilience training due to the lack of holistic, through-career structure to military resilience training. Whilst a 'Robust Training Through-Career Pipeline' is offered in Air Publication 3379, leaflet 1275 (2016) these are broad-brush and without analysis of how the career interventions work symbiotically either individually, or within the military social demographic. Furthermore, RAF resilience focused FD/APDT programmes are embryonic and have not been qualitatively or quantitatively verified. A more prescriptive guidance for military resilience training literature would offer examples of resilience traits that were engrained within the training policy, with specific purpose of the intervention

within an individual's career. This engagement between the resilience policy and training would also ensure that training is critically reviewed to ensure its efficacy.

Within the RAF, this is primarily (but not exclusively) through the Stress Management and Resilience Training Team (SMARTT) adapted from Attention and Interpretation Therapy (AIT) derived by Loprinzi *et al.* (2011) concept taken from civilian research and Trauma Risk Management. This was developed by the US Marines from their experiences in Iraq and Afghanistan with supporting medical and/or chaplain services when required. Coupled with this policy and training are guidelines to prevent workplace stress and access to mental-health and welfare support services, to help the affected service-person. These policies and support networks are reducing the stigma attached to mental health within military personnel; but not without areas for development. Whilst military policies offer interventions for developing resilience, there has been limited focus in developing a cohesive, long-term, interlinked tactical-level, personalised (through-life) resilience development strategy in the RAF.

Hendricks-Thomas (2016) proposes that resilience traits are trainable and even more so in military communities, further emphasising the importance of effective training interventions in resilience development according to Loprinzi *et al.* (2011) and Robertson *et al.* (2015). Therefore, in order to educate, train and prepare RAF personnel for the resilience stressors they will experience throughout their service careers in both peace and war, Wessely (2005) argues that it is essential that service personnel receive adequate contextualised training to harness and develop the psychological and emotional capital, that Sinclair and Britt (2013) associates with resilient service personnel.

According to Walker *et al.* (2016), stressors within the military provide unique opportunities to constantly evolve the positive psychological and biochemical adaptations involved in neurogenesis. This evolution of resilience through interventions, constantly develops participant's resilience to complex and challenging situations. This allows an enhanced level of life long resilience maturity that cannot be replicated within normal civilian occupations, other than those with risk to life or exposure to trauma such as first responders, police, prison officers and rescue services as part of a career-resilience development programme (Arnetz *et al.*, 2009; Schoenfeld, Ogborn and Krieger, 2016; Myers, 2019). The use of resilience education programmes in these occupations also develops conflict resolution, which is essential when dealing with potentially volatile situations.

Despite the neuro and biogenesis factors presented in the literature, combined with the positive behavioural and attitudinal responses developed through an increased resilience baseline, further gaps in the literature begin to appear. These are most notably in the overlapping and interdependence of psychological, spiritual, social and physiological resilience. More specifically, how the four domains are connected. Roy (2010) and García-Martínez, De Paz and Márquez (2012) report that this could be due to an increased positive self-schema through the achievement of physical endeavour, internal or external praise and peer/superior approval. With no contradictory research separating the dovetailing of these resilience domains, it is the researcher's opinion that they collectively form and impact on an individual's perceived and actual resilience.

Although much of the research surrounding resilience training within the military focuses on the rehabilitation of PTSD and depression, there is limited research

(Rhodes and Martin, 2014) evidencing the efficacy of through-career military resilience training programmes. This research is required to develop protective factors that prevent/insulate from the incidents of over-stress to reinforce the resilience baseline, long before individuals are exposed to potential harmful stress.

According to the literature, this training will contribute to the total-force resilience fitness concept of psychological, spiritual, physical, nutritional, behavioural and occupational, family, social, medical and environmental resilience identified by Roy *et al.* (2010). The training will develop resilience through a perceived inferred osmosis of resilience and not rely on extant general training or ad-hoc interventions. This structured career resilience training strategy set against a formalised, reflective, reflexive and reinforced resilience performance matrix is purported to give military personnel the resilience resources to act with a positive cognitive behavioural response to a threat or stressor (Lazarus and Folkman, 1984, in Gilbar, Ben-Zur and Lubin, 2010, p.549).

Section 5. Literature review summary.

This thesis aims to contribute new knowledge in the RAF's understanding of the immediate and short-term (six months) outcomes of a five-day RAF FD/APDT intervention on participant's psychological, physical, spiritual and social resilience development for primary role effectiveness. A further purpose of the study is to provide research insights to inform RAF and Defence strategy regarding the use of FD/APDT interventions for through-career resilience development for personnel.

The vast subjective variables proposed within resilience theory, the dearth of research into resilience and FD/APDT linkages, FD/APDT's effectiveness in

developing resilience and workplace application are key areas of concern. These concerns identified within the literature, undermine FD/APDT's credibility within resilience development. These are essential combined facets of the concept of resilience development through FD/APDT for enhanced personal resilience and role performance that are required to address the research aim and question.

Through attempts to delineate between relabelled learning/transfer theories for both resilience and FD/APDT, the literature has demonstrated FD/APDT's perceived effectiveness in developing resilience and workplace efficacy, to create resilient individuals and communities of practice. However, there is still an evident gap in knowledge as to whether this transfer of learning is applicable within a RAF context.

Although FD/APDT has been identified within the literature as having the proposed ability to contribute, in part, to the development of resilience within RAF personnel through its underpinning principles and the controlled exposure to risk, the immediate and short term impact and consideration for participant's primary role effectiveness remains unresearched. This lack of research undermines RAF FD/APDT claims of resilience development and its contribution to psychological, physical, social and spiritual resilience, morale, RAF operational effectiveness and Defence strategic capability. The linkages between FD/APDT theoretical claims of developing resilience require substantiating through further research, as this literature review demonstrates.

Advocates of FD/APDT found little coherence in the philosophical and pedagogical approach to the FD/APDT design, raising further concerns about the provider's inability to present evidence of their programme's ability to meet the training outcome claims (Brooks, 2003). This requirement and scepticism when evidence is not

available, remains FD/APDT's Achilles heel (Brown, 2010) in providing data in a social-science that relies heavily on individual experiences, to elicit data on the successful transfer of learning. This thesis will provide analysis of the FD/APDT intervention's transfer of resilience learning outcomes within RAF personnel; specifically phase 1 and 2 trainees.

CHAPTER 3 – METHODOLOGY

Section 1. Introduction to chapter.

A methodology is a domain or a map, while a method refers to a set of steps to travel between two places on the map (Jonker and Pennink, 2010, in Wahyuni, 2012, p.72).

For the reader's understanding, this chapter:

1. Outlines the rationale for the research within the pragmatist paradigm and the utility of the sequential explanatory mixed-methods (Almalki, 2016; Subedi, 2016) for this thesis.
2. Outlines the research ethics and principles for this thesis and how mixed-methods can be used within a pragmatic paradigm for FD/APDT research.

Almalki (2016, p.293) defines sequential explanatory mixed-methods data gathering as “a two-stage design which sees quantitative data being used as the basis on which to build and explain qualitative data. The quantitative data informs the qualitative data selection process which, to my mind, is a great strength”. This chapter further identifies how this strength can be employed within a pragmatic approach for a professional setting and is essential during this embryonic understanding of military, specifically RAF, FD/APDT's role in resilience development. This creates a baseline of quantitative, questionnaire data, supported by qualitative, focus group knowledge, that is essential to understand the FD/APDT phenomenon within a military professional setting.

Discourse is, with respect to the relation of forces, not merely a surface of inscription, but something that brings about effects. Thus, we should study discourse as ways of conquering, or producing events, or producing

decisions, of producing battles, or producing victories. (Foucault, 1972-1977, in Paparone, 2017, p.135).

However, this methodology and data collection method must be aligned with further, deeper analytical understanding of how the interventions purportedly influence resilience to inform senior RAF commanders and stakeholders for future FD/APDT intervention policy, design and delivery. This thesis' methodology used the mixed-methods concept by administering the 25 item Connor Davidson Resilience Scale (CDRS-25) to 250 phase 1 RAF trainees before and immediately after a five-day RAF FD/APDT intervention. Focus groups were conducted six-month later and the two data sets combined to interpret the data.

The methodology combines questionnaire data collected immediately before and after the five-day intervention and focus groups' findings conducted six-months later, within a sequential explanatory mixed-methods data gathering process. This methodology allowed the data emerging at the initial questionnaire stage to inform the themes for the sequential qualitative data to substantiate, challenge or help explain the findings. This methodology developed through the requirement to understand the short-term outcomes of the existing FD/APDT interventions on resilience and create a starting point for future longer-term research. It is the researcher's opinion that this is a pertinent and prudent methodology given the previously unresearched area of RAF specific FD/APDT.

Moving from the holistic methodology to the specific data collection methods used, the chapter provides justification for the use of the Connor-Davidson Resilience Scale-25 questionnaire (CDRS-25) (2018) at Appendix 2 and focus groups discussion. The chapter develops the argument for the CDRS-25, given its productive utility in both military resilience and FD/APDT studies and considers how

it can be used to draw these two sets of evidence together. The chapter further expands on the utility of focus groups as the second phase of the sequential explanatory mixed-methods research. The data analysis, peer review and research approach adopted when identifying occurring themes across the four resilience domains used in the data merging, is also discussed within this methodology chapter.

Given the pragmatic approach to this research, this chapter then summarises the methodological approach, tying together the rationale for the specific data collection methods in relation to the professional setting. The chapter defines the reasoning for the pragmatic methodology and specific mixed-methods data collation whilst drawing on past civilian research data to develop the holistic understanding of FD/APDT given the dearth of literature within this specialist military field. This is essential to interpret the new mixed data collated during this thesis (Clandinin and Connolly, 1998; Richardson, 2000, in Denzin and Lincoln, 2000; Taylor and Settelmaier, 2003).

The pressure on FD/APDT providers to present empirical statistical data does not fit with the traditional qualitative data stories (Asfeldt and Beames, 2017) experiences and narratives, that are associated with personal growth throughout the FD/APDT literature that creates dissonance within the field. Whilst quantitative evidence is available (Scrutton and Beames, 2015; Cooley, Burns and Cumming, 2016) these findings are only useful for presenting statistics unless paired with qualitative research. The value of the qualitative data provides individual thoughts and thematic responses within FD/APDT research, that includes an in-depth understanding of the student's learning. This provides meaningful and useful data, which is a concept challenged by positivists who rely on statistical data alone.

Section 2. Research design.

This section outlines the contesting research paradigm arguments, the evolution of the pragmatic paradigm and the research design for this thesis. To achieve this intent, it is essential to “think outside the box and consider other data-analytical approaches that are not used in your field. Choose the research design that best fits the hypotheses and know the assumptions and limitations of that design” (Hughes, 2016, p.166). In considering the holistic paradigm debate, traditional perceived paradigm constraints and requirements for a flexible approach to research, the mixed methodological design demonstrates the requirement for a pragmatic and mixed-methods data gathering process to serve the aim of this thesis.

a. Research paradigm and implications for this thesis.

Education within the military is progressing from reliance on the objective analysis of data, to a subjective approach to problem solving using multiple paradigms (Paparone, 2017). This progressive move from the traditional stance of objective and positivist military research, demonstrates military educators’ efforts to expand on the evidence available on significant issues affecting military topics (Paparone, 2017). Within this move towards a more integrative subjective approach to military education, the use of a range of research embedded within interpretivist paradigms, is providing a broader understanding of military related issues, outside of the past objective approaches. This thesis’ contribution to this modern approach to military education is considerate of the complementary and competing research paradigms, adopting a pragmatism based research paradigm.

Nguyen and Tran (2015, p.24) outline contrasting opinions of “what constitutes a research paradigm” while Mackenzie and Knipe (2006) identify multiple varying paradigms. MacNaughton, Rolfe and Siraj-Blatchford (2001) offer the opinion that a research paradigm is comprised of three elements; a belief about the nature of knowledge, a methodology and criteria for validity. This process is being followed and implemented within this thesis’ methodology. Smith and Avramadis (1999), Neuman (2000) and Creswell (2003) refer to paradigms as epistemology, ontology or even research methodology. Irrespective of the associated paradigm, researchers must understand their respective paradigm’s concept of reality (Steves, 2009, in Stone and Petrick, 2013; LaTorre, 2011, Patel (2015). This demonstrates how researcher’s intentions, goals and philosophical assumptions are linked with their research paradigms (Grix, 2004).

In understanding these linkages, Crotty (1998, in Duffy and Chenall, 2008) describes how the researcher’s view of reality, predispositions and social bias affects research methodology when exploring research questions. Crotty (1998 in Duffy, 2008; Guba and Lincoln, 1994, in Denzin and Lincoln, 1994) further explores how this view of reality, pre-dispositions and social-bias will also affect the way researchers will conduct their research. This bias could also be evident in organisations that may have funded the research project and is of pertinence to the credibility of this thesis’ pragmatist methodology.

Stakeholders, granting bodies, thesis examiners, journal editors and readers all may struggle with particular (but different) elements of a presentation; each has their own biases and methodological preferences and tends to understand terms used from the perspective of their own framework, even where an alternative framework is spelt out (Bazeley, 2002, p.8).

Whilst the paradigm wars have their staunch advocates (Goertz and Mahoney, 2012), even they appeal for the “fruitful understanding that each culture best investigates the types of questions for which it is suited or “tolerance of the other paradigms” (Tashakkori and Teddlie, 2003, p.20). Whilst some researchers believe contrasting epistemologies may be understood with respected and permeable boundaries exploited (Goldkuhl, 2012; Fraser, 2014), Howe's (1988) incompatibility theory suggests that "qualitative and quantitative research paradigms, including their associated methods, cannot and should not be mixed" (Howe, 1988, in Johnson and Onwuegbuzie's, 2004, p.14). However, in this research, within a highly specific military setting and a focus area that relates to individualised experiences and responses, a mixed approach is highly relevant.

When considering research paradigms and methodology, Smeyers (2008, p.692) believes that "although doubtful to find universal laws within social science that remain fixed in a particular methodology, the contextualisation of theoretical insights is necessary". It is the researcher's opinion that this contextualisation allows for the extraction of data specifically relevant to this thesis' research, that Ferguson (1993) believes will provoke curiosity, imagination and inquiry. This contextualisation of data within this thesis' methodology is also crucial for success in understanding the role of FD/APDT in resilience development. For a researcher to collect data, they must “decide on a strategic action plan within which to execute the particular methods of data capture and the process by which the inquirer can find out about what they believe to be true” (Guba and Lincoln, 1994, p.108, in Denzin and Lincoln, 1994).

To capture this data, this thesis draws on a pragmatic research approach through sequential explanatory mixed-methods (Johnson and Onwuegbuzie, 2004; Knowlton,

2013) to elicit new knowledge. This ensures any perceived researcher bias is transparently addressed (Grix, 2004; Agar, 1980, in Bunniss and Kelly, 2010).

To ensure this transparency, it is the researcher's opinion that this requirement for a pragmatic mixed-methods approach is essential for this thesis, to capture the perceived resilience development through the FD/APDT phenomena. This pragmatic mixed-methods approach will allow for the collective data gathering of initial quantitative and complementary qualitative data to fully understand participant's outcomes after participation in the FD/APDT intervention and on role performance.

Carson (2001) and Dharamasi (2009) claim that quantitative methodology provides non-emotive and objective research, with Lukka (2010) and Houghton (2011, p.2) positing that "this approach is flawed and limits the scope of intellectual activity, with limited sole application in the social science to interpret the subjective nature of data". According to Johnson and Onwuegbuzie (2004) and Fisher and Stenner (2011), the provision of empirical evidence based on positivism is challenged by interpretivists as "outdated, paradigm-blinded and one-sided" (Fraser, 2014, p.4).

This outdated concept would therefore be irrelevant for this thesis and provide limited contextualised data in line with interpretivism's ontology, that social actors are influential in the conscious definition of reality and how we play our role, as part of the larger humanistic view of reality (Greene, 2006; Van der Walt and Potgieter, 2012; Nguyen and Tran, 2015).

To expand on this concept of humanistic reality, this humanistic approach is entwined with Guba and Lincoln's (1994) view that reality is subjective. This subjectivity is critical in the methodology for this thesis, to allow the resilience themes to permeate through quantitative and qualitative data merging and analysis.

Indeed, through their subjective interpretivist view of research, Johnson and Onwuegbuzie (2004) call for interpretivist methodology to be complemented by statistical data which is essential for this thesis to underpin the questionnaire and focus groups mixed-methods. "The goal of mixed-methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies" (Johnson and Onwuegbuzie, 2004, p.14-15). This utilisation of mixed-methods will accommodate different forms of relevant evidence to be gathered in a way that can address the complexity of the focus of the research.

To move research forward, Knowlton (2013) and Greenhalgh and Papoutsi (2018) call for an intellectual division of labour and cross-paradigm collaboration to understand our world as we see it (Adcock and Collier, 2001; Dharamasi, 2009). In the researcher's opinion, it is apparent that interpretivists, criticalists and positivists are using different methodologies, albeit on parallel tracks towards new knowledge. Bunniss and Kelly (2010) further assert that there is no one superior methodology within the paradigms. In accepting the combination of differing methodologies within contesting paradigm frameworks (Steves, 2009, in Stone and Petrick, 2013; LaTorre, 2011), Knowlton (2013) believes advances in social sciences will occur, especially considering the subjective nature of research (Goldkuhl, 2012; Hurt and Callahan, 2013).

The combination of mixed-methods data gathering leads to an understanding of learning transfer from the practical activity (in this case, FD/APDT), its theory of learning, what it is purported to benefit and if the participants benefitted (Atwater and Yammarino, 1992). This aligns with the rationale for this thesis in understanding

what impact FD/APDT has on developing immediate and short-term resilience. In embedding the FD/APDT theoretical learning into their workplace, participants are perceived as being more productive (Williams, Graham and Baker, 2003; Baker, Jensen and Kolb, 2005) as the programme relates to their personal subjective experiences.

To understand these personal experiences, the paradigm arguments range from the “purported superiority of one approach over all others, to appeals for letting a thousand methodological flowers bloom” (Knowlton, 2013, p.38). In further support of the growing call for a combined approach to educational research, Johnson and Onwuegbuzie (2004) call for a mixed-methods approach to research to capture all available data (Bryman, 2004; Johnson and Onwuegbuzie, 2004; Morgan, 2007; Fraser, 2014). Creswell and Plano Clark (2007, in Ma, 2012, p.1860) summarise the mixed-methods debate as:

There are three major “stances” in dealing with the alternative or conflicting world views or paradigms in MMR: (a) pragmatism-the research question should be of primary importance regardless of the method or the philosophical worldview that underlies the method; (b) multiple paradigms: the researchers recognise that “different paradigms give rise to contradictory ideas and contested arguments-features of research that are to be honoured but cannot be reconciled” and (c) the view that MMR is strictly a “method”, thus allowing researchers to employ any number of philosophical foundations for its justification and use.

This combined approach is essential when considering “the positivism research paradigm leaves out the common meanings of social phenomenon” (Denzin and Lincoln, 1998, in Rahman, 2016, p.106) and fails to ascertain deeper underlying meanings and explanations. Hence the requirement for a mixed-methods, pragmatic approach to this thesis and an insistence on the use of mixed-methods data

gathering to answer the research question. Morgan (2007, p.67) summarises the debate:

Fortunately, there is an alternative close at hand, because we can follow Kuhn's advice and treat our field as composed of groups of scholars who share a consensus about which questions are most important to study and which methods are most appropriate for conducting those studies.

It is the researcher's opinion that pragmatism allows the combination of this thesis' quantitative, objective findings to merge with subjective narrative from follow-up interviews within focus groups, to move the military's comprehension of its own FD/APDT concept forward.

b. Pragmatism's epistemological and ontological methodology considerations for this thesis.

Pragmatism evolved as a US philosophy driven by the ideas of William James, John Dewey (Zink, 2014) and those of C.S. Peirce (Johnson and Onwuegbuzie, 2004). A pragmatist philosophy "rejects historical dualisms and accepts both realist and constructivist perspectives on epistemology" (Greene, 2007, in Plowright, 2013, p.68) to "identify a philosophical position followed by the methodology on which the research will be based to ensure the epistemological integrity of the research" (Morgan, 2007, p.57). Underpinning the researcher's epistemological and ontological beliefs aligned to pragmatism, Barnes and Roche (1997, in Barnes-Holmes, 2000, p.191) note that "pragmatists, it is commonly believed, are not concerned with the nature of reality, but with successful working".

To ensure the thesis has utility within an organisational context, it is essential to conduct the methodology within a pragmatic paradigm for the thesis' practical

application within the RAF. The use of the pragmatic paradigm will provide a methodology focused on evidence and outcomes from the research, that have practical utility to address the research aim. This is the approach and reasoning for the researcher's alignment within pragmatism and the desire to provide the original contribution to knowledge and ensure organisational utility of the thesis' findings. The pragmatic research paradigm (Dewey, 1952) supposes that a mutually beneficial approach to research is more conducive to achieving results than conducted with "paradigm-blinkers" (Goldkuhl, 2012, p.136). The pragmatic use of any methodology embodies intelligent problem-solving and common-sense solutions to situations in overcoming paradigm biases (Cuthbertson, 2009; Morrill, 2015).

Instead of questioning ontology and epistemology as the first step, pragmatist supporters start off with the research question to determine their research framework. They emphasise that one should view research philosophy as a continuum, rather than an option that stands in opposite positions (Wahyuni, 2012, p.71).

The proposed pragmatic and normative, intellectual division of labour (Knowlton, 2013) could be perceived as "sidestepping the contentious issues of truth and reality" (Feilzer, 2010, p.8) if not managed to ensure the subjective narrative is interpreted into this thesis' findings. Wheeldon and Ahlberg (2011, p.124) point to one of the major strengths of mixed-methods data as "by providing multiple options, researchers can experiment with different analysis strategies and, provided they justify their approach, can offer valuable new approaches, methods and even measures".

In refining the pursuit for the nature of reality, researchers define ontology as the study of the nature of being or social reality, what it looks like and human interaction within it (Hudson and Ozanne, 1988; Grix 2004; Gosden, 2008). Epistemology is the

researcher's understanding of their relationship between their perception of reality and themselves (Erdirisingha, 2016) and how "knowledge can be created, acquired and communicated" (Scotland, 2012, p.9).

Pragmatists believe this reality is constantly renegotiated, debated, interpreted, and the best method is the one that solves the problem (Patel, 2015). Bazeley (2002, p.3) outlines pragmatism as:

Pragmatism increasingly overruled purity (Rossman and Wilson, 1985) as the perceived benefits of mixing methods in "getting research done" came to be seen as outweighing the importance of the philosophical difficulties in their use (Miles and Huberman, 1994).

This methodology challenges the traditional constructs of the experiential education phenomenon (Johnson, 2004; Bunniss *et al.*, 2010; Lukka, 2010 and Fisher, 2011) that leads to the "jingle and jangle fallacies" (Block, 1995, p.210) or lack of coherence of interpretivist results. Whiteside and Lynam (2001, p.2) notes that "the jingle fallacy refers to situations in which two constructs with equivalent labels are in reality, quite different. On the other hand, the jangle fallacy refers to situations in which two constructs with different labels are actually the same". This is already evident from the literature in the relabelling of FD/APDT and resilience theories and not pragmatic in progressing new knowledge.

The researcher offers the opinion that the contesting ontological perspectives, question the validity of predominantly or solely quantitative versus qualitative data and the subjective internal and external affective variables that raise doubt over the efficacy of an interpretivist approach to research. Creswell and Plano Clark (2014, in Almalki, 2016, p.294) notes that "at the end of the day, we are social, behavioural and human science researchers first, and divisions between quantitative and

qualitative research only serves to narrow the approaches and the opportunities for collaboration”.

This thesis does not profess to bridge the practice knowledge gap in resilience development through FD/APDT in isolation, but the data provided within its pragmatist approach should resonate, in part, with contesting researchers within their respective paradigms. This will occur through the quantitative findings coupled with qualitative narrative research within a subjective field. It will attempt to bridge the knowledge gap between FD/APDT, resilience and the RAF's understanding of the theoretical and practical application of FD/APDT outcomes. As there are no universal constraints of how to conduct research within a pragmatic paradigm (Wahyuni, 2012), this thesis will collate and present the data to find the best way to answer the research question.

This does not demonstrate indecision, insecurity or scepticism about truth and reality (Matson, 2010, p.15) but it is the researcher's opinion that this represents a common sense and pragmatic approach to developing new knowledge that is essential for this thesis to inform personal resilience development for RAF personnel.

Section 3. Mixed-methods research.

Freedom from traditional methodological constraints allows “quantitative and qualitative research to be blended or integrated in such a way that reference to the terms ‘quantitative’ and ‘qualitative’ is no longer needed” (Plowright, 2013, p.67). The principles of research are adhered to and this ensures the acceptance of the research's credibility, across the research paradigms. This is more apparent with

mixed-methods research given the extensive variables surrounding qualitative and quantitative synthesis and contesting opinions on their interlinkages or separation.

One critical issue in mixed-methods research is the reconciliation of the polarised views of reality in qualitative and quantitative research. The clarification of philosophical assumptions is necessary for constituting a methodology in social inquiry, arguing that “assumptions about the nature of social world (ontology) and about the nature of warranted social knowledge (epistemology)” as well as issues such as “objectivity and subjectivity, the role of context and contingency in social knowing, and the relationship between the knower and the known” should be clarified (Greene, 2006, p.93 in Ma, 2012, p.1859).

a. Mixed-methods data gathering for this thesis.

Single data collection methods alone will not provide the in-depth analysis essential for FD/APDT research (Hattie *et al.*, 1997; Malick *et al.*, 1998; Clandinin and Connolly, 1998; Richardson, 2000; Taylor and Settelmaier, 2003; Marsh, 2008; D'Amato and Krasny, 2011). Quantitative data will not consider the plethora of variables such as cultures, beliefs and ideology that cannot be interpreted within statistical data alone (Smeyers, 2008). Furthermore, the ‘loose’ language (Russell, Gillis and Lewis, 2008) and perceived unsubstantiated evidence from FD/APDT qualitative data, requires statistical support to ensure a rounded approach to predominantly qualitative FD/APDT research and potentially, practice.

Collective data contributes to the understanding of small behavioural adaptations that could result in enduring attitudinal change (Moore, 2018). A five-day FD/APDT intervention may not immediately change engrained attitudes, but will provide a pragmatic starting point from which to springboard longitudinal research and guidance for longer-term intervention development. Furthermore, the resilient behaviours experienced during FD/APDT may provide stimuli for long-term resilient

attitudinal change. This is dependent on the complex interplay between cognitive, affective and behavioural components of attitude and behaviours (Cherry and Gans, 2018). Consequently, a mixed-methods approach would be the best option to elicit evidence in these complex areas.

Authors should make clear the rationale of the mixed research study- that is, why the study is needed. The rationale is the most important aspect of a study because it identifies the gap in the literature. Furthermore, a rationale should be presented for the research formulation as it relates to the underlying participant(s) or group(s), particularly in terms of the historical, cultural, linguistic, social, and/or psychological composition of the sample members (American Educational Research Association (AERA), 2006, p.34).

To understand this linkage, if any, between cognitive, affective and behavioural components of attitude and behaviours (Cherry and Gans, 2018) with regards to FD/APDT and resilience, a flexible approach is required due to the multiple subjective variables addressed through FD/APDT. Nastasi *et al.* (2007, p.168) highlights flexibility in the mixed-methods approach through a multistage framework where “researchers use multiple stages of data collection that may include various combinations of exploratory sequential, explanatory sequential, and convergent approaches”. This flexible and complementary building of one data set onto another and the mutually beneficial approach to this research thesis, allows for the holistic progression of military FD/APDT comprehension; albeit within a short-term timeframe and as a starting point for future long-term research.

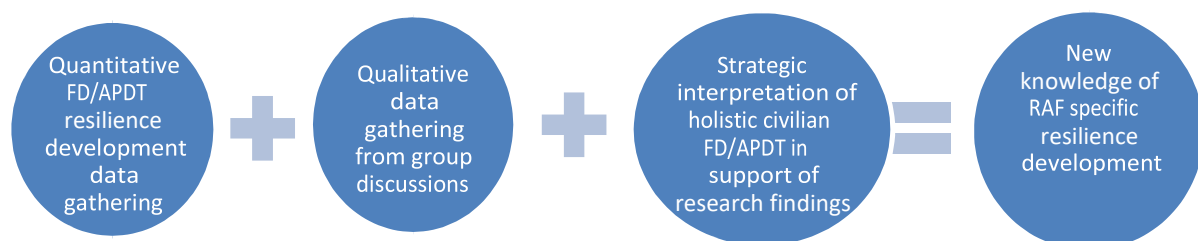
An emerging flexible approach to data collection and research methods is important for the completion of this thesis; more specifically, sequential explanatory mixed-methods (Creswell and Plano Clark, 2007, in Almalki, 2016, p.293) has significant support within educational research and is outlined in Figure 7.

Figure 7. Sequential explanatory mixed-methods research design (Creswell and Plano-Clark, 2007, in Almalki, 2016, p.293).



Figure 7 outlines the concept for the foundations of this thesis and provides the rationale for the mixed-methods approach and the basis for data collection and interpretation. This methodology is further expanded in Figure 8 to outline the pragmatic sequential mixed-methods designed specifically for this thesis that was aligned to the sequential process of data gathering, analysis and presentation. This methodological linear approach provided the researcher with a formalised structure for data gathering, that had been extensively used within mixed-methods data gathering and provides additional assurance for the reader that the researcher is following a structured data gathering process.

Figure 8. Pragmatic sequential explanatory methods for this thesis.



b. Research ethics and principles to consider in sequential explanatory mixed-methods research.

The questionable confirmation bias (Nickerson, 1998; Goodwin, 2010; Sanderson, 2010; Gray, 2011) in favour of the organisation, is argued by Jones and Oswick

(1993) as a main failing of research within FD/APDT and has the propensity to undermine the validity of the research to date. However, to counter this perceived prejudice, Harper (2010) notes that researchers of FD/APDT adhere to the strict code of ethics, including transparency/openness and reflexivity in their research or face academic discrediting. The complementary use of qualitative inquiry to inform quantitative research and vice-versa enjoys a degree of flexibility within mixed-methods (O'Cathain, Murphy and Nicholl, 2010) but consideration is required regarding the principles of these data collection methods.

Regarding the qualitative phase, researchers should describe in detail any threats to trustworthiness, credibility, dependability, authenticity, verification, plausibility, applicability, confirmability and/or transferability of data (Creswell, 2007; Miles and Huberman, 1994, in Leech and Onwuegbuzie, 2010, p.64).

When considering the additional principles associated with quantitative research to the above quote regarding qualitative research, the researcher believes a complex interplay of these 2 research approaches creates a convoluted but required appreciation of the challenges associated with mixed-methods research. To highlight this, the Centre for Innovation in Research and Teaching (CIRT) (2018) defines the principles for qualitative research as validity, reliability, falsifiability, generalisability, and reproducibility. In achieving this integration of qualitative and quantitative data, Leech and Onwuegbuzie (2010, p.66) challenge researchers to be “flexible, integrative, holistic and rigorous in their investigative techniques as they attempt to address a range of complex research questions” to ensure holistic credibility.

To present effective mixed-methods within the research principles for this thesis, consideration must be given to the results of the study and the rigour of the research. “Rigour refers to the extent to which the researchers worked to enhance

the quality of the studies” (Lobiondo-Wood and Haber, 2013, in Heale and Twycross, 2015, p.66). Therefore, mixed-methods combines both qualitative and quantitative research but with a word of warning highlighted by Plowright (2013, p.67) as “the Q words are the root and the route of all evil. Once you embark in either direction, then the journey is fraught with conceptual, methodological and axiological difficulties”.

In order to address these difficulties, it is essential to understand the research principles outlined above but within a mixed-methods context. Bazeley (2002, p.9) outlines the critical issues for mixed-methods research as:

Clarity of purpose, basis and substantive focus, giving direction to the study and a logical basis for explanation; awareness of the limitations of traditional methods as they are modified in a mixed-methods environment; appropriate use and interpretation of ‘quantitised’ coding from qualitative data; varied methods of treatment of error or deviance, and appropriate generalisation, given choice of sample and methods.

Using Creswell’s (2007; Miles and Huberman, 1994, in Leech and Onwuegbuzie, 2010, p.64) research principles coupled with the other research principles identified within this section, the researcher has combined these to address the multiple research principles considerations for this thesis. This ensures a collective view of research ethics and principles across multiple researchers to comprehensively cover the research ethics principles of trustworthiness of research, confirmability, transferability (applicability) of data, reproducibility, validity (plausibility), removal of bias (authenticity) as a research principle and ethical consideration, falsifiability/integrity/verification, informed consent, confidentiality agreements between the participants and the researcher, incentives given for participation, funding sources, potential conflicts of interest and the challenge of hierarchal organisational research.

i. Trustworthiness of research.

Research and researcher trustworthiness remain an underpinning principle that defines the success or validity of any research. Without credible methodology and processes, the researcher, research design credibility and trustworthiness will be questioned. The method by which the data are presented, interpreted and analysed are all research credibility aspects of fundamental consideration during this research thesis. "What is important for all validation strategies is that they are congruent with the theoretical assumptions underpinning a study's dominant paradigm" (Giddings and Grant, 2009, p.123).

Trustworthiness within mixed-methods research is challenging, with both quantitative and qualitative researchers raising questions regarding the most suitable means to ensure trustworthiness. Within qualitative research, Rolfe (2004, p.304) states "any attempt to establish a consensus on quality criteria for qualitative research is unlikely to succeed for the simple reason that there is no unified body of theory, methodology or method that can collectively be described as qualitative research". However, Sandelowski (2003, in Noble and Smith, 2015, p.34) states that "if qualitative methods are inherently different from quantitative methods in terms of philosophical positions and purpose, then alternative frameworks for establishing rigour are appropriate". The main point arises here is that the cross-referencing of the different forms of evidence, enhances the trustworthiness of the evidence.

Indeed, the researcher is acutely aware that questions could be raised regarding the trustworthiness of this thesis' mixed-methods if required to be replicated or validated given the data merging analysis, funding source and the perceived potential for researcher bias. This view could be construed for a great deal of funded doctoral

level research but is reliant on the demonstrated trustworthiness of the research and researcher to alleviate these concerns. Lincoln and Guba (1985) and Pretty (1994, in Johnson and Rasulova, 2015, slide 5) outline trustworthiness in Table 5. Whilst table 5 outlines the above researcher’s views of trustworthiness, the table’s utility with other researcher’s concept of trustworthiness are blended together within the following sub sections of this section, to holistically address the trustworthiness research principle.

Table 5. Trustworthiness as rigour (Lincoln and Guba, 1985; Pretty, 1994, in Johnson and Rasulova, 2015, slide 5).

Lincoln and Guba: trustworthiness as rigour

Quantitative research	Qualitative research (Lincoln and Guba, 1985)	Questions that underpin the principles of qualitative research (Pretty, 1994; p. 42)
Internal validity	Credibility	How can we be confident about the ‘truth’ of the findings?
Objectivity	Confirmability	How can we be certain that the findings have been determined by the subjects and contexts of the inquiry, rather than the biases, motivations and perspectives of the investigator?
Reliability	Dependability	Would the findings be repeated if the inquiry were replicated with the same (or similar) subjects in the same or similar context?
Generalisation	Transferability	Can we apply these findings to other context or with other groups of people?
	Authenticity	Have people been changed by the process? To what extent did the investigation prompt action?

In meeting Lincoln and Guba’s (1985, in CREC, 2018) requirement to ensure trustworthiness in mixed-methods as outlined in Table 5, the researcher created a comprehensive audit trail at Appendix 1, for additional trustworthiness within this thesis’s data gathering process. These “process notes” (Cohen and Crabtree, 2006, p.1) are designed to provide an audit trail through the collation of key processes and

events within the thesis. Lincoln and Guba (1985, p.319) and Cohen and Crabtree (2006, p.1) cite Halpern (1983) when describing process notes as including methodological notes (procedures, designs, strategies and rationales), trustworthiness notes (relating to credibility, dependability and confirmability) and audit trail notes for a detailed explanation of how all research principles were addressed within this thesis.

ii. Confirmability.

Confirmability presents a challenge to mixed-methods research when replicating findings within the subjective field of research (FD/APDT). Confirmability remains a fundamental principle aligned to bias, when interpreting the research data in this thesis to ensure at the data merging stage, the interpretation of quantitative data within the qualitative narrative ensures unbiased alignment. “Confirmability is there to verify that the findings are shaped by participants more so than they are shaped by a qualitative researcher” (Lani, 2018, p.1).

A similar challenge presents itself in the confirmability of the quantitative data if the statistics are manipulated or data misrepresented. Here, confirmability that data findings were provided by participants and not falsified, will falter under scrutiny as the replication of data procedures should present similar findings. Although similar findings to assure confirmability are expected within validity or reliability assessments, i.e. Cronbach’s Alpha co-efficiency, the data are unlikely to be similar if using a different set of participants, given likely subjective and personal variables. This could be rectified if using a similar research group, i.e. another set of 250 RAF basic recruits during FD/APDT followed up by focus groups discussions six months later, where data findings may present similar socio-cultural themes and statistics.

Whilst ensuring the confirmability of research, it is crucial the researcher ensures a reflexive approach to research and consistently questions their research ethical considerations, to ensure they adhere to the research ethics. This reflexive approach is also conducive to researcher best practice during all research and ensures constant critical analysis of the researcher's management of information and research methodology (Attia and Edge, 2017). To achieve this reflexivity during the thesis, the researcher constantly reviewed the data to ensure quantitative data and qualitative themes emerged and were not influenced by the researcher. The data gathering approach and merging was further discussed within the audit notes, to outline reflexive processes such as how the data sets influenced each other and what the outcomes of the data suggested for RAF FD/APDT and the thesis.

iii. Transferability (applicability) of data.

“Unlike generalisability, transferability does not involve broad claims but invites readers of research to make connections between elements of a study and their own experience” (Barnes *et al.*, 2012, p.1). Therefore, it is the researcher's opinion that transferability within mixed-methods requires cognitive appreciation of the context in which the research is transferred. If a participant or research reader understands the environment in which the data are to be transferred and utilised, then transferability can be effective. This is extremely prevalent for the use of transferable knowledge from the FD/APDT intervention into personal resilience within the RAF. However, if there is uncertainty of the ability to transfer the data into a specific environment, this can lead to data misinterpretation or misuse.

For this thesis, the methodology combined with threading data into the utility of RAF FD/APDT and resilience education aims is a fundamental requirement for the

transferability (and reader's comprehension) of the analysis of data. If the data are non-transferable or not contextualised, then this thesis will be useless as "the most we can ever realistically hope to achieve in educational research is not prediction and control but rather only temporary understanding" (Cziko, 1992, p.10). In this thesis, the proposed temporary understanding relates to analysing the data for the immediate perceived outcomes of the FD/APDT intervention, immediately and six months later, on the participant's resilience, but cognisant of the multiple affective variables. Therefore, the transferability of the underlying data when piercing through the affecting variables to the core underlying transferable data, is essential to apply transferability of the thesis' findings; but not an easy task.

Whilst generalising results could undermine the perceived validity of data to readers of a positivist quantitative disposition, the thesis' methodology allows for generalisation to take place with supported qualitative data. This is prevalent when generalising subjective data for manageable interpretation during the data analysis and merging phase of mixed-methods research. As Mayring (2007, p.2) notes, "the procedure of generalization seems to be the kernel of all scientific work, a basic attribute of scientific knowledge as the aim of science. From single observations we try to draw inferences to more general formulations to be extended to future situations".

Identifying the necessity for generalisation and data transference into personalised contextual environments is a fundamental consideration, when interpreting and presenting findings for the results of this thesis. Results from population samples (trainees) have a high probability of providing generalisation of results that could be

consistent with the large-scale population RAF to which the sample group belongs (Barnes *et al.*, 2012).

Whilst large-scale generalisation study may resonate in other contexts involving other participants, it is not always possible to predict with absolute certainty. This is prevalent when considering if phase 1 and 2 trainees and the wider RAF personnel, would share similar results. With generalisability usually implying that results are transferable (Firestone, 1993), this leaves generalisation as a key consideration when transferring sample group data from this thesis into the wider RAF population.

iv. Reproducibility.

Dunie (2017, p.356) outlines reproducibility of research as amongst the most basic underpinnings of research science.

Without strong data management policies, documentation and data management, reproducibility is at risk. Research labs of all disciplines have varying types of equipment, but there is at least one standard among them: Research is to be documented in accordance with the scientific method. Good data is data that is documented, stored, and accessible.

A challenging principle within this research thesis' combined mixed-methods research (in a defined small military context), is that the reproducibility principle could come under scrutiny. However, to alleviate this concern, one half of the research thesis, the CDRS-25, is reproducible, as past research reviewed in the literature demonstrates. However, future researcher's interpretation of the qualitative focus groups' data depends on their ontological and epistemological perspectives that could prevent the reproducibility of this part of the research.

This potential cherry-picking (Fraser *et al.*, 2018; Murphy and Aguinis, 2018) of research outcomes within the qualitative literature to meet researcher's requirements, must remain a concern within mixed-methods research that could undermine the validity of the research. Whilst the 2 principles (validity and reliability) are distinctive, it is the researcher's opinion that they have absolute inter-reliance to mutually support adherence to ethics and validity. "Reliability is not equivalent to validity because reliability and validity are two separate properties of scores" (Ritter, 2010, p.4).

v. Validity (plausibility).

Validity refers to the "extent to which an instrument and/or its subscales reflect the intended construct or phenomenon" (DeVellis, 2012, in Rasmussen *et al.*, 2017, p.185) and of the multiple types of validity assessments to ensure the effectiveness of data collection methods and methodology. As outlined previously, the use of content validity has already been extensively assessed within the CDRS-25. This extensive validation of the principle statistical data questionnaire, underpins the validity of the quantitative data to outline how threats to validity within this thesis are removed (Leech and Onwuegbuzie, 2010).

Such an analysis helps us to understand validity and truth claims as they occur in these different ontological worlds. The formal ontological categories also clarify that MMR is feasible within a communicative-pragmatic framework and that qualitative and quantitative research methods are not necessarily objectivistic or relativistic patterns (Ma, 2012, p.1866).

Noting the challenge of data integration, Onwuegbuzie and Johnson (2006, p.53) state that "because of the complexity involved in combining qualitative and

quantitative studies either in a concurrent, sequential, conversion, parallel, or fully mixed manner, mixed research gives rise to what we call the problem of integration”.

To ensure adherence to this research principle, validity (within the qualitative phase of this thesis) was achieved through member-checking and the continued cross-checking of qualitative narrative recorded to ensure coherence with the responses given. This also removed the potential for confirmatory bias as the participants were able to confirm their responses. In the development of themes aligned to the four resilience domains within the responses, these data were recorded, transcribed and checked by participants before merging with the quantitative data.

vi. Consideration of bias (ensuring authenticity) as a research principle and ethical consideration.

Whilst the ethical issue of bias has been touched on earlier, it is essential to elaborate on the consideration of bias within mixed-methods research. This is most prevalent considering the merging and interpretation of mixed-methods data and warrants specific attention before moving forward. The potential for researcher and participant bias can be present at any stage of the mixed-methods approach.

However, the data interpretation and merging of qualitative and quantitative data is the critical juncture within this thesis, where it is essential to carefully merge the two data sets together; without inadvertently introducing bias. “Merging typically occurs after the statistical analysis of the numerical data and qualitative analysis of the textual data” (Fetters, Curry and Creswell, 2013, p.2136).

Further pertinent to this research thesis’ design, Pazzaglia, Stafford and Rodriguez (2016, p.3) also contend that “probability samples use techniques to best represent

the target population, but this can also result in biased estimates of target population values if response rates are low, or if those who respond to the survey differ in meaningful ways from those who do not". This occurs predominantly through falsification of generalised data by the researcher. To avoid this potential for bias, the member cross-checking ensured non-bias integration during the merging of the qualitative and quantitative narrative. The data was also critically reviewed by a senior work colleague of the researcher to ensure the data was credible. This is important to prevent cherry-picking qualitative narrative to support the outcomes of research and to ensure a cohesive and balanced analysis of the qualitative data; or risk a disjointed thesis. This qualitative analysis and member cross checking was conducted during the focus group discussions by asking the participants to check and confirm the comments recorded during the discussions and discussed later in this chapter. It is "better to progressively unveil relevant evidence on a path to a common conclusion than to organise on the basis of method used" (Bazeley, 2002, p.9).

This neutral approach to the merging of the two data sets further enforces credibility and integrity within this thesis. Merging of questionnaire and focus groups evidence required consideration of the balanced perception of RAF FD/APDT's perceived immediate outcomes and 6-month follow-up on resilience. This was required to present an open and balanced critical analysis of the data collection themes (Irwin and Stafford, 2016).

This is further pertinent given the researcher's role as a serving RAF officer, that could be perceived as bias in the objective collection and presentation of this thesis' research.

Doctoral researchers are more likely to view research as involving measurement and collecting empirical data. They are also more likely to believe that it is not possible to be procedurally objective when collecting data. This challenges the view that, “traditionally, the aim of the research enterprise from a methodological perspective, is to use a procedurally objective set of methods in order to gain an ontologically objective understanding of the events and objects we study” (Eisner, 1993, in Plowright, 2013, p.79).

vii. Falsifiability/integrity/verification.

Research integrity may be defined as an active adherence to the ethical principles and professional standards essential for the responsible practice of research (Korenman, 2018). The integrity of the research and researcher is arguably the underpinning research principle that the others are subordinate to. Without integrity, the researcher believes the other principles risk being undermined to meet the researcher’s requirements. These requirements could manifest themselves through funding pressures, forced positive outcomes by sponsoring organisations and other risks to integrity. This is extremely prevalent given the researcher’s role in the management and delivery of RAF FD/APDT and the funding of this thesis by the RAF. The strict adherence to these ethical and research principles assured the reader of the integrity of the research.

It is therefore incumbent on all scientists and scientific institutions to create and nurture a research environment that promotes high ethical standards, contributes to ongoing professional development, and preserves public confidence in the scientific enterprise (Resnik, 1998; Grinnell, 1999; IOM, 2001; Yarborough and Sharp, 2002, in NCBI, 2018).

To further develop this approach to integrity, the National Centre for Biotechnology Information (NCBI) (2018) outlines responsible research conduct as:

1. Intellectual honesty in proposing, performing and reporting research.
2. Accuracy in representing contributions to research proposals and reports.
3. Fairness in peer review.
4. Collegiality in scientific interactions, including communications and sharing of resources.
5. Transparency in conflicts of interest or potential conflicts of interest.
6. Protection of human subjects in the conduct of research.
7. Humane care of animals in the conduct of research.
8. Adherence to the mutual responsibilities between investigators and their research teams.

The All European Academies (ALLEA) (2017) outlines reliability, honesty, respect and accountability within the construct of integrity to ensure the continued integrity of research, while the Houses of Parliament (2017) proposed incentives for researchers that includes:

1. Amending the Research Excellence Framework.
2. Revisiting correction of research literature.
3. Extending funding.
4. Reproducing findings.
5. Journals placing less emphasis on positive results.

Of further concern is that the FD/APDT intervention has not been amended to provide additional evidence for the participants to score higher or represent false subjective feelings due to organisational pressures. This potential issue was removed as the questionnaire and focus groups briefing asked the volunteer participants to answer honestly and without pressure. Moreover, the member checking of data (especially within the focus groups discussions) was rigorously conducted. "This treatment integrity involves the mixing of quantitative and qualitative techniques for the rationale of assessing the fidelity of interventions, programs, or treatments" (Leech and Onwuegbuzie, 2010, p.63).

c. Specific ethical considerations for thesis methodology.

To ensure all ethical considerations were implemented for the volunteers of this research, a research proposal and ethical approval request were submitted to the required Research Ethics Committees (MOD and University) at Appendix 6. This was essential as the participants are all serving RAF personnel within the first two phases of their basic and trade specific training. "All research undertaken in situations which involve people interacting with each other will have an ethical dimension; educational research is no exception and the ethical issues are often complex" (Stutchbury and Fox, 2009, p.489).

The University of Wolverhampton's Research Student Handbook (2004, p.29) cites research ethical considerations as "excellence, honesty, integrity, co-operation, accountability, training and skills care and safety and respect". In support of these considerations, Farrimond (2013, in Rahman, 2016, p.107) outlines the importance of research ethics as "paramount not only in the primary research in particular, but also even in terms of using secondary data sets because there are ethical issues relating to fair and unbiased selection of sources and analysis". Within educational research specifically, Oliver (2003, in Stutchbury and Fox, 2009, p.502) encourages students to tackle the issue from different perspectives and advocates a 'situationalist' approach. "This recognises that a flexible system is needed to take account of the great variety of situations that arise in educational research and the best that we can do is to place humanity and the welfare of others at the centre of our considerations".

The welfare of participants during this thesis, coupled with the requirements to present unbiased findings is the major ethical consideration for research that

involves human participation, especially when considering these complex ethical issues are vulnerable to abuse (Pendlebury and Enslin, 2001). This is both an ethical consideration but also a basic human emotion to ensure no harm comes to participants, either physically or emotionally. The ethics of hierarchal organisational research and possible hierarchal pressure imposed on the participants (Koski, Xie and Olson, 2015) is an essential consideration for the implementation of this research. These ethical issues were addressed by removing rank, using first names and ensuring the participants were not influenced in their answers by higher ranked personnel within their chain of command, as they were not present during the focus groups. The data gathering was collated in a relaxed workplace environment without concerns regarding reprisals for their answers. The participants were informed that the answers provided would not be attributable and that discussions remained confidential within the group.

Of further consideration to the identified ethical considerations, is the possibility of reputational harm to an academic institution or funding organisation whose ethical stance could be brought into question, if research falls short of these ethical guidelines.

Authors should always strive to report how all ethical considerations were addressed in the study, including the following: informed consent of the participants, confidentiality agreements between the participants and the researcher(s), incentives given for participation, funding sources, potential conflicts of interest, and biases (AERA, 2006, in Leech and Onwuegbuzie, 2010, p.68).

To demonstrate the adherence of this research thesis to these 5 ethical considerations highlighted by the AERA (2006) and other research organisations,

the following mitigations for each ethical consideration during the completion of this thesis are outlined below:

i. Informed Consent.

Informed consent is an ethical and legal requirement for research involving human participants. It is the process where a participant is informed about all aspects of the trial, which are important for the participant to make a decision and after studying all aspects of the trial the participant voluntarily confirms his or her willingness to participate in a particular clinical trial and significance of the research for the advancement of medical knowledge and social welfare (Lokesh *et al.*, 2013, p.134).

Informed consent was given by the volunteer participants after they were briefed on the format of the research (at both the questionnaire completion and focus groups) and their right to withdraw or refuse to answer any questions they did not want to (General Medical Council, 2013). They were also assured that anonymity would be respected concerning their questionnaire and focus group responses as outlined by the ESRC (2015). This is extremely important given that many of the participants would have been basic phase 1 and 2 RAF recruits. This methodology adheres to the central tenet of consent within the founding principles of research ethics.

The 1964 Helsinki Declaration stipulated that valid consent is properly informed and also freely given – without pressures such as coercion, threats or persuasion. The Nuremberg Code and Helsinki Declaration remain at the foundation of principles of consent in research today (Ethics guidebook, 2018).

ii. Confidentiality agreements between the RAF participants and the researcher.

The ethical consideration of confidentiality in protecting data and individuals was addressed by ensuring anonymity, as no names or personal details are included within the questionnaire or comments attributed to any named individual in the focus groups, other than rank and age for coding purposes. The decision to limit the amount of personal data collated for each of the participants was taken due to the small number of RAF personnel within the focus groups, the ease with which comments could be attributed to personnel and the confidentiality agreed between the participants and the researcher.

The focus groups were derived from phase 2 trainees consisting of several junior ranks (ranging from Aircraftsman to Acting Corporal). However, there are only a handful of training schools at the researched phase 2 training establishment whose students are A/Cpl and SAC's. From those courses it would be easy to identify specific comments to individuals i.e. limited number of females or individuals that had been recoured for two years. To protect the participants, coding is provided but is purposefully limited in the data collated for the participants to ensure anonymity and confidentiality.

Completed questionnaires were stored in a secure cabinet in a locked office and the notes taken during the focus groups were destroyed immediately after the research data collection and merging had concluded; as required by the research proposal. This ensured adherence to the GMC's research advice that, "a researcher must respect the participant's right to confidentiality and make sure that any data collected

as part of a research project is stored securely and in accordance with data protection law and other requirements” (GMC, 2013, p.5).

During the completion of the questionnaires and focus groups, the participants were briefed on the confidentiality of the data and the subsequent analysis that would not refer to any individual set of data or any specific individuals. This was extremely important given the potential for recruit’s concerns regarding confidentiality and possible reprisals. The focus group data is coded and grouped into themes. These themes reflect the four domains of resilience and the sub-factors of these domains identified within the CDRS 25, i.e. personal competence, high standards and tenacity and all comments were non-attributable.

iii. Potential conflicts of interest.

Strategies to advertise their products and making propagandas about them being safe have raised many questions related to the funding of research by those companies. Suppression of facts in the form of a negative response while disclosing a conflict of interest, is another area where the publishers need to be wary of (Mandal, Parija and Parija, 2012, p.89).

This point aligns specifically with concerns regarding funding sources and validity/reliability of the data to demonstrate neutrality in collation, interpretation, merging (within mixed-methods research) and presentation. The researcher must declare any potential conflicts of interest at the earliest opportunity within research, so the reader understands the mitigations that have been introduced to ensure transparency and sound ethics.

The basic dilemma in the relationship between science and ethics is whether the codes of ethics are essential regulators of scientific activities? Do they hinder the freedom of scientists in research or is their role to keep the researcher within the framework of socially

acceptable conduct and ensure the fulfilment of “socially desirable objectives” (Schrader-Frechette, 1994, in Petrovic, 2017, p.98).

Ethical standards prevent against the “fabrication or falsifying of data and therefore, promote the pursuit of knowledge and truth, which is the primary goal of research” (CIRT, 2018). The GMC (2013, p.5) further states that “researchers must identify any actual or potential conflicts of interest that arise and declare them as soon as possible to the research ethics committee, other appropriate bodies and the participants, in line with the policy of your employing or contracting body”.

The main conflict of interest already declared within this thesis is the researcher’s role as a Training Officer in the RAF and the RAF’s funding of this research. To avoid the conflict of interest issues and any confirmatory bias associated with insider-research such as falsification and credibility of the data gathered, the FDIs distributed the questionnaires to the participants and the completed forms were checked for completion by the officers at the RRC who stored the forms in a locked cabinet. At the focus groups discussions, the participants were asked to verify the comments they made during the sessions and confirm any comments the researcher had made on the white boards for the removal of any insider-researcher bias. The data merged was further cross-checked by a senior work colleague of the researcher, to ensure validity and remove any potential for confirmatory bias.

Given the hierarchal nature of the RAF and the junior ranks of the participants, it was decided to keep the questionnaire and focus groups as relaxed as possible and without pressure applied on the participants by senior personnel within their CoC. The questionnaires were distributed and administered by FDIs, the majority of whom are Cpls or Sgts and the focus groups were delivered by the researcher in civilian

clothing and without the participant's line managers in the room. The participants were volunteers for both elements of the data gathering; albeit within their respective phases of training and were given the option not to participate.

d. The challenge of hierarchal organisational research.

One of the most significant challenges for this thesis is the use of RAF personnel within a hierarchal organisation, where the question of rank pressure to produce results, is always a potential risk to undermine the research findings. Moreover, criticism of the linear organisational research (all RAF focused) and the thesis' inability to draw parallels across Defence for a holistic view of the FD phenomenon, could also fuel concerns of the strength on this thesis in isolation from complementary FD/APDT research by the Army or Royal Navy. Given that the Army and Royal Navy conduct their own versions of FD/APDT with different contexts and aims, this thesis can only focus on the findings for the RAF but considers its findings for application across Defence.

Given the potential scepticism of the reader for the removal of hierarchal pressures on the participants in any form of internal management research (Honig *et al.*, 2018), the topic of research within hierarchal structures warrants review for this thesis to ensure this issue has been thoroughly considered and mitigated against through the ethics measures defined in this chapter to ensure the credibility of the research.

As Tourish and Craig (2018, p.26) notes that to ensure integrity, researchers must:

Focus afresh on the motivations of disinterested inquiry and curiosity that are the mainstay of good research, rather than seeing research mainly in terms of career advancement and publication as 'a game' that we play to that end. It would, we believe, strengthen our collective commitment to research integrity and help to prevent research from becoming a corrupt

game that damages the scholarly community and, ultimately, our wider society.

Whilst measures to remove hierarchal pressure have been highlighted in this chapter, the use of any managerial research within organisations that involve both peer review and local contexts (Clair, 2015) will always be under scrutiny. To combat this risk of scientific misconduct, the onus remains with the researcher to adhere to the research ethics, irrespective of their motivations for conducting the organisational research. Lindorff (2007, p.21) identified these motivators as “consultancy, instrumental academic, co-consultancy, and academic research pro bono publico.” However, Lindorff (2007, p.22) further proposes an alternative view of the purpose that drives this thesis to develop organisational learning with professional and ethical standards.

An alternative way of viewing the relationship between participants, research and researchers is to return to the view of researchers as professionals with standards for ethical conduct. The effect on participants as then seen not merely as a consequence of the values of the researcher, but as an interaction with independent requirements and specific moral principles.

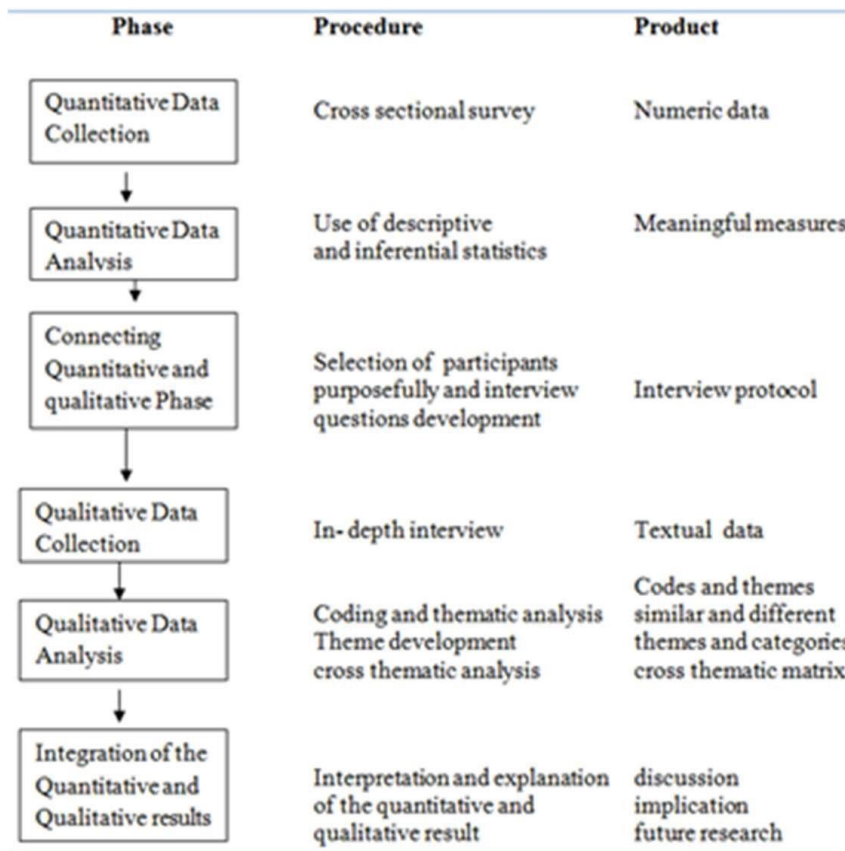
The hierarchal pressures placed on researchers to generate supportive findings for their theories, has the potential to undermine research integrity if internal and external pressures are too overwhelming for researchers (Saxe, 1996). However, when reducing this organisational pressure, researchers have the freedom to examine wider facets of a phenomenon to fully appreciate the entirety of the research findings. This further allows the researching organisation to consider contextual application of the findings to improve its output, productivity or align best practice with the research findings, instead of forcing dishonesty to meet short-term

aims instead of considering the second or third order effect of their interference with results.

Section 4. Data gathering and analysis process.

Significantly, the format for this thesis aligned with Creswell and Plano-Clark's (2007) sequential explanatory mixed-methods to provide the required quantitative and qualitative data with the subsequent data merging for RAF FD/APDT and resilience development. This is achieved by using the quantitative data collection to complement the qualitative narrative from follow-up focus groups discussions and develop themes for analysis to inform RAF FD/APDT intervention design. This will create the desired RAF baseline understanding of FD/APDT's role in developing resilience. This is outlined in Figure 9 adapted from Subedi (2016, p.574) and this process is used to outline each phase of this thesis' mixed-methods and the analytical process associated with each of these phases. Adaptations from the procedure and product have been explained within each of the phases to synchronize with the requirements of this thesis.

Figure 9. Sequential explanatory mixed-methods diagram taken from Subedi (2016, p.574).



With the comprehensive understanding of the ethical considerations for both elements of data merging within mixed-methods, it is essential to tie these together for the reader to understand the research process within the ethical guidelines, during the thesis' analytic process within Subedi's (2016) sequential explanatory mixed-methods. Coupled with the extensive audit trail at Appendix 1, and Figures 7, 8 and 9, this thesis' analytical process incorporates the required ethical considerations when analysing the data within the sequential explanatory mixed-methods research analytic process.

a. Quantitative data gathering and analytical process (phases 1-2).

The researcher believes that complementing questionnaire data with qualitative research in mutual support, provides a comprehensive approach to pragmatic mixed-methods research, but only if the questionnaire in use has credibility, reliability and can be readily replicated within the specific research field. The below quote provides an outline to the use of a valid questionnaire to establish identical formats and ensure reproducibility and credibility.

A standardised questionnaire is one that is written and administered so all participants are asked precisely the same questions in an identical format and responses recorded in a uniform manner. Standardising a measure increases its reliability (Boynton and Greenhalgh, 2004, p.1314).

When considering the choice of a suitable questionnaire for this research thesis, the challenges occurred in identifying a credible questionnaire that could be separated into the four resilience domains (psychological, physical, social and spiritual) and holds validity within both FD/APDT, resilience specific research and past military studies. This allowed for the understanding of why the questionnaire had to appeal to multiple areas within this research and produce useable and credible data for analysis.

In other words, what do you want to learn from the questionnaire? For what purpose will the data gathered be used? Not clearly defining the goal or goals at the outset runs the risk of gathering incomplete, misleading, or non-essential data (Fink, 2013; Pope, Boleman and Cummings, 2005). It is easy to get caught up in wanting to know too many things, so identify only one or a few goals that are essential to making a decision (Fink, 2013, in Harlacher, 2016, p.2).

As the use of the questionnaire would only provide immediate quantitative data regarding the respondent's perceived resilience development after the intervention,

the pragmatic evaluation of expected short-term or complementary qualitative research, underpinned the interpretation of the questionnaire results in further understanding behavioural change over time. This was essential to prevent the replication of existing qualitative narrative within a pragmatic hermeneutic spiral of knowledge development and progress military FD/APDT learning forward. This also forms the basis for the focus groups' evidence in understanding how the qualitative narrative explained any perceived development of resilience, as a result of the FD/APDT intervention.

Second, behaviour change is often not immediate. It takes time. Therefore, it may be preferable in terms of measuring impact to ask about behaviour change months after the conclusion of a program (longer-term post) to give participants time to adopt the desired behaviour. (Pope, Boleman and Cummings, 2005, p.13).

When considering the different phases of the sequential explanatory mixed-methods, research by Stoecker (2007, p.98) confirms that “although a questionnaire is a good method of data collection, research data practice does not have to be informed by a theoretical or disciplinary-based question and instead, may be informed by a practical need”. Glaser (1992, p.12) also states that “in order for the research to be successful, the research should be directed to an area of interest, where patterns will emerge with the gentle assistance of the researcher, not through forcing”. Equally, Gummesson's (2003) perspective on the continuous interpretation of data throughout the research process is a critical consideration during this research thesis.

As Creswell (1994, in Bazeley, 2002, p.8) alludes to, “the level of understanding of the audience, similarly, can be a problem. The mixed-methods researcher needs to convey methods which may be unfamiliar to readers from one side or the other”.

This is also the case if the reader has no preference, but nevertheless, this thesis'

methodology's transparency and in-depth explanation of the process, data gathering, interpretation and presentation will assist in the reader's understanding. Wheeldon and Ahlberg (2011, p.11) notes that "through multiple stages and methods of data collection and/or analysis, researchers can get a better understanding of a phenomenon by combining the reliability of empirical counts with the validity of lived experience". It is this better understanding that is also required for the reader and highlighted within the audit trail process in Appendix 1. This will be achieved through the data analysis and interpretation conducted at the data merging point. This will provide context for the military FD/APDT phenomenon (Smith, 2018) that considers participant's "lives, lived experiences, behaviours, emotions, and feelings as well as organisational functioning, social movements, cultural phenomena and interactions" (Rahman, 2016, p.103).

The use of a questionnaire as a tool for data collection within educational research is a well-established research method with multiple benefits to the researcher, as they offer a "means of collecting information about people's knowledge, beliefs, attitudes, and behaviours" (Boynton and Greenhalgh, 2004, p.1312). Whilst an effective research tool to extrapolate data from within a research field, it is not without its limitations and concerns surrounding bias that requires consideration. The use of such instruments may lead to biases (Penwarden, 2013) that distort the research outcomes (Johnson and Wislar, 2012).

Questionnaires rely on the ability of participants to clearly comprehend what is being asked of them, their willingness to answer, their willingness to consider and reflect, and their honesty and accuracy of recall in providing responses. Failure on any of these counts may result in no response or inaccurate responses (Pope, Boleman and Cummings, 2005, p.6).

The success of the questionnaire relies on its adherence to many of the research principles; especially validity and reliability. Inappropriate instruments and lack of rigour inevitably leads to “poor quality data, misleading conclusions and woolly recommendations” (Boynton and Greenhalgh, 2004, p.1312). The potential for lack of rigour for the questionnaire selection for this thesis, was addressed by using the CDRS-25 due to its extensive past use and validity testing.

The use of an established, peer evaluated and stable questionnaire, alleviates many concerns regarding construct reliability and underpins the reasoning for the use of the CDRS-25 for this thesis. “Using a previously validated and published questionnaire will save you time and resources; you will be able to compare your own findings with those from other studies, you need only give outline details of the instrument when you write up your work” (Boynton and Greenhalgh, 2004, p.1312). From a pragmatic perspective, the use of an established and empirically validated questionnaire (CDRS-25) also expedites the research process, through removing the need for sampling or for developing a new and unvalidated questionnaire design (Pazzaglia, Stafford and Rodriguez, 2016).

Furthermore, the participants’ willingness to take part in the survey and their accurate completion of the questions, presents a cognitive burden for the participants and a weakness within this data collection method (Burgess, 2001; Buber, Gardner and Richards, 2004; Fink, 2013, in Harlacher, 2016; Kountur, 2016). Participants are not tested on “actual knowledge, instead participants express what they perceive to be their own level of understanding before and after the programme with any increase being an indicator of knowledge gain” (Pope, Boleman and Cummings, 2005, p.11).

Despite the intention of the questionnaire to identify participant recognition of immediate behavioural changes as a result of the FD/APDT intervention, the complementary use of the immediate questionnaire data gathering with follow-up focus groups, is a further extension of the pragmatic approach for this thesis. As Aksu (2009, p.215) states, “researchers do not have to choose one of the methods to collect data. They can use both methods in the different stages of a study”. This approach further feeds into the concept of the pragmatic mixed-methods research supported by Hartley’s (2017, p.74) perspective that the “data given in questionnaires might be more convincing, if they were supplemented with comments and opinions from the respondents”.

There have been numerous attempts to prioritise one resilience scale as the preferred option for researchers (Windle, Bennett and Noyes, 2011; Neill, 2011; Aburn, Gott and Hoare, 2016) but without success. In a review of 2979 resilience research theses, Windle, Bennett and Noyes (2011) identified 19 separate resilience scales grading content validity, internal consistency, criterion validity, construct validity, reproducibility, agreement, reliability responsiveness, floor and ceiling effects and interpretively of each scale. Despite this promising approach to identify the gold standard of resilience scales, Windle, Bennett and Noyes (2011) were unsuccessful, but did identify the CDRS-25 and Brief Resilience Scales (Smith, 2008) as receiving the best psychometric ratings. Although these findings are supported, Ahern *et al.* (2006) stated the CDRS-25 required further investigation.

Despite this concern, the broad-spectrum support for the validity of the CDRS-25 is noted throughout several research sciences. These include sport (Gucciardi *et al.*, 2011; Schoenfeld, Ogborn and Krieger, 2016), neurobiology (Russo *et al.*, 2012),

trauma survival (Karairmak, 2010), psychopharmacology (Vaishanvi, Connor and Davidson, 2007) and relevant to this thesis, separate military resilience studies (Johnson *et al.*, 2011; Ewert and Yoshino, 2011; Xie *et al.*, 2016) but never in a combined military or RAF specific FD/APDT study. Whilst cited as the more valuable of the resilience scales available to researchers, resilience scales (and the CDRS-25) are not without their critics, both as broad resilience measuring tools and specifically within FD/APDT. This issue is further compounded by the lack of evidence for their utility within a combined military and FD/APDT context.

Within the argument surrounding the use of the multiple resilience scales, the CDRS-25's positive factor analysis and low Flesch reading score (aged 12) underpinned the decision to use this questionnaire for the study. However, the CDRS-25 receives a great deal of attention that merits further examination in its limitations within the thesis.

Numerous studies have used the CDRS-25 to assess change during treatment with medication, psychotherapy, or from some other form of intervention, such as instruction in stress-management or resilience-building (Connor and Davidson, 2003).

Consisting of 5 main factors and researched through 25 self-reporting items (scored 0-4) within the questionnaire, the CDRS-25 outlines personal competency, high standards, and tenacity (8 items), trust or tolerance of negative affect and stress (7 items), acceptance of change and secure relationships (5 items), control (3 items) and spirituality (2 items) (Gonzalez *et al.*, 2005). The CDRS-25 has also been extensively scrutinised using Cronbach's internal consistency co-efficient scoring 0.89 (Sharma and Sharma, 2016; Yu *et al.*, 2011). To add further context to the factors and their linkages to the four domains of resilience (physical, psychological,

spiritual and social), in earlier works during the creation of the CDRS-25, Connor and Davidson (2003, p.3) noted:

Factor 1 reflects the notion of personal competence, high standards, and tenacity (*Physical and Psychological*). Factor 2 corresponds to trust in one's instincts, tolerance of negative affect, and strengthening effects of stress (*Physical and Psychological*). Factor 3 relates to the positive acceptance of change and secure relationships (*Social*). Factor 4 was related to control (*Psychological*) and Factor 5 to spiritual influences (*Spiritual*).

The use of the CDRS-25 in binding its factors within the identified domains of resilience, are useful in codifying the questionnaire items for use in this research and it is the researcher's opinion that the alignment of the CDRS-25 against the literature themes identified presents the best-fit questionnaire for this thesis.

Gonzalez *et al.* (2015) reported high internal consistency, good test-retest reliability and adequate convergent and discriminate validity for the 25-item questionnaire with Yu *et al.* (2011) and Sharma and Sharma (2016) identifying the CDRS-25's internal consistency through the Cronbach alpha co-efficient, to be 0.89 for the full scale 25-item questionnaire. A shortened version of the CDRS-25 also "exhibited appropriate psychometric properties, including internal consistency, test-retest reliability, and structural and concurrent validity" which was validated during research within Chinese military personnel (Xie, 2016, p.1).

To further establish the researcher's reasoning behind the use of the CDRS-25, studies using variants of the CDRS-25 within military populations have been conducted since the questionnaire's inception with positive consistency, reliability, validity and utility within this unique demographic. In a US Air Force study of 63,000 personnel, Prabahakaran *et al.* (2012, in Connor and Davidson, 2018), used the

CDRS-10 to outline personal coping (facet of the CDRS-25) as essential in developing the four pillars of fitness, i.e. physical, psychological, social and spiritual in the US Air Force's Comprehensive Fitness programme. McNally *et al.* (2011) used the CDRS-25 to demonstrate that repressor type coping and trait anxiety, but not resilience, were predictive of post-deployment PTSD in a sample of US Air Force medical personnel. In further military specific research, Bezdjian *et al.* (2017) found that in 50,000 US Air Force recruits, the CDRS-25 score was lower (76.9) in those who were eventually separated from service as being unsuitable, compared to the remainder (84.0), and similarly for those who developed mental illness (76.1) compared to those without (83.9).

Whilst previous research focused on serving personnel, variants of the CDRS have also been demonstrable in understanding resilience within retired military veterans and notably found that resilience (CD-RISC-10) was a predictor for successful ageing, along with gratitude and purpose in life (Pietrzak *et al.*, 2010). In further demonstrating the military utility of the CDRS-25 for this thesis, in previous research, Pietrzak *et al.* (2010) used cluster analysis to derive three groups of Operation Iraqi Freedom and Operation enduring Freedom (OIF/OEF) veterans: low combat/low PTSD (n=134), high combat/high PTSD (n=72), and high combat/low PTSD (n=61). CDRS scores in the groups were 76.0 (1.9), 66.3 (2.6) and 80.1 (2.2) (Connor and Davidson, 2018). In a study of 475 US Marines, Hourani *et al.* (2012) used the CDRS to find that pre-separation CD-RISC score predicted risk (i.e. higher scores protected against) of mental health problems and functional impairment on follow-up, with strongest influence being noted on the latter.

For the first phase of the mixed-methods data gathering, the CDRS-25 questionnaire was completed by 250 RAF personnel (n=250) who participated in a five-day FD/APDT intervention during their phase 1 training and was conducted over multiple cohorts within a 3-month data gathering period. The participants ranged in rank from Aircraftsmen/women to Acting Corporals based on the students at an RRC in phase 1 or 2 of their RAF training. Due to 13 erroneously completed questionnaires, only 237 (n=237) questionnaires were eventually used. The volunteer participants completed a CDRS-25 questionnaire on the first morning of the five-day intervention conducted at a RAF RRC and then retested by completing another CDRS-25 questionnaire on the final day of the intervention under the supervision of a RAF FDI.

Of the 250 (n=250) CDRS-25 questionnaires issued, 237 completed responses were gathered with the data analysed to produce individual scoring grids for differences in each of the CDRS-25 items. The 13 questionnaires excluded from the study were incomplete and presented unusable data for the data gathering exercise. Whilst there are 5 factors within the CDRS-25, these were grouped into the four domains of resilience and associated CDRS-25 identified factors to allow the entirety of the CDRS-25 to be used. These four domains and sub-factors were used to construct the analysis and address the research question. This occurred due to the close similarities between Factor 1 (personal competence, high standards and tenacity) Factor 2 (trust in one's instincts, tolerance of negative effect and strengthening effects of stress) and Factor 4 (Control) that cross both physical and psychological resilience domains. This was also required due to the inability to separate the 2 domains within the CDRS-25 as directed by the questionnaire's authors copyright and usage authority.

The Likert scale (Likert, 1932, in Macleod, 2008) scoring used for the questions were as outlined below and scoring given to reflect an increase or decrease in the relevant scoring for each question, after the FD/APDT intervention. For example, if the participant scored 'rarely true' (1) at the start of the FD/APDT intervention and 'sometimes true' (2) at the end of the intervention, they were recorded as +1 for this question. The most that could be either positively or negatively scored was either -4 or +4.

Not true at all (0)

Rarely true (1)

Sometimes True (2)

Often true (3)

True nearly all the time (4)

This allowed the proposed resilience development to be captured immediately after the five-day intervention within an Excel spreadsheet to identify any emerging patterns for later use within the second phase of the mixed-methods data gathering.

The CDRS-25 questionnaire (2018 version) was purchased through www.connordavidson-resiliencescale.com with further communiqué directed to Dr Davidson at jonathan.davidson@duke.edu to ensure the questionnaire's correct administration. A copyright and disclosure agreement were signed to ensure the usage of the most recent CDRS-25 questionnaire and user manual.

Once the questionnaires were completed, they were kept in a locked file by the Officer Commanding in accordance with the ethical approval request. After the data had been collated from the 250 participants and recorded, the completed questionnaires were shredded in accordance with the research proposal. Appendix 2

shows the 25 Item Connor-Davidson Resilience Scale questions used (Connor and Davidson, 2003).

b. Connecting quantitative and qualitative data phase (phase 3).

The next phase of the mixed-methods data gathering utilised follow-up focus groups six months after the intervention, to consider the perceptions that the FD/APDT intervention had on the participants after a short period of time. The focus groups consisted of (n=33) participants split into 2 groups with the discussions occurring sequentially and each lasting 90 minutes and conducted by the researcher. This allowed for the collection of in-depth reviews of participant's perceptions of resilience development as a result of the intervention into the start of their RAF careers. The focus groups also allowed for the in-depth analysis to ascertain if participants felt the transfer of learning occurred for resilience development. The discussion further allowed the participants to elaborate on whether their ability to cope with the demands of the workplace had improved, as a result of their participation in the FD/APDT intervention.

Bloor *et al.* (2001, in Gill *et al.*, 2008, p.292) notes that "focus groups are used for generating information on collective views and the meanings that lie behind those views. They are also useful in generating a rich understanding of participant's experiences and beliefs". The questions in Appendix 4 were developed by the researcher to stimulate discussions and with open questions used to elicit and facilitate further discussion. They are not designed to be leading questions but to promote discourse.

Aksu (2009, p.203) gives a rather specific definition of focus groups and considers the discussion as “a conversation initiated by the interviewer for the specific purpose of obtaining research relevant information and focused by him on content specified by research objectives of systematic description, prediction or explanation”.

Understanding a conceptual and ethereal subject such as resilience for this thesis, requires the additional support of the focus groups to underpin the quantitative statistics to ensure a cohesive mixed-methods approach. As Frey and Fontana (1991, p.175) note, “researchers can use focus group discussions as a more efficient use of resources and as a means of adding valuable insight to the interpretation of a social or behavioural event”.

Of further concern for the use of focus groups, is the influence of the researcher in guiding the group to develop the themes they require for their research. This ability for the researcher to remain neutral is both a strength and weakness if not balanced correctly. As a strength, the researcher can ensure the focus groups’ discussions remain on track, but as a weakness, the researcher can ‘front-load’ questions and introduce bias; either consciously or unconsciously. As Kahneman (2012, in Gulliksen and Hjordemaal, 2016, p.6) notes:

The role of the researchers is more involved in focus groups than in other types of group discussions. The dynamic interaction between all participants is the core of success. The researchers open the discussion and contribute to its progression and, as such, utilize the anchoring effect, the priming effect, and the deliberate process of adjustment.

Given the military background of the group participants, the use of external researchers to understand the military language, culture, beliefs, banter, colloquialisms and its affinity towards abbreviations, three letter words and

acronyms, may prevent contextualization of the narrative drawn from the focus groups. This may lead to the dilution or lack of understanding of many of the key qualitative data outcomes. Finch and Lewis (2003, in Jordan *et al.*, 2007, p.3) have cautioned that “although everyone is in the same boat, it is important to facilitate disclosure and discussion. They concluded that the ideal situation is usually a point of balance between the two extremes of heterogeneity and homogeneity, with as much diversity as the group can take and no more”. This point links to the role of the facilitator in the effectiveness of the transfer of learning highlighted within the literature review.

In expanding the common military background of the participants, it is further essential that researchers must be able to encapsulate and interrogate the data from a grounded understanding of the group they are researching. However, the researcher may commence the research with preconceived ideas and answers to the research question, that they must acknowledge at the start of the research for trustworthiness. They further need to subdue these ideas during the conduct of the research to remove any potential researcher bias.

The nature of the relationship enables the researcher to share the experience of the observed. When this experience is expressed in the group setting and it adds a dimension to the knowledge of everyday life that the researcher might have overlooked or missed if data gathering had been limited to one-on-one focus groups discussions (Frey and Fontana, 1991, p.175).

The freedom allowed within focus groups consisting of RAF personnel allows for the openness and diversity of dialogue, but also ensures that their knowledge of the FD/APDT and its implications for their perceived resilience development is amplified through the discussions. As Aksu (2009, p.204) explains, “in this group interview

technique, questions are asked to a group of respondents selected for a specific purpose. The respondents are selected because of their 'enough amount of knowledge' about the research topic". Kitzinger (1994) and Morgan (1998, in Gill *et al.*, 2008, p.292) further expand on the purpose of focus groups in collecting data as "a focus group is a discussion on a particular topic organised for research purposes. This discussion is guided, monitored and recorded by a researcher, sometimes called a moderator or facilitator".

The analytical process for this transition phase had already been mapped out, as the format for the qualitative data gathering in the sequential explanatory mixed-methods had already been decided. However, it was realised at this juncture that the focus group discussions had to be relevant to the four resilience domains of psychological, physical, spiritual and social resilience without leading the focus group's participants in their discussions. The analytical process during this phase was spent devising several questions at Appendix 4 that could be used to stimulate discussion without leading the participants. This was developed through the analytical process of determining the success of the previous phase of data gathering through the CDRS-25. Had this phase been excluded as just a transition phase without any analysis, it is almost certain that the second phase of data gathering may not have been as successful without the analysis and development of the focus groups' questions.

c. Qualitative data gathering and analytical process (phases 4-5).

The follow-up focus groups allowed an opportunity for recording the outcomes of the resilience focused FD/APDT programme on participants after six months. Many of the interviewees were in phase 2 training and this allowed for explanatory narrative from the participants for the interpretation of their resilience behavioural adaptations

(if any) and FD/APDT outcomes on perceived resilience. The six-month timeline ensured that follow-up discussions completed within these six months would capture data on how the FD/APDT intervention was benefitting their ability to cope with the demands of phase 2 training and still within a short-term period.

The focus groups were arranged by the trainee's chain of command to remove any researcher or external influencers that could have shaped or pressured the answers provided by the interviewee. Moreover, member-checking occurred during the cross-checking of qualitative data, i.e. post-intervention follow-up interview within this study, to check data and answers provided were as recorded. The questions used to facilitate the focus group discussions are at Appendix 4. This information was gained through open questioning and facilitation of the focus groups with two comprehensive 90-minute discussions to elicit the thick descriptions of the four domains of resilience that were captured in generic resilience themes (four domains) and succinct comments for data gathering.

The participants in the focus groups were split into two separate groups (group 1, n=22 participants and group 2, n=11 participants) of phase 2 trainees (n=33) who had completed the FD/APDT intervention within the past 6-9 months (two years in one recoured participant's case). The 2 focus groups were split into the groups with whom participants had completed phase 1 training and participated in the FD/APDT intervention. As previously discussed, it was decided not to collate the actual age, other than age-groups, gender or demographic data of the participants both in the questionnaire and focus groups to ensure confidentiality and anonymity.

However, for the qualitative statements coding purposes, the rank and age-range of participants were captured with coding, i.e. SAC1, annotated against the responding

statement. The breakdown of the participants outlined in Appendix 3 were, Acting Corporal (A/Cpl) (n=11), Senior Leading Aircraftsman (SAC) (n=16), Leading Aircraftsmen (LAC) (n=4) and Aircraftsman (AC) (n=2) with their age-range coded against the participants in Appendix 3. This allowed the qualitative data gathering for the same social group but not questionnaire participants to understand the perceived outcomes of the FD/APDT on resilience within the same research group demographic (RAF trainees) when applied to the next phase of formal RAF training. Although individuals have been number coded, i.e. Cpl 1, SAC 1, LAC 1 or AC 1, as the two groups of focus group participants are from two small courses currently completing phase 2 training, it was agreed between the researcher and participants to ensure anonymity for the group, to provide accurate and honest data that could not be attributed to the participants.

To protect the participants, the researcher has purposefully omitted participants' personal details such as specific age, sex, length of service as their comments could be attributable; although age groups have been collated for potential use in later longitudinal research. To ensure one participant did not provide all the answers, each person was given an allocated number and the opportunity to express any thoughts generated by comments they had written on the white board, or agreed with if the comment had already been written, and each participant was asked in turn which comments they had written.

In total, there were 49 recorded comments written on the white board under the resilience factor headings by the participants, with participants confirming comments if another participant had recorded it and elicited/expanded on through wider discussions and thick descriptions. This removed the prescriptive answering or

enforced 'quantitising' of qualitative data which would have watered-down the responses. These were recorded against the five factors within the four domains of resilience and participants aligned comments within the factors against the domains to avoid duplication of the same comments.

d. Data merging of qualitative and quantitative results (phase 6).

This phase of the mixed-methods data gathering represents the critical juncture of data merging for interpretation and is the pivotal element of the two data gathering tools integration in this thesis. To further expand on the risk associated with data merging, Onwuegbuzie and Collins *et al.* (2007, in Leech and Onwuegbuzie, 2010, p.62) believe that "in a mixed research synthesis, reviewers treat each relevant article as data that generate both qualitative and quantitative information, yielding analysis of quantitative and qualitative data, and meta-inferences, i.e., inferences from qualitative and quantitative data being integrated into a coherent whole".

This management of the risk to present a coherent data analysis, aligns with Rahman (2016) and Almalki's (2016) belief that rigid boundaries do not assist in the enhancement of effectively interpreting data. For the purpose of this thesis, rigid boundaries to research will not allow the data to merge within the mixed-methods analysis. This will restrict the integration of data, knowledge, analysis and interpretation of the FD/APDT transfer of learning and short-term outcomes within participant's primary roles. The methodology and mixed-methods data gathering used within this thesis aligns with Creswell and Plano-Clark (2007, in Almalki, 2016, p.293) embedded mixed-methods research design that advocates "one method of enquiry being used in a supportive secondary role that enables researchers and readers to make sense of the study in its entirety". This was essential for this thesis'

research process to ensure all available data gathered from both focus groups and questionnaires was captured.

In support of this requirement to continuously interpret data to ensure integration within mixed-methods research, Juznic (2003, p.327) states that “research is an inquiry process that includes the components for collective inquiry, research design, methodology, data collection and analysis, concluding with the communication of the findings”. Willig (2013, in Almalki, 2016, p.289) suggests “there are no right and wrong means of going about conducting a piece of research”. This allows the freedom of manoeuvre when conducting mixed-methods research within pragmatism and expands on the utility of mixed-methods data gathering opportunities to comprehensively understand the intended area of research.

Some researchers advocate expanding the repertoire of research methods, especially as a way of getting at aspects of the context, which are inaccessible via traditional or conventional assessment methods, such as surveys and questionnaires. Others strongly stress a mixed-methods approach, where some qualitative research is incorporated into a study (Brace, 2001, p.142).

This freedom of manoeuvre from research rigid boundaries to interpret the data from this thesis was adopted by using the mixed-methods data gathering. By analysing the questionnaire data taken before and after the FD/APDT intervention, the researcher was able to establish the proposed immediate outcomes of the FD/APDT intervention on participant’s perceived resilience development. This provided the quantitative data baseline from which to interpret the qualitative data six months later. This comparison and qualitative contextualisation of the participants’ perceived development, provided the essential data for the short-term outcomes of the FD/APDT intervention on their primary roles. The review of proposed resilience

development six months after the intervention, allowed the researcher to review proposed resilience growth within a long enough period for behavioural changes, that could be related back to the FD/APDT intervention (or not) but not too long, that the behavioural or attitudinal changes could be linked to wider life experiences. The period of reflection could therefore not be too short to be linked to the euphoria of enjoying a novel experience, but not too long ago that any proposed resilience development associated with the FD/APDT was dismissed.

Moreover, the purposeful splitting of these two data gathering phases within Subedi's, 2016 process, allows for the in-depth interrogation of each data set by the reader. This requirement for comprehensively understanding the strengths and limitations of the contrasting singular data gathering methods and their utility in combining these approaches, remains a contested issue within the research literature. Although Opdenakker (2006) believes that face to face focus groups are an extremely personal way to gain information from a subject, Wengraf (2001, p.194) believes a significant limitation of qualitative research that hampers interpretation of data is that:

Researchers must be both listening to the informant's responses to understand what he or she is trying to get at and, at the same time, bearing in mind your needs to ensure that all your questions are liable to get answered within the fixed time at the level of depth and detail that you need.

To ensure this issue was addressed in the focus groups, the participants were asked to put their comments regarding whether they thought the FD/APDT intervention had benefitted their resilience development on flip charts and white boards; one for each of the four resilience domains (psychological and physical resilience CDRS-25 factors were placed on the same board) and CDRS-25 identified sub-factors to

gather a holistic view of the domains. For example, 1 whiteboard was titled 'psychological and physical resilience' with three flip charts for the three associated sub factors: personal competence, high standards and tenacity; trust in one's instincts, tolerance of negative effect and strengthening effects of stress; and control.

After all the participants had written their statements down or agreed with other comments already recorded, a discussion regarding the comments ensued where additional notes were made by the researcher. These notes and participant's comments, including those already made by other participants, were then confirmed by the participants to capture the narrative of the participant's experiences.

To further highlight the researcher's decision to use mixed-methods data gathering and the importance of effective data merging analysis, Denzin and Lincoln (1994, p.2, in Rahman, 2016, p.103) claims that "qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter" to contextualise the quantitative data collated during this research. Fisher and Stenner (2011, p.90) also noted that the "ontological divide between qualitative and quantitative methods is unnecessary, counterproductive and illusory".

Further pertinent is Stewart and Shamdasani's (1990) belief that information collected from groups can produce rich data revealing a deeper level of meaning and connection. This requirement for rich data and contextualised meaning underpins the justification for the merging of mixed-methods data for a deeper understanding of the outcomes of FD/APDT in resilience development through the interpretation of this thesis' data. This is not possible utilising singular data collection methods in isolation (Almalki, 2016, p.288) but requires a "negotiated account of the findings that brings together both components of the conversational debate" (Bryman, 2004, in Almalki,

2016, p.293). In a substantial review of 500 nursing published works, Kinn and Cuzio (2005, p.333) concluded that further research is required to “refine and develop ways of mixed-methods to allow the full potential of integration to be met”.

To ensure the credibility of data analysis and discussion, the two areas’ distinctive research elements of questionnaires and focus group data are merged for the data analysis and discussion chapter. This reflects the conduct of the data collation and interpretation for each phase of data gathering performed during the research in line with Subedi (2016) sequential-explanatory mixed-methods data gathering. This provides transparency and credibility to complement the separate mixed-methods data gathering as each data set can be interrogated. Given this is the first time that RAF FD/APDT has been researched at Doctoral level and that it is part funded by the RAF, this transparency of results of each data gathering tool is essential. Without this progression, the data merging could be challenged as neither credible, valid or transparent.

As Fetters, Curry and Creswell (2013, p.2143) outlines:

Expansion occurs when the findings from the two sources of data diverge and expand insights of the phenomenon of interest by addressing different aspects of a single phenomenon or by describing complementary aspects of a central phenomenon of interest. For example, quantitative data may speak to the strength of associations while qualitative data may speak to the nature of those associations.

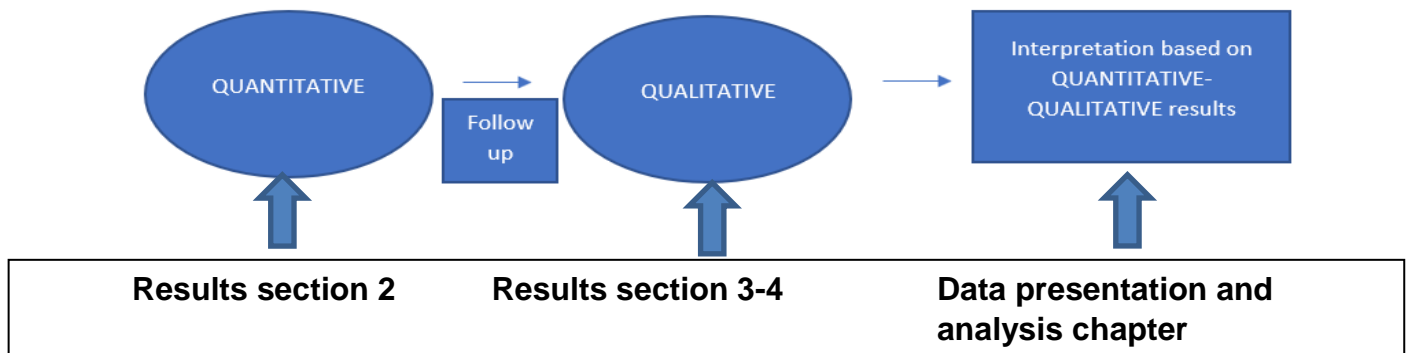
This was evident during the preliminary review of the data and the researcher was acutely aware that the nature of the strength of associations between the FD/APDT and resilience development could only be analysed effectively with enriching qualitative data to support the quantitative data.

This expansion and amplification of the themes developed and merged within the mixed-methods allows for the greater understanding and mutual support for the data gathered (Shenton, 2003). The transparency and credibility are further assured through member checking, conducted within each phase of the qualitative and quantitative data gathering. To consolidate this member checking, the data gathered and 'rogue' answers such as the 13 incomplete questionnaires that may have affected the results, were identified and are highlighted in the data analysis and discussion chapter. These were highlighted to ensure they were included for clarity and thoroughly reviewed for any elements of the data gathering, where researcher bias could be perceived as influencing the data merging.

The researcher identified the data merging stage as the point at which the highest potential for data analysis errors could occur. This high potential for error could occur with the presentation, interpretation and analysis of data that would influence the concluding summary of the entire thesis. This conclusion, if based on incorrect data merging and interpretation developed within the data analysis and discussion chapter, would undermine the validity of the thesis' holistic results. The methodology conducted within this thesis, discussed in the methodology, through cross-member checking, peer review of data and confirmation reanalysis by the researcher, ensured this risk was identified. The risks were highlighted within the audit trail and methodological principles of ethical data gathering and mitigated against. To further establish the analytical process, the use of a peer review by a senior work colleague was used to ensure that the results chapter derived by the data merging, did not present any concept of researcher bias and that the data merging had been balanced as correctly interpreted. This process expands on Subedi (2016)

sequential explanatory mixed-methods research design for this thesis outlined in Figure 8 with phase 6 of the data analysis and presentation.

(Expansion from methodology chapter - Figure 8. Subedi (2016) sequential explanatory mixed-methods research design).



This approach was required as it allowed the researcher to collate and present the data clearly and provide clarity on the next stage of the research for this thesis. To have collected a large amount of both qualitative and quantitative data together in the same time frame, would not have allowed the researcher to ensure the sound methodology of the sequential explanatory mixed-methods approach to this thesis' research. The initial quantitative data was collated to provide assurance that the 3rd phase that connected the next phase of qualitative data gathering of Subedi (2016) sequential explanatory methodology, was appropriate and would be effective for this research. This 3rd phase allowed the researcher to establish how the focus groups would be conducted in line with ethical guidelines, to maximise their utility as a data gathering medium for the 4th and 5th phase of the research. Table 6 outlines this approach for the presentation of the data to present congruence within the proposed methodology for data gathering, data merging and analysis to demonstrate how the resilience factor's data were interpreted.

Table 6. Subedi (2016) sequential explanatory methodology application for this thesis.

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Methodology: Data gathering	Quantitative data collection	Quantitative data analysis	Connecting quantitative and qualitative data/ development of qualitative data collection instrument	Qualitative data collection	Qualitative data analysis	Integration of quantitative and qualitative data from this thesis' research
Results: Data analysis and discussion	Data gathering and grouping of quantitative results. (Subedi, 2016, phase 1-2). Analysis of quantitative data for resilience domains.		Data gathering and grouping of focus groups qualitative results. (Subedi, 2016, phase 3-5). Analysis of qualitative data for resilience domains.		Data merging and presentation of qualitative and quantitative data within the sequential explanatory mixed-methods research. (Subedi's 2016, phase 6). Evaluation and presentation of both data sets for resilience factors.	

Section 5. Methodology summary.

Mixed-methods has come of age. Perhaps it is now time for mixed-methods research to develop a more mature independence and grow into an integrated methodology that is not hidebound by a reliance on a traditional polarisation of qualitative and quantitative research paradigms? (Creswell 2003, p.4).

The above quote demonstrates a mature independence in the generation of new knowledge, unbound from a single linear approach to research such as the use of one data gathering tool. This would only serve to create a one-dimensional view of the phenomenon of resilience development through RAF FD/APDT and not a holistic understanding. The collection of qualitative data further reduces the risk of hierarchal

influence on the collective data, as this was collected separately and with different groups than the quantitative data.

For this thesis, Creswell and Plano-Clark's (2007, in Almalki, 2016, p.293) concept of 'entirety' considers the study of military FD/APDT from a holistic perspective. This approach is intended to develop a knowledge baseline for RAF FD/APDT's dynamic hermeneutic spiral of research development and not a flat, replicative process. As Gummesson (2003, p.6) states "research should not stay put as a flat circle but should be an upward spiral in which we interpret and reinterpret data in a never-ending trial-and-error process of both theory generation and theory testing".

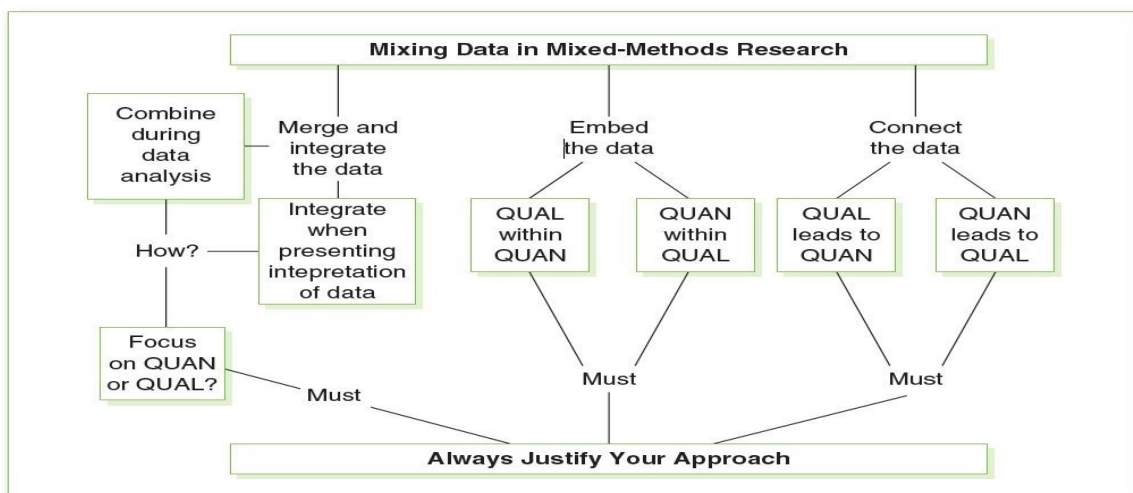
Moreover, this thesis' methodology presents congruence with contemporary research theory to use any research means necessary, to effectively and transparently present the data. This is the case for the data gathering for this thesis and critically, is derived from the understanding that "no matter which particular typology of mixed-method research is employed, there is a purposeful and carefully implemented sequence to the study which is conscientiously documented and evaluated" (Rovai *et al.*, 2014, in Almalki, 2016, p.293). This careful implementation and evaluation are conducted throughout the completion of this thesis to ensure the methodology remains credible and without any perception of confirmatory bias.

However, this approach is not without risks to the research principles. These risks are primarily associated with the potential for the misinterpretation of data (Dick, 2002) during the analysis, data merging and presentation of the mixed-methods data research findings. These potential challenges are further exposed when transposing mixed-methods data from one study, a small military demographic data set, and

supporting or challenging its evidence from vast existing civilian, not military, FD/APDT research.

Wheeldon and Ahlberg (2011, p.124) outline the requirement to justify any approaches made within mixed-methods research as outlined in Figure 10. This is achieved through the explanation of ethical considerations, rationale for the choice of questionnaires and focus groups and outlining of the transparent analytical process to ensure the reader does not have any concerns regarding the reproducibility, credibility and trustworthiness of the research. This thesis will use the integration of data at the presentation phase of Wheeldon and Ahlberg’s (2011) mixing data strategy and demonstrates how the researcher justifies and considers the approach for the mixed-methods research requirements for this thesis i.e. ‘connect the data’ on the far right of the diagram.

Figure 10. Mixing strategies in mixed-methods research (Wheeldon and Ahlberg, 2011, p.124).



Note: QUAL = primarily qualitative; QUAN = primarily quantitative.

The single triangulation of sequential evidence collated at different times related to the same phenomenon and groups of RAF trainees, is a key consideration for the trustworthiness of this thesis' holistic mixed-methods research. This is clearly evidenced through the comprehensive analytical process and audit trail at Appendix 1. In highlighting the importance of the requirement for constant evaluation and analytical process (that will be actioned within this thesis), Jones (2013, p.402) notes that:

A less-than-thoughtful approach to the type of qualitative content analysis or to secondary analysis of existing qualitative data is fraught with incongruences. When using a superficial approach, researchers risk producing findings that are abstracted from the context of data and are not fully developed, which results in interpretations that lack the richness expected of qualitative research.

To ensure this richness, once both elements of the mixed-methods data collection were completed for this thesis, cross-checking by peers and the researcher was implemented to ensure dependability in the themes identified and the data gathered. Using an audit trail, the member cross-checking of data and the interpretation of themes within the literature review merged to support or refute the data during the analysis. These themes were recorded and grouped into those resilience themes identified within the literature review and CDRS-25 (physical, physical, social and spiritual resilience) for future analysis.

This mixed-methods research ensured validity, reliability and adherence to the other prevalent research principles. These considerations were underpinned throughout the research through alignment with research ethics (as defined in the methodology) and absolute transparency throughout the completion of the thesis. Where conflicts of interest have been apparent, i.e. RAF Training Officer completing RAF funded

research of a RAF FD/APDT programme, these have been declared and the steps taken to mitigate against any hierarchal pressures during the research ethics adherence outlined in Section 3d of the methodology. The use of a coherent analytical process also ensured the sequential explanatory mixed-methods data gathering process was scrutinised and transparently presented, to address the research question for the immediate/short-term perceived outcomes of the FD/APDT intervention on RAF participant's perceived resilience development.

This requirement for a sequential explanatory mixed-methods data gathering process, provides the required qualitative and quantitative data to provide thematic analysis and interpretation. This data subsequently provides a pragmatic understanding of the FD/APDT intervention's outcomes for resilience and proposed transfer of learning, within the data analysis and discussion chapter.

CHAPTER 4 – DATA ANALYSIS AND DISCUSSION

Section 1. Introduction to chapter.

This data analysis and discussion chapter provides:

1. The integration of quantitative and qualitative data for each of the four resilience domains.
2. An analysis of the four resilience domain's mixed-methods data across the domains, with comparisons and discussion of emerging themes.
3. Discussion on the implications for RAF FD/APDT and Defence for consideration and segue into conclusions and recommendations.

The research aim for this thesis is concerned with providing an understanding of the immediate and short-term outcomes for RAF personnel's perceived psychological, physical, spiritual and social resilience after participation in a five-day RAF FD/APDT intervention. In addressing this aim and associated research question, this thesis explores the possible short-term impact of the FD/APDT intervention on participants' resilience and discusses FD/APDT's possible impact on longer term personal and future force resilience development through primary role performance.

The results from the questionnaire data, provides evidence to address the research question regarding any immediate changes to perceived resilience following participation in the intervention within the four domains of resilience (psychological, physical, spiritual and social) after the five-day FD/APDT intervention. The focus group data provides evidence to address the influence of the FD/APDT's short-term outcomes on resilience. The quantitative and qualitative data are combined to

present findings thematically, according to each resilience domain and associated factor(s) in turn.

This approach is required as it aligns with the methodology to provide two data-set gathering tools with data merging for each resilience domain after the research has been completed (Almalki, 2016) and further supports the alignment of the results within the methodological approach outlined by Subedi (2016). In continuing this thread for the results presentation, analysis, data merging, analysis and interpretation, this approach will add further transparency and validity to the individual step-by-step methodology and data merging for this thesis. This allows the reader to understand each data gathering process and the data merging by which the data were interpreted and tested for statistical significance, whilst interpreting the data holistically.

Whilst it is imperative within this data analysis and discussion chapter to discuss the broad implications of the findings of this thesis for the future implementation of RAF FD/APDT interventions, this must be balanced against the duplication of research themes from civilian research, to ensure this thesis' original contribution to knowledge. More significantly, there is a need to consider FD/APDT's applicability within next generation RAF and military personnel's resilience development future strategies. As previously stated, the perpetual cycle of FD/APDT anecdotal narrative with the rebranding of extant resilience and conceptual learning theory is not useful in moving the field of FD/APDT research forward; especially within a military context. However, this thesis does consolidate and corroborate the extant data findings when balanced against the analysis of supporting mixed-methods data collected during this research.

The chapter explores HQ RAR's tactical FD/APDT delivery and its findings will inform operational and strategic context for the long-term sustainability of RAF FD/APDT within Defence's intent. These will be expanded on within the conclusions and recommendations chapter which will offer further comment on FD/APDT's applicability towards the development of resilience required for primary and operational roles. The synergy of this research thesis' findings with extant current civilian FD/APDT literature's and Defence/RAF doctrine in the collective requirement for military personnel's resilience, is a fundamental facet of this chapter.

The data analysis and discussion chapter concludes by identifying the concerns regarding this proposed synergy and discussing resilience education programmes delivered through FD/APDT, areas for future research and considerations for resilience education programme stakeholders. This aims to inform the RAF of the resilience education concept, language and scheme to develop a resilient RAF community and contribute to Defence's strategic intent.

a. Introductory overview of data.

An in-depth analysis of each resilience domain collective findings is discussed from section 3 onwards but it is essential for an introductory overview of the data for the reader to understand the holistic data, before analysing the statistical testing and individual analysis of each resilience domain. To provide an overview of the CDRS-25 scores changes and perceived changes to resilience immediately after the FD/APDT intervention on the four resilience domains, Table 7, presents the percentage frequency distribution of data generated from the administration of the CDRS-25 before and after the intervention. The first part of the table outlines the results for 237 participants across the 5 resilience factors. The second part of the

table outlines the results for each of the resilience factors for 237 possible responses (n=5925) to each of the CDRS-25 items.

As noted in the methodology chapter, the close similarities between factor 1 (personal competence, high standards and tenacity), factor 2 (trust in one's instincts, tolerance of negative effect and strengthening effects of stress) and factor 4 (control), share similarities that cross both physical and psychological resilience domains. It was therefore essential to merge these factors together under both psychological and physical resilience domains in order to prevent duplication of results and align the CDRS-25 factors under the resilience domains, without affecting the integrity of the CDRS-25. This was also required due to the inability to separate the 2 domains within the CDRS-25 as directed by the questionnaire's copyright and usage authority. As these first 2 resilience domains have 3 separate factors, statements and questions relating to the 3 separate factors were broken down to focus on one element at a time during the focus groups. This allowed for further in depth questioning of the participants using the questions in Appendix 4 to stimulate initial discussions and collect data from the participants during the focus groups.

Table 7 demonstrates the confirmed perceived development for physical and psychological resilience first 2 factors of personal competence, high standards, tenacity and for trust in one's instincts, tolerance of negative effect and strengthening effects of stress that each demonstrated a 33.38% (n=79) increase in CDRS-25 score and perception of enhanced resilience. Whilst this data proposing some increase in CDRS-25 scores for resilience within these two factors, the data suggests that two-thirds of the participants did not perceive an increase in CDRS-25

scores or in their resilience as a result of participation in the intervention. However, further increases in the third physical and psychological resilience factor, control, demonstrated an increase in CDRS-25 scores of 41.90% (n=99). These results for the first three factors demonstrate limited, albeit apparent, increase in CDRS-25 scores and perception of an increase in resilience immediately after the intervention.

The largest increase in CDRS-25 scores and perceived positive development was evident in the social resilience factor of positive acceptance of change and secure relationships of 55.27% (n=130). Spiritual resilience (spiritual influences) of 25.30% (n=60) were also recorded and demonstrated the smallest increase in CDRS-25 scores. These positive developments (albeit limited initially) were further perceived as enhanced across the four domains of resilience at the 6 month’s focus groups point and discussed within the separate resilience domain’s analysis in Section 3.

The quantitative data are represented graphically in Figure 11 for clarity in identifying the most significant resilience domains developed through the FD/APDT intervention.

Table 7. Quantitative results summary for changes in participants’ CDRS-25 scores before and after participation in the FD/APDT intervention.

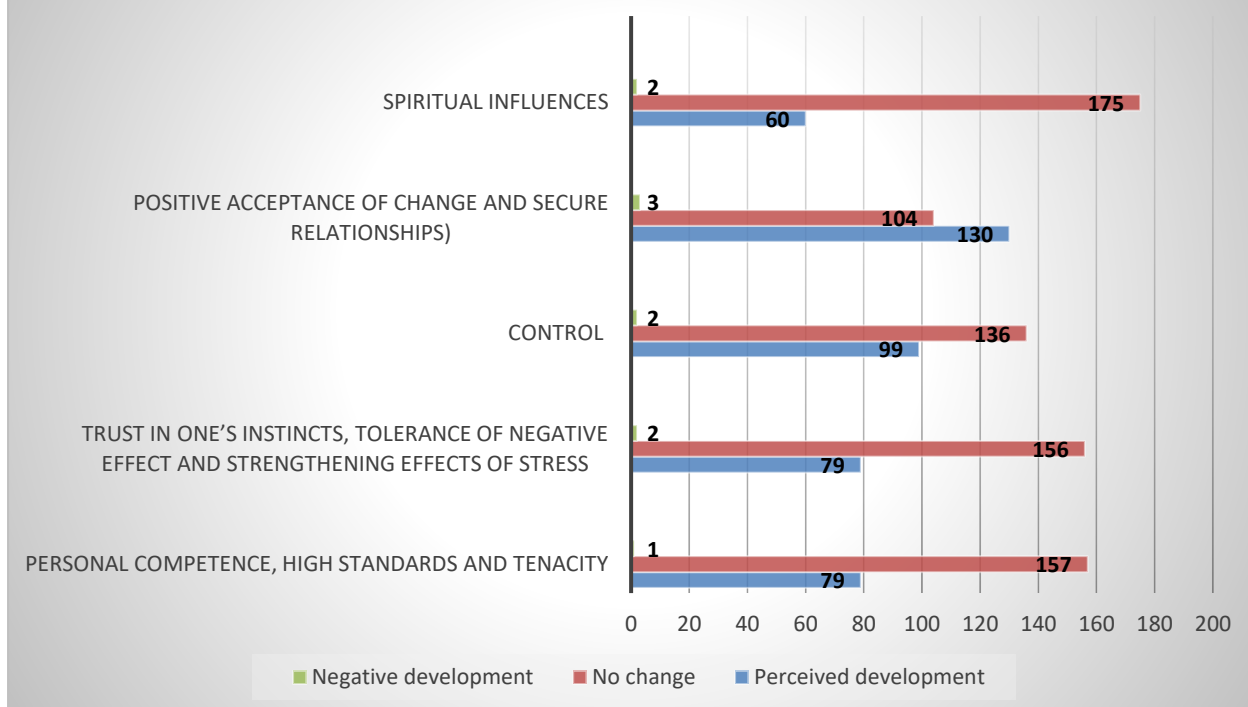
Data presented as 237 respondents in percentage				
Resilience domain	Resilience domain factors	Positive development	No change	Negative development
Physical and psychological resilience	Personal competence, high standards and tenacity	79 (33.38%)	157 (66.29%)	1 (0.31%)
	Trust in one’s instincts, tolerance of negative effect and strengthening effects of stress	79 (33.38%)	156 (66.0%)	2 (0.60%)
	Control	99(41.90%)	136 (57.66%)	2 (0.35%)

Social resilience	Positive acceptance of change and secure relationships)	130(55.27%)	104 (43.79%)	3 (0.92%)
Spiritual resilience	Spiritual influences	60(25.3%)	175 (74.05%)	2 (0.63%)
Data across all 237 respondents and 25 items (5925 responses) in percentage				
Resilience domain	Resilience domain factors	Positive development	No change	Negative development
Physical and psychological resilience	Personal competence, high standards and tenacity	633 (33.38%)	1257 (66.29%)	6 (0.31%)
	Trust in one's instincts, tolerance of negative effect and strengthening effects of stress	554(33.38%)	1095 (66.0%)	10 (0.60%)
	Control	298(41.90%)	410 (57.66%)	0 (0.35%)
Social resilience	Positive acceptance of change and secure relationships)	655(55.27%)	519 (43.79%)	11(0.92%)
Spiritual resilience	Spiritual influences	120(25.3%)	351 (74.05%)	3(0.63%)

Factor 1 = 8 items x 237 responses = 1896.
Factor 2 = 7 items x 237 responses = 1659.
Factor 3 = 5 items x 237 responses = 1185.
Factor 4 = 3 items x 237 responses = 711.
Factor 5 = 2 items x 237 responses = 474.

Figure 11. Overall quantitative data graphical representation for changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention (n=237).

Quantitative results graphical representation



Quantitative data from Table 7 and Figure 11 displays the participants' perception that whilst significant 'no change' scores were evidenced, increased CDRS-25 scores and perceived developments across all four domains were also demonstrated, albeit for fewer participants' 'no change' scores. The quantitative data shows that participation in the FD/APDT intervention demonstrated growth in reported resilience. However, as discussed later in this chapter, the focus groups indicated that immediate effects were not as large as short-term ones, over the 6-month follow up period.

Section 2. Statistical testing.

To alleviate the potential for errors and ensure an appropriate test for the distribution of data significance, the thesis used the one-way ANOVA in analysing statistical data collated from the CDRS-25, that has been routinely supported across multiple past

research disciplines (Connor and Davidson, 2003; Karairmak, 2010; Yang *et al.*, 2020). Therefore, the one-way ANOVA statistical testing was adopted for this thesis in order to capture the probability of data being 'significant or not' for the before and after scores on the CDRS-25 Likert scale. The full data is presented at Appendix 5.

The one-way ANOVA results for overall possible CDRS-25 results, ensures consideration of the research question/aim and the resilience factors as a consequence of the FD/APDT intervention. The use of a parametric test assured the normal distribution of data for the n=237 responses and overall n=5945 possible responses through the ANOVA for checking of the normal distribution of data. The pre-and post-analysis of resilience factors, the n=237 and large scale consideration of possible percentage scoring and high responses across all CDRS-25 items (5925 possible responses), further negated the use a non-parametric test of statistical significance for the paired matching sample data set for this thesis.

The data gathered provided the measured differences across all CDRS-25 items for the n=237 participants and provides percentages based on the CDRS' 25 item overall total possible responses for each item, to present overall resilience factor data. This was analysed with the one-way ANOVA for assurances that the means for the resilience factors were distributed 'normally' and presented in Table 9 and Figure 13. Whilst 'significant' or 'not significant' results do not relate to FD/APDT's influence on affecting differences in developing these factors of resilience, it assures the reader that the distribution of data is within normal data distribution and probability parameters and there is a low probability ($p < 0.5$) that the results have occurred by chance, but have been influenced by an effect; in this thesis' case, the FD/APDT intervention.

This clarity is further required given the multiple groups of participants completing the questionnaires in different batches and no accepted numerical data point at which small or large scale data sets are categorised as such (Hekler *et al.*, 2019).

Moreover, the 'question set mean' requires an ANOVA to test the means set against the other resilience factors to demonstrate if the resilience factors' data were either 'significant or not'. With regards to the importance of the means and use of the ANOVA, Ogee *et al.* (2019, p.1) comments that "you are implicitly asking about the variability of the means. After all, if the group means don't vary, or don't vary by more than random chance allows, then you can't say the means are different. And that's why you use analysis of variance to test the means".

Indeed, the academic debate regarding the use of non-parametric and parametric statistical tests for ordinal data was considered during the research of the ANOVA selection. In comparing parametric and non-parametric statistical tests applied to Likert scales, Mirciou and Atkinson (2017, p.26) noted that "in this case of Likert ordinal data with high response rates, restraining the analysis to non-parametric methods leads to a loss of information. The addition of parametric methods, graphical analysis, analysis of subsets, and transformation of data leads to more in-depth analyses".

Whilst Likert scales are considered ordinal data sets for mean comparisons of paired data, non-parametric test for this thesis such as the Wilcoxon Signed Rank Test or Mann Whitney Test would have increased the risk of introducing type 1 or type 2 errors. This would have occurred when accepting or rejecting the null hypothesis that no effect was evident, when identifying the relationship of the data means, and not

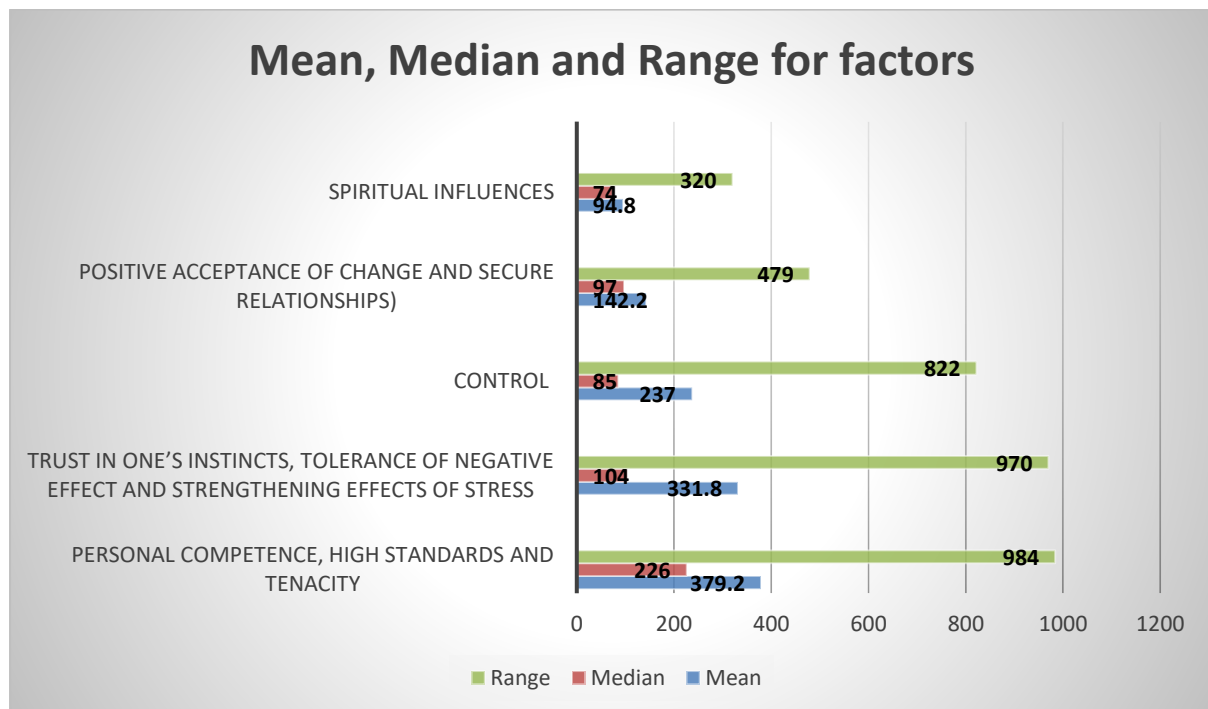
allowed the researcher to evaluate overall percentages of responses across 5925 possible overall responses to the 5 resilience factors within the CDRS-25.

These errors would have been caused due to multiple levels of statistical testing required to initially test the paired data from the 237 samples, identify differences scored across the resilience factors, test overall resilience factor scores and comparisons of data between the four resilience domains. Each level of testing would have required a non-parametric test that could have increased the risk of introducing type 1 or type 2 errors. To limit the potential for these errors, the Likert scale differences were recorded, then resilience factor means generated by the perceived positive, negative or no change results to develop Table 8, that provides the means, median and range of the data sets for analysis. The means were tested using the one-way ANOVA for repeated measures to show the variance (f-ratio) and probability (p-value) of the means within each resilience domain for positive, negative or no change results for resilience domain comparison.

Table 8. Resilience factor means, median and range.

Resilience domain	Resilience domain factors	Mean	Median	Range
Physical and psychological resilience	Personal competence, high standards and tenacity	n=379.20	n=226	n=984
	Trust in one's instincts, tolerance of negative effect and strengthening effects of stress	n=331.80	n=104	n=970
	Control	n=237	n=85	n=822
Social resilience	Positive acceptance of change and secure relationships)	n=142.20	n=97	n=479
Spiritual resilience	Spiritual influences	n=94.80	n=74	n=320

Figure 12. Mean, Median and Range for resilience factors data graphical representation.

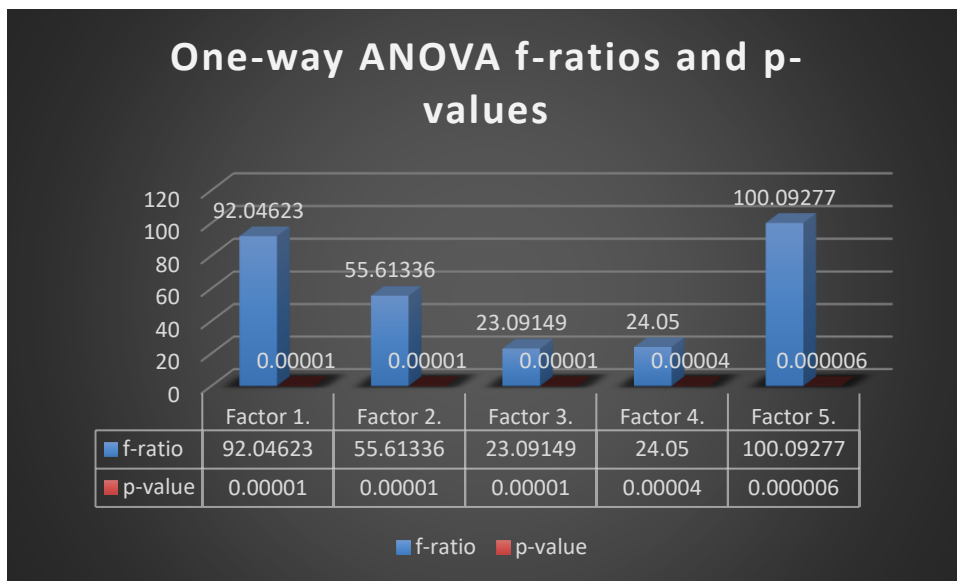


The means outlined in Table 8 and Figure 12 were used to statistically validate the one-way ANOVA for repeated measures to present the graphical data for the p-value (probability of obtaining the results) and f-ratio (measures group variance between the resilience domains) for the resilience factors. The one way ANOVA results are presented in Table 9 and Figure 13 and demonstrates the low p-value and high f-ratio at $p < .05$ that outlines the 'significant' score for all 5 factors of resilience. This 'significant' score evidences the low probability that the change has occurred by chance instead of through an affect such as the FD/APDT intervention.

Table 9. Overall one-way ANOVA results.

Factor No	Resilience factor	f-ratio	p-value
Factor 1.	Personal competence, high standards and tenacity. (<i>Physical Psychological resilience</i>)	92.04623.	< .00001.
Factor 2.	Trust in one's instincts, tolerance of negative effect and strengthening effects of stress. (<i>Physical Psychological resilience</i>)	55.61336.	< .00001.
Factor 3.	Positive acceptance of change and secure relationships. (<i>Social Resilience</i>)	23.09149.	< .00001.
Factor 4.	Control. (<i>Psychological Resilience</i>)	24.05	<.0.00004.
Factor 5.	Spiritual influences. (<i>Spiritual Resilience</i>)	100.09277.	<.000006.

Figure 13. Graphical data for the one-way ANOVA f-ratio and p-value for the resilience factors.



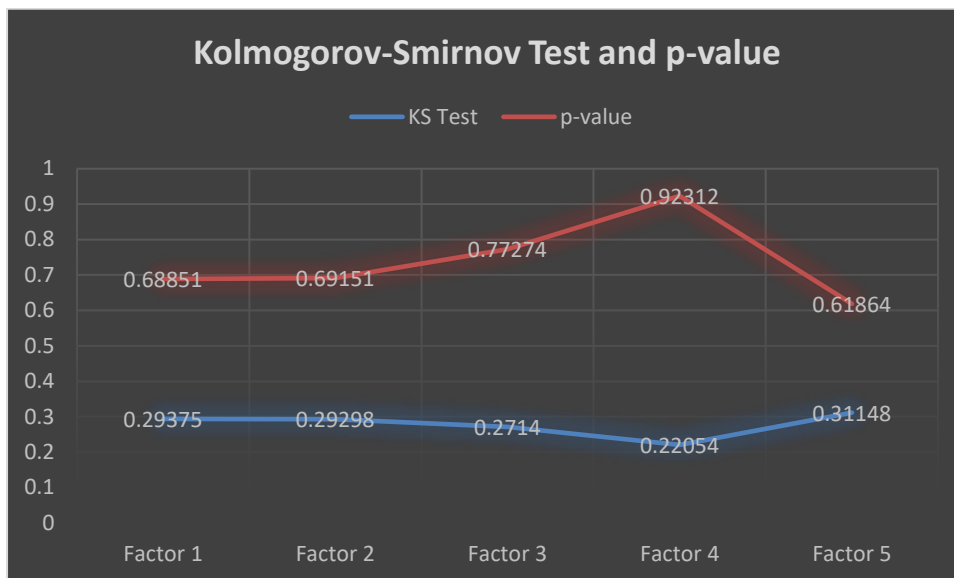
The overall resilience factor data was then tested using Kolmogorov-Smirnov's (KS) Test of Normality to ensure the results did not deviate from the expected normality of data distribution. Table 10 and Figure 14 shows the KS results for the quantitative data gathered and demonstrates the normal distribution of data for both KS test values and p-values. The lower the scores for both the KS and p-values demonstrate

the measurement of fit (KS) and the probability that the effect of statistical differences and ‘significant’ or ‘not significant’ results have not occurred by chance (Statistical Package for Social Sciences, 2020). Results that are ‘not significant’ within the KS denote the normal distribution of data that is evidenced in Figure 14.

Table 10. Kolmogorov-Smirnov Test of Normality.

Factor No	Resilience factor	K-S test statistic	p-value
Factor 1.	Personal competence, high standards and tenacity. <i>(Physical Psychological resilience)</i>	The value of the K-S test statistic (D) is .29375.	The p-value is .68851. The data does not differ significantly from that which is normally distributed.
Factor 2.	Trust in one’s instincts, tolerance of negative effect and strengthening effects of stress. <i>(Physical Psychological resilience)</i>	The value of the K-S test statistic (D) is .29298.	The p-value is .69151. The data does not differ significantly from that which is normally distributed.
Factor 3.	Positive acceptance of change and secure relationships. <i>(Social Resilience)</i>	The value of the K-S test statistic (D) is .2714.	The p-value is .77274. The data does not differ significantly from that which is normally distributed.
Factor 4.	Control. <i>(Psychological Resilience)</i>	The value of the K-S test statistic (D) is .22054.	The p-value is .92312. The data does not differ significantly from that which is normally distributed.
Factor 5.	Spiritual influences. <i>(Spiritual Resilience)</i>	The value of the K-S test statistic (D) is .31148.	The p-value is .61864. The data does not differ significantly from that which is normally distributed.

Figure 14. Data distribution for Kolmogorov-Smirnov Test of Normality.



Section 3. Data analysis and discussion for physical and psychological resilience domains.

In the following sections, the researcher outlines the data-merging analysis for each of the resilience domains and the associated CDRS-25 factors to achieve an in-depth analysis and discussion of the research findings. This is required to analyse each resilience factor and domain and the proposed outcomes of the FD/APDT intervention on each of these different resilience domains and factors.

a. Personal competence, high standards and tenacity.

Table 11 outlines the quantitative data collated for Factor 1 (personal competence, high standards and tenacity) with n=237 responses across the 8 questionnaire items for this factor with total scores across each response scoring. This allows further interpretation of possible total score percentages within each of the 8 items for this factor.

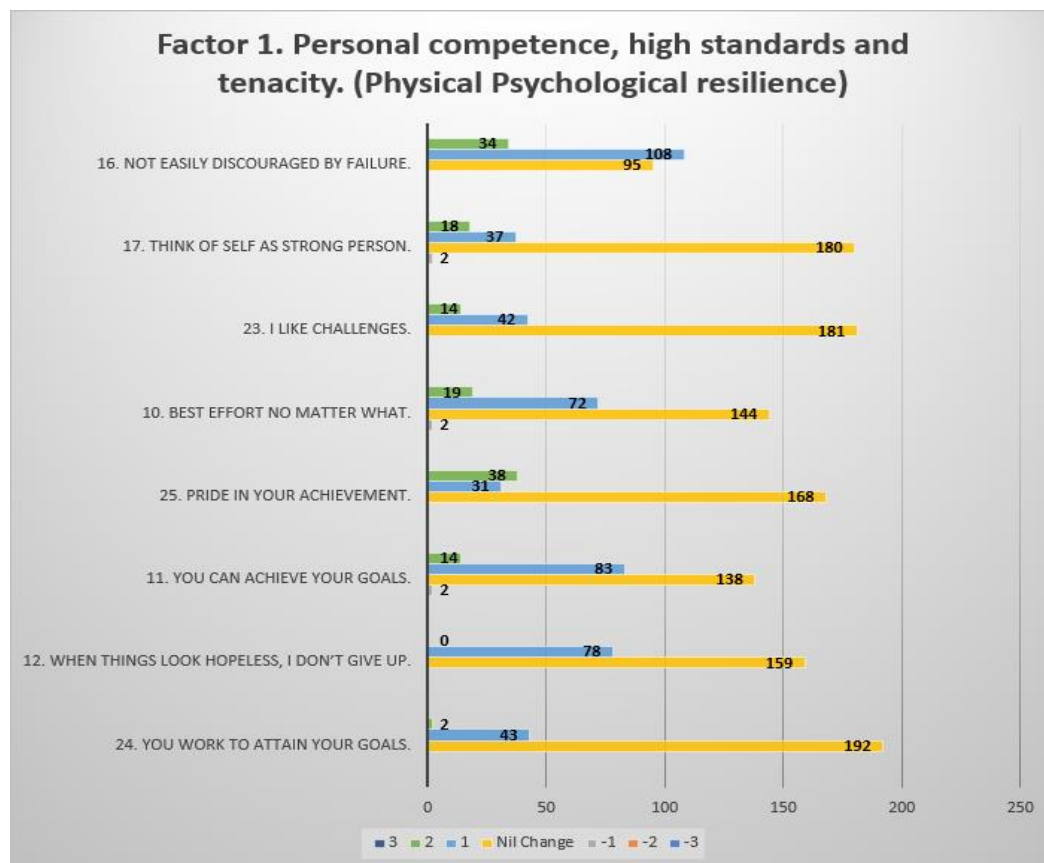
Table 11. Changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 1, personal competence, high standards and tenacity.

Factor 1	Personal competence, high standards and tenacity. (<i>Physical Psychological resilience</i>)						
CDRS-25 Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
24. You work to attain your goals.	0	0	0	192 (81.01)	43 (18.14)	2 (0.84)	0
12. When things look hopeless, I don't give up.	0	0	0	159 (67.08)	78 (32.91)	0	0
11. You can achieve your goals.	0	0	2(0.84)	138 (58.22)	83 (35.02)	14 (5.90)	0
25. Pride in your achievement.	0	0	0	168 (70.88)	31 (13.08)	38 (16.03)	0
10. Best effort no matter what.	0	0	2 (0.84)	144 (60.75)	72 (30.37)	19 (8.01)	0
23. I like challenges.	0	0	0	181 (76.37)	42 (17.72)	14 (5.90)	0
17. Think of self as strong person.	0	0	2 (0.84)	180 (75.90)	37 (15.61)	18 (7.59)	0
16. Not easily discouraged by failure.	0	0	0	95 (40.08)	108 (45.46)	34 (14.34)	0
Overall Totals (1896)	0	0	6 (0.31)	1257 (66.29)	494 (26.05)	139 (7.33)	0

This data is presented graphically in Figure 15 which clearly shows the high no change scores across items for this factor, balanced against significant, yet lower, positive development scores. The one-way ANOVA for repeated measures demonstrated a *f-ratio* value of 92.04 ($p < .05$) as significant, measuring the CDRS-25 Factor 1 responses against factor means. These results demonstrate that the

means figure of the data in the perceived development scales, are considered statistically significant, with a high probability that the significant ANOVA f-ratio and p-value for these items have not occurred by chance, but possibly by participation in the FD/APDT intervention.

Figure 15. Graphical representation for changes in participant’s CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 1, personal competence, high standards and tenacity.



When scrutinising the data, the item for which the largest number of participants showed a positive change in scores, was Item 16 (I am not easily discouraged by failure) where 59.80% (n=149) of participants indicated a positive development after the FD/APDT intervention with zero negative responses. When set against the remaining 7 items, Item 16 provides the strongest positive response set. This result

was echoed within the focus group discussions where participants noted how the FD/APDT intervention had improved their ability for persistence after the 6-month period. Comments included “I found that my understanding of how to be persistent in pushing others who were struggling physically and psychologically in given tasks got better and I was able to give them a hand. This meant the whole group benefitted” (SAC11). This point is further amplified due to the low level of negative responses collated across Item 17 (I think of myself as a strong person when dealing with life’s challenges and difficulties) with 0.84% (n=2). This promotes the perception that n=235 of the participants indicated a positive or stable score for personal competence, high standards and tenacity.

The results highlight that whilst the positive results of 18.98% (n=45 for Item 24) and 29.11% (n=69 for Item 25) for CDRS-25 items related to psychological resilience development in this study, there were respondents (81.01%) for Item 24 (n=192) and 70.88% (n=168) for Item 25 (I take pride in my achievements) who did not perceive any growth for Factor 1. Collectively, this represents 66.29% (n=157) of participants whose scores indicated their personal competence, high standards and tenacity elements of psychological resilience were unaffected by the FD/APDT intervention. In contrast to the perceived no resilience development of 66.29% (n=157), the respective growth of 38.38% (n=91) for Item 10, 18.98% (n=44) for Item 24 and 29.11% (n=68.99) for Item 25, provided data to support the immediate perceived growth of psychological resilience as a result of the FD/APDT intervention.

Most significant was the perceived ‘no change’ of 76.37% (n=181) of participants for Item 23 of the CDRS-25 (I like challenges). This was an interesting data set given the proposed available opportunities within FD/APDT and the development of

personal outcomes through the intervention. Although a high score for this item, this was contrasted by additionally strong perceived development in the participant's ability to approach challenges with a positive frame of mind (23.62% (n=56)).

Interpretation of the analysis of the two data-sets provided evidence for the transfer of learning from the FD/APDT intervention back into the workplace for improved role performance for personal competence, high standards and tenacity from the FD/APDT intervention. Improved confidence of the individuals in dealing with phase 1 and phase 2 training was also evidenced in the focus groups by statements such as "the week makes you feel more confident to achieve your ability with everything else that you do out of phase 1 in the main RAF when we graduate" (A/Cpl3) for the presentation of tacit knowledge and coping strategies in the development of confidence. However, these must be balanced against the participant's limited ability to transfer learning into any primary role, as the participants are still in phase 1 and 2 training. For these participants, the training environment remains their primary role on which to reflect on the transfer of resilience learning from the FD/APDT intervention.

However, the results within the psychological and physical resilience domains do allow for the contextualisation of the FD/APDT perceived resilience development to be aligned to military practice and essential to understand the effect of the resilience development within a military context. The perception of growth after the resilience development intervention (FD/APDT) is partly attributable to the experiences of the participants in the FD/APDT intervention, as evidenced through the participant's statements in the focus group discussions such as "we failed an inspection on the morning after the camping expedition and the group had to complete hard physical

exercise for 20 mins to correct our issue. It (the physical exercise) was forgotten about and we bonded better to ensure it didn't happen again. I felt better about myself for passing the next inspection and for completing the tasks" (AC1). These findings present a positive indication towards the use of FD/APDT in military personnel's resilience development, specifically psychological and social, and are not "flat earth findings" (Brooks 2003, p.126). The use of personal statements and evidence combined with the positive change in scores and resilience growth, negates these flat earth findings and brings the evidence to life within their applied military context.

The focus groups elicited the collective opinion that the FD/APDT intervention was an integral and essential element of training that instilled a personal belief in their abilities, especially when given responsibilities to lead the group or act as the senior student for the day. This belief and trust within the personal competence, high standards and tenacity factor, were evidenced in statements such as "during the activity, I had to trust the instructor/man in front, and they had to trust me" (LAC2). This evidences the development of trust within the participant and other group members that was still apparent after six months. The sense of self-efficacy and personal achievement as a positive consequence of the FD/APDT intervention, was highlighted throughout the discussions and the evidence (although not as strongly evident) provided in the questionnaires of 33.38% (n=79) for the immediate perceived resilience development of personal competence, high standards and tenacity. This resonates with the findings of Bobilya *et al.* (2010) who also found increases in mental strength or psychological resilience for the purposes of this thesis, up to two years after participation in FD/APDT programmes.

Whilst only measuring the immediate perceived outcomes of the FD/APDT intervention, the comparatively high number of focus group participants' perception of personal competence, high standards and tenacity growth as part of psychological resilience, are more positive than the lower perceptions of resilience development for questionnaires completed immediately after the intervention. Further evidence of this short-term growth was presented in multiple positive comments such as "I learnt to control myself in stressful situations such as the tougher parts of caving" (SAC13). This highlights that participants in the focus groups felt they had developed more psychological resilience during the intervening period, as a result of their experiences of the FD/APDT intervention through the comments made during the focus group discussions.

These findings are comparable with Kinsella (2001) and Waite (2007) who noted the importance of reflection during FD/APDT, that was highlighted by focus group participants to implement and consolidate resilient behaviours and develop more resilient attitudes to training and the workplace. The focus group participants also felt there was inadequate time during the five-day FD/APDT intervention to consolidate learning. This learning took place through implementing the resilience education from the FD/APDT intervention and reinforcing this knowledge, behaviour and learning during the intervening period, in order to become more resilient to workplace challenges.

The perceived development of personal competence, high standards and tenacity was still evident after six months (up to two years in one individual's case-due to being re-coursed) as the statements from the focus groups' discussions highlighted. Whilst some of the comments seem on the surface to relate to thoughts at the time

of the FD/APDT intervention, the reference to the comments by the focus group participants is that the 'at the time resilience learning' from the FD/APDT intervention is still applicable at the 6 month focus groups. Statements such as "the week made me feel more confident with going into (and dealing with) the unknown" (LAC3) coupled with the themes of transferring the ability to be resilient into phase 2 training, further support the role of FD/APDT in developing Factor 1. These were outlined as fundamental elements of psychological resilience within the CDRS-25, focus groups and literature review domains associated with resilience.

However, whilst the use of the FD/APDT interventions in developing this factor of psychological resilience was recognised throughout the focus group discussions, several contrasting comments from those participants who did not feel their psychological resilience had developed, were collated. This was evidenced in comments such as "because I was fit and not scared or stretched by the activities, I just got stuck in to help the other team members out who were from different courses" (A/Cpl7). This represented a contesting opinion on the efficiency of the intervention on developing resilience in participants who may already perceive themselves as highly psychologically and physically resilient. This data presents a majority view of a positive development in resilience within the focus groups, but this majority view is not prevalent with the questionnaire's quantitative data conducted immediately after the FD/APDT intervention and further explored in the analysis of the data merging. Moreover, there is a comparable reflection of the perceived resilience development from the questionnaires and focus groups that not all participants felt a perceived enhancement in their resilience after the FD/APDT intervention.

This perception could be a result of reflection and evidence of implementing attitudinal behaviour over the intervening 6-month period, as the positive qualitative data outlined. However, the concept of social desirability responses and hegemonic masculinity affect was addressed through the reassurance of the participant's anonymity and the honest and insightful responses evidenced within the focus group discussions. Of further consideration are the negative statements (although limited) against the development of personal competence, high standards and tenacity by the higher ranked participants such as "I thought the week was excellent but wanted harder challenges to see if I could do them" (A/Cpl8). This comment considers the respondent's previous exposure to similar FD/APDT activities prior to participating in the RAF FD/APDT and indicates the potential to further develop participants' resilience through these interventions.

The evidence of high positive change within focus group responses and the low level of negative qualitative responses support the concept that personal competence, high standards and tenacity is developed over time (six months after the FD/APDT intervention). However, the overall perception from the qualitative follow-up is that of a positive development in personal competence, high standards and tenacity.

In contrast to the changes in negative scores of Items 10, 11 and 17 within the CDRS-25, the perceived positive development of 38.38% (n=91), 40.92% (n=97), and 23.20% (n=55) of participants recorded perceived positive resilience development for the same 3 items (10, 11 and 17).

Whilst some positive developments are evidenced as occurring, there were also participants that perceived no change to their resilience development in response to their participation in the FD/APDT intervention. All of the Likert scoring demonstrated

'significant' results within the ANOVA test and identified the f-ratio and p-value for all items within this factor as 'significant'. The 'significant' result highlights the probability ($p < .05$) that the differences in means and data for the perceived developments and 'no change', were not attributed to chance.

The positive reflections of participants on the remaining items within this personal competence, high standards and tenacity (physical, psychological resilience) CDRS-25 resilience factor, further demonstrates a perceived improved ability to cope with and bounce back from, stressful situations as a result of their participation in the FD/APDT intervention up to six months afterwards. This ability to remain persistent in achieving goals and bounceback/forward is an integral factor to the resilience development and baseline growth of individuals and outlined within the literature review as critical to the perceived success of FD/APDT programmes (Hattie *et al.*, 1997). The evidence provides positive associations between student's perceptions of being able to bounceback from adversity with more resilient mindsets to face work stressors and improve role performance as a result of the FD/APDT intervention; although this was not consistent across all participants.

In congruence to the perception of psychological resilience development, statements such as "I didn't receive enough pressure or challenging enough circumstances" by an acting Cpl (A/Cpl17), present frustration by already resilient individuals who felt they were not pushed by the intervention and subsequently, the FD/APDT intervention had limited impact on their resilience growth. Indeed, this is presented on a number of occasions and within the development of 'trust in one's instincts, tolerance of negative effect and strengthening effects of stress' part of the focus groups' discussion. The participants also referred to previous statements under the 3

sub-factors of physical and psychological resilience (personal competence, high standards and tenacity factor, trust in one's instincts, tolerance of negative effect and strengthening effects of stress factor and control) to collectively describe their perceived development (under the physical and psychological resilience domain) or if 'no change' had occurred.

This perception that the intervention was not challenging enough for already resilient individuals is reflective of several literature review points (Ewert, 1989; Breslau, Peterson and Schultz, 2008; Breslau and Peterson, 2010) that identified pre-exposure to FD/APDT activities or previous experiences of similar programmes prior to joining the RAF, as likely to reduce the outcomes of the FD/APDT on previously exposed participants. Further analysis of the statements within the focus groups, provided evidence of participation in similar activities in the past within a civilian context and that the individuals who made these statements, were already active in the outdoor environment. These student antecedents and the previous exposure to the risk/challenges associated with the FD/APDT intervention, demonstrated no perceived resilience development in those participants who had previous exposure to FD/APDT interventions. However, the focus group comments evidence the transfer of learning from the FD/APDT intervention back to the workplace.

Further indicative themes of psychological resilience development from the focus groups provided evidence of the perceived development of mindfulness, resilience, positive attitude to develop and achieve the goal that led to successes throughout the week, humility to ask for help, willingness to learn and be flexible to changing circumstances. There was no perception of improved physical resilience, but this is to be expected due to the short five-day intervention and suggests the combination

of these 2 resilience domains was not suitable for data gathering. The follow-up discussions did however indicate that participants felt more motivated to participate in FD/APDT interventions in the future, as evidenced by comments such as “I felt open minded to try new things after doing new activities that will help with my RAF career” (A/Cpl2). This positive transfer of learning is key evidence for future programme design and psychological resilience factor development interventions within the RAF.

The outcomes of the FD/APDT intervention on the first of the psychological and physical resilience factors demonstrates the utility of the intervention in developing personal competence, high standards and tenacity immediately after the intervention and after six months. However, this statement must be tempered by the fact that the participants within the research are still in their initial phase 1 and phase 2 of training and are developing both personally and professionally within the RAF. Claims of the use of a single five-day FD/APDT intervention in receiving all the credit for any psychological resilience enhancement within this factor, must be set against other professional or personal interventions the participants may have been exposed to within the 6-month reflective period.

This approach is required to ensure a balanced view of the outcomes of the FD/APDT intervention. However, when considering the qualitative responses to the outcomes perceived by the participants on the role of FD/APDT on their professional effectiveness and personal resilience, it is clear that the participants regarded the psychological resilience growth within the personal competence, high standards and tenacity factor as directly attributable to the FD/APDT programme. This was apparent through the high number of perceived changes and comments regarding

self-confidence and tenacity to complete tasks; both personally and for the group. Moreover, the evidenced development across multiple self-schemas such as self-esteem, demonstrates the utility of the FD/APDT intervention in enhancing participants' self-schemas for utility within the workplace.

The development of personal competence, high standards and tenacity could also be attributed to the participants' development of self-confidence as they learn to master new skills within their phase 1 and 2 training, that they may not have been previously exposed to, even outside of the FD/APDT intervention. Simple factors such as pride in personal appearance, learning a new trade, sense of belonging to a new professional service could enhance perceptions of personal competence and high standards. These elements cannot be solely attributable to the FD/APDT programme. The collective training elements of the phase 1 and 2 training must be considered when developing an understanding of how the FD/APDT is purported to have made such advances in personal competence, high standards and tenacity.

This development in resilience through FD/APDT programmes was also noted by Kelly (2019) who outlined the exposure to resilience challenges instead of the actual FD/APDT programme as fundamental to personal resilience development. However, when reviewing the data, current literature and participants' experiences and perceptions of the FD/APDT intervention's outcomes in response to the development of personal competence, high standards and tenacity, participants noted the significant personal impact the FD/APDT intervention had on their perception of this resilience factor. This was also evident through their responses for the transfer of learning for professional workplace effectiveness, as a consequence of their participation in the FD/APDT intervention.

The results evidenced the positive results for the resilience factor of personal competence, high standards and tenacity as the second highest within the physical and psychological resilience domain and provided strong evidence of the perceived personal competence, high standards and tenacity traits associated with resilient individuals. The results from both data sets were not overwhelmingly positive though and a concentrated number of 'no change' results still raises questions on the whole-group effectiveness of a five-day FD/APDT intervention within this factor. It is the researcher's observation that this may be attributable to the existing resilient nature of RAF recruits, the programme design or any of the affecting variables of FD/APDT interventions as highlighted within the literature review such as student antecedents, programme design, facilitator effectiveness, perceptions of risk during activities or previous exposure to FD/APDT interventions.

b. Trust in one's instincts, tolerance of negative effect and strengthening effects of stress.

The interpretation of the data for the outcomes of trust in one's instincts, tolerance of negative effect and strengthening effects of stress as a result of the FD/APDT intervention, outlines that not all participants felt the FD/APDT (either immediately or after six months) developed this factor. This was apparent from a number of statements made during the focus groups such as, "I didn't receive enough pressure or challenging enough circumstances" (A/Cpl7) and "I was in a really slow group and got frustrated sometimes" (A/Cpl4). In comparison to the questionnaire results for this factor, 33.38% (n=79) of participants felt perceived resilience development but this factor received limited negative comments from the focus groups. This further supports the perception of growth of trust in one's instincts, tolerance of negative

effect and strengthening effects of stress over time, as a result of the FD/APDT intervention and learning transfer from its successful implementation into primary roles.

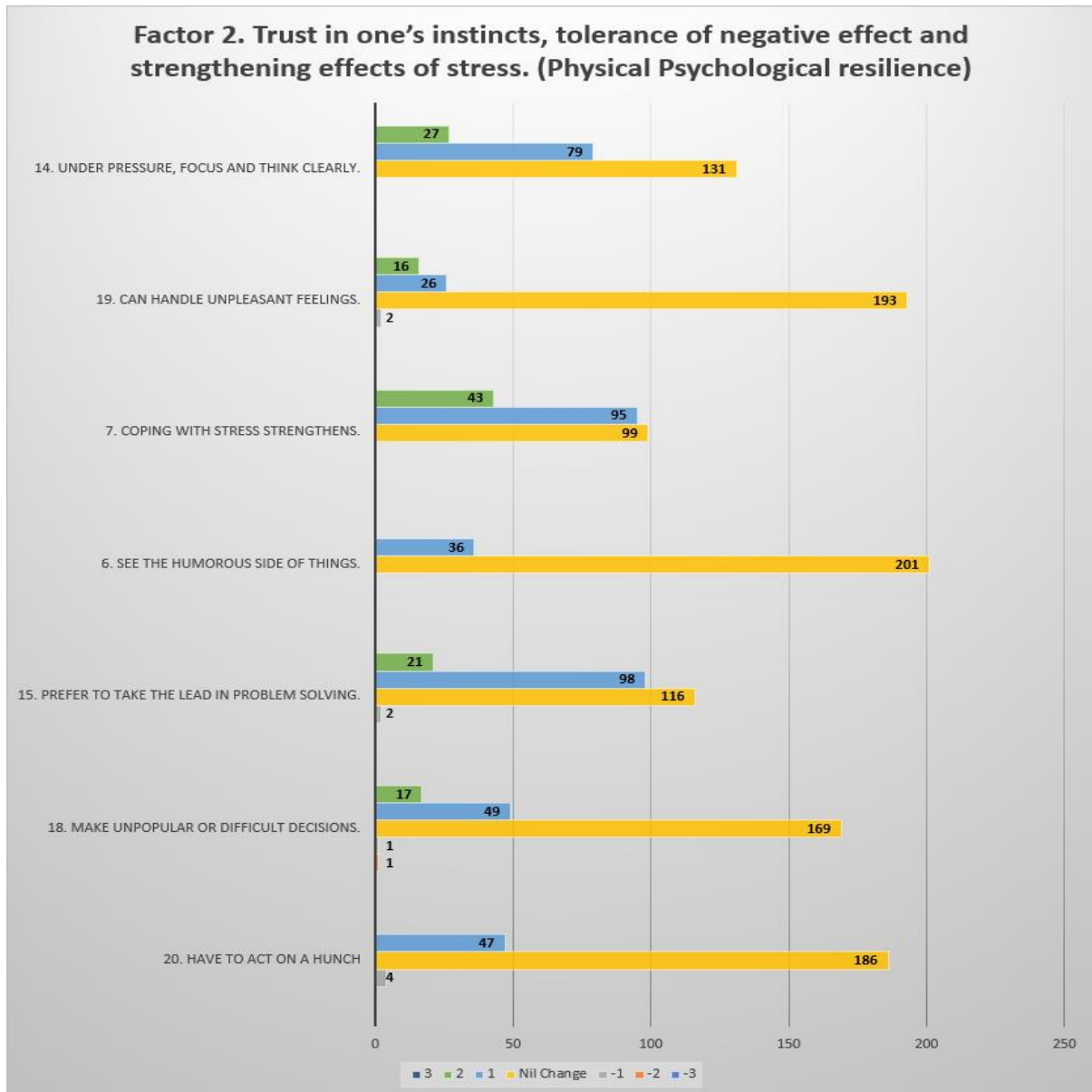
Most pertinent within the negative responses in the initial questionnaire were those of Item 20 (In dealing with life's problems, sometimes you have to act on a hunch without knowing why) with 1.68% (n=4) of participants replying that they perceived a negative change. The use of a 'hunch' is linked to empowerment and mission command when faced with a problem and there may have been incidents within the unfamiliar FD/APDT intervention where confidence was shaken if they failed in an activity, that may have influenced the results for this item. Table 12 presents the quantitative data for trust in one's instincts, tolerance of negative effect and strengthening effects of stress.

The data within this table also reinforces the theme from Factor 1 in the large number of no changes to perceived resilience development as a result of participation in the intervention. The data however also mirrors that of Factor 1 in presenting positive responses to perceived resilience development. This data is presented in graphical form for clarity in Figure 16 to illustrate the similarities in data between Factor 1 and 2 in the high numbers of perceived no change and lower perceptions of positive change.

Table 12. Changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 2, trust in one's instincts, tolerance of negative effect and strengthening effects of stress.

Factor 2	Trust in one's instincts, tolerance of negative effect and strengthening effects of stress. (<i>Physical, Psychological resilience</i>)						
CDRS-25 Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
20. Have to act on a hunch	0	0	4 (1.68)	186 (78.48)	47 (19.83)	0	0
18. Make unpopular or difficult decisions.	0	1 (0.42)	1 (0.42)	169 (71.30)	49 (20.67)	17 (7.17)	0
15. Prefer to take the lead in problem solving.	0	0	2 (0.84)	116 (48.94)	98 (41.34)	21 (8.86)	0
6. See the humorous side of things.	0	0	0	201 (84.81)	36 (15.18)	0	0
7. Coping with stress strengthens.	0	0	0	99 (41.77)	95 (40.08)	43 (18.14)	0
19. Can handle unpleasant feelings.	0	0	2 (0.84)	193 (81.43)	26 (10.97)	16 (6.75)	0
14. Under pressure, focus and think clearly.	0	0	0	131 (55.27)	79 (33.33)	27 (11.39)	0
Overall Totals (1659)		1 (0.06)	9(0.54)	1095 (66.0)	430 (25.91)	124 (7.47)	0

Figure 16. Graphical representation for changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 2, trust in one's instincts, tolerance of negative effect and strengthening effects of stress,.



With 84.81% (n=201) of participants identifying no change to their sense of humour (Item 6) but 15.18% (n=36) noting a 1-point positive change (within the CDRS-25 scores), this is weak evidence that the FD/APDT intervention positively impacted the participant's sense of humour. Albeit, the lowest positive score within the factor, a

sense of humour during stressful, arduous conditions is a fundamental strength in dealing with stressful situations (Silter *et al.*, 2014). This perceived positive development is significant, as a sense of humour will help steel against the effects of stress, but may not be as positively affected after a five-day FD/APDT intervention as the other items within this factor.

The analysis of the data merging identified the perceived development of this factor as a result of the FD/APDT intervention. The results demonstrated that 33.33% (n=79) of participants reported a perceived development immediately after the FD/APDT intervention, with strongly reported qualitative data recorded after six months for the perceived development of trust in one's instincts, tolerance of negative effect and strengthening effects of stress. In measuring the factor's means with the one-way ANOVA for repeated measures, the data for this factor demonstrated a *f-ratio* value of 55.61336 and $p < .00001$ at $p < .05$, identifying a significant variation in the means for this resilience factor.

However, there were several negative responses (n=10) to this suite of questions that provided a challenging aspect to the analysis of these results, as no further investigation as to why the negative responses occurred was sought. These negative responses were prevalent in Items 15, 18 and 19 all with 0.84% (n=2), and in Item 20 with 1.68% (n=4). Moreover, the now established theme of large numbers of participants perceiving no change to their resilience was apparent in all 7 items within the trust in one's instincts, tolerance of negative effect and strengthening effects of stress element of physical and psychological resilience development. Although these large 'no change' scores were consistent across all seven items, it is evident that the largest elements of perceived resilience development according to

the CDRS-25 responses were also provided within this factor of physical and psychological resilience development. Whilst cognisant of the lesser number of items (set against factor 1 of 8 items), the data set for factor 2 (7 items) provided reasonably high results for both no perceived and positive change for items within this factor.

There were perceived collective levels of resilience growth in all 7 CDRS-25 items for this factor, demonstrating a development in the participants' trust in one's instincts, tolerance of negative effect and strengthening effects of stress. This was evident in overcoming obstacles and perseverance (Items 15 and 18) of 50.20% (n=118) and 27.84% (n=66) respectively with 44.72% (n=106) reporting a perceived resilience growth in Item 14 (under pressure, I stay focused and think clearly) and 44.72% (n=106) developing in their ability to take the lead in solving problems rather than letting others make all of the decisions. However, the most significant perceived growth was evident in Item 7 (having to cope with stress makes me stronger) of 58.24% (n=138), that is further reflected in the focus group responses discussion that tie these two areas of data collection together for this specific item. Whilst there were no negative responses to this item within the CDRS-25, this must be tempered by the negative responses presented during the focus group discussion, where obvious frustrations were evident on the lack of challenge associated with the FD/APDT intervention by some of the participants (A/Cpl 4 and 7).

However, these items were also noted as significant developments during the qualitative follow-up and demonstrates the further perception of psychological resilience development after the 6-month intervening period. When relating this factor (trust in one's instincts, tolerance of negative effect and strengthening effects

of stress) with the previous psychological resilience factor (personal competence, high standards and tenacity), the data merging and interpretation of both data sets develops a trend on initial limited perceptions of psychological resilience development immediately after the five-day intervention, but with significant perceived development after six months (two years in one individual's case). This could be linked to the resilient behavioural changes over time resulting in resilient attitudinal changes being portrayed within the participant's primary role. Indeed, participants in the focus groups felt the FD/APDT intervention had developed their trust in one's instincts, tolerance of negative effect and strengthening effects of stress and was being implemented within their phase 2 training.

Given the personal nature of bouncing back from adversity (Goldenberg and Prosolino, 2008) with social group support, it is feasible to view this factor as a critical psychological/physical resilience factor when integrated with success within social settings; such as group tasks within FD/APDT. However, it is unclear from the data how individuals were able to cope with any negative influences during the FD/APDT intervention such as a clash of personalities. This initial quantitative data for Item 19 (I am able to handle unpleasant or painful feelings like sadness, fear and anger) with 0.84% (n=2) demonstrates there is a requirement to view the holistic data as weaker when balanced against the 'no change' theme that is also prevalent within the perception of FD/APDT in developing an ability to deal with emotional issues such as fear, anger and sadness. However, the follow up qualitative data does present positive narrative to demonstrate an element of perceived development for trust in one's instincts, tolerance of negative effect and strengthening effects of stress through comments such as "I learned to take a second to gather my thoughts, control my breathing and focus on the task in hand when in high pressure/stress

situations” (SAC7) and “taking the lead role in navigation on the hike gave me loads of confidence. My group were really supportive, and this made me want to get them to the top” (LAC1).

The ability for participants to trust their own instincts and tolerate negative affect whilst strengthening their effectiveness to withstand stress, was a key finding within the data analysis and provided evidence of the FD/APDT’s utility to develop wider self-schemas across those identified within Table 1. The intervention’s ability to enhance this trust in one’s instincts was evident through the data provided and through significant responses to the focus groups’ discussions, where the confidence to step forward into leadership positions or step up to the challenge when the going got tough, evidences the success of the FD/APDT intervention in developing trust in one’s instincts, tolerance of negative affect and strengthening effects of stress.

However, there are a number of issues that could have impacted on this perception that draws comparisons from the personal competence, high standards and tenacity factor in that these response were given during a personally challenging and educational demanding period of the participants’ professional careers. During this period, the participants are subjected to intense learning and opportunities for personal and professional growth that many may be unfamiliar with. The immersion into a mature and professional military culture for many young trainees is a life changing experience, that could have influenced many of their answers as they may have perceived the FD/APDT intervention as one of the most enjoyable experiences or a novel exposure to risk, they felt had developed them. Although the positive data evidences the perceived psychological development within the trust in one’s

instincts, tolerance of negative affect and strengthening effects of stress factor, these personal and professional influences must be considered.

However, the evidence gathered, and outcomes elicited by the participants provides a rich data set to surmise that participant's ability to cope with stress during arduous situations whilst under pressure, was enhanced as a result of their participation in the FD/APDT intervention. Furthermore, the participant's ability to rationalise in uncomfortable situations was perceived as developed and the participant's ability to make measured judgements through self-control and a positive outlook when under pressure, were strong indicators of the FD/APDT psychological resilience outcomes for this factor. These findings of enhancement within the factors are comparable to developments within similar psychological resilience factors in recent FD/APDT research (Scarf *et al.*, 2017) albeit the evidence from this thesis's outcomes are directly transferable to the participants' RAF workplace and professional careers. This was qualitatively evidenced through the participants' perception of improved workplace efficiency as a result of their participation in the FD/APDT intervention.

c. Control.

For the reader's understanding, whilst control is noted as factor 3 within the psychological and physical resilience domain, it is factor 4 within the CDRS-25 (Connor and Davidson, 2003, p.80) and has been placed within this section purposefully as the third factor of psychological and physical resilience. This is to ensure the integrity of the CDRS-25 question set and order.

High correlations between no perceived change in Items 13, 21 and 22 of the CDRS-25, continue to demonstrate already high levels of extant resilience within the

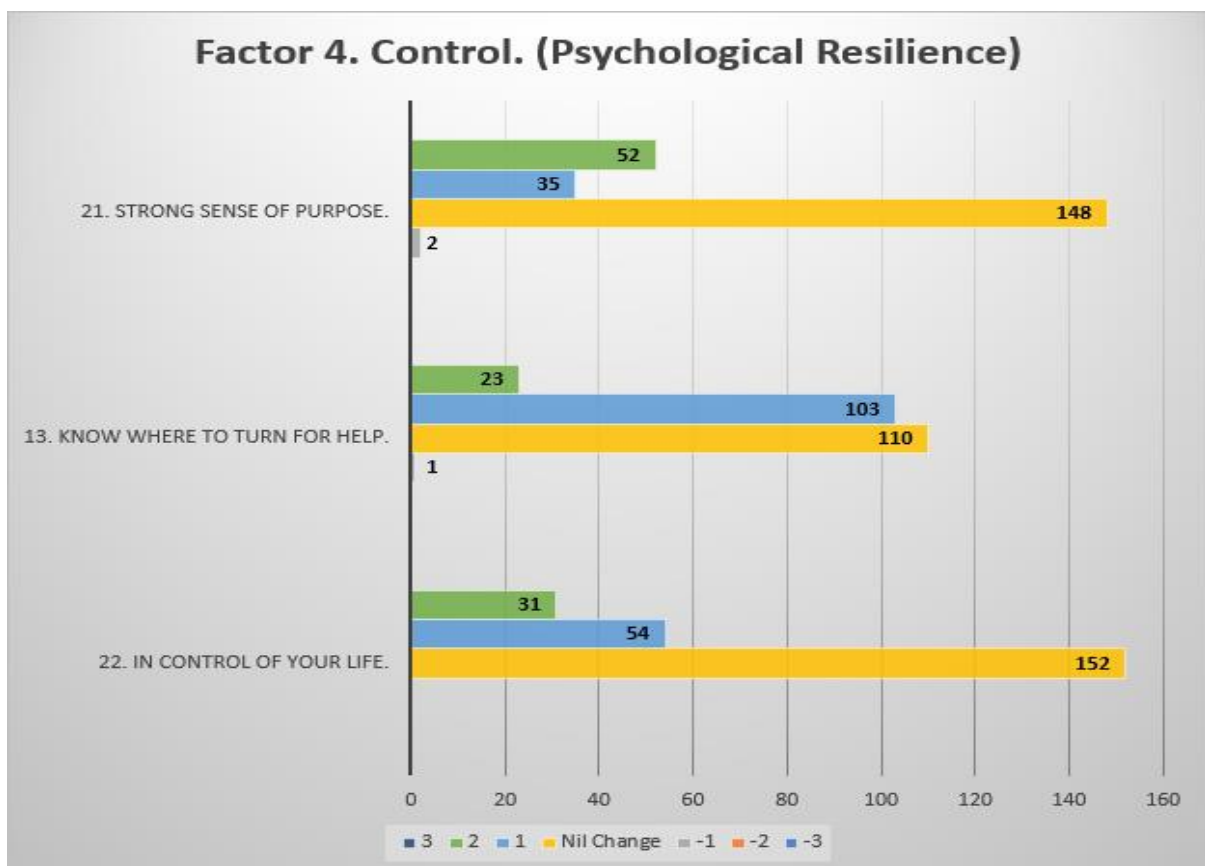
participants who were unaffected by the intervention. The positive development of participants within this sub-element of control is further evident in the remaining 2 CDRS-25 items of 'I have a strong sense of purpose in life' (CDRS-25 Item 21) and 'I feel in control of my life' (CDRS-25 Item 22). For Factor 4, the *f-ratio* value is 24.05 and the *p-value* is .00004 for the one way ANOVA for repeated measures and demonstrated the significant variation in factor mean results across the multiple groups of personnel who completed the CDRS-25 during the data collection period.

Whilst a pattern has been identified within the 'significant' ANOVA across the positive (+1, +2, +3) measures, it is apparent from the ANOVA results that these significant results could represent a high probability that similar data could be found during future research and could demonstrate the influence of the FD/APDT programme on perceived resilience development. The significant data recorded also supports the negative scores against the Items where participants felt there was no perception of resilience development. Table 13 presents the quantitative data for control and demonstrates the continued theme of high numbers of perceived no change in perceived resilience for this specific factor (in keeping with Factor 1 and 2 findings) immediately after the FD/APDT intervention. The table also presents the perceived developments for this factor and is represented in graphical form for clarity in Figure 17.

Table 13. Changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 4, control.

Factor 4	Control. (Psychological Resilience)						
CDRS-25 Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
22. In control of your life.	0	0	0	152 (64.13)	54 (22.78)	31 (13.08)	0
13. Know where to turn for help.	0	0	1 (0.42)	110 (46.41)	103 (43.45)	23 (9.70)	0
21. Strong sense of purpose.	0	0	2 (0.84)	148 (62.44)	35 (14.76)	52 (21.94)	0
Overall Totals (711)	0	0	3(0.42)	410(57.66)	192 (27.00)	106(14.90)	0

Figure 17. Graphical representation for changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 4, control.



These high levels of perceived no change scores is a significant finding, as it demonstrates the already perceived levels of resilience in many of the FD/APDT participants who found the FD/APDT intervention was unable to enhance their control factor of psychological/physical resilience. It is also pertinent for the design considerations of the programme (Paisley *et al.*, 2014), to establish the effectiveness of the programme for many of the participants. This provides supporting evidence for the effectiveness of the FD/APDT intervention in developing elements of resilience for some participants, but not all. It is also unlikely that any training intervention will truly meet the needs of all its participants, given the vast subjective variables associated with resilience interventions and participants.

Although Item 21 (I have a strong sense of purpose in life) provides a high percentage of combined perceived development of 36.70% (n=87), it is apparent that 57.66% (n=136) remained unaffected by the intervention. Whilst any perceived positive development within the 3 items of control is useful for understanding the utility of FD/APDT interventions, the contrasting high 'no change' scores across the control factor, are representative of limited effect on an engrained personality and behaviour over a five-day non-personalised FD/APDT intervention. This theme resonates throughout these items and throughout the psychological resilience factors; albeit with results that collective psychological resilience factors (in varying levels) are positively influenced through the participation in RAF FD/APDT interventions. There are large numbers of participants who stated they felt unaffected by the intervention and demonstrates the requirement to address elements of the intervention that need improvement, to meet the demands of more resilient individuals.

In tempering concerns about 'no change', it is evident from the data that not all participants were enthusiastic about taking part in the FD/APDT intervention and felt it was another milestone to pass during training. This could also present the concept that participants may not have been fully immersed in the training to gain the maximum benefit in improving their resilience. Although 41.90% (n=99) perceived a positive development in their 'control' within physical/psychological development, 57.66% (n=136) perceived no change with only 0.42% (n=3) of participants demonstrating negative responses to the intervention for 'control'.

The continuity of this theme into short-term resilience development during the phase 2 training was evident in the focus groups' qualitative data provided and through statements/themes provided by the participants. To ensure clarity during the focus groups' discussion on 'control', these 3 items also provided several supportive statements on the role of the FD/APDT week on developing the participant's psychological resilience six months (up to two years in one individual) after the intervention.

These positive themes developed through the focus groups are not in keeping with the high percentage of 'no-change' (57.66% (n=136)) responses provided during completion of the 'control' factor within the CDRS-25. It is apparent from the focus groups that further in-depth contextualised data were available and that further positive changes in 'control' is evident six months to two years later (in one individual's case), but not as powerful an effect/resilience development growth element after just 5 days. These positive results for the short-term psychological resilience development of control (as a result of the FD/APDT intervention) provides evidence for the growth and conceptual transfer of psychological resilience.

One of the notable data sets from this factor was Item 13 (during times of stress and crisis, I know where to turn for help) that provided the highest individual positive score of 43.46% (n=103) for 1-point increase and 9.70% (n=23) for 2-point positive increase in resilience. These collectively demonstrate a 53.15% (n=126) perceived immediate understanding where to turn to for help. These large positive data sets could be attributed to positive achievements within the social cohesion of the group discussed in the next section during the intervention, with individuals acknowledging other team members to whom they could turn to in completing certain tasks.

Self-control within this factor of psychological resilience was not perceived as significantly affected by the FD/APDT intervention as there were a number of high 'no-change' scores that could have undermined the immediate outcomes of the FD/APDT intervention on control. These were mitigated by the linkage of this control within a group setting through high scores for the 'know where to turn to for help' item of the data. In closely reviewing the control factor, it is evident that self-schemas were perceived as enhanced as a result of participation in the FD/APDT intervention. However, as with the previous 2 psychological/physical resilience factors discussed, many of the positive claims could be attributed to significant events within the participants' personal and professional lives, given the initial stages of training that they are undergoing.

Whilst the control factor was perceived as developed within the immediate and short-term (6-month) time frame, it is unclear how this factor and the other 2 factors perceived development would be sustained over longer durations. Moreover, it can be surmised that exposure to additional resilience interventions (not necessarily FD/APDT), would provide enhancement training to sustain this resilience

development. However, it could also be noted that as the participants progress within their RAF careers and are exposed to more challenges and higher level exposure to increased managerial/leadership opportunities, these resilience interventions could have the opposite effect. This could be through over-stretching an already overworked RAF service-person if they are mandated to participate in this resilience enhancement training, especially if this is linked to any promotions or professional competency. Whilst it is unlikely that this will ever be the case, as the interventions (not necessarily FD/APDT) should be designed as personal and professional development opportunities and not to over-stretch an already stressed participant.

d. Merging psychological and physical resilience factors analysis.

It is essential to understand where these 3 psychological and physical resilience factors sit within the longer-term proposed psychological resilience development when considering the significant number of proposed resilience factors identified within Table 1 and this thesis. In addressing these comparable resilience factors early in a service-persons career, research studies conducted within the field of psychological resilience reviewed within the literature found a wide variety of traits associated with resilient military personnel that are shared with normal society (Schok, Kleber and Lensvelt-Mulders, 2010; Sudom, Lee and Zamorski, 2014; Naifeh *et al.*, 2016; O'Brien and Lomas, 2017). This should come as no surprise due to the social demographic from which the UK military recruits its personnel. However, developing these resilience factors early within a service-persons career, is fundamental in cementing and developing personal resilience attributes for the individual's military career.

This concept of exposing RAF participants to resilience development FD/APDT interventions has provided evidence that the psychological resilience factors of personal competence, high standards, tenacity, trust in one's instincts, tolerance of negative effect, strengthening effects of stress and control are perceived to have been developed after participation in a five-day FD/APDT intervention. These perceived developments are evident both immediately and six months after the FD/APDT intervention; albeit more significantly after the 6-month intervening period.

Whilst promising for these psychological and physical resilience factors, these are only a handful of the proposed resilience factors identified within Table 1 and further research is required to ascertain the outcomes of the FD/APDT intervention on a broader set of psychological resilience factors to truly understand the outcomes across the psychological resilience domain. It is also apparent from the data analysis, that the short-term outcomes can be discussed with some certainty, but cannot account for the significant subjective variables associated with the participants. Moreover, whilst it can be conjectured that the longer term outcomes of the FD/APDT intervention can be assured due to the proposed short-term outcomes, it is incumbent on the FD/APDT stakeholders to provide longer term, sustained research to further examine the perceived longer term role of FD/APDT in developing psychological resilience, specifically within military personnel.

In narrowing the field of resilience traits pertinent to military personnel that could be developed by FD/APDT, Simmons and Yoder (2013) identifies adaptive coping, personal control, hardiness and social support as the characteristics of resilient military personnel. In supporting this, research by Gould *et al.* (2015) found that although student self-ratings of resiliency did not change, they reported significant

improvements in their ability to use strategies to cope with captivity during outdoor survival training exercises.

These improved abilities to cope with adversity after resilience intervention training were also present during this thesis' research, albeit more apparent after the 6-month intervening period than immediately after the five-day intervention. Despite these individual resilience factors, Morgan and Bibb (2011, p.976) cites (within the same research group of active duty service members) that their seemingly poor adaptability to traumatic stressors is a risk to force health and further calls for evidence-based interventions in new programmes, especially ones that focus on positive emotional outcomes:

Even though military population-based psychological resilience programmes are in place, clear evidence for the comprehensiveness and effectiveness of these programmes is needed to provide information to focus conduction of population health studies. Once conducted, these studies can be used to inform policy and decision making related to military population-based psychological resilience programs.

Here, the past research asserts the requirement for resilient military personnel to contribute to 'force health' that ensures collective community resilience to military-sociological stressors. Furthermore, the UK Joint Doctrine Publication 0-02, 3rd Ed (2017, p.3) draws on comparisons from the civilian academic literature and wider UK military doctrine on resilience, to define resilience in a military context as "the degree to which people and capabilities will be able to withstand or recover from difficult conditions". This is comparable to the theme of civilian resilience academia. This key 'recovery/bounce-forward' conceptual training outcome of FD/APDT (especially considering the transfer of procedural and declarative learning from the FD/APDT intervention to the workplace, RAF and strategic intent) should come as second

nature in personnel's procedural understanding of the structured interventions at the tactical, operational or strategic level to develop resilience.

In understanding this 'second-nature' response to stressors, studies by Clark, Klesges and Neimeyer (1992, p.445) in cognitive psychology identified that knowledge comes in essentially 2 forms. One form is procedural knowledge (understanding how the FD/APDT intervention works) and the other is declarative knowledge (stored facts and information).

The first would be to make certain that participants move from their action-learning programmes directly to job assignments that build upon programme lessons and in turn perpetuate the learning process. By not doing so, the learning process stops prematurely. Secondly, organisations would ideally involve participants in multiple action-learning programmes that build upon the lessons of the prior programme - in essence, reinforcing learning and increasing the number of case experiences to enhance the acquisition of declarative knowledge.

This action learning process from the psychological resilience development experienced within the FD/APDT intervention and its subsequent transfer to the workplace, has been supported through the data collected within the thesis. However, whilst supporting the concept of resilience transfer, the findings from this thesis also present the notion that service personnel must understand the procedural and theoretical transfer of resilience learning. This is key for the proposed longitudinal and engrained resilience development throughout the service-person's career.

Whilst the early integration of the FD/APDT intervention could account for a number of higher scores attributed to the novelty of the FD/APDT intervention, these must be balanced against the positive responses acknowledged within the second data

gathering process that allowed for any novelty to subside after six months of reflection. It can be surmised that the perceived growth within the four domains of resilience could be extended if the participants were exposed to reinforced FD/APDT conceptual development opportunities or routine follow-up/enhancement by RAF professionals to 'top-up' this learning, throughout the service-persons career. The evidence presented within this thesis highlights the perceived psychological resilience development, but significant longitudinal evidence is required to substantiate any long-term claims of psychological resilience growth attributed to FD/APDT, after a longer period than six months within a military demographic.

In identifying the requirement for enduring resilience growth through amended behaviours and attitudes, Mackay, Tatham and Rowland (2012, p.4) states:

Whilst attitude is a poor precursor to behaviour, behaviour is actually a very strong precursor to attitude. Or in other words, if you change behaviour, even in non-compliant audiences, there is a good chance that with time, attitudes will follow.

Despite the growth in resilience research (post conflict), Jennings *et al.* (2006), Betancourt and Khan (2008), Pietrzak *et al.* (2010) and Brewin, Garnett and Andrews (2011) believe there is still a requirement to conduct more studies to understand pre, during and post military deployment resilience levels and the development of personal resilience baselines through developing protective factors. This thesis begins to develop the RAF's embryonic data gathering for the immediate contribution of RAF FD/APDT interventions in the development of participant's resilience and its findings reinforce the proposal for longitudinal studies from which to develop knowledge baselines of FD/APDT and resilience learning transfer. This will springboard future research from which to develop FD/APDT interventions.

In parallel to this post-intervention resilience development research, Sudom and Lee (2016) reviewed 37 theses from 5 country's (UK, US, Australia, Canada and New Zealand) military resilience longitudinal research (not related to FD/APDT though). They too concluded that recent findings require additional future studies to understand how the dynamic process of resilience changes over time and how different factors affect it. At this point, both past research and this current thesis are not helpful in designing specific targeted resilience interventions given the apparent dearth of research on military resilience programmes.

Furthermore, the research field presents limited studies that provide evidence within conscious mindfulness/mastery and resilience development to address the four resilience domains in either a progressive or parallel growth construct. Indeed, Schofield and Beek (2005) argue that this could be in part due to the long-term nature of such a study that could last for a significant part of the participant's life. The challenge to the field emerges when trying to 'operationalise' this longitudinal data (Sameroff and Rosenblum, 2006; Crane *et al.*, 2012) on resilience development when collating data on neurological, behavioural or attitudinal changes that take years to change or evolve and are too vast in personal experiences and subjective nature to measure.

Further engrained within this longitudinal data challenge is the understanding of the effect of FD/APDT's contribution to the holistic resilience education and training within RAF personnel's careers. Identified as an integral training medium, FD/APDT is engrained within the RAF's psyche and military strategic contribution to the resilience development of personnel and operational success as identified in JDP 1-05, Personnel Support for Joint Operations (2015, p.3).

The physical component is delivered through the force generation process. Pre-deployment training is essential to ensure personnel are prepared for their role. Physical training, adventure training and sport each enable the requisite levels of stamina and fitness required on operations. The physical component is maintained during operations through in-theatre training and deployment facilities. Physical recreation enables personnel to maintain their physical fitness. In group activities, physical recreation builds team spirit which contributes to unit cohesiveness and, in turn, operational effectiveness; and it provides a means for de-stressing.

These human performance behaviours and adaptations require constant maintenance with the FD/APDT used to ensure the continued de-stressing within other complementary, RAF delivered resilience supporting interventions. These coping strategy mediums are also essential in addressing the pre-determinants of over-stress; as previously discussed (Bailey, Johann and Hyoung-Kil, 2017; Booth and Neil, 2017). Whilst this thesis does not approach the research from a medical perspective for the use of FD/APDT in rehabilitation, FD/APDT's use in the management and treatment of PTSD, stress and psychological/physical well-being (within both a civilian and military setting) is cited within the reviewed literature. In support of this sub-field of FD/APDT, the results of this thesis' research demonstrate a perceived benefit to psychological and physical resilience, during and after a five-day FD/APDT intervention; albeit limited in initial growth (personal competence, high standards and tenacity, n=79 (33.38%); trust in one's instincts, tolerance of negative effect and strengthening effects of stress; n=79 (33.38%) and control, n=99 (41.90%)) and more prominent after six months and up to two years in one individual's case.

Section 4. Data analysis and discussion for social resilience domain.

The perceived development of social resilience during the 6-month interlude was a significant perceived resilience growth factor from the focus groups. All of the focus group participants felt their ability to operate within a new social group from the FD/APDT intervention (and replicate this ability in the primary workplace) was a significant development factor and highlighted in the quantitative data in Table 14. This perceived social resilience development was also attributed to successful team cohesion in the completion of the previous phase of training and the ability of the socio-cultural group to work together in the current phase of training. Of note were comments outlining the importance of socio-cultural support during elements of the FD/APDT intervention and subsequent similarities between the intervention and the workplace; especially during challenging elements of the training phases. These comments included “the activities helped me adapt within changing situations and able to change my mindset depending on the situation” (LAC4) and “working as a group and utilising each other’s strengths and weaknesses can instil resilience, as I realised, I don’t need to excel in certain areas as a group can cover weaknesses to achieve a goal” (SAC15).

This socio-cultural support coupled with the perceived development of resilience, demonstrated the improved ability of the participants to bounce-forward from the workplace challenges and become more positive about improving their resilience. The concept of bouncing-forward was elicited throughout the discussions with comments such as “the week made me realise that whether you approach struggle and setback with a positive mental attitude instead of being dejected and giving up is important” (LAC3). The focus groups agreed that the FD/APDT intervention and

interluding period had allowed the participants to consolidate and apply their learning from the FD/APDT intervention.

The focus groups further elicited the role of a collectively resilient team and group as critical for increased effectiveness in the workplace and during phase 2 training.

However, whilst no negative comments were made on the perceived social resilience development, it was apparent that several participants felt they had not required any social support in the completion of their training. These participants felt the FD/APDT intervention had been a good opportunity to develop other traits such as leadership with comments such as “it (the FD/APDT intervention) taught me how to deal with team members who may be getting stressed in a situation that I understood, to get the job done” (A/Cpl11).

The focus groups’ participants provided in-depth discussions relating to the importance of the team building and resilience in achieving tasks throughout the week as a key transferable skill now being utilised throughout their phase 2 training. The requirement of the FD/APDT and phase 2 training to build bonds, understand limitations, break barriers, meet new people, trust strangers, be resilient during fatigue and develop others despite being uncomfortable during the week are essential skills for future success in the RAF, as identified by the participants.

The collective group participants all positively supported the use of FD/APDT interventions in the retention and recruitment of RAF personnel. Indicative responses and themes included the use of FD/APDT programmes as a unique opportunity to develop personal resilience during safe adverse conditions/environments. The groups also noted the use of the RAF’s FD/APDT scheme as future opportunities for

morale and the welfare of teams/individuals in developing resilience and as outlets for stress reduction.

a. Positive acceptance of change and secure relationships.

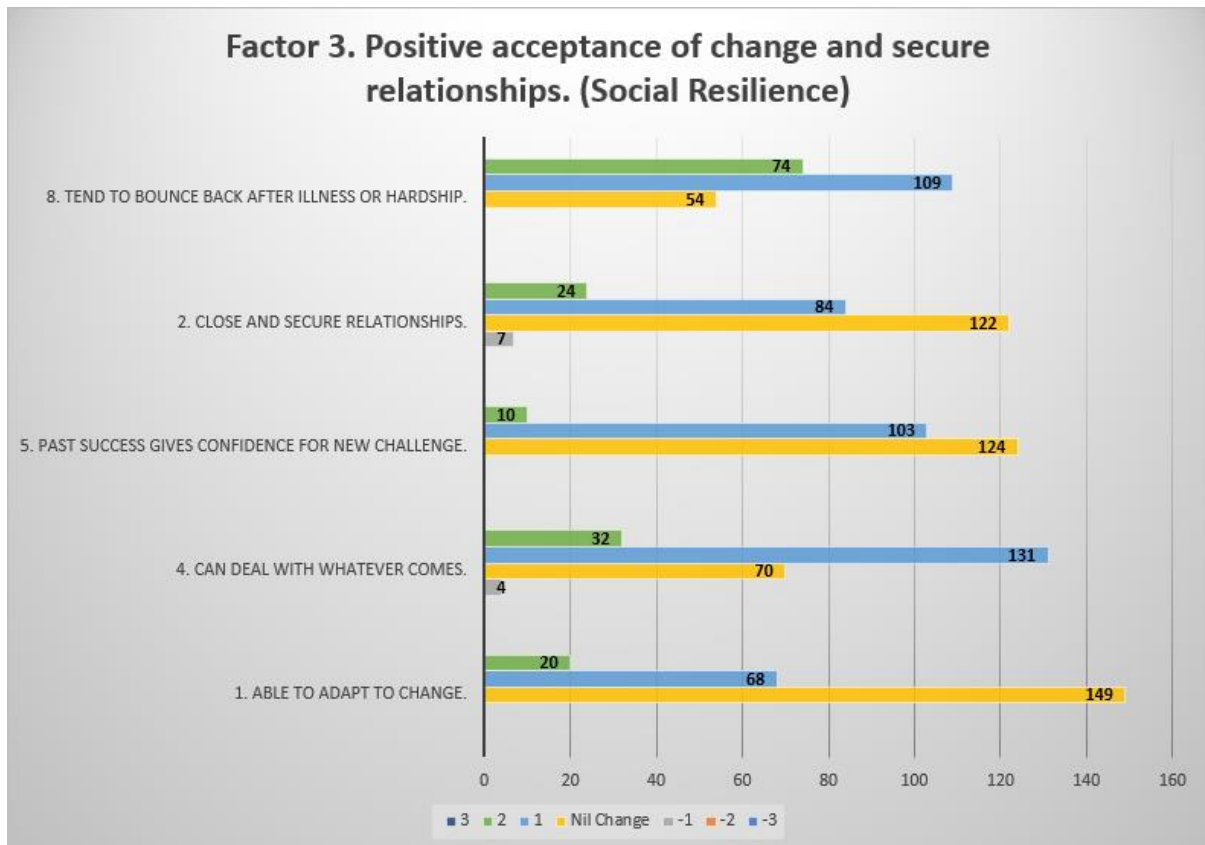
The perceived limited development in social resilience immediately after the FD/APDT was contrasted by the stronger reported evidence after the six months intervening period. However, the initial questionnaire results contrast the importance elicited by the focus groups for social resilience to complete the FD/APDT intervention and phase 2 training. It is feasible that social resilience therefore, should have scored higher within the CDRS-25 results. During the focus group discussions, the higher perceived social resilience development was attributed to the consolidation of social resilience experience.

This was elicited during the FD/APDT intervention at the start of the participant's phase 1 training course and then consolidated through friendships, course camaraderie and mutual endeavour to complete the phase 2 training (captured during the focus groups' discussions) within phase 2 training. Table 14 presents the quantitative data for positive acceptance of change and secure relationships and demonstrates the continued theme of high numbers of no change, comparable to the results of psychological and physical resilience. However, there are higher levels of perceived development within social resilience than the 3 psychological and physical resilience factors. This data is presented in graphical form for further clarity in understanding the data in Figure 18.

Table 14. Changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 3; positive acceptance of change and secure relationships.

Factor 3	Positive acceptance of change and secure relationships. (Social Resilience)						
CDRS-25 Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
1. Able to adapt to change.	0	0	0	149 (62.86)	68 (28.69)	20 (8.43)	0
4. Can deal with whatever comes.	0	0	4 (1.68)	70 (29.53)	131 (55.27)	32 (13.50)	0
5. Past success gives confidence for new challenge.	0	0	0	124 (52.32)	103 (43.45)	10 (4.21)	0
2. Close and secure relationships.	0	0	7 (2.95)	122 (51.47)	84 (35.44)	24 (10.12)	0
8. Tend to bounce back after illness or hardship.	0	0	0	54 (22.78)	109 (45.99)	74 (31.22)	0
Overall Totals (1185)	0	0	11(0.92)	519 (43.79)	495 (41.77)	160 (13.50)	0

Figure 18. Factor 3. Graphical representation for changes in participant’s CDRS-25 scores before and after participation in the FD/APDT intervention; positive acceptance of change and secure relationships (social resilience) quantitative data.



This factor may not have developed as significantly during the limited five-day FD/APDT intervention as perceived after the 6 month intervening period, hence the high ‘no-change’ scores that are challenged by the later qualitative results. The strength of the follow-up data demonstrates the positive role that the FD/APDT intervention and reflection has on the perceived development of participant’s resilience. The ability to bounce-back/forward from the challenges associated with the phase 2 training, was identified by the participants as a fundamental requirement to complete their phase of training. Moreover, the social support from course

colleagues was deemed essential for the success of all personnel in completing both the FD/APDT intervention tasks and the phase 2 (RAF trade specific) training.

The results set for participant's perceived ability to positively accept change and bounce-forward after the FD/APDT intervention, collectively (against all responses) demonstrated 43.79% (n=103) no change, 55.27% (n=130) positive development and 0.92% (n=2) perceived negative development from all responses across the positive acceptance of change and secure relationships factor of the social resilience domain. The one way ANOVA for repeated samples *f-ratio* value was measured as significant for this resilience factor, presenting a score of 23.09149 with $p < .05$.

Despite the strong positive evidence for a perceived development in resilience for positive acceptance of change and secure relationships, this is contrasted by several negative responses within the ability to positively accept change and secure relationships that challenge the intervention's ability to develop this factor. These large 'no-change' scores were not evident during the focus groups where predominantly positive comments regarding to social cohesion and resilience were noted. Comments such as "the week allowed me to know who to turn to in challenging situations as you know each other's strengths and weaknesses which developed during the week" (SAC13), support the positive perceptions of social cohesion.

In data merging the quantitative data with the qualitative data from the focus groups', positive acceptance of change and securing relationships CDRS-25 responses and the importance both for personal and group resilience, it was evident that bounce-back/forward was a primary theme that permeated across all the other themes during discussions. The use of the team to get through the FD/APDT challenges and

the social resilience of the group to achieve tasks also became a dominant theme within the focus groups.

The 'no change' theme within positive acceptance of change and secure relationships presents similar findings to other physical and psychological resilience factors where most responses demonstrated no change set against lower positive results, albeit with minor contrasting negative responses. The theme was most evident across all of the 5 items within this factor with Item 1 (I am able to adapt when changes occur) scoring the highest perceived no change of 62.86% (n=149). The remaining items record lower responses that could demonstrate the existing resilience demonstrated by the participants and the requirement to amend the training design, to meet the requirements of the more resilient participants. This may not be in keeping with the intent of social resilience development through FD/APDT to bring the team together, irrespective of their personal abilities to achieve a common goal if more resilient individuals do not support the less resilient ones. The impact of the team dynamics and resilience would have been a useful sub-study to complement or challenge the findings of the data set within this factor.

Furthermore, the perceived social resilience development of the teams, the transferrable skills into phase 2 training and life outside of the RAF was regarded by the participants as a large part of the FD/APDT's enduring learning transfer. This aligns to findings from the literature review themes surrounding the positive correlation between social resilience development, specifically positive acceptance of change and secure relationships and FD/APDT (Holman and McAvoy, 2005; Hoad, Deed and Lugg, 2013; Kelly, 2019). This was evidenced by statement themes generated by the focus groups' participants and the relevance of the learning

transfer to phase 2 training, enhanced role performance and subsequent future RAF careers.

The strong responses from both data sets demonstrates the positive outcomes of the FD/APDT intervention in enhancing the positive acceptance of change and secure socio-cultural relationships during the FD/APDT intervention, the intervening six months and the perception that these would endure after phase 2 training noted during the focus group discussions. The ability for the FD/APDT intervention to enhance positive acceptance of change from a personal perspective, could be attributed to the social support provided to individuals. This could also be due to the fact that all members of the socio-cultural groups are in the same phases of training and subject to the same stressors and challenges that requires teamwork to benefit all members of the group.

Recent research (Scarf, *et al.*, 2017) within the development of resilience of social groups, points to the utility of shared challenges, goals and the inter-reliance on team members to ensure group and personal success. The findings from this research and this thesis demonstrates the utility of resilience interventions in developing social cohesion and the positive acceptance of change. This acceptance of change however may be affected by the level of social support available during challenging situations. It is clear from the evidence in this thesis that reliance on the social group was a fundamental element of personal success during the FD/APDT intervention and transfer of learning into the RAF workplace. Indeed, this factor was noted in the data provided as scoring the highest perceived development (55.27%) across the four domains of resilience factors.

This evidence is strongly supported by past research into the effectiveness of FD/APDT in developing social factors of resilience and provides support for the intervention's outcomes of positive acceptance of change and secure relationships as a result of participation within the intervention. This key finding provides strong evidence for FD/APDT's future role in developing social resilience within RAF participants that is also supported by research within civilian academia, on the role of civilian variants of FD/APDT interventions developing social resilience. The key differentiator within this thesis and the civilian research is that this thesis has linked the positive acceptance of change and secure relationships contextual transfer of learning back to the participant's RAF workplace role performance, through the focus group discussions.

As discussed earlier in the thesis, the comparisons from civilian research and this thesis' data analysis cannot provide a flat circle that complement each other's findings, but must move the learning and evidence forward within a RAF context whilst discussing how this thesis findings link into RAF specific socio-cultural resilience. The use of social influence on individual behaviours and attitudes emerges throughout this thesis' research findings and is a main indicator of how individuals will behave within a particular social environment. In the context of FD/APDT and the development of resilient behaviours, it can be surmised that if the social group and individuals act resiliently during stressful and challenging situations, these behaviours and attitudes will pervade into the social fabric, norm, identity and social proofing of this group.

This concept has demonstrable linkage to "strengthening resilience in children, young people and adults" (Harris, 2002, in Rogers and Smith, 2002, p.7; Sikorska,

2017). The results of this thesis and the analysis of the descriptive narrative and comments made by focus groups' participants, presents the utility of FD/APDT as a credible social resilience development intervention. With this data, it is conceivable that a resilient RAF community would grow from these participants as they continue in their careers, armed with enhanced resilience as a result of their participation in the FD/APDT intervention.

As Mackay, Tatham and Rowland (2012, p.10) note during their observations of the science of social influence:

In ambiguous situations, people will observe what others are doing as a guide to what they themselves should be doing, For the purposes of influence, it is imperative that we understand the importance of group norms, the social and behavioural dynamics, and the pressures of minds on minds that shape the totality of our behavioural interactions.

Therefore, if resilience is perceived as the social norm, then through FD/APDT interventions and other resilience training mediums, the behavioural and attitudinal understanding of the micro-group (RAF section, Flight or Squadron), resilient social norms will then expand into the wider RAF socio-cultural fabric; thus, becoming an essential linkage/key fundamental requirement in devising resilience interventions. This social learning is in keeping with the Social Cognitive Theory (Bandura, 1977, in Schuman and Sibthorp, 2014, p.197) identified within the literature review. Moreover, the continuous reinforcement and maintenance of this learning fits with Prochaska *et al.* (1992, in DiClemente, 1983; Morris *et al.*, 2012) Stages of Change model to prevent relapse and consolidate gains (Morris *et al.*, 2012). Ensuring behavioural change requires immediate attention within FD/APDT to cement resilience learning, enhance the common social bond that ensures resilience within the RAF and prevent potential relapses into non-resilient behaviours and attitudes. Siebold (2001)

identifies this social bond (or golden thread) as the military, associated sociological positive attitudinal behaviours and it's intertwining within other affective social factors.

Social and organisational resilience in developing a resilient RAF culture through common resilient language, social norms and behaviours is an essential learning outcome of the FD/APDT interventions in both the literature review and the results of this thesis. These mature into essential skills for understanding RAF (own organisational) resilience and culture but further prepares personnel as part of wider RAF experiences and education, to understand and respect other cultures, languages, social norms, when deploying on both operations, overseas exercises and international Defence engagement as outlined in JDN 4/13 Culture and Human Terrain (2017, p.1-1).

Culture is not something that only other people have. As diverse as it is, all humankind has culture. Equally, individuals do not generally act randomly; they behave in ways that make sense to other people in their group. These ways are accepted and understood within their group due to shared ideas about what is normal behaviour. But people rarely recognise or understand the cultural perspective of their own attitudes, beliefs or behaviour. This is deeply embedded within their psyche and regarded as habitual. Culture is defined as the customs, ideas and social behaviour of a particular people or group. In essence, it is the shared concepts that guide what people believe and how they behave. It includes:

1. How they are organized.
2. Their beliefs and values.
3. The ways in which they interact with each other and outsiders.

Analysing cultural influences, interrelationships, core beliefs, motives and perceptions is also integral to understanding the operating environment.

This common socio-cultural norm and the subjective/objective variables that strengthen or erode the social cohesion/resilience, are simulated within the

FD/APDT intervention with the isomorphic and tacit knowledge transference of learning and then reflected upon to elicit key learning points. The lessons identified during the interventions, allow the understanding of social resilience norms within the RAF (especially the lessons identified and no-blame culture) to evolve. These evolve along with shared purpose, understanding leadership, followership, integrity and discipline in a potentially hostile risk to life environment, as some of the essential traits when delivering effective military intent.

This training aim of the FD/APDT intervention was deemed effective by the participants through their presentation of positive scoring in the questionnaires and thick description statements recorded in the focus groups. Although small, the results are encouraging with 55.27% (n=130) of participants perceiving positive development after 5 days, but more significantly perceived as developed after six months. This is despite the proposed longer duration for effective teams to develop through the forming, norming and storming (Tuckman, 1965) stages and that participants were within their first 2 weeks of RAF training.

However, by establishing a culture of resilience early in the professional development of a service-person (such as phase 1 and 2 training), these skills can help prevent negative outcomes during stressful professional challenges and especially following deployments (Adler, 2013) and during the duration of any element of a service-person's career that involves stressful situations. This is certainly evident from the initial findings of this thesis. The earlier that RAF personnel develop these positive behavioural and attitudinal adaptations to stressors, the earlier and more efficient they will become at managing them with healthy

responses, without perpetuating non-healthy risk determinants such as stress related illnesses.

In developing these positive behavioural adaptations, Thomas *et al.* (2016), Bezdjian *et al.* (2017), Crow *et al.* (2017), Sims and Adler (2018), Sheerin *et al.* (2018) and Mancini *et al.* (2018) cite that the personal resilience and well-being protective factors developed through social resilience within a military community, contributes positively to the through-life well-being of serving and veteran military personnel. Therefore, if the use of RAF resilience (through-career and enduring) education and support programmes is engrained within RAF training, then it can be surmised that the RAF will reduce incidents of stress related pre-determinants. The provision of training opportunities such as FD/APDT through structured formats, could therefore develop the RAF's holistic resilience.

In support of FD/APDT's contribution to social resilience development, the English Outdoor Council (2005) includes the more commonly cited parameters of confidence, resilience, self and social awareness, cooperation, trust and teamwork but also identifies a positive attitude to challenge and adventure, environmental awareness, the acquisition of outdoor skills, health and fitness, and increased motivation toward learning. However, Mackay, Tatham and Rowland (2012, p.8) noted that during activity, the consideration for "environment, mood, social situation, physical ability, personalities, attitudes, desires and tendencies behaviour rarely displays cross-situational stability".

This cross-situational stability (from an FD/APDT intervention to primary role to operational, family and external situations) is a key transference of cross-situational learning. It is purportedly bound together by a single unifying cause or effort such as

being in the RAF or operational intent supported by healthy individuals and organisational resilience, that is understood and promoted by the hierarchy. This thesis' research shows growth in social resilience as task completion within the FD/APDT programme, that became the single unifying effort. In addition, Krasny, Lundholm and Plummer (2010) suggested that nature based (FD/APDT) interventions are positioned within therapeutic models of resiliency, because they include components that build community and (in the case of this thesis) have the potential to affect the broader military community.

The protective factors of social resilience developed through collective and immersive training programmes against stress determinants, have been widely researched with well designed, longitudinal formal and non-formal resilience enhancing programmes as central to social resilience's effectiveness against stress pre-determinants (Thomas and Bowie, 2016; Puskar *et al.*, 2018). This ability of the resilience education training to ensure camaraderie in the face of adverse conditions and positively influence the esprit de corps, is a critical leadership requirement for resilient teams (Mjelde *et al.*, 2016). If the 'esprit de corps' is affected by a lack of resilience/faith in leaders, this has catastrophic implications for both commanders and subordinates, as "when unit esprit is gone, the lights go out and the individual spirit fades" (Slotnick, 1978).

When extending the concept of the military socio-cultural construct, it is easy to forget about families and partners of serving personnel who also require resilience and who have a critical role to play in ensuring the maintenance of the esprit de corps. Albeit a far stretch to fully-fund RAF families' FD/APDT resilience interventions, this could form a RAF families investment opportunity for service

families to collectively develop holistic resilience within Mancini *et al.* (2018) primary concepts in the contextual model of family stress and the social organisation theory of action and change. The identification of reported high social resilience as a result of the FD/APDT intervention, echoes the civilian research in this area of socio-cultural resilience development through FD/APDT participation. This change would develop antecedent pathways for stress management and resilience growth in military families. Using FD/APDT as a medium for resilience development, this collective family resilience and social organisational process (Saltzman *et al.*, 2016; O'Neal, 2018; Jindal-Snape, Norton *et al.*, 2019; Miller, 2019) would allow the further management of stressors imposed on RAF families under the tutelage of RAF Force Development Instructors (FDI), given the common stressors they manage as a family unit.

Common military life experiences such as deployment separations and shared core values such as honour and integrity serve not only to unify members and their families but also to represent the shared identity of what it means to serve and to be a military family. In turn, this shared identity and set of values guide individual and family behaviours and interactions and might also be thought of as a central element in military family resilience (MacDermid *et al.*, 2008, in Mancini *et al.*, 2018).

To further highlight the shielding factors of social group resilience within the military, Pietrzak *et al.* (2010) used cluster analysis to derive three groups of OIF/OEF veterans; low combat/low PTSD (n=134), high combat/high PTSD (n=72), and high combat/low PTSD (n=61). CD-RISC scores in the groups were 76.0 (1.9), 66.3 (2.6) and 80.1 (2.2).

The researchers reported that membership in the highly resilient group was characterised by the following: being in a relationship, having few psychosocial difficulties, reporting greater sense of purpose and

control, and the presence of family support. (Pietrzak *et al.*, 2010, p.234).

In conjunction with subordinate's and commander's roles in resilience, considerations by training programme stakeholders must be given to the format of the training and career development of the service-person to equally develop 2 crucial questions throughout their careers/life; how the training interventions work (if at all) and the longitudinal affect and required reinforcement of these contextualised interventions? This also has the potential to backfire on resilience education if the participants fail to achieve the challenges (within the FD/APDT programme) and 'regress' an individual to a previous lower resilience baseline.

This could bring into question the efficacy and validity of non-medical resilience training intervention's longitudinal beneficial claims, such as experiential learning. Despite Stephenson's (2015) statement from the literature review that resilience training within the UK military is thorough, further research is required to inform resilience training intervention's immediate and longitudinally reinforced design across military communities. Randles and Mander (2009) describe this resilience as stickiness, noting that we do not often or easily reflect on social practices and their internal arrangements make them structurally rigid. For social practice theorists then, the choices and attitudes of individuals are, more often than not, secondary to these contextual factors with people becoming carriers (Reckwitz, 2002) of practices or routines rather than autonomous agents.

Given the diverse array of sub-organisations within both the RAF and wider Defence, this societal resilience developed through collective training and acceptance of sub-

organisational differences requires formalised training interventions to benefit the collective conceptual skills.

Human capability should be regarded as a key resource and should be fully integrated into Defence planning. Rather than simply relying on superior fire power and technical capabilities, our commanders must seek out, develop and exploit human qualities such as effective thinking, resilience, adaptability and empathy to build the agility which Defence will need in the future operating environment. Commanders should also champion innovative practice (JDP 0-01, 2014, p.38).

The use of FD/APDT for the development of collective conceptual skills has been effectively (albeit ad-hoc) used in the past within the whole force concept but never validated or delivered holistically with a single unity of purpose. This is essential if the collective resilience of whole-force RAF sub-organisations and contractors are to fully understand, empathise and develop collective goals that impact on organisational effectiveness (Bell, 2003; 2006). However, due to current insurance, legal constraints and risk management, the 'true' whole force collective training of non-MOD personnel is unlikely to be realised within the FD/APDT context which demonstrates the lack of full utility of an effective whole-force training medium.

The integrated approach is underpinned by our people – regular and reserve service personnel, MOD civil servants, contractors and other civilians. Working together, these different groups form the 'whole force' which delivers Defence outputs. Under the whole force approach, Defence places human capability at the heart of its decision-making and ensures that Defence outputs are delivered by the right mix of capable and motivated people now and in the future, and that people are managed as a strategic resource (JDP 0-01, p.42).

Section 5. Data analysis and discussion for spiritual resilience domain.

The CDRS-25 data for spiritual influences and focus group discussions provided several related themes to this factor (identified by the participants) that included a

sense of achievement and the human-spirit to keep going when things are difficult, to have faith in personal abilities, team-mates and instructors, faith in leaders, understanding personal limitations but a desire to exceed them where possible and expanding their personal spiritual comfort zone. Whilst the CDRS-25 provided a large number of 'no change' results in both of the factor's 2 items, the results from the focus groups demonstrated notable themes linked to spiritual and personal resilience development within the participant's statements such as "you need this to get through the challenges of the week and I feel this personal spirit is important to get through the hard times" (A/Cpl10) to demonstrate the group's perceived development in participant's psychological, physical, spiritual and social resilience as a consequence of their participation in the FD/APDT intervention.

These themes and responses outlined that previous experience and exposure to activities, existing positive outlook, self-perceived control over emotions under pressure and a perception of high self-resilience, resulted in 2 of the focus groups' participants stating they did not believe their resilience had developed as a consequence of participating in the FD/APDT intervention. They did however, note the importance of the FD/APDT intervention in developing social bonds and collective resilience through group activities. The focus groups deemed the personal spirit of team members as essential to resilience and felt support by their team-mates encouraged them to complete tasks or try new challenges.

a. Spiritual influences.

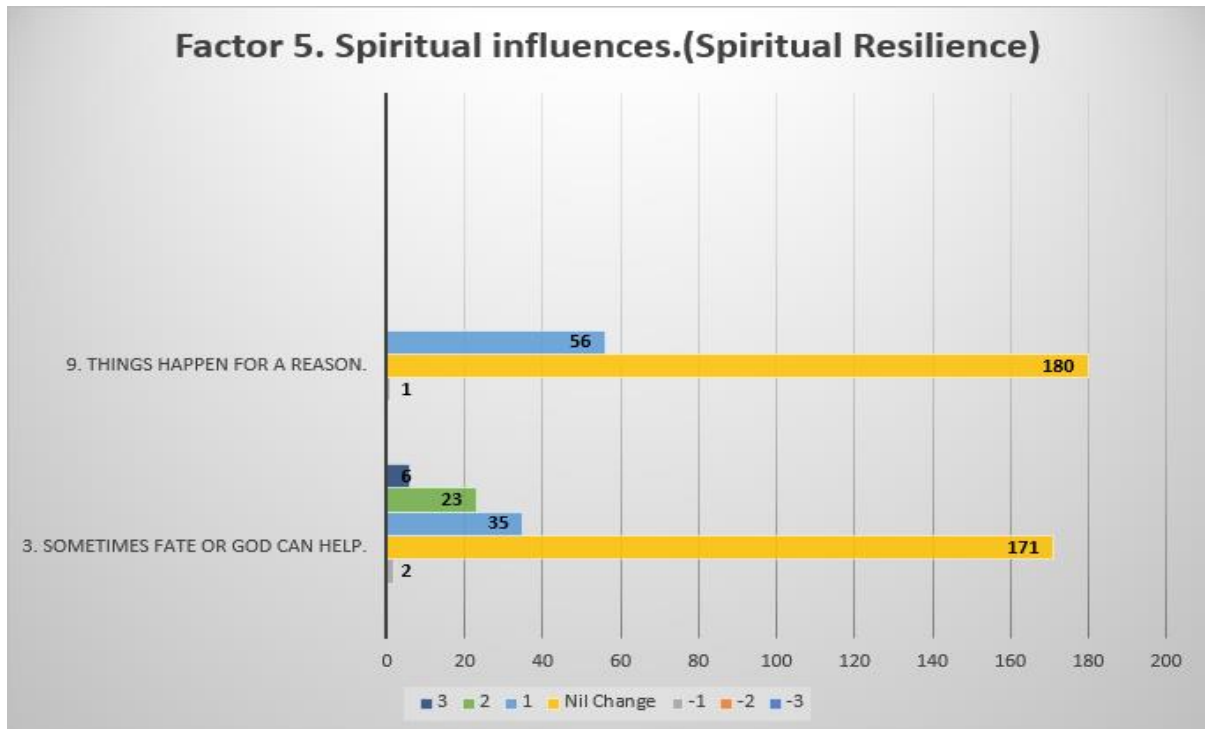
Notable perceived 'no change' within spiritual influences were evident in Item 9 (good or bad, I believe that most things happen for a reason) with 75.95% (n=180) of responses demonstrating no change to the perception of how events occur and the

participant's interaction or ability to bring about certain outcomes. Similar to the high score attributed to 'no change' in sense of humour from factor 1, it is likely that the perception of an individual's ability to affect fate (Item 9) remains unchanged from participation within a five-day FD/APDT intervention, signifying a high 'no perceived change' data set as presented in Table 15 and in graphical form in Figure 19.

Table 15. Changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 5, spiritual influences.

Factor 5	Spiritual influences. (<i>Spiritual Resilience</i>)						
CDRS-25 Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
3. Sometimes fate or God can help.	0	0	2 (0.84)	171 (72.15)	35 (14.76)	23 (9.70)	6 (2.53)
9. Things happen for a reason.	0	0	1 (0.42)	180 (75.95)	56 (23.62)	0	0
Overall Totals (474)	0	0	3(0.63)	351 (74.05)	91 (19.19)	23 (4.85)	6 (1.26)

Figure 19. Graphical representation for changes in participant's CDRS-25 scores before and after participation in the FD/APDT intervention; Factor 5. spiritual influences (spiritual resilience) quantitative data.



Crucially, the evidence supports the concept that a five-day FD/APDT intervention does contribute to the perceived development of spiritual resilience; albeit limited. However, whilst the percentage scores provide a basis from which to form patterns or emerging themes of spiritual resilience development through FD/APDT, most of the negative scores may have started at 'often true' and then dropped to 'sometimes true' if their experiences on the intervention may have been negative or they were unsuccessful in the activity. Whilst it would be unlikely to affect their belief values system, it may have resulted in a negative score attributed to the respective item. This can also be true of positive experiences during the intervention that provided a spike in positive results, that may not be replicated longitudinally but is compatible

with the research literature review in short-term conceptual skills development during FD/APDT interventions.

The main challenges within the analysis of the spiritual resilience domain data are the restrictive 2 items (Items 3 and 9) within the CDRS-25 from which to extract limited data. Only measured by 2 items within the CDRS-25, this data provides limited information from which to fully understand the proposed immediate outcomes after the five-day FD/APDT intervention for spiritual influence outcomes.

Furthermore, the one way ANOVA test for repeated samples results for this factor noted the *f-ratio* value of 100.09277 with a p-value of .000006. The result is significant at $p < .05$, noting that the 2 item measures within this factor demonstrated significant variations in means across all of the Likert scale scorings. However, having only 2 items from which to gather and analyse data, limits the understanding of the spiritual influences outcomes of the FD/APDT intervention.

This presents a problem in providing an in-depth critique of the outcomes of the FD/APDT intervention on the participant's perceived spiritual resilience development. However, this was contrasted by the qualitative data that provided in-depth narrative to the participant's perception of spiritual resilience development after the 6-month intervening period. This was evidenced by comments such as "the FD week allowed me to better understand my own self-reflection and how this helps me" (SAC6) and "you need this to get through the challenges of the week and I feel this personal spirit is important to get through the hard times" (A/Cpl10).

Instead of viewing this element of spiritual resilience from a theological perspective to view the answers, the perceived data set from the CDRS-25 could be posited from a spiritual resolve perspective against the challenges faced within the FD/APDT that

could also explain the perceived positive scores for spiritual resilience items within the CDRS-25. This is comparable to the literature review themes that also presented the strong correlation between increased resolve to deal with stressors, after experience of adverse situations (Rhodes and Martin, 2014).

Although not substantial, the perceived growth within the collective limited data sets of 25.30% (n=60) does warrant further investigation and a wider item set to provide data on-par with the other 3 resilience factors to present a balanced data set.

Despite this small data set, Item 3 (when there are no clear solutions to my problems, sometimes fate or God can help) provided the largest +3 points presenting 2.53% (n=6) of participants that felt fate or God would help during the FD/APDT intervention. This may be linked to the participants' trust in others or new attitude towards giving the activities a try and committing themselves to the intervention. This was evident during the focus group questions with comments such as "during the activity I had to trust the instructor/man in front, and they had to trust me" (LAC2) but was not expanded on during the initial quantitative data gathering.

Overall, the initial data from the CDRS-25 was quite weak (given that there were only 2 questions) in comparison to the strong follow-up qualitative data provided during the focus groups. Whilst immediate development was apparent from the results, further research on the long-term impact of the FD/APDT intervention would have benefited from the in-depth analysis of the participant's perceived spiritual resilience development. However, the extremely limited 2 item question set could be enhanced with a separate spiritual resilience questionnaire to extract more effective and quantifiable data.

Given the multiple subjective variables identified by the participants and from research conducted through the literature review, the follow-up qualitative analysis or questioning was useful in clarifying the statistical data trends within the quantitative results. However, when considering 237 participant's subjective responses based on a brief five-day generic resilience programme and against factoring in 237 life experiences, socio-cultural backgrounds and multiple affecting variables, this follow-up only provided qualitatively contextualised themes identified within the CDRS-25 for comparison.

In data merging the evidence for the participant's perceived development within the short-term (and up to two years in one individual), the data suggests that greater perceived growth is evident in the short-term (6 month intervening period) but not immediately after the FD/APDT intervention. This could be attributed to the opportunity for self-reflection, evidence of learning transfer, implementation of the skills into phase 2 training and cyclic reviewing of FD/APDT as the catalyst for this development. In contrast though, a great deal of personal development and exposure to adverse/stressful challenges in the training environment (within the six months period) could also have impacted on the individual's spiritual resilience development. However, during the focus groups, the participants alluded to their ability to remain resilient, bounce-forward and strong sense of self-efficacy for social and spiritual resilience as directly enhanced by the FD/APDT and transferred into their remaining phase 1 and phase 2 training.

The congruence of the data set from this study combined with the researched literature review provides supportive evidence for the immediate development of spiritual resilience after the five-day RAF FD/APDT intervention and up to six months

afterwards. Although this statement is supported by the results provided, the data is undermined by the study's inability to research a broader array of spiritual sub-elements instead of just 'spiritual influences' as outlined in the CDRS-25. This limitation of the study in supporting or refuting the literature's past findings or the ability of the RAF FD/ADT intervention to positively affect the spiritual resilience of participants, does not undermine the data but does leave the spiritual development aspect of FD/APDT requiring further strengthening.

This strengthening of the data set could have been extended outside of the sub-element of 'spiritual influences' into wider spiritual resilience sub-elements and a separate spiritual resilience scale such as the Spiritual Attitude and Involvement List (SAIL) (De Jager-Meezenbroek *et al.*, 2012) used to complement either the CDRS-25 or as a standalone, sub-study. Sub-resilience factors identified within the separate spiritual resilience study would have been fundamental in widening the knowledge through this research, which did not contribute to the RAF's understanding outside of the 2 items within the CDRS-25. Therefore, the limited analysis of only 2 items presents limited data from which to extrapolate findings in support of (or challenge) spiritual resilience's perceived development after the five-day FD/APDT intervention. These sub-scales would have allowed the research to expand further than the single sub-element of 'spiritual influences' with only 2 items from which to interrogate the data, that was not available during this research.

When reviewing past research, Behan *et al.* (2001, in Jirasek *et al.*, 2017) noted that FD/APDT interventions (mountain biking and hiking) allowed participants to gain a sense of peace and serenity and experience a sense of oneness with nature and the cosmos. Despite these positive claims of spiritual resilience development related

research, this factor's 'no change' results are comparable with those of Trainor and Norgaard (1999) and Jirasek *et al.* (2017) who also found that spiritual resilience was unaffected during their research (negative effect, 13% (n=13)) and unsure (18% (n=18)) by the FD/APDT intervention in the short-term, but continued exposure and reinforcement provided enhanced spiritual development. This is a crucial observation for the enhancement of spiritual resilience reinforcement and education through FD/APDT in the RAF as part of a continuous resilience programme and highlights the requirement of longitudinal resilience research within FD/APDT interventions (Carless, 2014).

The research data baseline developed through this thesis has provided a starting point for the advancement of spiritual resilience education through RAF FD/APDT, as the results show some perceived improvement (25.3% across the spiritual resilience factor (n=60)) through a programme that has not been specifically designed to target spiritual resilience. This leaves significant room for development when exulting the ability of FD/APDT interventions to develop spiritual resilience without investment in this area (programme design) to affect the positive results and ensure through-career reinforcement. Moreover, the contribution of the spiritual resilience specialist within the RAF Chaplaincy Service have only just begun to dovetail with the RAF's FD/APDT specialists to inform the spiritual education of participants and facilitators collectively. Whilst embryonic in the FDI's understanding and facilitation of key RAF and military spiritual resilience requirements, the study demonstrates that 'spiritual influence' is already developed (albeit moderately) as a result of the FD/APDT intervention. As this aspect of the FD/APDT intervention matures, it is anticipated that proposed spiritual development through FD/APDT and

its implementation within the military, will begin to be fully understood and synergised alongside the development of the other 3 resilience domains.

Furthermore, the findings of this thesis are complementary in establishing a new empirical and anecdotal data baseline for RAF FD/APDT intervention development of spiritual resilience, without duplicating past civilian research findings and perpetuating the inability to progress the RAF's understanding of the FD/APDT and spiritual resilience growth linkage. Indeed, the extant research within the spiritual development of military personnel through focused spiritual resilience educational packages (not specifically FD/APDT), is already encouraging for its role in the collective resilience education of RAF personnel.

In support of spiritual resilience within overall military resilience and the military chaplaincy's continued involvement during FD/APDT programme design, research by the US military has specifically identified the role of the chaplaincy as essential for military spiritual resilience development. In US military research that included the Air Force Resiliency Training programme (US DoD, 2004) the Army's Total Force Fitness, and the Marine Corps' Operational Stress Control and Readiness, Hendricks (2016) and Cafferky, Norton and Travis (2017) confirmed that chaplaincy intervention (on the development of spiritual resilience within military resilience) was a significant direct and indirect factor in the enhancement of spirituality, resilience, family coping, marital satisfaction and Air Force satisfaction. The requirement to use the chaplaincy's spiritual resilience knowledge within the medium of FD/APDT (as an effective training mechanism) for military utility and resilience development is a critical function and accelerant for the holistic spiritual development of RAF personnel. Its integration into the fabric of FD/APDT is essential if service-personnel

are to develop the ability to withstand, recover, or grow from adversity, stress or changes.

It would be naïve to state that the fundamental spiritual groundings of an individual will be completely changed during the five-day FD/APDT intervention, and that participants would all become converts and regular attendees to their respective religious services. However, when focusing on the non-religious element of spiritual resilience, this contribution to the resilient-self and internal reflections are evidently immediately developed through participation in the five-day FD/APDT as evidenced in this thesis' research.

Without focusing on the religious aspect and only focusing on the spiritual resilience aspect, a different perspective of spiritual resilience is adopted. When considering faith as “complete trust or confidence in someone or something” (Oxford English Dictionary, 2018) or the belief in an unquantifiable human emotion, faith impacts on health psychologically, socially and physically (Levin, 2002, in Thomas, 2016). Hence, its importance as a resilience concept developed through FD/APDT programmes without necessarily focusing on the religious connotations of faith, but more on the human spirit. Indeed, this point had to be clarified during the focus groups to ensure the participants understood the concept of spiritual resilience. As a fundamental element of Sinclair's and Britt (2013) model of building holistic resilience within military personnel, the use of FD/APDT as a viable training interlocutor between the 2 elements (resilience and military) has been evidenced through this thesis. However, this spiritual development must be reinforced through chaplaincy support to RAF FD/APDT interventions, to meet the spiritual resilience development requirements of the RAF.

Moreover, when considering the elements of a successful FD/APDT intervention that discusses facilitator education and contextualisation of training, the use of the chaplaincy to develop RAF FDI's understanding of spiritual resilience (in a non-religious context) will ensure the delivery of contextualised and applicable holistic resilience education (focusing on the human spirit to overcome adversity) within the FD/APDT interventions that are delivered by the RAF FDIs. Activities, therefore, may need to balance novelty, which supports inquisitiveness with known experiences to make it worth learning. This underlines the importance of identifying the relevance of any adventure experience or event to everyday life (Brown, 2010; Allan *et al.*, 2012).

This 'student buy-in' and contextualisation of FD/APDT conceptual and technical skills transfer of learning, immediately provides participants with both personal and professional ownership of the FD/APDT programme and allows critical reflection in a contextualised 'double loop' learning process (Argyris and Schön, 1978). For example, the individual may participate in a leadership task within a FD/APDT intervention, spiritually reflect on the success of the task and consider the implementation into a professional context, then consider the 'so-what' (reflection) of how they develop their resilience in leadership situations or other conceptual skills further.

This spiritual reflection and contextualisation of FD/APDT extends into Brookfield's (1988) research that promotes 5 activities central to critical reflection within learning that are applicable within an FD/APDT context; assumption analysis, contextual awareness, imaginative speculation, reflective scepticism and reflective practice. Furthermore, (Haskins and Clawson, 2006) believes that these can only be effectively delivered and facilitated by a trained FD/APDT educator versed in the

student's or organisation's primary roles to contextualise the learning and achieve cognitive, psycho-motive and affective objectives (Knapp, 1989) through humanising the FD/APDT experience. These would be complemented by the RAF Chaplain's experience and spiritual knowledge to ensure the complete synergy of the FD/APDT intervention in delivering spiritual resilience aspects through a trained FDI, to reinforce the human spirit focused resilience during FD/APDT.

The apparent linkages between the requirements for spiritual resilience developed in a military environment through a military training programme for Defence's intent are exposed during the development of this thesis. Having a viable and effective resilience training intervention to meet wider RAF Operational and UK strategic Defence requirements is outlined in the Future Force Concept (2017, p.15) that states:

We cannot train for the unforeseen but generating the right mindset for adapting to the unanticipated and unfamiliar is feasible. Training that creates the fundamental building blocks of capability – our core competencies, fighting spirit and moral cohesion – must endure. But adaptability will flow from training that allows us to practice rapidly reorganising or modifying those well-understood building blocks.

This specific reference to mindset, spirit and moral cohesion directly underpins the requirement for effective training programmes that develop recognised RAF and UK Defence requirements of its personnel to meet the hybrid and direct threats to the UK as identified in Joint Defence Publication 0-01 (2017, p.5).

Furthermore, hybrid attacks by adversaries against the will and cohesion of the nation, possibly through targeting soft targets in our homeland, is likely to increase. It needs a broader and more coherent view of protection; a whole-of-society resilience and, thus, a full spectrum approach.

The contribution of FD/APDT in the development of resilient RAF personnel to contribute to the RAF's and MOD's full spectrum approach to societal resilience (as part of a larger system of through-career RAF resilience education) is a fundamental catalyst for resilience growth identified within this thesis' research. This is especially pertinent considering the moral and spiritual will for society (including the RAF and MOD) to overcome adversity. As civilian society will look towards the UK military through Military Aid to the Civil Authorities (MACA) and emergency services in times of national crisis, (JDP 0-02, 2017) as was evident during Operation Slubber (foot and mouth in 2001), Operation Fresco (firefighters dispute in 2002-2003), Operation Olympics (security for Olympic Games 2012), and Operations Rescript and Broadshare (MOD's support to the civil authorities during the COVID-19 outbreak in 2020), it is essential that military personnel are trained to demonstrate this spiritually resilient resolve.

Whilst spiritual resilience has only emerged over the last decade as an important concept in human performance optimisation and is included among holistic approaches to developing and maintaining mentally fit fighting forces (Thomas *et al.*, 2018), its importance within the application of military force to prepare personnel for military stressors is further described as:

The soldier's heart, the soldier's spirit, the soldier's soul, is everything. Unless the soldier's soul sustains him, he cannot be relied on and will fail himself, his commander, and his country in the end. It is not enough to fight. It is the spirit which we bring to the fight that decides the issue. With it all things are possible; without it everything else, planning, preparation, and production, count for naught (Marshall, in Kuhl, 2005, p.4).

The experiences throughout a service-person's life allows resilience to develop in preparation for these unexpected challenges and (non-religious) spirituality or the

belief in someone or something greater than oneself, that provides purpose and meaning: it is transcendence, the assumption that there is more to life than can be seen or heard. “Spirituality is more than simply going to church; it is living by standards that cause you to be accountable to someone or something greater than yourself” (Underwood, 2006, in Simmons, 2018, p.67). The ‘greater purpose’ exposed throughout the literature surrounding spiritual resilience and the results from this research, propose the organisational (RAF) purpose and single unity of effort or purpose to achieve a common goal that could be perceived as the greater purpose. Furthermore, research by Fangauf (2014), Thomas (2016), Ormsby, Harrington and Borbasi (2017) and Torbert (2018) suggests that spirituality and spiritual care may provide positive benefits in protecting against the long term psychological, emotional and spiritual impacts of military service on deployed operations. In turn, this will contribute to the long-term spiritual fitness of service-personnel and veterans (Amato *et al.*, 2017; Skomorovsky and Bullock, 2017; Thomas *et al.*, 2018).

This isomorphic transference from military resilience training programmes (that include elements of spiritual resilience) to real-life events, is evident from this thesis and critical evidence for the use of realistic military training that exposes and addresses the resilience development requirements of its personnel. In turn, this reduces the proposed impact of moral injury (Simmons, 2018) and creates a new positive way of “interpreting the world, independent of religion” (Lindeman, Blomqvist and Takada, 2012, in Fangauf, 2014 p.136) to reduce the impact of stressors.

This positive and spiritually resilient interpretation of the world, relies on the use of spiritual language and common values in a non-religious context and is recognised within the military. Its importance for Air Force personnel is cited by US Lieutenant Colonel Chaplain Stavrevsky (1999, p.2) as:

Spirituality in this context refers to the dimension of human reality that coexists with body and mind in the whole person. The language of spirituality reveals the inspirations, intuitions, and devotions that reside in the spirit (soul, inner life, core, subconscious) of human beings. My assertion is quite simple: the failure of a discussant to appreciate the fullness of the human experience – mind, body, and spirit – is a disqualifier in the pursuit of creating effectual character development strategies. This is not to say that each and every participant in such a pursuit must be ‘expert’ in a holistic understanding of personhood. It does suggest, however, that the end product of a collaborative effort reflect a profound appreciation of the whole person. It demands that no one enter the process in militant rejection of the synergistic composition - spirit, mind and body; operative in a human being.

Section 6. Data analysis and discussion summary.

The data merging provides initial evidence that the FD/APDT intervention provided limited immediate resilience development across the four domains of resilience to address the research question. The evidence and discussion further demonstrated significant perceived development in all four domains with consideration to enhanced role performance to address the research aim when evaluated up to six months after the intervention (up to two years in one individual's case). Whilst this may seem positive for the use of RAF FD/APDT in developing all areas of resilience, this must be tempered as the perceived levels of resilience development for the four domains is significantly different. The majority of perceived growth for both immediate and short-term resilience development was evidenced within the social and psychological resilience domains, but the physical and spiritual domains were not conclusively developed in line with the other two domains. Furthermore, individuals with previous life-experiences or pre-determinants such as exposure to previous FD/APDT interventions, perceived limited development against those who were experiencing the intervention for the first time.

The impact of the participants' pre-exposure on perceived resilience development after the FD/APDT intervention, was evident from the responses given during the focus group discussions such as "I didn't really feel pushed as I have done a lot of these things before, but the instructors gave me the lead a few times which was challenging but I didn't get a lot from the week" (A/Cpl4), "because I was fit and not scared or stretched by the activities, I just got stuck in to help the other team members out who were from different courses" (A/Cpl7) and "I thought the week was excellent but wanted harder challenges to see if I could do them" (A/Cpl8). This possible pre exposure to similar stressors was further supported through the CDRS-25 responses that significantly demonstrated, 66.29% (n=157) of participants felt there was no change to their perceived development for the physical and psychological resilience factors of personal competence, high standards and tenacity, 66.00% (n=156) felt no change for trust in one's instincts, tolerance of negative effect and strengthening effects of stress and 57.66% (n=136) felt no change for control.

For social resilience development, 43.79% (n=104) reported no change and 74.05% (n=175) felt there was no development for spiritual resilience. Moreover, participants that felt a negative physical and psychological resilience change after participation in the FD/APDT intervention were recorded as 0.31% (n=1) for personal competence, high standards and tenacity; 0.60% (n=2) for trust in one's instincts, tolerance of negative effect and strengthening effects of stress and 0.35% (n=2) for control. Negative development responses for social resilience were 0.92% (n=3) with spiritual resilience remaining as 0.63% (n=2).

The results identified several questions within the CDRS-25 that were grounded in a person's fundamental belief framework that were potentially not compatible with the FD/APDT intervention outcomes and presented elements of negative data; thus, affecting the results and data analysis. For example, significant negative scores were evident against items that participants felt were not developed by the intervention (for example: Item 3 - when there are no clear solutions to my problems, sometimes fate or God can help, Item 13 - during times of stress and crisis, I know where to turn for help and Item 20 - in dealing with life's problems, sometimes you have to act on a hunch without knowing why). However, Item 3's positive scores contrast other participants' negative perceptions of the outcomes for this item as a result of the FD/APDT intervention.

Given the short time frame of the FD/APDT intervention, this could be attributed to the participant's already high level of resilience in which they felt the intervention did not develop them as they were not challenged (asymptomatic as discussed in the literature review) by the activities. Personal control and ability to deal with problems during the FD/APDT activities assigned to personal self-schemas, could also mitigate the outcomes associated with reliance on fate, God or other participants to perceive positive outcomes from the intervention.

This adds further support to the 'not one fit for all' concept of FD/APDT interventions that cannot cater for all previous exposure to FD/APDT as cited by Beard and Wilson (2006). It is also essential to consider that the five-day period in which to expect psychological, physical, spiritual and social changes in the fundamental cognitive behaviour, epistemological and ontological perspectives of participants, is too short to elicit lasting attitudinal change. For example, it is unlikely that an individual's ability

to form relationships (Item 2), belief in fate or God (Item 3), sense of humour, is likely to be affected by a five-day FD/APDT intervention, but its scoring of 'no change' can be perceived as a negative effect of the training as recorded in the questionnaire results. However, there were also positive results scored for these questions too that further confused the data set, and these are discussed later in this section.

To validate this perception, 13 items (2,3,4,9,10,11,13,15,17,18,19,20,21) used within the CDRS-25 scored negative results. Although these negative results and high number of 'no change' scores across all 25 items are significant, these are balanced by the positive changes noted in all 25 items; albeit moderate in positive development. These negative results cannot be ignored as anomalies and must be attributed to potentially negative experiences during the FD/APDT intervention that may have affected confidence, perceived ability, and competence when under pressure or self-efficacy. Albeit an extremely low level of negative perceived changes in responses to personal competence, high standards and tenacity as a result of the participation in the FD/APDT intervention, these negative perceptions displayed in the statistical results demonstrate the requirement for follow-up within the focus groups discussion.

When merging and interpreting the data, the overall quantitative data provides 61.29% (n=3632) of possible overall responses as representing no change across the possible 5925 total available responses, 0.55% (n=33) for negative perceptions for resilience development and 38.13% (n=2260) for perceived immediate development after the five-day FD/APDT intervention. However, the qualitative follow-up discussions provided evidence that the participants felt stronger perceived development growth after six months. The positive results of both the questionnaires

and focus group discussions demonstrates the perceived immediate development of the four resilience factors: albeit in differing levels as outlined within the quantitative and qualitative data. The flow of this resilience development indicates that psychological (encompassing physical resilience too), social and spiritual resilience development were consistently developed domains of resilience, both immediately after the five-day FD/APDT intervention but with further perceived enhancements reported after six months to address the research question.

This data provides new knowledge specific to RAF FD/APDT to provide an understanding of RAF FD/APDT without regurgitating extant research field findings. As discussed in the introduction and literature review, any regurgitation only perpetuates the inability of FD/APDT knowledge to move forward in its understanding (Block, 1995). In merging the questionnaire and focus groups' data, the results provided a coherent analysis of the holistic research gathered and the immediate and short-term effect of the FD/APDT intervention on perceived resilience development.

Given the extent of the civilian literature review findings and the anticipated outcomes of military FD/APDT interventions on resilience development and conceptual skills growth within participants, it was anticipated that the current intervention design would provide rich mixed-methods data from which to baseline the current perceived resilience development through FD/APDT in the RAF. This was achieved despite the short 6-month timeframe in which the data were gathered and the number of volunteer responses (n=237) combined with focus groups discussions (n=33), that presented a large amount of data to process but provided obvious themes and patterns to analyse within the four domains of resilience. When

considering the statistically significant data provided by the ANOVA, it is essential to consider that whilst this data reinforces the positive claims of participants of the CDRS-25 as a result of the FD/APDT intervention, the statistically significant data also supports the items that scored highly in refuting the effectiveness of the intervention; especially across the 'no-change' score for the four domains of resilience as identified in Table 7.

The integration of the data across the four domains (and sub factors) of resilience has allowed a holistic view of the proposed resilience development purportedly experienced by the participants; albeit it with varying reports of success.

Indeed, the low level of negative comments made for the perceived development of resilience over the 6-month intervening period between the questionnaires and focus groups is of real concern from a data gathering perspective. This low level of negative responses could be attributed to a number of factors such as the participants felt uncomfortable giving negative responses due to underlying pressures of being within phase 2 training, they were unsure if any transfer of learning occurred, the FD/APDT transfer of learning had been successful or the participants were subject to group-think or pressured into giving only positive answers.

Given the planned focus group process manner in which the focus groups were conducted and the rapport between the researcher and participants, it is improbable that the groups were pressured into group think as each participant was given the opportunity to comment in a relaxed environment. Moreover, the frank discourse and descriptive narrative provided during the focus groups, makes any reservations on the participant's part in providing accurate qualitative data, improbable in the

researcher's opinion. Moreover, the focus groups discussions allowed the individuals to discuss their opinions on resilience development after a 6-month reflective period, in which they had the opportunity to consolidate their applied contextualised learning from the FD/APDT intervention within their primary roles.

If the use of FD/APDT interventions positively develops participant's resilience as identified in this thesis, FD/APDT interventions could have an active and potentially pivotal contribution to alleviate many of the issues associated with the unique stressors linked with service life. Studies by Hammermeister *et al.* (2009) focused on the impact of improved resilience in reducing PTSD symptoms, suicidal ideation, depression and substance abuse that was supported by Griffith and West's (2013) study of 351 combat-exposed Stryker Brigade troops, where resilience fully mediated the relationship between psychological skills (goal setting, stress management, cognitive skills) and PTSD.

Furthermore, Kramer *et al.* (2013) observed that resilient individuals were more likely to use accommodative coping to maintain their assumptions following stress, and that being resilient was predictive of accommodative focused coping and of positive growth after a stressful event. The ability to switch flexibly back and forth between processing affective and non-affective stimuli is regarded as central to trait resilience and a fundamental underpinning function of FD/APDT and resilience development. Indeed, this was evident from the data gathered during this thesis, especially within the focus groups discussion in this positive reappraisal and accommodative focused coping towards stressors associated with primary roles within a military context.

In research conducted into life-longevity and perceptions of resilience, Mayordomo-Rodriguez *et al.* (2013) confirmed the clear relationship between resilience,

psychological well-being and coping strategies which is further highlighted during the RAF FD/APDT intervention's ability to develop procedural resilience skills when processing affecting variables (i.e. challenging activity). This further demonstrates FD/APDT's role in the tacit and isomorphic transfer in the development of resilience (through FD/APDT) when exposing the participants to new stimuli in a controlled risk environment to simulate the procedural/declarative knowledge in their primary and operational roles.

These observations create an obvious avenue for further research into the longitudinal impact of FD/APDT interventions on personal resilience for primary role effectiveness, to complement the short-term results evidenced within this study for the development of resilience traits after only a five-day period and 6-month follow-up. The key theme identified, is the reinforcement and promotion of new resilience baselines through repeated exposure to managed stress and FD/APDT interventions that pre-arm the psyche to prevent over stress psychological injuries throughout the RAF service-person's career; thus, ensuring resilient RAF personnel and their families:

The fundamental paradigm of "stress and recovery" contends that a balance of neurobiological processes helps realign psychosocial equilibrium in the short-term and over time. Through progressive, repeated exposure to custom-built outdoor challenges, the concept of brain resilience may provide a scientific platform for understanding the mechanisms of achieving meaningful, authentic and healthy outcomes. It could also help to begin to illuminate a section of the black box of adventure processes (Allan, McKenna and Hind, 2012, p.3).

A number of key points that emerged from the data analysis identified the large number of no change scores across all four domains of resilience and the requirement to address the FD/APDT programme design. The changes should be

measured against additional role performance effects as a consequence of these programme changes. Whilst these no change scores may create concern across RAF stakeholders, it is essential that an innovative opportunity for the development of an evidence-based resilience intervention medium be seized. This will ensure the maturation of the FD/APDT intervention within future RAF resilience education, to meet the needs of next generation RAF personnel's resilience development.

Whilst this thesis has responded to the research question to address the research aim and provide an original contribution to knowledge within the use of RAF FD/APDT programmes in RAF personnel's resilience development, it has exposed a number of requirements and shortfalls for the RAF's understanding of FD/APDT's utility throughout a service-person's career. These could be addressed through a further extension to this study to follow-up on the research findings and understand the longitudinal impact of FD/APDT interventions. The sub-branches of this research could then expand into and incorporate family impact, career, life and well-being that could contribute to a plethora of holistic RAF resilience frameworks that benefit the RAF. However, greater in-depth analysis of long-term resilience retention (as a result of the FD/APDT intervention) is required to elicit the effectiveness of the programme.

Critically, the programme design, activity or other pre-determinants were not assessed during the results/data gathering which would create areas for programme change to better develop resilience through RAF FD/APDT and address the key factors associated with FD/APDT from the literature review such as facilitator, programme design and student variables. These points have significant implications in evidencing the strengths and weaknesses of FD/APDT interventions for future

longitudinal research in advancing the proposed short term outcomes from this thesis and are addressed in the conclusion and recommendations chapter.

The use of past research within the field of FD/APDT (from research separate to this thesis) required reviewing a large amount of relevant past civilian research that effectively merged with the military mixed-methods data provided within this thesis to provide complementary evidence in a pragmatic mixed-methods methodology.

However, if the research thesis were to be reproduced, it would be recommended that a mixed-method, staged longitudinal methodology was adopted (12-18 months follow-up) and that civilian literature would still have to be used for literature reviews to support or refute the military findings. This is due to the limited UK military (RAF specific) FD/APDT research.

Whilst this would not be an essential requirement for the reproduction of this research intent, it would alleviate any readers' concerns regarding the large leap across the perceived holistic mixed-methods research gap between this thesis (based on military groups) and the existing (civilian) narrative when considering the longitudinal effect of the FD/APDT intervention. The use of a FD/APDT intervention that incorporates all four domains of resilience as part of a through-career reinforcement and REP is theorised as creating effectual character development strategies as discussed by Stavrevsky (1999) in ensuring adequate psychological, physical, social and spiritual resilience education in advance of exposure to military operational and strategic stressors.

Although this requires additional longitudinal research using this thesis as a baseline from which to develop the FD/APDT contribution to the RAF REP, the requirement for a collective approach to through-career resilience development requires further

consideration. This is evident from the literature review, this thesis's findings and the dearth of military professional setting research in proposed workplace transfer of learning from military FD/APDT interventions. These critical linkage from this thesis' research evidence in addressing the military FD/APDT theory practice gap and professional application for role performance, binds the thesis to the RAF's future FD/APDT construct and is essential for this thesis to address the research question and research aim.

CHAPTER 5 – CONCLUSION AND RECOMMENDATIONS

Section 1. Introduction to chapter.

This conclusion and recommendations chapter :

1. Synergises the data analysis and discussion themes with significant aspects of the literature review themes to address the research aim and answer the research question. These relate to the four domains of resilience in enhancing RAF personnel's resilience and the proposed application of this resilience for enduring military demands.
2. Develops guidance for FD/APDT stakeholders and highlights findings that will develop the application of RAF FD/APDT within a professional military context. This progressive forward movement of the research findings for the RAF's understanding of FD/APDT's military application into a strategic 'over the horizon' conclusion, allows for the evolution of new knowledge derived from this thesis.
3. Provides comment on the use of FD/APDT in the development of next generation 'whole force RAF' resilience (regular and reserve service personnel, MOD civil servants, contractors and other civilians) and by extension, RAF families.
4. Comments on the three concluding themes derived from this thesis.

The recommendations in this chapter provides specific guidance on the development of the three central themes of the thesis drawn from the research question, literature review themes of resilience and data analysis and discussion chapters. The recommendations will offer comment on the transfer of knowledge and reinforcement of training whilst considering FD/APDT's application within wider UK Defence

operations and its role in preparing personnel for the resilience demands of future operational environments. The evidence drawn from the literature review themes, gathered evidence and discussion, further links into the issues identified within the literature on the validity of FD/APDT interventions as credible mediums for resilience development. These are notably the FD/APDT programme's design, student's antecedents (Ewert, 1989) to FD/APDT programmes, addressing the apparent theory-practice gap (Lave, 1996) in FD/APDT, the role of the facilitator, the impact of continued reinforcement of FD/APDT learning (Harper, 2010; Carless, 2014) and military application of FD/APDT for longitudinal personal resilience development.

The study has identified several considerations for future FD/APDT programme design that requires immediate attention from stakeholders to improve and continuously validate the FD/APDT interventions, in order to entrench the process of resilience education within the RAF through-career training psyche. This is essential to engender a collective view of the RAF as a resilient community with the requirement for an integrated model of resilience development, when considering Calitz's (2018) perspective of resilience development.

Many researchers propose that resilience is a malleable trait, or set of behaviours, that can be developed. Others have pointed out that resilience may be a more stable capacity that resides within an individual. Furthermore, some people may have a genetic disposition to resilience that is modified over their lifetime by environmental exposures including the workplace. An integrated model of resilience needs to take into consideration the influence of personal, work, family and community resources that contribute to an individual's capacity to adapt to stress or grow in the face of adversity (Calitz, 2018, p.823).

Noting that the evidence provided during this research outlines the utility of FD/APDT in developing participants' resilience immediately after the FD/APDT intervention, and up to six months afterwards, the thesis provides three concluding themes. The

three central concluding themes drawn from this thesis's research findings across all four domains of resilience have been identified as:

Concluding theme 1. The role of FD/APDT in the immediate and short-term development of resilience domains and recommendations for the future reinforcement of FD/APDT resilience learning outcomes.

Concluding theme 2. FD/APDT's role in developing personal resilience for enhanced primary role effectiveness and considerations for a through-career Resilience Education Pathway aligned to service personnel's career progression.

Concluding theme 3. The future role of FD/APDT in developing military personnel's resilience to meet RAF and Defence requirements against next generation threats.

Section 2. Concluding theme 1: The role of FD/APDT in the immediate and short-term development of resilience domains and recommendations for the future reinforcement of FD/APDT resilience learning outcomes.

The evidence from this thesis demonstrated the positive and immediate development across all four domains of resilience after participation in the FD/PADT intervention. This development was further perceived as consolidated further after six months in addressing the research question. This raises the conclusion and recommendation that a reinforcement/follow up of the programme's resilience learning outcomes should be initiated as part of the FD/APDT concept to reinforce the FD/APDT's transfer of short term learning ability and capitalise on the effectiveness of both the immediate FD/APDT intervention and reinforcement follow up.

The research provides both quantitative and qualitative evidence that participation in the RAF FD/APDT intervention provided immediate and short term perceived development in psychological, physical, social and spiritual resilience. However, the two data sets demonstrated that perceived resilience development was further enhanced and consolidated through reflection up to six months after the intervention (two years in one individual's case, due to being recoursed) with significant perceived growth reported by participants. This perceived enhanced resilience growth after six months was noted by the focus group participants as a result of developments in self-confidence and wider self-schemas, as a result of achieving success through adversity during the intervention and the subsequent transfer of learning into the phase 1 and 2 training.

This perceived development was also noted by the social group for both the individual and a collective team effort to complete the FD/APDT intervention and also the formal RAF training. This was evidenced by statements such as “the team motivation to push each other as we had achieved a similar task before” (LAC2) and “working as a group and utilising each other's strengths and weaknesses can instil resilience, as I realised, I don't need to excel in certain areas as a group can cover weaknesses to achieve a goal” (SAC15). The FD/APDT resilience intervention also positively impacted on participants' ability to cope with the challenges of the workplace through the development of enhanced resilient behaviours and attitudes, relating to their positive experiences during the FD/APDT intervention and subsequent success in dealing with adverse situations in the intervening period between the questionnaire and focus groups. This was evidenced by comments such as “the week made me realise that whether you approach struggle and setback with a positive mental attitude instead of being dejected and giving up is important”

(LAC3) and “if something goes wrong, you don’t just stop and give up. You solve the problem together. This helps when as a group, you need to do challenges” (A/Cpl3).

Although psychological and social resilience were identified as the most prevalent factors developed from the intervention, (33.38% for personal competence, high standards and tenacity; 33.38% for trust in one’s instincts, tolerance of negative effect and strengthening effects of stress; 41.90% for control and 55.27% for social resilience’s positive acceptance of change and secure relationships) this can only be evaluated for the short 6-month period of this thesis, but initial findings also lean positively towards an increased perception of military spiritual resilience developed (in-part) through FD/APDT. This was evidenced by comments such as “tasks became easier once you understood the outcome, especially when your mates remind you of it, i.e. the gratification of achieving the task and my past successes”. (SAC2) and “you need this to get through the challenges of the week and I feel this personal spirit is important to get through the hard times” (A/Cpl10).

However, the evidence suggests that some participants were not challenged by the FD/APDT intervention and requires a review to establish where the programme could be amended to meet these demands. Coughlin (2018) suggests that the pre-deployment practices for fostering resilience in all four domains within military organisations, includes the requirement for well-designed organisational training that meets the needs of the participants, through competence and confidence and are realistic in creating adversity to manage the expectations of war (Winn and Dykes, 2019). The use of the FD/APDT intervention in creating this adversity (as stated by Winn and Dykes, 2019) cannot be used solely for the development of resilience at the expense of other conceptual skills such as leadership and

teamwork. Furthermore, resilience training cannot be shoehorned into the current training format, originally designed for other conceptual skills without consideration for the activity format, FDI re-education in resilience theory and opportunity for progressive/individual approach to resilience education. These considerations must be cognisant of Beard and Wilson's (2006) findings that 'a one size fits all' training medium will not be as effective.

Evidence from this thesis suggests that grouping of more resilient individuals into complementary groups during the FD/APDT, may allow the more resilient members to be exposed to other measured/challenging activities against other less resilient members. This could be achieved through pre-course questionnaires and grouping students on ability, albeit this would be difficult to achieve given manpower, course management and resource constraints. This would negate the 'one-fit-for-all' concept but allow the FDI to truly challenge the more resilient individuals in the group that would likely lead to higher positive responses to future resilience questionnaires, if the training were more personalised to groups of similar ability. However, current resources and training constraints such as time, finance and manpower, prevent this from happening in basic training but could be a further consideration as a resilience education follow-up within phase 2 training or by Unit Force Development Squadrons.

The first would be to make certain that participants move from their action-learning programmes directly to job assignments that build upon programme lessons and in turn perpetuate the learning process. By not doing so, the learning process stops prematurely. Secondly, organisations would ideally involve participants in multiple action-learning programmes that build upon the lessons of the prior programme-in essence reinforcing learning and increasing the number of case experiences to enhance the acquisition of declarative knowledge (Clark, Klesges and Neimeyer, 1992, p.445).

This training requirement is further underpinned by Murphy, Hodson and Gallas' (2010, p.492) model of delivery of psychological support for military personnel's personal and professional development. Murphy, Hodson and Gallas' (2010) model is specifically designed for the Australian Defence Force (ADF) in Figure 20, where FD/APDT outcomes identified within this thesis such as physical, psychological, social and spiritual resilience contributes to a number of the sub-elements of the 3 pillars of organisational health and effectiveness, performance enhancement and psychological health and readiness. The model further outlines the requirement for these resilience domains in capability, operational effectiveness and force preservation; comparable to the requirements of the RAF for its personnel's ability to cope with the stressors of military service.

Figure 20. Model of delivery of psychological support to Australian Defence Force operations (adapted from Murphy, Hodson and Gallas, 2010, p.492).



Figure 1. Model of delivery of psychological support to the ADF

Given the evidence from this thesis' research on the applicability of FD/APDT interventions on the development of the four domains of resilience, the linkage of this resilience to the capability, operational effectiveness and force preservation outlined in Figure 20, are immediately applicable to the operational effectiveness of RAF personnel given the commonality of military enabling foundations, albeit different services and countries will provide different labels or specific task requirements. The underpinning principles of providing effective training for personal resilience and role enhancement for operational effectiveness and strategic intent, remains the requirement for long term military training systems as evidenced in Figure 20.

However, to continue this proposed resilience development, it is recommended that the FD/APDT intervention be reviewed to include specific resilience development opportunities at different levels to attending participants, given their own perceptions of personal resilience to maximise opportunities for resilience growth when participating in the FD/APDT intervention. This should then be followed-up with a measure of effect review six months later, with possible reinforcement of FD/APDT resilience training outcomes conducted by the HQ RAR or Force Development Squadrons. Given the proposed enhanced resilience development and primary role effectiveness noted by the participants after the 6 month reflection and follow up focus group discussion, the evidence from this thesis suggests there is utility in the reinforcement of resilience training and education.

This is further apparent to ingrain FD/APDT resilience development as participants are exposed to new challenges throughout their service careers. Associated stressors with these new challenges could be mitigated through the resilience learning identified through participation in the FD/APDT intervention. This was noted

in comments such as “I learned to take a second to gather my thoughts, control my breathing and focus on the task in hand when in high pressure/stress situations” (SAC7). If FD/APDT can offer support for positive adaptations to behavioural and attitudinal responses to stressors associated with service careers, then high pressure/stress situations experienced at different stages of a service-person’s career coupled with effective resilience education could be mitigated. This could lead to the management of stress and malign responses to stress or high pressure, for enhanced primary role effectiveness and improved operational output as the evidence in this thesis suggests.

This recommendation aligns with previous research highlighted within the literature review for the requirement for longitudinal follow up of FD/APDT learning outcomes and research into the long-term effects. Whilst this concluding theme provides evidence for the research question, this only meets the immediate and short term outcomes of the FD/APDT intervention on resilience development, and can only offer recommendations and suggestions of how resilience could be developed longitudinally.

Section 3. Concluding theme 2: FD/APDT’s role in developing personal resilience for enhanced primary role effectiveness and considerations for a through-career Resilience Education Pathway (REP) aligned to service personnel’s career progression.

Whilst the quantitative data demonstrated large ‘no change’ scores and many of the qualitative data responses could be viewed as ‘in the moment’, the evidence for the transfer of learning and positive outcomes of the FD/APDT in resilience development and personal/workplace effectiveness is apparent from the focus group discussions.

The perception of positive developments across all four domains of resilience in the immediate and short term period after the FD/APDT intervention, offers a natural discussion and segue for the recommendations on a through-career resilience strategy to incorporate the recommendations from this thesis' findings on the initial and short-term outcomes of FD/APDT interventions on resilience. This through-career resilience development concept across the resilience domains was devised through the focus group discussions on the positive transfer of knowledge into primary role effectiveness developments, when addressing the research question and aim. The concept was further identified by the researcher to include a longitudinal measure of effect for FD/APDT's resilience development throughout an individual's career, in improving enduring primary role effectiveness.

The perception of improved role effectiveness as a result of participation in the FD/APDT interventions through its resilience development, addressed part of the research aim for this thesis. Moreover, the data collated within this thesis demonstrated the participants' perception that the transfer of resilience learning from the FD/APDT intervention was a significant contributing factor for their resilience development. However, as identified within the data analysis and discussion chapter, it is unlikely that FD/APDT can be solely credited with enhanced perceptions of role performance. It is likely that a combination of newly acquired role competencies over the intervening period between the FD/APDT intervention and focus groups, in combination with multifaceted developments during the individual's personal and professional development during phase 1 and 2 training, is also responsible for this resilience development.

The FD/APDT intervention is credited with enhancing role performance, supported by statements such as “I feel able to look at something and compare it to larger adversity and relate to challenges I completed before” (SAC15), “I felt open minded to try new things after doing new activities that will help with my RAF career” (A/Cpl2) and “I find it much easier to try things that scare me now and show others that are scared that it is no big deal” (SAC15). The perception of participants’ enhanced primary role effectiveness as a result of the FD/APDT after six months provides the evidence outlined through the focus group comments, to address elements of the research aim but is unable to provide any evidence for enduring resilience development past six months. This aligns with previous research that states FD/APDT research is unable to provide longitudinal evidence to successfully support its claims (Seaman and Rheingold, 2013). Moreover, the evidence required to address the research aim has the same issue attached to the research question in that this thesis can only offer evidence for the immediate and short term ability of the FD/APDT intervention to develop resilience across the four domains for primary role effectiveness.

The concept of reinforcing these short term perceived outcomes of the FD/APDT intervention on enhanced role performance as identified by the focus group statements, led the researcher to consider the long-term influence of FD/APDT on resilience. This is further worth consideration when coupled with the possible reinforcement of resilience learning transfer as part of a recommended enduring RAF through-career resilience strategy. The current lack of a structured through-career, resilience education pathway for all four domains of resilience and FD/APDT’s role within this proposed structure e.g. FD/APDT threaded within career junctures such as promotion courses, FDS support, formal Sqn/Unit training

requirement, requires attention if the intervention is to support long term personal resilience development within future operating environments. This is to ensure the RAF are exploiting the full recognised capability of FD/APDT for the longitudinal, formalised holistic development of conceptual military skills for primary role performance, operational and strategic influence.

The concept of a Resilience Education Pathway (REP) could in part address the long-term continued reinforcement of the proposed learning for personal resilience development across the four domains. This will align FD/APDT programmes with primary role effectiveness, throughout a service person's career to address the continued transfer of learning from FD/APDT interventions' tacit knowledge into the participant's primary roles identified by Quinault, (1992), Rhodes and Martin (2014), Roger, Loy and Brown-Bochicchio (2016) and Kelly (2019) in the literature review.

In support of the recommendations for a further structured 'through-career resilience education pathway', the concept of resilience provides useful information in order to build the framework of the individual's resilience. As identified within the literature review, evidenced in this thesis' data and discussed during the analysis, resilience consists of behaviours and attitudes that can be taught (Pettit *et al.*, 2016; Sharp, 2019). The evidence within this thesis that supports the teaching of resilience behaviours and attitudes is evident from the positive findings of perceived resilience development within the quantitative and qualitative data. Moreover, continuous training and learning can effectively improve the aspects of a person's resilience (Norris, 2010, in Wilson *et al.*, 2017, p.91).

This continuous training and learning are supported by the evidence in this thesis, that resilience development through FD/APDT is more prevalent after a period of

reflection. The development of the RAF REP to provide this continuity of resilience training as a soft non-kinetic effect, supports the UK's International Defence Strategy in its position as the world's leading soft power to press international influence (National Defence and Security Strategy, 2015). This soft power allows resilient service members to ensure kinetic application, the resolve to complete missions and deliver RAF operational intent; further contributing to UK strategic defence. However, the contents of this REP (and FD/APDT's role) need careful consideration if the through-career resilience education and training is to be properly understood, implemented and executed.

The role of additional resilience education follow-up/reinforcement by phase 2 and phase 3 training instructors, Unit Force Development Squadrons and FDIs as part of the structured pathway, builds on the current learning within phase 1 training as a fundamental missing link in ensuring the consolidation of resilience education throughout a service-person's career. The role of the FDI in facilitating this effective training for role, operational and strategic development, is critical for FD/APDT's transfer of learning. In closing the resilience/FD/APDT theory-practice gap, facilitating and delivering resilience development activities for the group, must also be considered in taking the conclusions from this thesis forward in the development of RAF FD/APDT to enhance resilience.

Central to the facilitation of the participant's resilience development is the RAF FDI's education in the transference and promotion of resilience theory and universal design of instruction (Warner and Dillenschneider, 2019). This is not only required as continued professional development, but as a fundamental underpinning professional requirement to truly understand military resilience concepts. This

requirement is further extended as part of the RAF's proposed development of a REP within the RAF Resilience Strategy where RAF FDI's will play a crucial role in the longitudinal reinforcement and enhancement of RAF personnel's human performance optimisation, personal resilience and military conceptual skills growth; from enlistment to retirement and beyond.

Finally, instructors can educate airman about stress responses, provide specific behavioural and cognitive skills training and structure opportunities to practice these skills at different career stages to optimise performance under stress (Anderson, 2017, p.28).

These stakeholders would further reinforce the linkage of conceptual learning to primary role and operational effectiveness, whilst feeding back to training managers on the double-loop analysis of reflecting and developing whilst training continues, using common training outcomes from FD/APDT programmes, terminology, behaviours and expectations for all RAF and whole-force personnel. Whilst each service will have their unique colloquialisms, it is essential that a common understanding of language and terminology is agreed. This commonality in language, terminology, culture and experienced understanding of resilience theory and practical enhancement through workplace and resilience education intervention application, will ensure the hermeneutic growth of a coherent RAF resilience strategy and framework.

This framework and REP will underpin the structured through-career education of RAF personnel and directly feed into expected resilience knowledge at career junctures, ranks and Command levels. This will complement the future research 'spring-boarded' from this thesis and the findings of studies by Hosseini-Shokouh, Dabaghi and Rahimi (2018) who found that life-skills based education for military

individuals, improved effective resilience. This pathway and framework will also ensure ownership from participants, as the self-reflection on personal resilience and other conceptual skills required throughout the RAF service-person's career, has the potential to increase the efficacy of resilience training. This occurs through giving the individual the tools to self-assess and improve their own coping and view stressor events as an opportunity for growth (Crane *et al.*, 2016; Crane and Boga, 2017). The opportunity for growth through stressful events was evidenced in this thesis through the initial quantitative data but was more apparent through focus group statements such as "I was scared of heights during the rock-climbing but smashed it during the activity. I felt great after" (SAC14), "I felt open minded to try new things after doing new activities that will help with my RAF career" (A/Cpl2) and "I find it much easier to try things that scare me now and show others that are scared, that it is no big deal" (SAC15).

The structure of the REP or any longitudinal resilience training programme requires baseline knowledge of the current, anticipated and end resilience requirements for RAF personnel, especially in the current high-tempo operational climate set against constrained resources. Moreover, once the REP or similar through-career training programme is developed, there must be parallel investment in the development of FDI's, Training Officers and RAF-wide delivery stakeholders resilience education to impart the resilience knowledge during the FD/APDT, human performance and further mainstream (HQ RAR/FD/APDT Wing) extensive resilience development deliverables.

To ensure the RAF educators are correctly trained, it is important to take this dialectic learning forward to enforce the 7 categories of practice knowledge

(Schulman, 1987) including content knowledge, curriculum knowledge, general pedagogical knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, and knowledge of educational values. These were significant areas identified within the literature review and further identified within this thesis' data analysis and discussion that require investment if FD/APDT interventions are to be used to their full capability. Table 16 proposes the key learning points and enabling objectives within the four domains of RAF resilience identified as a result of this thesis.

Table 16. Proposed elements of the RAF Resilience Education Pathway.

Resilience Domain	Enabling Objective	Key Learning Point
Demonstrate physical resilience.	Understand the importance of maintaining physical robustness for operational and primary role effectiveness.	Describe the risks of over stress to physical resilience.
		Describe healthy stress in relation to physical resilience.
		Describe the human factor limitations of physical resilience.
	Understand physical resilience limitations and the management of physical injuries.	Describe the management of injuries (under medical supervision) in promoting recovery.
		List the stressors associated with reduced physical resilience.
	Understand the concepts of the RAF's development of human performance.	List and demonstrate the application of human performance development principles.
	Describe the CoC's role in providing support and guidance for the development of their personnel's physical resilience.	List the opportunities available for the participation in physical resilience interventions and produce a plan to develop individual's physical resilience.
Describe the role of APDT in developing Physical resilience.	Describe the application of the RAF's Resilience model in the context of risk to life APDT interventions.	
Participate in a blended APDT programme.	Experience and describe the utility of APDT in developing individual and team resilience.	
Discuss spiritual resilience.	Provide examples of sources of spiritual resilience.	Describe role modelling of spiritual resilience.
	Demonstrate importance of spiritual resilience in daily life.	Understand the importance of spiritual resilience as a component of human flourishing.
	Describe the importance of spiritual resilience as a foundation for Air Publication 1-Core Values of the RAF.	Define the requirement for the RAF to develop collective spiritual resilience education alongside instruction in core values.
	Understand the role of FD/APDT in developing spiritual resilience.	Describe how spiritual resilience development may be enhanced by participation in FD/APDT interventions.

	Understand organisational spiritual resilience.	Demonstrate an understanding of the training and education opportunities available to develop spiritual resilience in the RAF, both corporately and individually.
Discuss social resilience.	Demonstrate an understanding of the principles of social resilience.	Describe the collective roles of the RAF family (RAFA, SSAFA, RAF-FF) in developing RAF resilience. Explain the RAF social demographic and their integrated roles.
	Discuss the role of social resilience in creating a resilient RAF culture and community of practice.	Demonstrate an understanding of the training and education opportunities available for the development of social resilience in the RAF.
	Understand the role of FD/APDT in developing Social resilience.	Describe the social resilience development attributes associated with participation in FD/APDT interventions
	Discuss the importance of developing a network of social support.	Discuss the importance of the 'Whole Force' and RAF family resilient community.
Discuss psychological resilience.	Discuss the role of FD/APDT in developing psychological resilience.	Describe the psychological resilience development attributes associated with participation in FD/APDT interventions.
	Describe how to develop psychological capital and resilience.	Describe the psychological capital principle of hope.
		Describe the psychological capital principle of optimism.
		Describe the psychological capital principle of efficacy.
		Describe the psychological capital principle of resilience.
		Demonstrate an understanding of the training and education opportunities available for the development of psychological resilience in the RAF.
	Discuss the importance of continual mental stimulus in building mental resilience.	List aspects of the Adversity Quotient (AQ). Discuss the importance of positive cognitive adaptations to stressors.
Understand the RAF's 6 core SERE resilience attributes.	Describe the resilience framework concept of operations and its importance as a leader.	Discuss the role of self-efficacy in developing resilience.
		Discuss the role of positive affect in developing resilience.
		Discuss the role of problem-focused coping in developing resilience.
		Discuss the role of emotion-focused coping in developing resilience.
		Discuss the role of sense of purpose in developing resilience.
		Discuss the role of support seeking in developing resilience.

Furthermore, the use of FD/APDT outcomes for influencing human capabilities e.g. resilience, links to the Modernising Defence Programme (MDP) (2018) and Project Astra (2020) requirements for developing military personnel. This concept further demonstrates the forward-thinking implementation of an evidenced based intervention to meet the required Future Force (2017) resilience of RAF personnel. Indeed, the importance of implementing first class training was identified by Air Vice

Marshal James (in Saunders, 2018, p.51) when he stated that "a world beating training system is really important, because if the output at the end of our training is better people than anybody else has got, then we will win. Our job is about winning: that is what the UK military is for. We are not paid to come second".

As a key differentiator between civilian and service FD/APDT, there are limited research findings that immediately place FD/APDT at the heart of military operational capability. The overall holistic conceptual skills development of individuals throughout their careers and plethora of training (procedural, declarative, developmental, compensatory) interventions, combine collectively to deal with stress exposure. The years of training thus combine to develop operational effectiveness through FD/APDT (as complementary to other career training interventions) and is pivotal in providing much of the contextualisation of training as previously highlighted.

Whilst many advocate the use of FD/APDT styled programmes and pedagogy of FD/APDT (Karhus, 2011) in developing resilience, Brooks (2003) believes there is much conjecture on the effectiveness of short-term FD/APDT without longitudinal reinforcement. Furthermore, Carless (2014) contends that the dearth in longitudinal studies of resilience education within FD/APDT undermines the perceptions of FD/APDT within mainstream resilience training and education. Carless (2014) does acknowledge the short-term positive outcomes of military sport and adventurous training (FD/APDT) in the psychological well-being of military personnel. However, Brown (2010) calls the evidence ambiguous and references Singley and Anderson's (1989, p.25) review of FD/APDT research, which cites evidence of near transfer but with little empirical support for general transfer "besides a few highly questionable

studies". With only a handful of research papers that focus on the use of FD/APDT within a military and Air Force specific context in building resilience (the majority of this research coming from the US and Scandinavia), researchers within the field of military FD/APDT (more specifically resilience development) must still turn to the civilian sector for the majority of the FD/APDT specific research; albeit with growing synergy across the two (civilian and military) domains.

Studying them over a six-month period (post expedition) is a start but the ideal approach for such work is to collect data either longitudinally or retrospectively for extended time periods. There are a host of methodological and logistical challenges to such approaches, but we believe that the repeated pre-post and delayed post research design in outdoor experiential learning is unlikely to render any more meaningful findings than are already evident in the extant literature (Allison *et al.*, 2018, p.13).

Coupled with this requirement for longitudinal assessment and the constant evolution of FD/APDT within the RAF (to meet the all-inclusive needs of the participants in its programme design whilst ensuring the validation of its outcomes), is the evaluation and assessment of subjective outcomes (Whittington and Aspelmeier, 2018). This is not easily achieved according to Berlinger and Wu (2005) but is essential to develop a baseline of military resilience themes supported by research evidence especially given the challenges faced during past research, where Rhodes and Martin (2014) found limited growth in resilience after FD/APDT interventions.

It is likely that this debate will continue without a single unifying design for FD/APDT programmes, that would be ineffective in meeting the all-inclusive subjective and statistical requirements of participants anyway. A single linear approach to FD/APDT from civilian and military perspectives would fail, but a consolidated, flexible, malleable approach at the tactical level by experienced SMEs with a collective

understanding of the four domains of resilience set against longitudinal time frames, could have a profoundly positive effect on the resilience of RAF personnel. This would also address the continued theme within FD/APDT past research (this thesis included) on the lack of learning reinforcement by organisations and individuals after FD/APDT interventions.

Although post-course reflection has been shown to enhance the use of learning after the course (Leberman and Martin, 2004), few researchers have investigated post-course factors. Most of the researchers we have cited base their claims either on participant opinion of what factors are important or on factor effects on course outcomes as measured using participant self-report immediately upon completion of a course (Rhodes, 2014, p.268).

This enhancement of resilience knowledge will enable the military to develop its understanding of resilience growth through FD/APDT, so that resilience and FD/APDT become “part of the necessary and ingrained resilient culture and psyche of an individual, Unit and Service” (Skormovsky, 2013, p.5). To underpin this REP, evidence is also needed to understand which programme elements best predict resilience as an outcome (Vanhove *et al.*, 2016; Calitz, 2018) and could form part of the longitudinal research into FD/APDT’s role in resilience development. This is in order to ensure the full utility of FD/APDT in exploiting the belief that participation in a lifetime of outdoor adventure experiences, will bestow personal, physical, social and spiritual benefits (Loeffler, 2018).

Section 4. Concluding theme 3: The future role of FD/APDT in developing military personnel’s resilience to meet RAF and Defence requirements.

Coupled with the thesis’ findings on the improved primary role performance and personal resilience as an outcome of the FD/APDT intervention, is the proposed

influence this thesis' findings could have on FD/APDT's contribution to future RAF and operational strategic Defence requirements. The research aim within the introduction chapter and the overarching genesis for this thesis' contribution to new knowledge, is to provide research insights to inform RAF and Defence strategy, regarding the use of FD/APDT interventions for through-career personal resilience development. The research aim extends to further inform the possible development of FD/APDT interventions for this through-career usage as a result of this thesis' findings. In addressing this central theme in addressing the overarching research aim, the research threads identified from the research question, inform the recommendations and considerations for the role of FD/APDT interventions in meeting future RAF and Defence requirements for military personnel's resilience, to overcome future threats to the UK and NATO.

The previous two concluding themes evidence the perceived immediate and short term development of physical, psychological, social and spiritual resilience on primary role effectiveness to address the research question and part of the research aim. However, these preceding concluding themes fall short in addressing an element of the research aim, to link this proposed through career resilience education to provide research insights, to inform RAF and Defence strategy regarding use of FD/APDT interventions for through-career resilience development. This 3rd concluding theme, addresses this shortfall to move the understanding of FD/APDT applicability to RAF and Defence strategic requirements forward.

The literature review, data gathered through this thesis' research, data analysis and discussion chapters highlighted the requirement for further research into the longitudinal outcomes of the resilience, including the implications for reinforcement

of learning for through-career impact for strategic effect. Furthermore, the data analysis and discussion chapter highlights weaknesses and strengths in the design of current RAF FD/APDT in the generalist nature of training, irrespective of current personal perceived resilience levels.

The analysis did however expand on the requirement for these linkages during the double-loop feedback to be integrated into current FD/APDT research design, coupled with the engrained requirement for structured resilience training (FD/APDT), as a fundamental building block for Commanders and RAF personnel in whole force development and the implementation of a REP. This in turn contributes to the resilience of the future force as outlined in the first 2 rings of the Enhancing Joint Action model to deliver future joint force advantage (JCN 1/17, 2017, p.7) in Figure 21.

Figure 21. Enhancing Joint Action; delivering future joint force advantage. (JCN 1/17, 2017, p.7).



The development of the next generation of resilient RAF personnel within UK Defence also links into NATO's requirement for resilient members for collective security, using its four themes of resilience outlined at the NATO Interdependency in Resilience Conference (2017) and the Chief of the Air Staff's priorities identified at the Air and Space Power Conference (2019). These are linked to this thesis as FD/APDT (through the research provided in this thesis) can contribute to the development of the four domains of resilience within NATO's four themes of resilience.

1. Building persistence in resilience
2. Considering resilience as a capacity
3. Developing integrated education on resilience.
4. Expanding experimentation, modelling and training to include resilience.

The last two themes are most prevalent for the use of contextualised RAF FD/APDT training within both UK and collective NATO Defence. For the FD/APDT intervention to be truly effective immediately, in the short-term and longitudinally, there is a requirement for its design to meet UK and NATO strategic intent through tactical level programme design. Indeed, building persistence in resilience, considering resilience as a capacity, the development of integrated resilience education and expanding experimentation, modelling and training to include resilience have been evidenced through this thesis's research.

The research question identifies (through the literature review, data analysis and discussion) the role of FD/APDT in developing these four NATO themes of resilience that align to build persistence through FD/APDT participants' perceived improved capacity for resilience. The contextualisation of the FD/APDT resilience outcomes into primary role effectiveness for RAF, Defence and NATO responsibilities, is

evidenced in the data analysis and discussion chapter. This alignment of the grand-strategic resilience requirements for NATO, with the tactical level outcomes of FD/APDT's role in developing resilience evidenced through this thesis' findings, generate this concluding theme's inclusion to address the overall research aim for this thesis.

The researcher can only comment on the immediate and short-term outcomes of the FD/APDT intervention on participant's resilience. Therefore, further longitudinal research (using this thesis' findings as a baseline) would contribute to the RAF's understanding of the operational and strategic impact of FD/APDT interventions (as part of a wider through-career development training programme) on resilience within enhanced joint action, UK and collective NATO strategic Defence.

Therefore, the future operating environment will make increasing demands on the judgement, training and resilience of our people, at all levels, and forces will require tailored cultural preparation for success. Our leaders must inspire and reward creativity, encouraging our people to anticipate and thrive on change and so prevail in demanding environments (JCN 1/17, 2017, p.14).

When synthesising the tangible linkages between the developments of personal conceptual resilience skills, the positive outcomes on primary roles and Defence intent, there are gaps that appear in identifying these links. These gaps are concentrated around the FD/APDT's biophilic design, implementation through FDI's understanding of contextualised resilience development, transfer of resilience education and measurement of FD/APDT effect within the workplace. The design of the FD/APDT programme is of key consideration when identifying not just personal resilience growth, but the measured impact within the individual's life, family and workplace that is only just being reviewed as a result of this research thesis' mixed-

methods baseline findings. This baseline however raises the question of developing and measuring the longitudinal effect of the interventions as part of a suite of wider RAF resilience training and education to impact strategic Defence.

This linkage between strategic intent (the development of UK military resilience) and FD/APDT may seem a long distance apart, but military planners require robust training mediums to develop personal resilience. Whilst this thesis specifically identifies the utility of current FD/APDT designed programmes to develop resilience, there are areas for improvement in programme design, longitudinal reinforcement and facilitator resilience theory education; especially if RAF personnel's operational and tactical decisions are to influence strategic aims. This fundamental requirement for military personnel to understand the requirement for their resilience in the tactical, operational and strategic space, is essential within the FD/APDT programme design and its contribution to Joint Operations as a resilience training medium and collective force enabler.

Furthermore, the activity choice within FD/APDT interventions and different levels of resilience maturity could detract from the collective team experience and development of social resilience. However, training in challenging situations where no 'right answer' exists will enhance their ability to handle uncertainty and comprehend complex and chaotic situations (Joint Council Note, ((JCN)) 2/17- Future of command and control) and links to JDP 0-01's (2017) requirement for constructive training. Although no right answer, at the tactical level, the FD/APDT intervention liberates participants to self-regulate risk taking and concern for others, which provides authentic and immediately observable consequences for these actions (Allan, McKenna and Hind, 2012).

The learning and transference of these consequences (tactical, operational and strategic) are essential in bringing the strategic implications of the FD/APDT, with real-life consequences into the foreground of the participant's experience during the intervention. Moreover, the consequence of a negative attitude, lack of resilience, poor leadership and other destructive behaviours will not only have immediate consequences for the FD/APDT participants, but these learned destructive behaviours (if not corrected) will have strategic implications. It is therefore essential that the FD/APDT intervention encourages growth through failure in a safe learning environment, as a structured resilience intervention to enhance positive adaptation into the real-life RAF, operational deployments with consideration to the impact of negative/positive resilience on Defence.

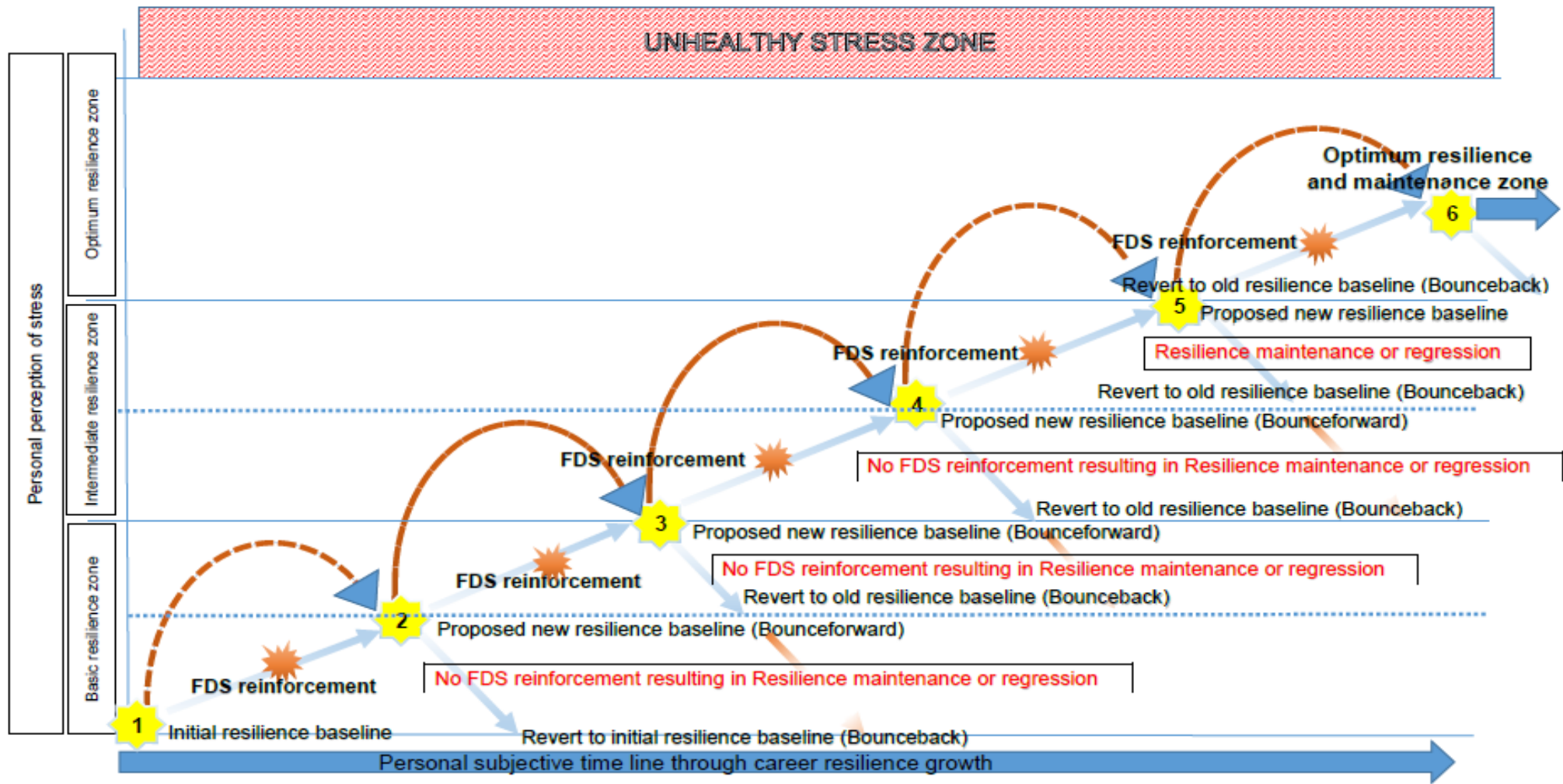
To achieve this long-term resilience enhancement, there is a requirement for longer, more sustained outdoor experience programmes that are well-designed with structured through-career reinforcement and to meet conventional and hybrid tactical, operational and strategic (even Grand Strategic if required) learning outcomes. This will further synergise the routine, primary role impact (feedback through Argyris and Schön's, ((1978)) double-loop learning) into the current FD/APDT training programme for continual amendment to programme content/design and outcomes if required, to develop learning through experience. This continuous feedback loop and development of the training through the measurement of effect (MOE), would be time-consuming and potentially unwieldy given the length of time required to change RAF FD/APDT within JSP 822 (2017) constraints, but is essential for programme success.

JDP 3-00 (2009, p.5-5) defines Measurement of Effect as the assessment of the realisation of specified effects. It considers what

effects, intended and unintended, have been realised – did we do the right things? It informs decision-makers on whether activity should be repeated or altered and is an evaluation, of which actions have been completed, rather than simply what has been undertaken – did we do, properly, the things we planned to do”?

The researcher’s interpretation for the proposed implementation of longitudinally reinforced resilience education through FD/APDT as part of a through-career programme is outlined at Figure 22. This theory encapsulates the learning derived from this thesis’ research findings to develop a professionally contextualised implementation of resilience education across the RAF, with Force Development Squadrons and instructors at the heart of this concept.

PERSONAL THROUGH CAREER RESILIENCE DEVELOPMENT THROUGH FD/APDT INTERVENTIONS



THROUGH CAREER PERSONAL RESILIENCE EXPOSURE

Figure 22. Resilience education through FD/APDT as part of a through-career programme.

FD/APDT's contribution to the conceptual and personal skills development for operational and primary role effectiveness, remains its raison d'être within the RAF as a formal education medium. The research from this thesis provides evidence of FD/APDT's role (in part) in developing the moral component of Air Power in support of defence requirements. Its further ability to contribute to, and advance single Service (RAF, Army, Navy, Marines) and collective Defence requirements for maturing personal resilience (underpinned by this thesis' research findings), is proposed as synonymous as a contributory factor within Defence's (and RAF's) personal development policies and in maintaining the requirement of resilient personnel for operational success.

This meets the policy direction of Joint Doctrine Publication (JDP) 02, UK Operations: The Defence Contribution to Resilience and Security (2016, p.3) outlined as:

It is a responsibility of the MOD to 'defend and contribute to the security and resilience of the UK and its Overseas Territories'. Specifically, this includes 'deterring attacks; defending our airspace, territorial waters and cyber space; countering terrorism at home and abroad; supporting UK civil authorities in strengthening resilience.

As the results of this research demonstrates, the FD/APDT intervention contributes to the enhancement of all four domains of personal resilience, albeit with varying degrees of success as previously discussed in the results for up to six months (two years in one participant). Per contra, the results do not demonstrate what contribution the implications of the FD/APDT intervention has on the strategic or operational personal resilience operating ability, nor does it specifically outline how participation in the intervention has developed operational capability. This is beyond the scope of this thesis and requires further longitudinal research. In addition, it is

suggested (and strongly evidenced) that resilient RAF personnel are key to the successful operational business continuity and resilience during conflict, influence on the international stage, civil emergencies and UK strategic resilience. This resilience within RAF personnel in delivering Defence requirements is simulated during resilience training interventions (including FD/APDT), albeit its linkages are not always clearly defined. For example, the completion of a team task to meet an output requirement during an FD/APDT intervention, could be linked to the conceptual learning or development of team success in completing a Civil Military Co-Operation (CIMIC) operation; demonstrating the linkage to strategic requirements.

The implications for required resilience growth within RAF personnel is further outlined in JCN 1/17, Future Force Concepts (2017, p.14) where personal resilience is identified as a pivotal game-changer in the future battle space and during peace time civil emergencies (CIMIC, HADR) within the Future Force Concept.

Therefore, the future operating environment will make increasing demands on the judgement, training and resilience of our people, at all levels, and forces will require tailored cultural preparation for success.

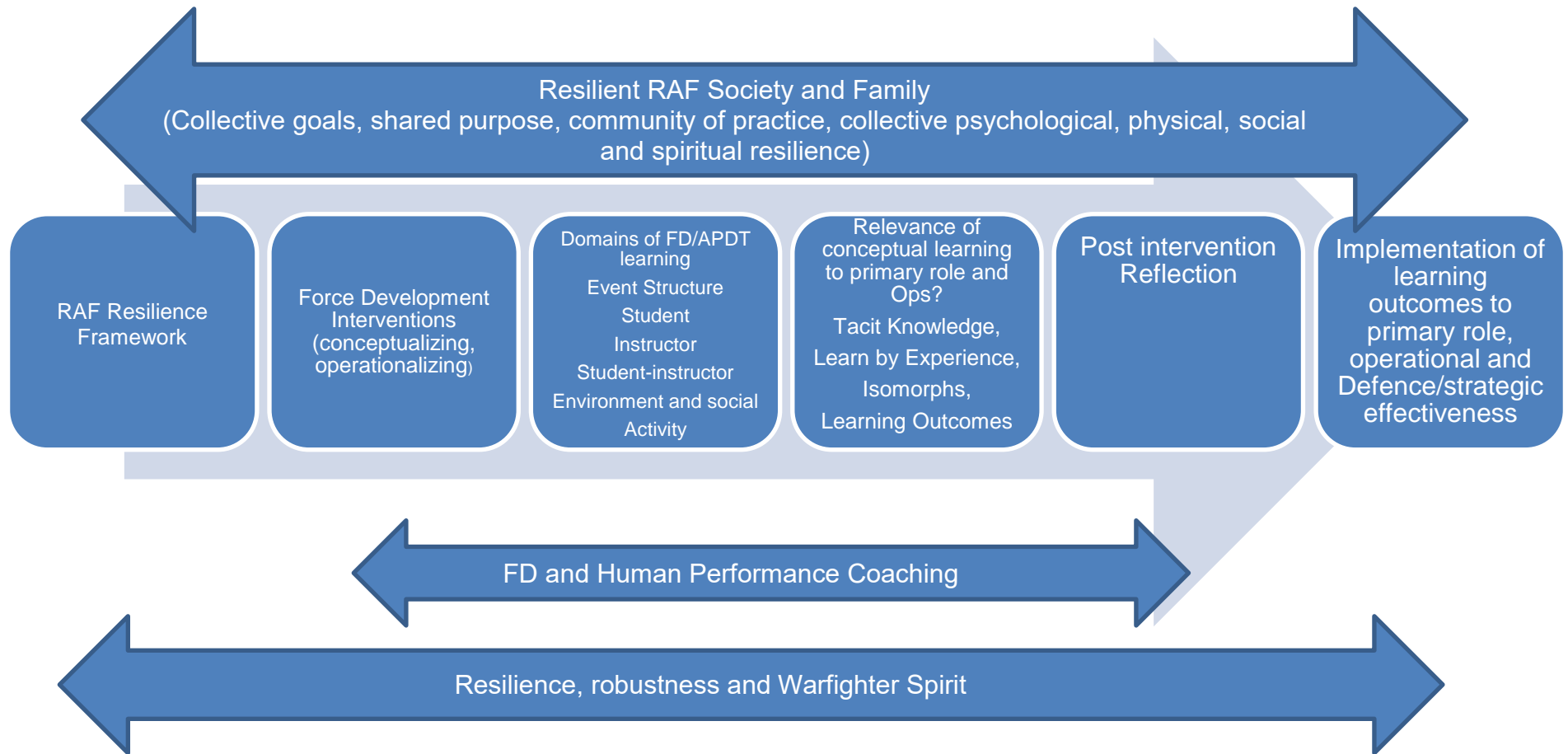
The use of internationally delivered FD/APDT provides a direct link into the UK's International Defence Engagement Strategy (2017). Specifically, when using Defence's capacity, expertise and reputation for positive soft power (conceptual skills required for cultural diplomacy and projection of non-kinetic effects) to influence Defence partners or adversaries, working alongside other tools of government; particularly diplomacy and development with international allies and partners. This use of soft power globally, is a reinforcement indicator of the UK Armed Forces personnel's resilient capabilities to ensure business continuity during

crisis (JSP 503, Business Continuity Management, 2017) on the global scale and present itself as a resilient fighting force to both its internal personnel and adversaries which is a key force-enabler in warfare:

If you know the enemy and know yourself, you need not fear the results of a hundred battles (Sun Tzu, no date, in The Sonshi Group, 2018).

The results of this thesis showed that the FD/APDT interventions have developed the four domains of personal resilience that in turn, can be directly attributed to improving primary role efficiency in meeting the RAF's and wider Defence's requirements as a training intervention for strategic resilience (Campbell-Sills *et al.*, 2008). This strategic resilience refers to the UK's capability to remain resilient in terms of materiel, material, war-fighting campaigns and sustainability when conducting kinetic or non-kinetic operations. Whilst FD/APDT's actual impact on the strategic resilience of the UK is unlikely to ever be the single contributory factor, its role as a tool within a vast toolbox of RAF and Defence training collective resilience training interventions delivered throughout service-personnel's careers, is supported by this thesis' research findings. The advancement of service-personnel's resilience through FD/APDT is also endorsed through Defence's doctrinal policy that mandates the requirement for training interventions to develop resilient personnel. Figure 23 outlines the concept of the transfer of tacit and isomorphic learning through FD/APDT interventions into tactical, operational and strategic intent.

Figure 23. Developing resilience through the RAF FD/APDT concept.



Section 5. Conclusion and recommendations summary.

This chapter provided three central concluding themes and recommendations derived from the evidence provided by the literature review, data analysis and discussion to address the research question and aim. Furthermore, the conclusion and recommendations chapter addressed the overarching research aim to provide insight into the utility of FD/APDT in developing military personnel's resilience for strategic effect against future threats such as hybrid warfare to military personnel and UK Defence.

As the UK military recruits volunteers who accept their chosen career involves arduous training, hardships, exposure to life-threatening stressors and opportunities for pushing personal abilities, UK military recruits (including RAF) will have a higher personal resilience baseline than the social demographic norm, to view the military as their chosen profession. The results from the 'no change' factions within the research conducted within this study from the CDRS-25, presents evidence that supports the perceived extant resilience in varying levels across the four domains prior to the FD/APDT intervention.

This perceived resilience and the proposed 'no change' across the resilience factors could be as a result of the FD/APDT training only affecting a smaller number of less resilient participants, or programme shortfalls in developing the resilience of more resilient participants. This could also be due to the extremely small demographic to whom the research pertains, the dearth of UK/RAF specific FD/APDT research and for whom resilience (in austere conditions or situations) is part of routine life in the military and second nature.

It is clear that the thesis is only able to offer a brief understanding of participants' perceived resilience development as an outcome of the FD/APDT intervention during phase 1 and 2 training. Adler *et al.* (2013) notes that to date, there has been no international review of mental health resilience training during Basic Training (within the US), nor an assessment of what service members perceive as useful from their perspective. Adler *et al.* (2013) research and this thesis' findings would imply that resilience education is required at the start of a service-person's career. It is suggested that resilience in military personnel is perceived as osmotic through the physical and mental toughness associated with military personnel; as stated by the instructors in Adler *et al.* (2013) study.

If specific signposted resilience education is supported through basic training and reinforced throughout a service-person's career through experiential learning, the researcher believes this would be an invaluable benefit to a service-person in meeting the demands of military life (Adler, 2015a). This education will align with the service requirements to begin developing protective factors such as coping strategies and strengthened resilience early in their careers, instead of addressing post-trauma treatment.

On reflection I wish I had invested more time in simple team building exercises like sport and adventurous training. We would have done well to focus less on technical skills that soldiers pick up very quickly in theatre and foster instead the bonds of loyalty that lead men to extraordinary acts (Company Commander, Op HERRICK, JSP 419, 2016).

The above statement linking the transferability of conceptual (including resilience) skills into operational theatres (in this case, Afghanistan) demonstrates the utility of FD/APDT (in part) to the development of resilience for front-line application.

However, despite the short term positive outcomes for the four domains of resilience evidenced in this thesis, further longitudinal research is required to fully understand the role of FD/APDT for Future Force (2017) resilience. This research could take the form of continued focus group discussions with identified individuals as part of a long-term understanding of the standalone five-day FD/APDT intervention, participation in the RAF's mandated 5 days every 3 years or the measure of effect for unit FD/APDT interventions in reinforcing the phase 1 and 2 formal FD/APDT interventions.

Critically, it is organisational learning that underpins innovation, adaptation and agility. We therefore require leaders throughout Defence to engage with and drive cultural and behavioural changes that enable learning, including experience from beyond Defence, supported by appropriate structures, processes, tools, training and education (JCN 1/17, 2017, p.10).

In an original contribution to knowledge, this thesis' results, recommendations and limitations with opportunities for further research, demonstrates the immediate perceived positive outcomes of RAF FD/APDT interventions on the psychological, physical, spiritual and social resilience of RAF phase 1 and 2 recruits up to six months (two years in one individual's case) after the intervention. The study also identified FD/APDT's utility as a retention tool for participants but highlighted the requirement for additional FD/APDT intervention reinforcement by Unit stakeholders throughout serving personnel's RAF careers as part of a REP, within a structured RAF Resilience Framework. The study highlighted the requirement for longitudinal resilience research in support of the contribution that FD/APDT interventions have on strategic resilience within Defence and the use of additional specific psychological, physical, social and spiritual resilience questionnaires to ensure a more balanced data collation across the four resilience domains.

As the first research thesis to specifically target RAF FD/APDT's perceived impact on RAF personnel's resilience development, this data provides a starting point for stakeholders in understanding the outcomes of RAF FD/APDT when coupled with the extensive current civilian research. The study acts to stimulate further discussion between RAF and Defence FD/APDT stakeholders in the improvement of extant resilience and conceptual skills learning programme's fidelity and the longitudinal utility of FD/APDT to "focus on student resilience, so that the next generation of people can adapt better, faster and can look after each other so that they are healthy and robust while running at a high pace" (AVM James, 2019, p.93).

This will be required within a coherent, holistic through-career pathway to complement other resilience education interventions and further support operational resilience whilst contributing (in part) to the training pillar of the Project Astra initiative to "build the next generation RAF" (Project Astra briefing notes, 2020, p.8).

This will move RAF resilience education forward, close the theory-practice gap between FD/APDT resilience activities and resilience growth, develop through-career resilience education structure for operational and primary role application and enhance the resilience learning cycle for strategic Defence intent.

Section 6. Limitations and future research.

The intent of this study was never to replicate or duplicate the qualitative anecdotal evidence and findings of past civilian FD/APDT research and transpose them (or reaffirm them) within or through military FD/APDT. This would only confirm or disprove current knowledge and limit the contribution to insightful new knowledge, that could advance the development of FD/APDT programmes within the military and

further align their effectiveness in developing resilience for primary and operational roles for strategic military effect.

Although the results of this study provide strong evidence in support of the five-day RAF FD/APDT intervention in developing physical, psychological, social and spiritual resilience and is supported by research by Carless (2014) and Hill *et al.* (2018), it is apparent that the positive findings require further longitudinal scrutiny. This is most evident in the lack of negative responses provided during the focus groups however, the focus groups participants may have benefitted from being smaller in number and only collecting individual one-to-one evidence or an in-depth interview. Furthermore, participants whom agreed with already recorded comments, should have been required to mark their number against the comment to ensure there were n=33 comments against each of the resilience domains to ensure clarity of the comments recorded. This would further remove any perception of cherry-picking data or influencing by the researcher.

This statistical tallying of comments is close to 'quantitising' qualitative data that could have lost the in-depth flow of discussions that created themes and patterns as was evident during the focus groups. The argument though is that participants may have felt targeted to provide a comment in their own words even though it was the same as another participant had already recorded.

The development of research evidence captured within this study is a starting point from which to devise the collection of big data (Allison *et al.*, 2018) across all RAF FD/APDT. Specifically, within the understanding of resilience and hardiness' relationship as a predictor of military personnel's health and well-being as a result of formalised resilience military training (Lo Bue *et al.*, 2018) to further advance the

organisation's knowledge of FD/APDT's role in the holistic through-career resilience education. The collation of this 'big data' would be a huge resource drain and requires careful management, but is essential for the validation and continued development of FD/APDT interventions within the RAF. This research is further crucial in devising effective FD/APDT resilience education programmes (in part-contribution) to allow the MOD to improve military 'total resilience health' through relevant strategies aimed at building resilience (Daffey-Moore, 2018).

Moreover, the linkages of civilian and RAF research should be moved forward to consider developing anecdotal data from primary roles and operational deployments. This will allow for reviews on the longitudinal impact that FD/APDT through-career interventions have on the effectiveness of RAF service-personnel's resilience, during the completion of their primary role and operational deployments. This will then feed back into the REP and resilience development cycle, to inform decision makers and stakeholders in the changes required within the resilience development aspect of the FD/APDT programmes. This is extremely prevalent considering the frequency and format of future resilience development interventions and the optimum duration, intensity and design of these intervention for maximum effectiveness.

This will ensure the RAF can immediately move forward in both the RAF's and Defence's application of FD/APDT using the extant data and the new mixed-methods data gained from this research thesis, in a holistic approach to FD/APDT research and professional RAF application. The initial findings from this thesis are the first to explore the RAF FD/APDT conceptual skills and resilience trait developmental proponents and acts as a baseline from which to springboard longitudinal RAF specific FD/APDT research. This should lead to organisational

learning for training and education adaptation and innovation (JDP 04, 2010); albeit cognisant of the limitations of this thesis.

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APPENDICES

Appendix 1. Audit trail for thesis trustworthiness.

Auditable activity phase 1: Literature Review. Analysis of the literature regarding Civilian and Military FD/APDT.		
Trustworthiness factors	Date March-August 17	Activity or event: Review of literature themes and development of literature review. This literature review was conducted significantly earlier in the thesis phase to ensure a comprehensive background understanding of the FD/APDT past research literature. This phase took six months.
Credibility	1 March – 28th March 17	<p>Decades of research. The large amount of mixed-methods, quantitative and qualitative research conducted over decades of civilian FD/APDT research provides rich and descriptive narrative of the FD/APDT phenomena for interrogation as part of the strategic mixed methodology adopted for this thesis. Within the past research viewed are wide ranging validated questionnaires used to collate data such as the CDRS (multiple variations), RSES, Leadership Practice Inventory and other conceptual skills measurement tools that have been rigorously tested.</p> <p>At this point I have begun segregating the literature papers into resilience focused themes that includes the literature's understanding of resilience theory, history of FD/APDT and its application in developing resilience. Further themes regarding military utility of FD/APDT and requirements for resilient service-personnel are also apparent.</p>
	28th March to 30th April 17	<p>Evaluate theory of resilience and FD/APDT application. This vast repository of qualitative data has provided multiple themes that begin to repeat themselves, albeit under different headings that demonstrate a lack of forward movement in the literature. Whilst wanting to move military FD/APDT forward, the contribution of qualitative 'rhetoric' from this thesis will not benefit the research. This is a flattening realisation given that just repeating already saturated narrative would render this thesis as not contributing to new knowledge. The other argument is that a limited (20-30 respondents) qualitative data might provide 'in-the-moment' answers and focus groups discussions conducted by a senior officer to young enlisted personnel could be seen a persuading the correct answers and not neutral. This would be a daunting prospect for a phase 2 trainee to not be intimidated or pressured to feel like they had to provide the right answers.</p>
	16 May 17	<p>Given the alignment of civilian and military FD/APDT constructs and conceptual skills development (the cohesive, holistic nature of FD/APDT), this strategic mixed-methods approach will allow new knowledge within military FD/APDT.</p> <p>Re-emerging themes. These themes appear as defining resilience, transfer of learning (isomorphs, tacit knowledge, contextualisation and pre-determinants) but with recognition within the literature of a requirement to move learning forward. There is a real dearth of military focused FD/APDT literature that may prove challenging to extract/compare data. This may also affect the methodology to ensure the</p>

		<p>creation of new knowledge. There are several papers that provide some semi-longitudinal follow-up, but few that develop the professional linkages between the founding principles of the organisation and FD/APDT as integral to the through-career development of its personnel.</p> <p>Military application engrained within organisational doctrine, policy and guidance instead of just reviewing FD/APDT literature entirely, further allowed the essential contextualisation of the thesis' literature review. Whilst remaining within FD/APDT civilian literature, the step up into the organisational doctrine and underpinning conceptual values provided strategic linkages to UK Defence. This also opened another avenue for further research (outside the scope of this literature review and thesis) on the combat operational impact that FD/APDT has on deployed personnel.</p>
Confirmability	19 Jul 17	<p>The cross referencing and analysis of qualitative data. I have structured the literature review to provide flow to the chapter to provide confirmability. Within this, I have ensured research papers (that provide a balanced view of FD/APDT and criticise its validity) are sourced to ensure a balanced holistic assessment of the FD/APDT field within the literature review.</p>
Dependability	March-August 17	<p>Cross validation of multiple qualitative and quantitative approaches to FD/APDT research with similar themes emerging. To ensure the dependability of the literature, I have conducted a wide review of a broad array of literature, to the point that I have been unable to find new research on FD/APDT interventions. This is specific to transfer of learning within FD/APDT papers as the literature begins to go around in circles, repeating past research findings.</p> <p>The literature collated has all been from reputable academic journals, books and accurately referenced and recorded to ensure dependability in the literature review sources and the balanced integration of the arguments presented within the past research.</p> <p>This cross validation has been an ongoing process within the literature review and has formulated challenges within a new approach to the methodology to prevent just adding to old themes. These will be discussed within the methodology audit trail.</p>
Transferability	15 July 17	<p>Military and civilian cohesiveness. Whilst the research could be transferred within organisations, one key issue is the transferability of civilian literature into military FD/APDT. Given the dearth of research on the latter and the similarities of the 2 demographics in terms of FD/APDT intervention designs and claims of conceptual skills development, this helps present the argument to merge the two areas together. This is further apparent when considering the historical beginnings of both strands from the same concept in the early 1930s.</p> <p>Replicability of qualitative data into combined civilian and military fields. Coupled with the transferability of data from one field to another is the evidence within the literature to present this argument. This has been developed through an historical analysis of the origins of both fields and the</p>

		<p>programme's design with facilitation methods used. The use of civilian research into the formulation of military theories and vice-versa is apparent throughout the literature. This evidence of transferability can be used within other groups (and is routinely done so) within groups that use FD/APDT for conceptual growth. The literature review is applicable to them too.</p> <p>This identification is a fundamental underpinning reason for the methodological approach and the synergy of military and civilian literature to help inform both fields.</p>
Authenticity	13 August 17	<p>Re-evaluation of similar themes. To ensure fairness, all stakeholders should be involved in the construction and interpretation of data. Guba and Lincoln (1989, in Milne, 2005) call this ontological authenticity with testimonials of participant's narratives of experience and an audit trial of data and assertions providing the necessary evidence. Such testimonies also provide opportunities for educative authenticity, such that participants develop an awareness of, and empathy for, other constructions. These would seem to be appropriate characteristics for ethical and authentic qualitative research (Milne, 2005).</p>
Summarising Comments		<p>The use of the trustworthiness elements within the literature review have acted as a sound handrail for self-critical analysis of both my stance as a researcher but also as in the holistic field of FD/APDT research that can be used to synergise the literature. The cross-checking of the validity of research resources and their remerging themes must be critically accepted as a stumbling block for FD/APDT. Whilst smaller areas of research may be possible within the themes, they are unlikely to garner genuine new evidence to the FD/APDT themes without rebranding old theories; as highlighted in the literature.</p> <p>Future trustworthiness assessments of this thesis must acknowledge the personal and funded potential bias for positive results within past research. Only when these are compared against more measured research papers can a balanced and analytical approach can be achieved.</p>

Auditable activity phase 2: Development of a research question.		
Trustworthiness factors:	Date: November 17 to January 18	Activity or event: Creation of research question and areas of research within the thesis.
	<p>5 November 2018</p> <p>7 January 2018</p>	<p>Overall auditable activity timeline:</p> <p>Discussion with RAF sponsors regarding research proposals and funding. This was conducted with my immediate Chain of Command to establish a suitable research topic. Without any pressure, I outlined my thesis intent to study the immediate impact of FD/APDT on perceived psychological, social, spiritual and physical resilience development.</p> <p>Engagement with University of Wolverhampton regarding research topic and proposal. After approval from the RAF for both the research topic and funding, I approached the University to begin discussions regarding the submission of a research proposal.</p>

	<p>12 February 2018</p> <p>17 February 2018</p> <p>12 March 18</p>	<p>Tutorial. A draft research proposal was discussed at a tutorial with my 2 doctoral supervisors with suggestions made to amend several elements. This process ensured the trustworthiness of my research methodology and transparency by exposing possible issues such as any external pressures on the research such as RAF requirements, the use of established questionnaires and wider FD/APDT past research.</p> <p>Completion and submission of University of Wolverhampton research proposal. After the feedback from the tutorial, I resubmitted a research proposal outlining the methodology to ensure credibility and openness regarding the format of the RAF focused research. This ensured there was no question of potential researcher bias.</p> <p>Submission of research proposal to the Ministry of Defence Research Ethics Committee (MODREC). Using RAF participants requires approval from the MOD hence the requirement for a MODREC research proposal. This ensured the factors of trustworthiness and ethical considerations were presented to the RAF with authority sought to conduct the research.</p>
Credibility	12-17 Jan 18	<p>The research question developed are credible through their achievability during this thesis. Furthermore, there were no pressures by the RAF to conduct research away from my original concept. This also alleviated any additional concerns regarding researcher bias.</p> <p>The questions rely on rigorous analysis to be answered and are not easy questions to simply answer.</p>
Confirmability	12-17 Jan 18	<p>As the research question development is driven by an organisation requirement, their structure could be open to bias. This is recognised within the research and will be routinely audited to ensure no research data gravitates towards possible bias.</p>
Dependability	12-17 Jan 18	<p>The development of the research question to present a non-biased, trustworthy research focus could be replicated without issue. It is likely that for the questions to be replicated though for another organisation, that they would require amending to relate to the respective organisation.</p>
Transferability	12-17 Jan 18	<p>These are organisation specific but can be transferred across to any organisational setting that uses FD/APDT.</p> <p>The transferability is key within differing groups given FD/APDT purported ability to cross multiple divides (group, social, demographics etc).</p>
Authenticity	12-17 Jan 18	<p>The measurement of the immediate perceived impact of the FD/APDT intervention on resilience provides in the moment data. This is authentic raw statistical data that will be married with vast qualitative data surrounding FD/APDT.</p>
Summarising Comments		<p>Although a respectively simple process with regards to auditing the decision-making process behind the research question development, the potential to front-load or implement bias within the questions to lean towards an obvious easy answer to the questions was apparent. To ensure the trustworthiness collective factors were addressed, these individual elements were considered during the completion of this auditable activity phase.</p>

Auditable activity phase 3: Methodology. Considerations mixed-methods data gathering methods.		
Trustworthiness factors	Date	Activity or event: Development of mixed methodology approach.
	Jan- July 18	Permission from RAF 22 Training Group and MODREC.
Credibility	19 Jan 18	<p>Defining the Research methodology. The use of a sequential explanatory mixed-methods could draw this credibility of this methodology into question. The decision to combine qualitative and quantitative data could be viewed as cherry-picking data or not fully completing a mixed-methods approach if merged correctly. This pragmatic approach to this sequential explanatory mixed methodology is highlighted within the literature review regarding the inability of new knowledge development and the jingly-fallacy (Block, 1995) of FD/APDT research.</p> <p>The freedom of manoeuvre and ability to approach this FD/APDT research in an innovative way is required to pull military FD/APDT understanding alongside its civilian counterparts in knowledge but without just adding to the rebranding of old theories. This strategic methods triangulation (Lani, 2018) incorporates decades of civilian research into military research combined with the quantitative analysis conducted for the 250 participants and follow-up focus groups discussions after six months. The vast focus groups discussions, questionnaires, surveys, studies and past research triangulation to form the multiple themes with FD/APDT and resilience development, will ensure the synthesis of data across the field. Lani (2018) describes this as theoretical triangulation: This involves using multiple theoretical perspectives to analyse the data.</p> <p>Another aspect of credibility (alongside triangulation) is member checking which can have its drawbacks given the subjective 'in time' responses by the members if required to please the researcher (Cohen and Crabtree, 2006). This 'requirement to please' was not evident as qualitative focus groups discussions were frank open discussions as demonstrated in the data presentation.</p> <p>Knowing what the likely answers will be to qualitative focus groups discussions is a form of researcher bias that would negate the credibility of this thesis. This is due to the replicated themes and narrative saturating the FD/APDT field. The thesis' collation of follow-up focus groups discussions with the quantitative data gathered immediately after the intervention (combined with the mixed-methods military data) is an exciting prospect to grow military understanding of FD/APDT. Moreover, the mixed-methods data gathering process is reproducible and credible for future similar studies.</p>
Confirmability	25 June 18	<p>Practice reflexivity. "When I ask an air force pilot how this innate knowledge is achieved, or a massage therapist how they can possibly feel what most of us objectively could not, they say they learn it, over time, through practice .Reflexivity is the same. It's not just an attitude but a sensibility we learn over time, as we reinforce certain habits and discard others. Although I'm sure some people are naturally more reflexive</p>

		<p>than others, certain techniques can help build reflexivity muscles (Markham, 2017, p.2).</p> <p>The use of reflexive practice to interpret the qualitative data, the vast themes that emerge from the FD/APDT literature and through the experience gleaned over 2two years of experience, have identified the holistic methodology as the preferred option. This is not without concerns though. The sequential explanatory mixed-methods (within the pragmatic research paradigm) allows for the researcher's understanding of their chosen field (through reflexive practice) and their perception of reality (i.e. ever changing and responsive) to choose the right research methodology and data collection methods. It demonstrates the researcher's understanding of their field, the limitations for the development of new knowledge within existing methodological frameworks in an already saturated and flat hermeneutic spiral of repeated literature themes.</p> <p>There has been a great deal of reflexive practice given the nature of this study and many hard questions asked of research positioning, correct methodology, questions regarding interpretation of qualitative data against quantitative data and researcher bias. Through reflexive practice and the internal questioning of researcher and research methodological credibility, it was concluded that in order for the new knowledge to be developed, this methodology is essential, and that the strategic sequential explanatory mixed-methods approach is a confirmable data gathering method and through reflexive analysis is a replicable and viable research methodology.</p>
Dependability	28 June 18	<p>Audit trail. The use of an audit trail within the auditable thesis phases is an essential opportunity to provide readers and future researchers with a dependable evidence trail of decisions and insights. But this is only as dependable as the researcher completing it and can be manipulated to present certain milestones or perceived evidence to satisfy questions regarding methodology.</p> <p>Cognisant of this potential for dependability of the research methodology to be questioned, the thesis demonstrates adherence to mixed methodology trustworthiness frameworks for both qualitative and quantitative research. This is through the audit trail, transparent analysis of possible methodological weaknesses and addressing issues of potential researcher bias and measures taken to prevent this. These measures include the declarations of funding sources, limitations of research design, scrutiny of the CDRS-25 and focus groups discussions and constraints of current qualitative research within both civilian and military FD/APDT.</p> <p>Dependability was further demonstrated through exposing the weaknesses and limitations of FD/APDT claims and the personal frustration in its inability (not as a panacea for all conceptual skills growth including resilience) to develop. This frank exposure of FD/APDT highlights researcher neutrality and remains evident throughout the thesis to ensure the removal of any perception of bias.</p>
Transferability	30 June 18	<p>Descriptive narrative. The vast amount of FD/APDT qualitative literature available allows for descriptive narrative spanning decades of research to support or refute the mixed-methods findings for this thesis. Moreover, the utility of this</p>

		<p>holistic strategic approach to promote new knowledge and not replicate past findings is a fundamental factor in the methodology. Given the dearth of military FD/APDT specific knowledge and the argument for the similarities of civilian and military conceptual skills development (albeit with different applications, i.e. workplace or warzone), it makes sense to sequentially blend the 2 quantitative and qualitative elements together. This creates the holistic strategic civilian and military FD/APDT new knowledge without just regurgitating and rebranding repetitive themes within FD/APDT literature.</p> <p>Cherry picking data. This is a genuine concern within mixed-methods (or any research) that I have been extremely careful to avoid. Any perception of this has been avoided by ensuring a vast analysis of FD/APDT research and past findings with the utility of a recognised quantitative (and widely validated) questionnaire, qualitative data gathering through focus groups discussions and the demonstration of counter arguments.</p>
Authenticity	30 June 18	<p>Researcher Bias. Removal of bias and the question of any perception of cherry-picking in the blending of the two data sets (after follow-up focus groups discussions to the resilience CDRS-25 survey) must be addressed within the mixed methodology authenticity within the pragmatic paradigm. To rebrand or regurgitate qualitative findings in an already saturated qualitative social science with interlinked commonality within the humanistic adult participants would be a frustrating acceptance that this thesis would not develop new knowledge; a bland and uninspiring concept.</p> <p>Within the pragmatic approach, the acceleration of the military FD/APDT alongside the understanding of civilian FD/APDT is required to bring military knowledge closer to that of its civilian counterparts. This cannot be completed by producing or replicating qualitative rhetoric or trying to create another military specific theme within FD/APDT. The two groups (military and civilian) are the same with regards to conceptual skills growth through FD/APDT albeit with different activities and applications.</p>
Summarising Comments	<p>The methodological approach for this thesis will draw the most questions regarding format and design given its claim of mixed-methods but with six months delay between the two data points. This is essential though as it is unlikely that attitudinal adaptations will occur immediately after the FD/APDT interventions, only behaviours. This 6-month follow-up will capture this initial behavioural adaptation and possible attitudinal changes within a group of phase 2 trainees. It is argued that for the purposes of this thesis and the embryonic nature of military FD/APDT and already saturated civilian rebranding of FD/APDT qualitative findings, an attempt to sequentially combine the two research methods into a coherent strategic forward moving thesis, is required for RAF FD/APDT development.</p>	

Auditable activity phase 4: Data collection and analysis using the CDRS-25 and focus groups.

Trustworthiness factors	Date July-September 18	Activity or event: The collection and interpretation of data for presentation and analysis.
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Credibility	28 Jul 18	<p>The distribution of the questionnaires and the data collection has started with several small auditable issues that need clarification. The questionnaires were delivered at one RRC to ensure all participants were basic, Phase 1 trainees within the same cohort (i.e. basic training).</p> <p>Instructors were briefed on how to administer the questionnaires and each participant given an explanatory sheet on how to complete the questionnaire and their right to withdraw. The questionnaire used was not adapted from the CDRS-25 to ensure no introduction of any additional measures and its format could not be questioned.</p> <p>Quantitative results from CDRS-25.</p> <p>Interpretation and presentation of data. The data analysis of the four resilience factors was challenging given that there are 5 themes within the CDRS-25 that align within the 4 factors for this thesis. This was highlighted in the literature review and carefully conducted. As the CDRS-25 items are broken down by the questionnaire's researchers into their relevant four resilience factors, this made the analysis of the results straight forward in presentation.</p> <p>The questionnaires scores pre and post intervention were scored on a tally chart of their score increase or decrease. These tallies were then recorded numerically and presented as charts for each of the resilience factors.</p> <p>The continued consultation with tutors and researchers in the construct of the methodology and outline of the research led to significant changes in the format of the methodology. The original concept to not include qualitative data from the research participants and use existing data was not deemed congruent with a mixed-methods approach and warranted a rethink of the methodology to use existing follow-up qualitative narrative. This example of member checking and cross-checking of research methodology presents evidence of trustworthiness within the research to ensure credibility.</p> <p>Follow-up - Qualitative focus groups discussions – The follow-up focus groups discussions allowed for the impact that the resilience focused FD/APDT programme had after six months. Many of the interviewees were in Phase 2 training and allowed for descriptive narrative and interpretation of their resilience behavioural adaptations (if any) and impact on perceived resilience.</p> <p>The focus groups discussions were arranged by the trainee's chain of command to ensure there was no researcher or external influencers that could have shaped or pressured the answers provided by the interviewee. Moreover, member checking occurred during the cross-checking of qualitative data (i.e. post intervention follow-up interview within this study) to check data and answers provided were as recorded.</p> <p>To ensure additional credibility in the qualitative phase, I requested that any issues surrounding the question of conduct within the focus groups discussions was highlighted by the participants and the organising staff.</p>
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Confirmability	Apr 19	<p>The use of the same questionnaire and same qualitative group interview implementation procedures with same guidance has provided credibility for the quantitative data collection.</p> <p>The use of tally charts to record to perceived development or reduction in resilience as a result of the five-day intervention is being conducted using the same single sheets with the same metric applied. This is highlighted in the methodology and conducted (collated) over a 2-week period without deviation or change to data recording. Once the tally sheets are finalised and combined, then these will feed into the result presentation and analysis.</p> <p>The ability to confirm the data collection and analysis by subsequent researchers is provided through the detailed methodological explanation, tally chart and interview comments to ensure ease of recording. As there are no qualitative variables that require researchers to interpret the data at this stage, this data collection cannot be manipulated, unless recording errors are present.</p> <p>The triangulation of data is challenging within the quantitative element but can only be triangulated against the qualitative narrative conducted by separate later focus groups discussions six months after the FD/APDT intervention.</p>
Dependability		<p>The use of mixed methodology and the interpretation of results within the sequential explanatory methodology is a recognised and dependable way to develop results through data interpretation. This method is only dependable if completed without researcher bias.</p> <p>Once both elements of the mixed-methods data collection were completed (questionnaire and follow-up focus groups discussions) and to instil dependability through the audit trail, I ensured the cross- checking of data collated and the interpretation of themes within the literature review to support or refute the data during the analysis to formulate future discussion points. These themes were recorded for future analysis. An example of this was the perceived low level of spiritual resilience development and use of only 2 questions within the CDRS that were unbalanced against other themes that had more questions allocated to them. This was part of the CDRS-25 design and could not be influenced to balance the questionnaire. This was highlighted as a weakness within the research design and results analysis to ensure dependability and credibility.</p>
Transferability		<p>If this thesis research is to be duplicated in future, the data collection (using tallies) is a simple data collection tool that can be easily repeated. This may the same for the interpretation of qualitative results due to the different subjective variables already discussed that may affect the qualitative data collated through the focus groups discussions.</p> <p>The descriptive narrative used within the analysis ensured that all aspects of the data interpretation were addressed to ensure credibility and ease of transfer. This was achieved through the recording of both qualitative and quantitative data that deeply analysed the rich data available. These descriptive narrative allow in- depth interpretation of the data and allowed themes for the discussion and strengths/weaknesses within both the</p>

		research design and FD/APDT as a resilience development medium to permeate through the results interpretation.
Authenticity		<p>“Does this device [or method] measure what it is said [or claims] to measure” (Westmeyer, 1981, p.42, in Lomawaima and McCarty, 2003). This was a constant question during this element of the thesis as if there were errors in the validity or authenticity of the data, then the thesis would be rendered untrustworthy.</p> <p>Local evaluations of authenticity, whether dependent on research subject or research investigator, should be respected in accordance with the principle of self-determination, even as researchers struggle to work out their often-anomalous positions as "insider", "outsider", or some combination of both (Brayboy and Deyhle, 2000 in Lomawaima and McCarty, 2003, no page).</p> <p>Change to methodology. The original concept to merge new quantitative military data to civilian past FD/APDT literature to develop a hybrid mixed-methods data gathering was deemed a weak research methodology and changed to ensure authenticity and credibility. Whilst the approach could have been used, the credibility of embryonic RAF FD/APDT research could have been brought into question. In highlighting this point, Jones (2013, p.402) notes that:</p> <p>“A less-than-thoughtful approach to the type of qualitative content analysis or to secondary analysis of existing qualitative data is fraught with incongruences. When using a superficial approach, researchers risk producing findings that are abstracted from the context of data and are not fully developed, which results in interpretations that lack the richness expected of qualitative research. Regardless of the declared orientation or approach to the research purpose and questions, the end product of many published qualitative studies is a list of themes or labels that link segments of data or codes together”.</p>
Summarising Comments		<p>Given the requirement to blend and merge the two data sets together and then link their interpretation, there was a significant threat of researcher bias that could have crept inadvertently into the data blending/merging.</p> <p>To ensure the trustworthiness of the research, I ensured that I remained neutral in the interpretation of the qualitative and quantitative data by ensuring a balanced review of the data and cross checking that I had not inadvertently overlooked any measurements, recordings or presented any perception of bias.</p> <p>This audit trail and the use of inquiry audit (although it has its disadvantages) allowed the cross checking of questionnaire results and answers to ensure understanding of the participants in answering the questionnaires correctly and without any external pressures during both questionnaire completion and focus groups discussions.</p>

Auditable activity phase 5. Results: Trustworthiness in the merging and triangulation of quantitative and qualitative mixed-methods data gathering.

Credibility	To ensure the credibility of results collation and presentation, I separated the two areas' distinctive research elements (questionnaires and focus groups discussions) and presented them accordingly. This provided transparency and credibility to complement the separate mixed-methods data gathering. I then merged the two data sets together to expand on the data gathered as per the
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	<p>sequential explanatory mixed-methods approach. As Fetters, Curry and Creswell (2013, p.2143) outlines, “expansion occurs when the findings from the two sources of data diverge and expand insights of the phenomenon of interest by addressing different aspects of a single phenomenon or by describing complementary aspects of a central phenomenon of interest”. For example, quantitative data may speak to the strength of associations while qualitative data may speak to the nature of those associations”.</p> <p>This expansion and amplification of the themes developed and merged within the mixed-methods allows for the greater understanding and mutual support for the data gathered. The transparency and credibility are further assured through member checking, conducted within each phase of the qualitative and quantitative data gathering. To consolidate this member checking, I evaluated the data gathered and ‘rogue’ answers that may have affected the results but made sure they were included for clarity and thoroughly reviewed any elements of the data gathering where researcher bias may have influenced the data merging.</p> <p>The data merging stage is where most errors could be made the presentation, interpretation and analysis of data that will influence the concluding summary of the entire thesis. This conclusion (if based on incorrect data merging and interpretation) would undermine the validity of the thesis holistic results.</p> <p>The use of a peer review was used to ensure that the results chapter derived by the data merging did not present any concept of researcher bias.</p>
Confirmability	<p>The sequential audit trail for the data merging to ensure confirmability included:</p> <ol style="list-style-type: none"> 1. Complete the analysis and results for each independent data gathering i.e. CDRS 25 and focus groups discussions. 2. Identify emerging themes within both data sets for the 4 areas of resilience for later evaluation and further in-depth analysis. 3. Joint display presentation of integrated results to align with the considerations for data presentation noted by Fetters <i>et al.</i> (2013, p.2151) that “when research question would benefit from a mixed-methods approach, researchers need to make careful choices for integration procedures”. 4. Outline the results for the integration in a textual narrative that amplified the qualitative and quantitative results into a cohesive mixed-methods joint display.
Dependability	<p>Integration procedures. When merging the data sets and providing analysis of the mixed-methods data gathering, this process was peer reviewed by colleagues to ensure no introduction of researcher bias. Reviews of the four resilience themes from the CDRS-25 were analysed against the qualitative data results and placed within the four themes to ensure congruence and adherence to the 4 central themes. Themes not attributed to the four resilience themes were used to develop further data analysis of the FD/APDT i.e. perceived long term impact on through-career resilience and contribution to retention.</p> <p>The development of these themes, the peer review of the data and the merging of the data ensured the dependability of the data merging process was beyond reproach and dependable.</p>
Transferability	<p>“When integrating through <i>joint displays</i>, researchers integrate the data by bringing the data together through a visual means to draw out new insights</p>

	<p>beyond the information gained from the separate quantitative and qualitative results” Fetter, Curry and Creswell (2013, p.2143).</p> <p>The displaying of the data is a crucial element of the research to ensure congruence and transferability. To achieve this, the qualitative and quantitative data results were recorded in separate sections of the results. They were then merged to highlight the themes and results that were affirmed through the mixed-methods. As the themes emerged, they were recorded within the results as a ‘data merging’ section that carefully demonstrated the holistic mixed-methods data development. If the data had been presented as a ‘fait de complete’ then there could be limited interrogation of the separate data gathering results that created the final mixed-methods results.</p> <p>This was essential to ensure the future transferability of the two data sets (and data merging) could be replicated and was transferable as a methodology into another future mixed method research project.</p>
Authenticity	<p>The merging of the two data sets to create holistic results was achieved through using the sequential explanatory mixed-methods process, triangulated with both data sets after themes and analysis were developed. The themes that emerged were cross-checked to ensure they were valid themes and supported by both data sets with any anomalies identified. This was apparent with the spiritual resilience data provided.</p> <p>The implications for this evidence collation, interpretation, analysis and theme descriptors within the results were essential to cross-check and triangulate through both data sets to ensure the evidence-based themes could be expanded upon within the discussion. Having a colleague evaluate the results and emerging themes allowed for peer-review that was supported (during the data collection) by member checking allowed for the authenticity of the results to be checked.</p> <p>This ensured that any question of potential researcher bias was removed at the data collection points, merging and presentation.</p>
Summarising comments	<p>“Group interview would avail the researcher of the opinions of many subjects in a relatively easy-to-access fashion; it thus would complement any other method being used. It would, on one side, "triangulate" the data of formal methodological techniques by adding to them the human element of the voices of multiple subjects; it would, on the other hand, with the cross-referenced multiple opinions stemming from its group nature, lend methodological rigor to the one-on-one interpretive nature of field focus groups discussions and ethnographic reports” (Frey and Fontana, 1991, p.175).</p>

Auditable activity phase 6: Data analysis and discussion		
Trustworthiness factors	Date Apr 19	Activity or event: The development and discussion of research themes that amplified the findings of the thesis research and (without introducing researcher bias) ensured the capture of the relevant discussion topics.
Credibility		Member checking. During the research, the cross checking of members was achieved by building rapport with the participants and reviewing the data and responses for the questionnaires with the participants. Although deemed as a credible trustworthiness tool, Morse <i>et al.</i> (2002, p.16) outlines member checking’s weakness within qualitative data checking:

		<p>“Investigators who want to be responsive to the particular concerns of their participants may be forced to restrain their results to a more descriptive level in order to address participant’s individual concerns. Therefore, member checks may actually invalidate the work of the researcher and keep the level of analysis inappropriately close to the data”.</p> <p>Triangulation. The triangulation of data using the quantitative and qualitative data to develop the discussion required careful consideration to ensure researcher bias was not introduced. The pragmatic assessment and direct correlation between the quantitative and qualitative data combined with the linkages to past research to produce a balanced discussion was achieved by:</p> <ol style="list-style-type: none"> 1. Cross checking of results to qualitative data, ensuring the arguments within discussions were balanced and not favoured towards the RAF FD/APDT as the panacea for all resilience development issues. 2. Analysis of existing data to ensure the use of credible sources to triangulate, corroborate or refute themes occurring through the analysis of results and the development of the discussion. 3. Utilisation of multiple reference sources. 4. Linkages to RAF Future direction and directed towards answering the research question. 5. Ensuring the same social group were involved in the focus groups discussions (I.e. RAF trainees within their first six months of service).
Confirmability		<p>This is a challenge given the use of military referencing resources to contribute to the discussion that may not be easily accessible to civilian researchers without specific permission. Throughout the development of the discussion I have tried to use military unclassified documents that are freely available through open sources. Should future researchers require access to military specific documents, they may have to seek permission. As these documents are not Secret, there should be no issues in obtaining them with MOD permission.</p>
Dependability		<p>The use of an inquiry audit would not be of use here given that this type of external researcher confirmation of the dependability of the research requires that reality is fixed and based on objective truth. This is counter-intuitive to my pragmatic research paradigm</p> <p>For inquiry audits, Lani (2018, no page) states that “it is important to keep in mind that this technique does assume that reality is fixed, and that truth is objectively perceived. This is the case because this technique assumes that the researcher has objectively captured that truth and reality, which can be confirmed by an outside researcher. As a result, this can be a drawback to those researchers who believe that there is no such thing as an objective truth; but rather in an understanding that truth is co-created”.</p>

		<p>Whilst not a practical dependability measure for this thesis, this audit trail (within the different auditable phases of the thesis) provides additional support to this measure of dependability. The audit trail also demonstrates the ease of replicability for future researchers. This is achieved through the clear and transparent explanation of the research methods, potential for bias, use of credible sources and adherence to the trustworthiness frameworks identified within the literature.</p>
Transferability		<p>The key facet of transferability for this discussion is the ability of the transference from military FD/APDT into civilian FD/APDT programmes, to holistically develop the field. Further required is the transference of the results, data and discussion into military (specifically RAF) professional application.</p> <p>Whilst the transferability between civilian and military FD/APDT seems straight forward due to the obvious historical synergies, there are issues in transferring the perception of the discussion points into the mainstream RAF. This is apparent as future researchers may not have had the comprehensive socio-cultural opportunity or understanding of military FD/APDT to contextualise the findings.</p> <p>To ensure this does not become a limiting factor within future transference, the discussion demonstrates neutrality of the interpretation of data, research, current research and applicability to future RAF context. Of concern within transferability is the ability to transfer across the wider RAF given that results were taken from basic trainees but should be transferable.</p> <p>“However, the results still have transferability—as long as the results are applied to exactly the same group” (Statisticshowto.com, 2018).</p>
Authenticity		<p>Ethics. Blodgett <i>et al.</i> (2005, in Milne, 2015) discuss the issues of researchers being thoughtful, anticipating participant’s concerns, protecting individuals who do not want their innermost thoughts revealed and criticised, and being attentive to researcher and peer pressure to participate. However, they do not seem to acknowledge that, for the purposes of the research, informed consent benefits the researchers more than it does the participants (Milne, 2005).</p>
Summarising Comments		<p>The linkage between data, existing qualitative research, discussion points and development moving forward, (RAF specific) requires delicate management to link the separate aspects into a coherent discussion without introducing researcher bias and ensuring transparency.</p> <p>To achieve this, the cross checking of data, use of credible mixed-methods collated data and constant rechecking of past narrative, results and the interpretation of discussion themes, was implemented.</p>

Auditable activity phase 7: Conclusion		
Trustworthiness factors	Date Apr 19	Activity or event: Summarising the thesis findings and discussion themes into a concluding chapter that provides

		<p>future guidance for the thesis' professional application for the benefit of RAF FD/APDT.</p>
<p>Credibility</p>		<p>This element of the thesis to ensure credibility had to be carefully managed to prevent any researcher bias or unbalanced persuasive argument in favour of RAF FD/APDT being introduced. This was achieved through cross-checking the data and results and ensuring the conclusion referenced these results and their influence on the conclusion. If there were no mention of the results, discussion and methodology within the conclusion and just completed with a focus on presenting the right data for the RAF, then this would clearly be derogatory to the thesis.</p> <p>I ensured that the conclusion themes developed from the discussion themes, were created from a balanced analysis of the results. This continuity ensured credibility and allowed the triangulation of data and themes within the thesis, cross-checked against past research, participant's perceptions and application into the RAF for the future use of FD/APDT and this research methodology.</p> <p>The conclusion acted as a capstone for encapsulating the data and analysing the weakness or strengths of the thesis and FD/APDT and allowed for the development of future research dictated /directed by the findings and analysis of data within the research and not through researcher bias of external influences.</p>
<p>Confirmability</p>		<p>Reflexivity. Harvey (2018) notes that "pragmatist's' statements about the essence of truth are about 'attempting to change the way we go about doing things. Pragmatists do not have any notion of a grand scheme to provide the final account of the world; they simply want to use their theories to convince others and to alter their actions".</p> <p>Coupled with my concern not to introduce any perceptions of researcher bias on influence the data and results through my own interpretation, I was extremely conscious about the conclusion that had to thread together the chapters of the thesis and continue to demonstrate neutrality.</p> <p>"A researcher's background and position will affect what they choose to investigate, the angle of investigation, the methods judged most adequate for this purpose, the findings considered most appropriate, and the framing and communication of conclusions" (Malterud, 2001, p.483).</p> <p>This framing of conclusions and the capstone of this thesis requires the careful management of the 'so what' aspect of this thesis and how its research findings can be implemented into a professional context. To achieve this, I ensured the transparency of any pre-conceptions and external influences that could be perceived as researcher bias or that could influence the conclusion and thesis.</p> <p>Whilst this audit trail is not a reflexive journal, its utility as a record of my actions and auditable sections/elements of the thesis allows for its credibility to be scrutinised and ensure transparency.</p>

Dependability		<p>The use of the audit trail for the conclusion includes specific reference to reflexivity to ensure that both self and thesis research reflection was considered. This holistic, reflexive approach to the confirmability and overall trustworthiness of the thesis serves to provide assurance of the removal of any researcher bias.</p> <p>This was achieved through interrogation and a reflexive assessment through analysing all chapters within the thesis to ensure trustworthiness throughout the research.</p> <p>The continual reflexive process conducted throughout this thesis in the reviewing of data and confirmation that all possible areas of contention with regards to trustworthiness are addressed and outlined within the thesis.</p> <p>The main issue of dependability within the conclusion is the final concluding statements that summarise the implementation of research, its credibility in the methodology requirement, the thesis as a trustworthy baseline and starting point for further research into military FD/APDT.</p>
Transferability		<p>The in-depth conclusion has drawn from the descriptive narrative within the research and data collection to ensure the transferability of the research findings can be implemented back into the RAF. This completes the holistic experiential learning cycle and the final stage of applying the learning back into primary professional roles.</p> <p>This transferability is also demonstrated through the ability for researchers to transfer the learning of RAF FD/APDT and this thesis' utility in pairing civilian and military FD/APDT.</p> <p>Throughout the thesis and conclusion, I have been cognisant of any perception that the concluding chapter will be biased in favour of the RAF FD/APDT programme as a panacea for all resilience development requirements. This is clearly not the case and I understand that all researchers whose funding supports research must consider the same perceptions. To alleviate this concern, the conclusion (and entire thesis) continually cross-checks (through reflexive practice) the trustworthiness of the thesis and ensures synergy between research data, discussion, results and conclusion.</p> <p>Without this synergy, the thesis is likely to be considered ineffective in answering the research question and ensuring trustworthiness.</p>
Authenticity		<p>The authenticity of the conclusion and the thesis must answer the reader's question of whether I trust this research. In order to ensure this authenticity (both in its methodology and conclusion), the conclusion was completed using a neutral stance and ensuring the data or research findings were not over inflated in favour of the RAF FD/APDT. Thesis weaknesses and linkages to future research were concluded in a holistic manner to ensure trustworthiness in the concluding comments. Critical to the trustworthiness of the conclusion is the linkage to the other chapters of the thesis in a comprehensive, flowing analysis of the FD/APDT phenomena.</p>

		<p>As Hammersley and Gomm (1997, p.71) states “more commonly, 'bias' refers to systematic error: deviation from a true score, the latter referring to the valid measurement of some phenomenon or to accurate estimation of a population parameter. The term may also be used in a more specific sense, to denote one source of systematic error: that deriving from a conscious or unconscious tendency on the part of a researcher to produce data, and/or to interpret them, in a way that inclines towards erroneous conclusions which are in line with his or her commitments”.</p>
<p>Summarising Comments</p>	<p>This was the most challenging section to combine the comprehensive analysis of the mixed-methods research data into a single cohesive chapter that encapsulated the thesis whilst ensuring trustworthiness remained throughout the entire thesis. Further challenging was the presentation of concluding statements and findings from the research to ensure they were not perceived as weighted in the RAF’s favour and were transparent for the reader and future researchers. Moreover, the conclusion gives an open and honest assessment of the utility of RAF FD/APDT in developing RAF personnel’s resilience and opportunities for advancing further knowledge in this highly specialised field.</p>	

Appendix 2. Connor Davidson Resilience Scale-25.

Content of the 25 Item Connor-Davidson Resilience Scale (Connor and Davidson, 2003, no page).

Item no.	Description.
1.	I am able to adapt when changes occur.
2.	I have at least one close and secure relationship that helps me when I am stressed.
3.	When there are no clear solutions to my problems, sometimes fate or God can help.
4.	I can deal with whatever comes my way.
5.	Past success gives me confidence in dealing with new challenges and difficulties.
6.	I try to see the humorous side of things when I am faced with problems.
7.	Having to cope with stress makes me stronger.
8.	I tend to bounce back after illness, injury or other hardships.
9.	Good or bad, I believe that most things happen for a reason.
10.	I give my best effort no matter what.
11.	I believe I can achieve my goals, even when there are obstacles.
12.	Even when things look hopeless, I don't give up.
13.	During times of stress and crisis, I know where to turn for help.
14.	Under pressure, I stay focused and think clearly.
15.	I prefer to take the lead in solving problems rather than letting others make all of the decisions.
16.	I am not easily discouraged by failure.
17.	I think of self as strong person when dealing with life's challenges and difficulties.
18.	I can make unpopular or difficult decisions that affect other people, if it is necessary.
19.	I am able to handle unpleasant or painful feelings like sadness, fear and anger.
20.	In dealing with life's problems, sometimes you have to act on a hunch without knowing why.
21.	I have a strong sense of purpose in life.
22.	I feel in control of your life.
23.	I like challenges
24.	I work to attain my goals no matter what roadblocks I encounter on the way.
25.	I take pride in my achievements.

Appendix 3. Participant coding.

Participant coding.

Rank	Coding	Age range
A/Cpl	A/Cpl1	18-25
A/Cpl	A/Cpl2	25-30
A/Cpl	A/Cpl3	18-25
A/Cpl	A/Cpl4	18-25
A/Cpl	A/Cpl5	18-25
A/Cpl	A/Cpl6	18-25
A/Cpl	A/Cpl7	25-30
A/Cpl	A/Cpl8	25-30
A/Cpl	A/Cpl9	18-25
A/Cpl	A/Cpl10	18-25
A/Cpl	A/Cpl11	18-25
SAC	SAC1	18-25
SAC	SAC2	18-25
SAC	SAC3	18-25
SAC	SAC4	18-25
SAC	SAC5	18-25
SAC	SAC6	18-25
SAC	SAC7	25-30
SAC	SAC8	18-25
SAC	SAC9	18-25
SAC	SAC10	18-25
SAC	SAC11	18-25
SAC	SAC12	18-25
SAC	SAC13	18-25
SAC	SAC14	25-30
SAC	SAC15	18-25
SAC	SAC16	25-30
LAC	LAC1	18-25
LAC	LAC2	18-25
LAC	LAC3	18-25
LAC	LAC4	18-25
AC	AC1	18-25
AC	AC2	18-25
Total	N=33	

Appendix 4. Focus groups questions.

1. Do you feel that your participation in the FD/APDT intervention has made you more resilient in being able to cope with stressors and if so, how?
2. Thinking specifically about psychological resilience, do you think the FD/APDT has improved your ability to handle military challenges with greater psychological resilience, and if so, how?
3. Thinking specifically about physical resilience, do you think the FD/APDT has improved your ability to handle military challenges with greater physical resilience, and if so, how?
4. Thinking specifically about social resilience, do you think the FD/APDT has improved your ability to handle military challenges with greater social resilience, and if so, how?
5. Thinking specifically about spiritual resilience, do you think the FD/APDT has improved your ability to handle military challenges with greater spiritual resilience, and if so, how?
6. What changes should be made to develop the FD/APDT programmes to promote resilience development?
7. What changes (if any) have you seen in work, life and career perceptions of personal and social resilience as a result of participation in the FD/APDT programme?
8. Do you feel more resilient as a result of your FD/APDT intervention?

9. Do opportunities to take part in FD/APDT encourage you to remain in the RAF?

10. Do you want more opportunities to participate in FD/APDT activities?

Appendix 5. Full data presentation tables and figures.

Table 17. CDRS-25 data gathering in numerical order.

Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
1. Able to adapt to change.	0	0	0	149 (62.86)	68 (28.69)	20 (8.43)	0
2. Close and secure relationships.	0	0	7 (2.95)	122 (51.47)	84 (35.44)	24 (10.12)	0
3. Sometimes fate or God can help.	0	0	2 (0.84)	171 (72.15)	35 (14.76)	23 (9.70)	6 (2.53)
4. Can deal with whatever comes.	0	0	4 (1.68)	70 (29.53)	131 (55.27)	32 (13.50)	0
5. Past success gives confidence for new challenge.	0	0	0	124 (52.32)	103 (43.45)	10 (4.21)	0
6. See the humorous side of things.	0	0	0	201 (84.81)	36 (15.18)	0	0
7. Coping with stress strengthens.	0	0	0	99 (41.77)	95 (40.08)	43 (18.14)	0
8. Tend to bounce back after illness or hardship.	0	0	0	54 (22.78)	109 (45.99)	74 (31.22)	0
9. Things happen for a reason.	0	0	1 (0.42)	180 (75.95)	56 (23.62)	0	0
10. Best effort no matter what.	0	0	2 (0.84)	144 (60.75)	72 (30.37)	19 (8.01)	0
11. You can achieve your goals.	0	0	2(0.84)	138 (58.22)	83 (35.02)	14 (5.90)	0
12. When things look hopeless, I don't give up.	0	0	0	159 (67.08)	78 (32.91)		0

13. Know where to turn for help.	0	0	1 (0.42)	110 (46.41)	103 (43.45)	23 (9.70)	0
14. Under pressure, focus and think clearly.	0	0	0	131 (55.27)	79 (33.33)	27 (11.39)	0
15. Prefer to take the lead in problem solving.	0	0	2 (0.84)	116 (48.94)	98 (41.34)	21 (8.86)	0
16. Not easily discouraged by failure.	0	0	0	95 (40.08)	108 (45.46)	34 (14.34)	0
17. Think of self as strong person.	0	0	2 (0.84)	180 (75.90)	37 (15.61)	18 (7.59)	0
18. Make unpopular or difficult decisions.	0	1 (0.42)	1 (0.42)	169 (71.30)	49 (20.67)	17 (7.17)	0
19. Can handle unpleasant feelings.	0	0	2 (0.84)	193 (81.43)	26 (10.97)	16 (6.75)	0
20. Have to act on a hunch	0	0	4 (1.68)	186 (78.48)	47 (19.83)	0	0
21. Strong sense of purpose.	0	0	2 (0.84)	148 (62.44)	35 (14.76)	52 (21.94)	0
22. In control of your life.	0	0	0	152 (64.13)	54 (22.78)	31 (13.08)	0
23. I like challenges.	0	0	0	181 (76.37)	42 (17.72)	14 (5.90)	0
24. You work to attain your goals.	0	0	0	192 (81.01)	43 (18.14)	2 (0.84)	0
25. Pride in your achievement.	0	0	0	168 (70.88)	31 (13.08)	38 (16.03)	0
Overall Totals		1 (0.01)	32 (0.54)	3632 (61.29)	1702 (28.72)	552 (9.31)	6 (0.10)
Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)

Total available (237 returns x 25 questions = 5925 responses).

Table 18. Results presented into resilience domains and sub factors.

Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)
Factor 1	Personal competence, high standards and tenacity. (Physical Psychological resilience)						
24. You work to attain your goals.	0	0	0	192 (81.01)	43 (18.14)	2 (0.84)	0
12. When things look hopeless, I don't give up.	0	0	0	159 (67.08)	78 (32.91)	0	0
11. You can achieve your goals.	0	0	2(0.84)	138 (58.22)	83 (35.02)	14 (5.90)	0
25. Pride in your achievement.	0	0	0	168 (70.88)	31 (13.08)	38 (16.03)	0
10. Best effort no matter what.	0	0	2 (0.84)	144 (60.75)	72 (30.37)	19 (8.01)	0
23. I like challenges.	0	0	0	181 (76.37)	42 (17.72)	14 (5.90)	0
17. Think of self as strong person.	0	0	2 (0.84)	180 (75.90)	37 (15.61)	18 (7.59)	0
16. Not easily discouraged by failure.	0	0	0	95 (40.08)	108 (45.46)	34 (14.34)	0
Overall Totals	0	0	6 (0.31)	1257 (66.29)	494 (26.05)	139 (7.33)	0
Factor 2	Trust in one's instincts, tolerance of negative effect and strengthening effects of stress. (Physical Psychological resilience)						
20. Have to act on a hunch	0	0	4 (1.68)	186 (78.48)	47 (19.83)	0	0
18. Make unpopular or difficult decisions.	0	1 (0.42)	1 (0.42)	169 (71.30)	49 (20.67)	17 (7.17)	0
15. Prefer to take the lead in problem solving.	0	0	2 (0.84)	116 (48.94)	98 (41.34)	21 (8.86)	0
6. See the humorous side of things.	0	0	0	201 (84.81)	36 (15.18)	0	0

7. Coping with stress strengthens.	0	0	0	99 (41.77)	95 (40.08)	43 (18.14)	0
19. Can handle unpleasant feelings.	0	0	2 (0.84)	193 (81.43)	26 (10.97)	16 (6.75)	0
14. Under pressure, focus and think clearly.	0	0	0	131 (55.27)	79 (33.33)	27 (11.39)	0
Overall Totals	0	1 (0.06)	9(0.54)	1095 (66.0)	430 (25.91)	124 (7.47)	0
Factor 3	Positive acceptance of change and secure relationships. (Social Resilience)						
1. Able to adapt to change.	0	0	0	149 (62.86)	68 (28.69)	20 (8.43)	0
4. Can deal with whatever comes.	0	0	4 (1.68)	70 (29.53)	131 (55.27)	32 (13.50)	0
5. Past success gives confidence for new challenge.	0	0	0	124 (52.32)	103 (43.45)	10 (4.21)	0
2. Close and secure relationships.	0	0	7 (2.95)	122 (51.47)	84 (35.44)	24 (10.12)	0
8. Tend to bounce back after illness or hardship.	0	0	0	54 (22.78)	109 (45.99)	74 (31.22)	0
Overall Totals	0	0	11(0.92)	519 (43.79)	495 (41.77)	160 (13.50)	0
Factor 4	Control. (Psychological Resilience)						
22. In control of your life.	0	0	0	152 (64.13)	54 (22.78)	31 (13.08)	0
13. Know where to turn for help.	0	0	1 (0.42)	110 (46.41)	103 (43.45)	23 (9.70)	0
21. Strong sense of purpose.	0	0	2 (0.84)	148 (62.44)	35 (14.76)	52 (21.94)	0
Overall Totals	0	0	3(0.42)	410(57.66)	192 (27.00)	106(14.90)	0
Factor 5	Spiritual influences. (Spiritual Resilience)						
3. Sometimes	0	0	2 (0.84)	171 (72.15)	35 (14.76)	23 (9.70)	6 (2.53)

fate or God can help.							
9. Things happen for a reason.	0	0	1 (0.42)	180 (75.95)	56 (23.62)	0	0
Overall Totals	0	0	3(0.63)	351 (74.05)	91 (19.19)	23 (9.70)	6 (1.26)
Item	-3(%)	-2(%)	-1 (%)	Nil Change(%)	+1(%)	+2(%)	+3(%)

Whilst the above scores relate to each Item within the CDRS-25, the table below outlines the thematic cumulative results across the four resilience factors identified within the design of the CDRS-25.

Table 19. Resilience factors breakdown of results.

Resilience Factor	-3(%)	-2 (%)	-1 (%)	Nil Change (%)	+1 (%)	+2 (%)	+3 (%)
Factor 1. Personal competence, high standards and tenacity. (Physical, Psychological resilience).	0	0	6 (0.31)	1257 (66.29)	494 (26.05)	139 (7.33)	0
Factor 2. Trust in one's instincts, tolerance of negative effect and strengthening effects of stress. (Physical, Psychological resilience)	0	1 (0.06)	9 (0.54)	1095 (66.0)	430 (25.91)	124 (7.47)	0
Factor 3. Positive acceptance of change and secure relationships. (Social resilience)	0	0	11 (0.92)	519 (43.79)	495 (41.77)	160 (13.50)	0
Factor 4. Control. (Psychological resilience)	0	0	3 (0.42)	410 (57.66)	192 (27.00)	106 (14.90)	0
Factor 5. Spiritual influences.(Spiritual resilience)	0	0	3 (0.63)	351 (74.05)	91 (19.19)	23 (9.70)	6 (1.26)

Factor 1 = 8 items x 237 responses = 1896.
Factor 2 = 7 items x 237 responses = 1659.
Factor 3 = 5 items x 237 responses = 1185.
Factor 4 = 3 items x 237 responses = 711.
Factor 5 = 2 items x 237 responses = 474.

Table 20. One way ANOVA for repeated measures for Factor 1. Personal competence, high standards and tenacity.

Summary of Data for Factor 1. Personal competence, high standards and tenacity.						
	<i>Treatments</i>					
	-2	-1	Nil Change	+1	+2	Total
Question set	8	8	8	8	8	40
ΣX	0	6	1257	494	139	1896
Mean for question set	0	0.75	157.125	61.75	17.375	47.4
ΣX^2	0	12	204335	35764	3681	243792
Std.Dev.	0	1.0351	31.2339	27.4109	13.4476	62.8228
Result Details						
<i>Source</i>		<i>SS</i>	<i>df</i>	<i>MS</i>		
Between-treatments		140559.85	4	35139.9625	$F = 92.04623$	
Within-treatments		13361.75	35	381.7643		
Total		153921.6	39			

The f-ratio value is 92.04623. The p-value is < .00001. The result is significant at $p < .05$.

Table 21. One way ANOVA for repeated measures for Factor 2. Trust in one's instincts, tolerance of negative effect and strengthening effects of stress.

Summary of Data for Factor 2. Trust in one's instincts, tolerance of negative effect and strengthening effects of stress.						
	<i>Treatments</i>					
	-2	-1	Nil Change	+1	+2	Total
Question set	7	7	7	7	7	35
$\sum X$	1	9	1095	430	124	1659
Mean for question set	0.1429	1.2857	156.4286	61.4286	17.7143	47.4
$\sum X^2$	1	25	181225	31452	3564	216267
Std.Dev.	0.378	1.496	40.6934	28.9762	15.0965	63.6235
Result Details						
<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>			
Between-treatments	121275.2571	4	30318.8143	$F = 55.61336$		
Within-treatments	16355.1429	30	545.1714			
Total	137630.4	34				

The f-ratio value is 55.61336. The p-value is < .00001. The result is significant at $p < .05$.

Table 22. One way ANOVA for repeated measures for Factor 3. Positive acceptance of change and secure relationships.

Summary of Data for Factor 3. Positive acceptance of change and secure relationships.						
	Treatments					
	-2	-1	Nil Change	+1	+2	Total
Question set	5	5	5	5	5	25
ΣX	11	519	495	160	0	1185
Mean for question set	2.2	103.8	99	32	0	47.4
ΣX^2	65	60277	51331	7576	0	119249
Std.Dev.	3.1937	40.015	24.1143	24.779	0	51.2673
Result Details						
Source	SS	df	MS			
Between-treatments	51852.4	4	12963.1	$F = 23.09149$		
Within-treatments	11227.6	20	561.38			
Total	63080	24				

The f-ratio value is 23.09149. The p-value is < .00001. The result is significant at $p < .05$.

Table 23. One way ANOVA for repeated measures for Factor 4. Control.

Summary of Data for factor 4. Control						
	<i>Treatments</i>					
	-2	-1	Nil Change	+1	+2	Total
Question set	3	3	3	3	3	15
$\sum X$	0	3	410	192	106	711
Mean for question set	1	0	136.6667	64	35.0856	47.4
$\sum X^2$	3	57108	14750	4194	0	
Std.Dev.	1	0	23.1805	35.0856	14.9778	42.8647
Result Details						
<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>			
Between-treatments	38368.2869	4	9592.0717	$F = 24.0563$		
Within-treatments	3987.3388	10	398.7339			
Total	42355.6257	14				

The f-ratio value is 24.05. The p-value is .0.00004. The result is significant at $p < .05$.

Table 24. One way ANOVA for repeated measures for Factor 5. Spiritual influences.

Summary of Data for factor 5. Spiritual influences						
	Treatments					
	-1	Nil Change	+1	+2	+3	Total
Question set	2	2	2	2	2	10
ΣX	3	351	91	2	6	474
Mean for question set	1.5	175.5	45.5	11.5	3	47.4
ΣX^2	2	61641	4361	529	36	
Std.Dev.	0.7071	6.364	14.8492	16.2635	4.2426	30.0
Result Details						
Source	SS	df	MS			
Between-treatments	4356.04	4	10890.1	$F = 100.0928$		
Within-treatments	544.003	5	108.8001			
Total	4410.4403	9				

The f-ratio value is 100.09277. The p-value is .000006. The result is significant at $p < .05$.

Table 25. Perceived resilience factor percentage development after a five-day FD/APDT intervention.

Resilience domain	Resilience domain factors	Negative development	No change	Positive development
Physical and psychological resilience	Personal competence, high standards and tenacity	n=1 (0.31%)	n=157 (66.29%)	n=79 (33.38%)
	Trust in one's instincts, tolerance of negative effect and strengthening effects of stress	n=2 (0.60%)	n=156 (66.0%)	n=79 (33.38%)
	Control	n=2 (0.35%)	n=136 (57.66%)	n=99(41.90%)
Social resilience	Positive acceptance of change and secure relationships)	n=3 (0.92%)	n=104 (43.79%)	n=130(55.27%)
Spiritual resilience	Spiritual influences	n=2 (0.63%)	n=175 (74.05%)	n=60(25.3%)

Table 26. Focus groups data for psychological and physical resilience.

Results for personal competence, high standards and tenacity factor.	
Positive comments	Negative comments
"I found that my understanding of how to be persistent in pushing others who were struggling physically and psychologically in given tasks got better and I was able to give them a hand. This meant the whole group benefitted". SAC11.	"I didn't really feel pushed as I have done a lot of these things before, but the instructors gave me the lead a few times which was challenging but I didn't get a lot from the week". A/Cpl4.
"The week made me feel more confident with going into (and dealing with) the unknown". LAC3.	"Because I was fit and not scared or stretched by the activities, I just got stuck in to help the other team members out who were from different courses". A/Cpl7.
"We failed an inspection on the morning after the camping expedition and the group had to complete hard physical exercise for 20 mins to correct our issue. It (the physical exercise) was forgotten about and we bonded better to ensure it didn't happen again. I felt better about myself for passing the next inspection and for completing the tasks". AC1.	"I thought the week was excellent but wanted harder challenges to see if I could do them". A/Cpl8.
"The week makes you feel more confident to achieve your ability with everything else that you do out of phase 1 in the main RAF when we graduate". A/Cpl3	
Results for trust in one's instincts, tolerance of negative effect and strengthening effects of stress factor.	
Positive comments	Negative comments
"The experience gave me the ability to rationalise in uncomfortable situations". LAC2.	"I didn't receive enough pressure or challenging enough circumstances". A/Cpl7.
"We got lost during the expedition, it was getting dark and we needed to find the camp. We weren't bothered as we knew we would get there, we	"I was in a really slow group and got frustrated sometimes". A/Cpl4.

had all the kit we needed and each other to get there. The instructor was great in letting us make the mistake safely and supporting us to get to the camp". SAC16.	
"I learnt to control myself in stressful situations such as the tougher parts of caving". SAC13.	
"Taking the lead role in navigation on the hike gave me loads of confidence. My group were really supportive, and this made me want to get them to the top". LAC1.	
"I learned to take a second to gather my thoughts, control my breathing and focus on the task in hand when in high pressure/stress situations". SAC7.	
"The week made me realise that there are worse things that can happen but if I believed I could complete the task; this positive outlook made the team strong and believe they could do it". LAC4.	
Results for control factor.	
Positive comments	Negative comments
"I feel more able to keep emotions in check, to not panic and to lead a group even if I don't know what the activity involves". LAC1	During the discussion after the focus group participants had completed their comments on the white board, they were asked why there were no negative comments about the development of both control and meaning under psychological and physical resilience as a result of the 6-month intervening period between the FD/APDT intervention. There were no negative comments provided despite the researcher's efforts to encourage discourse around this issue, but the participants did refer to the other comments noted under personal competence, high standards and tenacity and trust in one's instincts, tolerance of negative effect and strengthening effects of stress as the same for control and meaning.
"I learned to let common-sense override initial irrational fear of heights and confined spaces and feel more confident in my ability". LAC3	
"I feel able to look at something and compare it to larger adversity and relate to challenges I completed before". SAC15.	
"From my perspective, the week helped me overcome my mental barriers. My team-mates and friends were instrumental in this". SAC3.	
"Yes. The week made me try new activities and sports that pushed me; especially the challenging ones like caving". SAC8.	
"I felt excited that I had done something that made me feel uncomfortable and achieved it". LAC4	
"I was scared of heights during the rock-climbing but smashed it during the activity. I felt great after". SAC14.	
"I felt open minded to try new things after doing new activities that will help with my RAF career". A/Cpl2.	
"I find it much easier to try things that scare me now and show others that are scared that it is no big deal". SAC15.	
"The activity (especially caving) makes you realise that even with your eyes shut and pitch black, it's about trust and drive to continue". LAC2	

Table 27. Focus groups data for social resilience.

Results for positive acceptance of change and secure relationships factor.	
Positive comments	Negative comments
"Leaders had to adapt into their role in order to communicate and overcome a task effectively". A/Cpl1	There were no negative comments regarding the perceived development of social resilience over the 6-month intervening period after the FD/APDT intervention. Both discussion groups believed that social resilience and their group's social cohesion during the intervening period had developed as a result of the FD/APDT intervention and through reflection on their own/social resilience.
"People stepping up into a leadership role due to their confidence to command a task and followership required from peers". A/Cpl5	
"Some people were delegated to lead which put them out of their comfort zone which helped them develop and become more resilient under stress". SAC9.	
"The week allowed me to know who to turn to in challenging situations as you know each other's strengths and weaknesses which developed during the week". SAC13.	
"It (the FD/APDT intervention) taught me how to deal with team members who may be getting stressed in a situation that I understood to get the job done". A/Cpl11	
"The activities helped me adapt within changing situations and able to change my mindset depending on the situation". LAC4	
"I was able to constantly change to the new leader and group members who I had never met before. This made me have to trust new faces". LAC3	
"I had to adapt to work with a new group of people quickly to achieve tasks". SAC13.	
"Working as a group and utilising each other's strengths and weaknesses can instil resilience, as I realised, I don't need to excel in certain areas as a group can cover weaknesses to achieve a goal". SAC15.	
"As a group we adapted easily. We got good feedback from our instructor and beat the other team during team challenges". LAC1	

"The team motivation to push each other as we had achieved a similar task before". LAC2	The participants from both focus groups provided no negative comments of their perceived ability to bounce back from adversity as a result of the intervening period between the FD/APDT intervention. The researcher provided additional discussions surrounding social resilience to promote discourse and clarify any issues regarding resilience but there were still no negative responses.
"The week helped me to know how to move forward onto the next step, whether individually or as a team". SAC6.	
"The week made me realise that whether you approach struggle and setback with a positive mental attitude instead of being dejected and giving up is important". LAC3	
"If something goes wrong, you don't just stop and give up. You solve the problem together. This helps when as a group, you need to do challenges". A/Cpl3	
"When we didn't achieve a task, I wanted to do it again. Not doing well in exams/tests makes you want to try harder". SAC5.	

Table 28. Focus groups data for spiritual resilience.

Results for 'spiritual influences' factor.	
Positive comments	Negative comments
"The FD week allowed me to better understand my own self-reflection and how this helps me". SAC6.	There were no negative comments or statements made regarding the participant's perception of spiritual resilience development despite the researcher's facilitation of questions to stimulate debate regarding spiritual resilience. Many of the participants aligned themselves to the positive comments which were duplicated/repeated by other participants and reinforced during the discussions. Furthermore, 2 of the group (A/Cpls) referred to their earlier comments made during the Psychological and Physical resilience discussion.
"I have a better perspective of risk and transferring it to the reality of what's important". SAC12.	
"I feel more self-assured in dealing with challenging circumstances". SAC16.	
"The FD allowed me to identify my own strengths and weaknesses and develop them for the future". LAC1	
"I feel able to get comfortable with the uncomfortable". A/Cpl6	
"During the activity I had to trust the instructor/man in front, and they had to trust me". LAC2	
"I had to push myself and dig deep to get myself through, especially when going through deep water". SAC5.	
"Tasks became easier once you understood the outcome, especially when your mates remind you of it, i.e. the gratification of achieving the task and my past successes". SAC2.	
"You need this to get through the challenges of the week and I feel this personal spirit is important to get through the hard times". A/Cpl10.	

Appendix 6. Research approvals.

RAF Scientific Assessment Committee
RAF Centre of Aviation Medicine

RAF Henlow
Bedfordshire
SG16 6DN

[REDACTED]
PMRAFNS

Email: [REDACTED]

Tel: [REDACTED]

Dear Sqn Ldr Riley,

‘Measuring the immediate impact on RAF personnel's perceived resilience growth after participation in RAF FD APDT Programmes.’

Thank you for your revised Research Synopsis Application form. I am pleased to confirm that, on the basis of your revised application, the Committee has given your study their favourable opinion, providing the conditions below are met.

1. Please advise the EMSAC Secretariat of any changes/amendments to your research study from that reviewed.
2. Please ensure that your EdD dissertation clearly states that your study represents an immediate assessment of the effectiveness of the RAF FD APDT Programme and that a further longitudinal study might be required to inform future RAF policy.
3. Please send the RAFEMSAC Secretariat a final report on your study including a summary of the results for retention in accordance with the RAFEMSAC Terms of Reference.

This approval is valid for three years and is conditional on adherence to the details in your Research Synopsis Application form.

A copy of this letter will be forwarded to your Research Sponsor for their information.

Please

provide the RAF SAC Secretary with your Sponsor’s contact details.

You have received confirmation that your study does not require ethical review. I have copied this response to the MoDREC Secretariat for their information.

I trust that the above will permit you to proceed with your study on your planned schedule. May I offer you my best wishes in successfully completing your project.

With my kind regards,

[REDACTED]

Chairman
RAF Scientific Assessment Committee

**ROYAL AIR FORCE EXPERIMENTAL MEDICINE SCIENTIFIC ASSESSMENT COMMITTEE
SYNOPSIS APPLICATION FORM FOR RESEARCH STUDENTS**

Date: 12 Mar 18

Name	Sqn Ldr Steve Riley
Degree programme	EdD
University name and postcode	Wolverhampton University, WS1 3BD
Name of academic supervisor	Dr Linda Devlin
Military Sponsor (where applicable)	AVM James (AOC 22 Gp)
Project start and end dates	Mar- Sep 18

A. Has the synopsis been reviewed by your academic supervisor and/or an academic committee?
(e.g. university ethics committee or research review board)

No. Awaiting ethical approval.

**If Yes, please provide the name of the supervisor and/or reviewing committee*

B. Has any part of this synopsis or a related proposal been previously submitted to EMSAC?

No

**If Yes, please provide the MoDREC protocol application number*

1. Study title (25 words):

Measuring the immediate impact on RAF personnel's perceived resilience growth after participation in RAF FD APDT Programmes.

2. Background and rationale (100 words):

In order to influence future RAF FD APDT programme design and measure the impact of these 5- day programmes on RAF personnel's perceived resilience growth, there is a requirement to conduct research on the participants of the current RAF FD APDT scheme that encompasses the RAF Eagles, scheme, phase 1 and 2 training and Unit led FD APDT programmes.

The study will use data collected from 250 participants using the Connor-Davidson resilience Scale Questionnaire.

3. Study objectives:

To understand the impact of the FD APDT five-day interventions on participants perceived resilience.

4. Study design (please check 'x' in all the relevant boxes which apply):

Quantitative

Randomised control trial

Non-randomised (quasi-experiment) trial

Cohort study (prospective or retrospective)

Qualitative

Ethnography

Phenomenological

Grounded theory

Case control study	<input type="checkbox"/>	Narrative	<input type="checkbox"/>
Descriptive study	<input type="checkbox"/>	Case study	<input type="checkbox"/>
Case reports and series	<input type="checkbox"/>	Ideas, Editorials, Opinions	<input type="checkbox"/>
Other*	<input type="checkbox"/>	_____	

**If other, please provide details of the study design*

5. Study participants (inclusion/exclusion criteria where applicable):

250 Serving RAF personnel who volunteer to participate in the study taken from a wide range of trades, service experience and backgrounds. This will ensure a wide range for analysis.

6. Sample size or participant counts (accounting for attrition and withdrawals):

250 volunteer participants – Anticipate 10% attrition. Although the questionnaires will be completed immediately after the intervention, there may be reasons why participants may have to leave the programme or do not complete the questionnaires. 250 participants are the contracted amount through the CDRS-25 that I am funded for and represents approx 10% of overall Eagles and FD participants per year.

7. What data will you collect/measure and how do you propose to use and store the data?

The data collected will be recorded on the CDRS-25 questionnaire and stored in a secure filing cabinet for six months until all of the data has been collated. Once the study has been completed and data collated, then the questionnaires will be destroyed. The storage of all data will be in line with current MOD Data protection policy with SME advice from C4i at RAF St Mawgan.

8. What is(are) your primary outcome measure(s)?

The perceived impact of the five-day intervention on the resilience of the participants in line with the CDRS-25 questionnaire. Predominantly physical, psychological, social and spiritual resilience.

9. Have you identified potential influences in your study design? (e.g. exposures and covariates- quantitative studies)

The influences of peers and perceived requirement to demonstrate resilience growth during the intervention must be mitigated against and participants encouraged to give their true answers in the questionnaire.

10. Analysis:

a. What analytical methods will you use?
Cluster Analysis will be used to identify similarities between participants and develop groupings.

b. How will you address bias in your study (e.g. selection bias, confounding, missing data)?
A transparent and unbiased review of the data and presentation of results will be essential and provided by an honest appraisal of the data provided. Moreover,

participants will be encouraged to provide honest and un-pressured answers to their questions within the CDRS-25, with anonymity assured during the study.

11. Strengths of your proposed study:

Using a recognised and empirically supported questionnaire adds validity to the research design and ensures parity for all of the participants.

12. Limitations of your proposed study:

The data will only provide immediate responses to the perceived impact of the FD/APDT intervention on participant's perceived resilience.

13. Planned dissemination of study results (please check 'x' in all the relevant boxes which apply):

Submission as university dissertation	<input checked="" type="checkbox"/>	Presentation at scientific conference	<input type="checkbox"/>
Publication in peer-reviewed journal	<input type="checkbox"/>	Presentation at institutional meetings	<input checked="" type="checkbox"/>
Other* <input type="checkbox"/>	_____		

**If other, please provide details*

Participant Information Sheet

Please use this template or alternatively ensure that all the headings from below are included in your version of the Participant Information Sheet

Study Title

Measuring the immediate impact on RAF personnel's perceived resilience growth after participation in RAF FD APDT Programmes.

MoDREC Application No: xxx/MoDREC/2020

Invitation to Take Part

As a participant of the RAF Eagles, FD/APDT Scheme, you are invited to take part in this important research to determine the impact that your five-day intervention has on developing resilience.

What is the Purpose of the Research?

In order to influence future RAF FD APDT programme design and measure the impact of these five-day programmes on RAF personnel's conceptual resilience, there is a requirement to conduct research on the participants of the current RAF FD APDT scheme that encompasses the RAF Eagles, scheme, phase 1 and 2 training and Unit led FD APDT programmes.

Who is Doing This Research?

Sqn Ldr Steve Riley (SO2 FD APDT Requirements and Delivery), HQ Robson Academy of Resilience, 22 Trg Gp.

Why Have I Been Invited to Take Part?

As a participant of the RAF Eagles Scheme, your input into this research on the impact of the five-day intervention on resilience will contribute to the future development of the scheme.

Do I Have to Take Part?

No. This is an entirely voluntary research programme.

What Will I Be Asked to Do?

You will be required to complete a short 25 Item questionnaire on the first day of the intervention and then complete the same questionnaire on the last day of the intervention. Your scores are anonymous and will not be attributed to any individual.

What is the Device or Procedure That is Being Tested?

The Connor Davidson Resilience Scale is being used to capture the perceived resilience development through participation in the five-day FD/APDT intervention.

What are the Benefits of Taking Part?

The data collated from this research will provide 22 Gp with the requisite information to understand the perceived resilience development attributed to RAF FD/APDT interventions. This will further allow the Eagles Team to amend the five-day interventions to address deficits in resilience development identified through the completed questionnaires.

What are the Possible Disadvantages and Risks of Taking Part?

There are no discernible disadvantages or risks in taking part in the study. The questionnaires are voluntary and anonymous.

Can I Withdraw from the Research and What Will Happen If I Withdraw ?

Yes. There are no repercussions if you withdraw from the study, but the loss of data may restrict the overall understanding of resilience development during FD/APDT.

Are There Any Expenses and Payments Which I Will Get?

No.

Will My Taking Part or Not Taking Part Affect My Service Career?

No.

Whom Do I Contact If I Have Any Questions?

Sqn Ldr Steve Riley (SO2 FD/APDT Requirements and Delivery) [REDACTED]
[REDACTED]

Whom Do I Contact If I Have a Complaint?

Sqn Ldr Steve Riley (SO2 FD/APDT Requirements and Delivery) [REDACTED]
[REDACTED]

What Happens If I Suffer Any Harm?

If you suffer any harm as a direct result of taking part in this study, you can apply for compensation under the MoD's 'No-Fault Compensation Scheme.

What Will Happen to Any Samples I Give?

Not applicable for this study.

Will My Records Be Kept Confidential?

Yes. The completed anonymous questionnaires will be retained in accordance with MOD data protection policy until the data has been collated. Once the study has been completed, the questionnaires will be destroyed..

Who is Organising and Funding the Research?

AOC 22 Gp.

Who Has Reviewed the Study?

This study has been reviewed and given favourable opinion by the Ministry of Defence Research Ethics Committee (MoDREC).

Further Information and Contact Details

Name : Steve Riley

Address : [REDACTED]
[REDACTED]

Tel No : [REDACTED]

E-mail : [REDACTED]

Compliance with the Declaration of Helsinki

This study complies, and at all times will comply, with the Declaration of Helsinki¹ as adopted at the 64th WMA General Assembly at Fortaleza, Brazil in October 2013.

¹ World Medical Association Declaration of Helsinki [revised October 2013].
Recommendations Guiding Medical Doctors in Biomedical Research Involving Human
Subjects. 64th WMA General Assembly, Fortaleza (Brazil).

Arrangements for the Payment of No-Fault Compensation to Participants in MoDREC Approved Studies²

1. The MoD maintains the 'No Fault Compensation Scheme' specifically for the payment of no-fault compensation to, or in respect of, a volunteer who suffers illness and/or personal injury as a direct result of participating in research conducted on behalf of the MoD. The no-fault compensation arrangements apply to research participants (Military, Civilian, or non-MoD) who take part in a trial that has been approved by the MoD Research Ethics Committee.
2. A research participant wishing to seek no-fault compensation under these arrangements should contact the Directorate of Judicial Engagement Policy, Common Law Claims and Policy (DJEP-CLCP), Ministry of Defence, Level 1, Spine 3, Zone J, Whitehall, London, SW1A 2HB who may need to ask the Claimant to be seen by a MoD medical adviser.
3. CLCP will consider reasonable requests for reimbursement of legal or other expenses incurred by research participants in relation to pursuing their claim (eg. private medical advice, clinical tests, legal advice on the level of compensation offered) provided that they have been notified of the Claimant's intention to make such a claim.
4. If an injury is sufficiently serious to warrant an internal MoD inquiry, any settlement may be delayed at the request of the research participant until the outcome is known and made available to the participant in order to inform his or her decision about whether to accept no-fault compensation or proceed with a common law claim. An interim payment pending any inquiry outcome may be made in cases of special need. It is the Claimant's responsibility to do all that they reasonably can to mitigate their loss.
5. In order to claim compensation under these no-fault arrangements, a research participant must have sustained an illness and/or personal injury as a direct result of participation in a trial/study approved by MoDREC. A claim must be submitted within 3 years of when the incident giving rise to the claim occurred, or, if symptoms develop at a later stage, within 3 years of such symptoms being medically documented.
6. The fact that a research participant has been formally warned of possible injurious effects of the trial upon which a claim is subsequently based does not remove MoD's responsibility for payment of no-fault compensation. The level of compensation offered shall be determined by taking account of the level of compensation that a court would have awarded for the same injury, illness or death had it resulted from the Department's negligence.
7. In assessing the level of compensation, CLCP, in line with common law principles, will take into account the degree to which the Claimant may have been responsible for his or her injury or illness and a deduction may be made for contributory negligence accordingly.
8. In the event of CLCP and the injured party being unable to reach a mutually acceptable decision about compensation, the claim will be presented for arbitration to a nominated Queen's Counsel. CLCP will undertake to accept

² Section agreed with DJEP-CLCP Dep Hd 28/10/13.

the outcome of any such arbitration. This does not affect in any way the rights of the injured party to withdraw from the negotiation and pursue his or her case as a common law claim through the Courts.

Additional/Alternative Compensation Arrangements

9. **Compensation for Service Personnel.** Service personnel who took part in studies before 06 April 2005 and who consider that they may have suffered later harm or disability due to that study should contact MoD Defence Business Services-Veterans (DBS-Vets), Service Personnel and Veterans Agency (SPVA) for consideration of a war disablement pension. The personnel who are entitled to make claims under the war disablement pension scheme are laid out on the SPVA website,³ as are details of the claim's process.
10. In the event of service personnel suffering injury or disability as a result of their participation in MoDREC approved MoD research on or after 06 April 2005 then they may be entitled to compensation under the Armed Forces Compensations Scheme (AFCS). The details of the AFCS are promulgated on the MoD Intranet,^{4,5} and are also available on the DBS-Vets website.⁶ Claims should be made to DBS-Vets following the instructions available on the MoD Intranet and DBS-Vets website.
11. In the event of service personnel suffering injury or disability as a result of their participation in MoDREC approved MoD research which is sufficiently serious for subsequent medical discharge from the services, their medical records will automatically be forwarded to DBS-Vets for consideration of compensation and pension enhancements⁷ in addition to whatever MoD pension/gratuity they are already entitled to by virtue of their service. Similarly, in the event of death as a result of their participation in MoDREC endorsed MoD research, their dependants may be entitled to receive a supplemented pension.
12. However, if either a Service person or their dependants receive payment under the MoD 'no fault compensation' arrangements (or as the result of a common law compensation claim) for the same condition as that for which a pension is received, any pension entitlement may be reduced since compensation should not be paid twice for the same injury, disability or death.
13. **Civilian Pensions.** In the event of a civilian research participant suffering injury or disability as a result of their participation in MoDREC endorsed MoD research sufficiently serious for them to subsequently suffer a loss in earnings capacity; they may be eligible for benefits under Section 11 of the Principal Civil Service Pension Scheme (PCSPS). Further details are available in the PCSPS booklet Injury at Work. Similarly, in the event of death as a result of

³ http://www.veterans-uk.info/pensions/wdp_new_index.html

⁴ DIN

<http://defenceintranet.diif.r.mil.uk/libraries/corporate/DINS%20Archive/2008/01102RestrictDINs.pdf>

⁵ Armed Forces Compensation Scheme - Statement of Policy.

http://defenceintranet.diif.r.mil.uk/libraries/library1/DINSJSPS/20110714.1/974_AFCS_Statement%20of%20policy4.pdf

⁶ http://www.veterans-uk.info/pensions/afcs_new.html

⁷ http://www.veterans-uk.info/pensions/med_discharge.html

participation in MoDREC approved MoD research, their dependants may be entitled to receive benefits.

14. **Common Law Compensation.** If a research participant or their representative believes that injury, disability or death was caused by the negligence of the MoD or its staff, and do not wish to pursue the possibility of a 'no-fault' compensation payment, a common law claim for compensation should be submitted to Directorate of Judicial Engagement Policy, Common Law Claims and Policy (DJEP-CLCP) (at the address in Para 2 above) detailing the full facts of the claim and stating that common law compensation is being sought.

Multinational/Multicentre Research and Research Involving Other Government Departments

15. When MoDREC is involved in studies which involve Departments other than the MoD there may be a requirement for specific Compensation Arrangements on a study by study basis.

Ref: RESPROP PD(Oct 2017)	
FOR OFFICE USE ONLY Received by: Date:	Student Number:
	Proposed DoS:

Research Proposal: Professional Doctorate

Sections A and B are to be completed by the student in conjunction with Studies, prior to submission to the appropriate Faculty Research Committee, necessary guidelines when completing this form.

SECTION A:

A1: PERSONAL DETAILS

Title (Mr / Mrs / Miss / Ms etc)	Family Name on 10th Birthday
Mr	Riley
Family Name	First / Given Name(s)
Riley	Steve
Main Contact Address	Home Address (if different)
██████████	
██████████	
██████████	
Postcode	Postcode
██████████	
Main Contact Telephone Number	Mobile Phone Number
██████████	
Home Telephone Number (if different)	Fax Number
E-mail Address	
██████████	

SEX:	Date of Birth (e.g. 15/03/1972)						
Male (M)	<input checked="" type="checkbox"/>		Month		Year		
Female (F)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Programme of study of which the research project is to be a part.

Name of programme	Start date (mm/yy)	Expected date of completion (mm/yy)	Faculty	Level/ Credit Rating	Mode of Study (Full- or part-time)	Module code
EdD (Educational Enquiry)	Oct 15	Oct 19	Ed	8	PT	

SECTION B: DETAILS OF YOUR RESEARCH PROPOSAL

This section should be completed with the guidance of your proposed Director of Studies

B1: YOUR PROPOSED RESEARCH PROJECT:

PROPOSED TITLE OF THE PROJECT: Bulletproofing the mind- The impact of RAF Adventurous Personal Development Training Programmes on participant's resilience.

PROJECT SUMMARY
Background.

Adventurous Personal Development Training (APDT) has been identified as a viable training intervention for psychological well-being and resilience development in participants (Harun and Salamaddin, 2014; Paisley *et al.*, 2008; Neill and Dias, 2001 and Hattie *et al.*, 1997). However, Brown (2010), Zink and Dyson (2009), Brooks (2003), Harmin (2002), Atwater (1992) and Clark (1992) question the degree of positive effects of APDT programmes on an individual's conceptual skills growth (which includes psychological resilience development). Whilst both challenging and supporting the use of APDT programmes in the transfer of conceptual learning, there is agreement that further research and evidence is required (Sibthorp, 2003; Conger, 2002). Specifically, further interrogation of the APDT programme's design, student's antecedents to APDT programmes, addressing the theory-practice gap, in APDT, the role of the facilitator and the impact of reinforcement of APDT learning (Harper, 2010; Lave, 1996 and Ewert, 1989). With Scrutton's (2015) perception that this argument is unlikely to dissipate any time soon, there is a pressing requirement to evidence research to substantiate the claims of APDT researchers and providers (Rhodes and Martin, 2014). This is especially prevalent when considering these programmes as viable psychological resilience growth interventions.

Within a military context, one such mandated APDT scheme that focuses on developing resilience and other psychological concepts in conjunction with conceptual skills, is the Royal Air Force's (RAF) Force Development/APDT (FD/APDT) scheme. The FD/APDT concept utilises major (overseas) and minor (UK) expeditions, APDT programmes during Phase 1, 2 and 3/career points at FD Centres or Main Operating Bases (MOB) and the RAF Eagles Scheme⁸. In addition, these APDT interventions incorporate single or multiple Adventurous Training (AT) activities coupled with significant RAF historical events.⁹ The scheme's outputs are completed in an arduous outdoor environment to align the holistic APDT concept as a medium for facilitation, to meet the aims of the Generic Performance Statement (GPS)¹⁰. The GPS aligns the conceptual, moral and physical skills required of a RAF Officer or Airman/women against a generic, through-career framework for their careers, with 'Physical and Mental Stress', cited by Joint Service Publication 898 (2016) as a fundamental psychological factor of any service-person.

In highlighting the connecting themes of resilience and its perceived development through military APDT, the literature review will tie together the parallel research fields of resilience psychology, APDT in developing resilience and current theories of military resilience to identify synergies and conceptual linkages within the literature. In developing the Airman's resilience, the wider APDT interventions are cited as being underpinned through the promotion of resilience growth theory including neurogenesis, psycho-neuroimmunology, neurophysiological, and cognitive behaviour psychological growth in order to develop coping strategies for adversity (Sherman and Morley, 2015; Sibthorp and Jostad, 2014; Moffett, 2012; D'Amato and Krasny, 2011).

Moreover, the proposed transfer of learning from APDT programmes to participant's primary role is that the transferable skills learned in an austere and

⁸ The Eagles scheme consists of 18 separate, 1 day to 2 week programmes designed around significant historical events in the RAF's history.

⁹ Predominantly the Eagles Scheme.

¹⁰ The GPS consists of Conceptual, Physical and Moral skills/traits.

hazardous environment within the APDT programme, are then theorised as having the same tacit knowledge and psychological capital transfer of learning into an operational theatre (Rhodes and Martin, 2014). This seems promising for the future APDT programme design for the military application of APDT programmes, but not without evidence to build bridges across the theory-practice gap of APDT programmes.

Whilst Allan *et al.*(2012) provides research data supporting the use of APDT programmes in developing psychological resilience, civilian APDT and adventure educators researchers on both sides of the argument for whether or not APDT has utility as a resilience development medium, call for additional research into the effect of APDT programmes on career and life-long resilience development (Rhodes and Martin, 2014 and Brooks, 2003). Considering this dearth of military specific APDT available research, there is an absolute requirement to reach into civilian literature¹¹ to underpin, inform and evolve RAF FD/APDT programmes and interventions; especially when viewing the benefits claimed by these programmes. Indeed, most of the military APDT research focuses on the improvements made in psychological resilience concomitants in the field of mental health and in particular, the treatment of PTSD and stress after military operations (Vella, Milligan and Bennett 2013; Wagenfeld, Roy-Fisher and Mitchell, 2013 and Ewert *et al.*,2011). To the best of the researcher's knowledge, there have been no UK based military studies on the use of APDT programmes in enhancing resistance to over-stressed, pre-determinants. This is in part due to the embryonic use of APDT programmes alignment to conceptual skills and psychological resilience growth within the RAF, specifically resilience development. More-over, due to the short-term 'spikes in perceived conceptual developments' after APDT interventions (Ward and Yoshino, 2007), the role of essential 'follow-up' of APDT learning (in particular, resilience) has also been left wanting within both civilian and military academia (Rickinson, 2004). The concept advanced here is that by decreasing the time in between APDT or resilience trait growth interventions, the individual's skill fade or loss of learning also decreases as the learning is routinely reinforced in keeping with the theory of psychological resilience growth.

Methodology.

The 250 volunteer participants for the study will be RAF personnel with varying lengths of service, age, gender and background. This demographic data will not be used within the study as the focus will be on the 'RAF recruit,' irrespective of demographic specifics. Using the Connor Davidson Resilience Scale, the study will follow the proposed resilience growth of 250 subjects before and immediately after their initial exposure to a five-day Adventurous Personal Development Training intervention, with a focus groups discussion conducted with approx. 20-30 participants, six months later as part of a sequential explanatory mixed methodology. The questionnaires will be conducted face to face to provide quantitative data that will provide unique data in the field of APDT and Educational Enquiry within the RAF. This research will inform future research and programme design to positively affect RAF personnel's resilience growth through these APDT interventions.

¹¹ Due to this dearth of military specific literature on resilience growth through Force Development programmes (other than mental health and PTSD treatment), the paper uses current civilian academia with reference to military issues weaved into the narrative.

The research aims to couple research to inform the future APDT programme design and contribute to the wider APDT academia. This is essential if the RAF is to actively apply its theories and constructs into a 'through-career' resilience pathway. Furthermore, the role of the APDT programme's impact on military sociology and RAF retention remains an un-researched area. Due to this lack of past research on resilience development through APDT within the RAF, it is essential to review the available literature from the theory of resilience, theoretical issues surrounding resilience development, military application, contextualisation of resilience interventions, training and education gaps and the use of APDT programmes in developing resilience.

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B2: COLLABORATING INSTITUTION/AGENCIES:

Confidentiality/Collaboration agreements must be received by the FRC in order for the registration to take effect.

Will the proposed research project involve work, or support from, an external organisation? (please tick)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<input type="checkbox"/>
If YES , please insert the name and address :	Royal Air Force, RAF St Mawgan.	

B3: ETHICAL IMPLICATIONS:

Guidance available from University Ethics web page <https://www.wlv.ac.uk/research/about-our-research/policies-and-ethics/ethics-guidance/>

Will the proposed involve formal approval by an Ethics Committee? (Please tick)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<input type="checkbox"/>
If YES , which internal and external committees will be approached?	RAF and WLV	

B4: ACTION PLAN:

See Guidelines for completion for further details

<p><i>Action Plan</i></p> <p>Months 1-3 Completion of Introduction and initial literature review framework. The completion of the initial literature review will allow the interrogation of any past research on Adventure education within the military and comparable research within resilience and outdoor education. During this phase, initial groundwork will be made in collating subject matter expert advice from leading outdoor education practitioners within both the military and civilian fields.</p> <p>Months 4-6 Research into academic questionnaires to be used for the research and completion of ethical approval forms. During this phase it is essential that MOD and University approval is sought for a structured methodology through advice and discussions with module tutors.</p> <p>Months 7-9 Completion of methodology for the methodology. Using the information gathered from months 4-6 into the most effective and applicable questionnaire (Resilience Self Evaluation Scale or</p>

Connor Davidson Resilience Scale), this third phase will allow for the completion of the methodology for the research and allow for adjustments prior to commencing the actual study.

Months 10-16 Data collection phase. Due to the nature of the study that focuses on long term impact of resilience development after the adventure education programme, it is essential that six months is allowed to review the changes that occur throughout this time. Whilst this course of study cannot allow for time over the six months to collect data, it will provide solid grounding for further research.

Months 17-20 Write up results. Through consultation with tutors, this 3 months will be dedicated to writing up the statistical results to present both qualitative and quantitative data.

Months 20-23 Discussion write up.

To ensure the above action plan is enforced and adjusted accordingly, there will be routine scheduled meetings with the thesis supervisors at the University and agreement on the submission of elements of the action plan for gradual and progressive advice as the thesis evolves.

B5: SUPERVISION

To be completed by proposed Director of Studies

Please note that a candidate for a higher degree - whether registered at the University of Wolverhampton or elsewhere - is ineligible to act as a member of a supervisory team for another higher degree candidate.

In the case of a candidate proposing to work outside the UK, the proposed research project must be supported by an existing academic link between the University and an appropriate institution in the applicant's country of residence. It may be appropriate for a member of that institution to be appointed (with her/his approval) as a supervisor and be cited below, or to act as an advisor on the project.

Name of Director of Studies:	Dr Linda Devlin		RI/RC/School*:	Education	
No. of current supervisions:	Masters	Doct oral	No. of successfully completed supervisions:	Masters	Doct oral
		12		150	8
If the Director of Studies were returned to a RAE, what Unit of Assessment would they be linked to (please see list in section E)?					

Name of second supervisor:	Dr Val Hall		RI/RC/School*:	Education	
No. of current supervisions:	Masters	Doct oral	No. of successfully completed supervisions:	Masters	Doct oral
If the second supervisor were returned to a RAE, what Unit of Assessment would they be linked to (please see list in section E)?					

Name of second	Dr David Scott	RI/RC/School*:	Education
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supervisor:					
No. of current supervisions:	Masters	Doctoral	No. of successfully completed supervisions:	Masters	Doctoral
If the second supervisor were returned to a RAE, what Unit of Assessment would they be linked to (please see list in section E)?					

**If any member of the supervisory team is external to the University, please give contact details here*

B6: RESOURCE IMPLICATIONS:

Please detail in this section ALL projected resource implications for the duration of the project. Against each Item, please state who will be responsible for funding (e.g. RI, approved Unit, School, Student, Collaborating Institution, Sponsor). If the funding is yet to be sought for individual Items, please state the contingency agent responsible should the application for funding fail.

REQUIREMENT (please add as appropriate)	AGENT RESPONSIBLE FOR FUNDING
Supervisory/ tuition fees	Royal Air Force
Bench/Lab fees	Possible costs for the use of questionnaires Royal Air Force
Research Visits	Royal Air Force
Training	Royal Air Force
Conference attendance	Royal Air Force
Other (please specify)	

THIS FORM SHOULD NOW BE FORWARDED TO THE RESEARCH ADMINISTRATOR IN THE APPROPRIATE RESEARCH INSTITUTE OR APPROVED UNIT.

SECTION C: FINAL APPROVAL

I confirm that this proposal has been discussed at FRC, that account has been taken of the present supervisory load of the members of the proposed supervisory team, and that the proposal has been approved.

I confirm that appropriate confidentiality and collaboration agreements have been received and approved by the FRC, as detailed in section B2. I approve the resource implications detailed above in Section B6.

I confirm that the candidate was registered for the degree of Professional/Practitioner Doctorate (or equivalent) on:

Signature of the Postgraduate Research Tutor **Date**

Please tick✓	CRS Code	Course	SMB
	BM025P01UV/BM025P31UV	Practitioner Doctorate Clinical Physiology	FSE RIHS
	BM010V31UV	Professional Doctorate Biomedical Science	FSE RIHS
	ED037R31UV	Doctorate in Education (Professional Practice)	FEHW
X	ED038R31UV/ED038V31UV	Doctorate in Education (Educational Enquiry)	FEHW
	HW001R31UV/HW001V31UV	Doctorate in Health and Wellbeing	FEHW
	PS002P01UV/PS002P31UV	Practitioner Doctorate Counselling Psychology	FEHW
	PS018P31UV/PS018V31UV	Practitioner Doctorate Counselling Psychology Top Up TBV	FEHW
	PS002V01UV/PS002V31UV	Professional Doctorate Counselling Psychology	FEHW

Ethics Submission Form 2018 Faculty of Education, Health and Well-being

- *You must complete all sections of this form in as much detail as possible. (word counts are given if necessary) If your form is incomplete, it will be returned to you to resubmit.*
- *You must be given approval for your research project from the University before you can begin.*
- *Applications should be submitted by 1st Monday of each month to FEHWResearch@wlv.ac.uk*

SECTION ONE

1. Enter Your First Name and Surname Below:

First Name	Steve
Surname	Riley

2. Enter your University Student/ Number

--

3. Enter your University e mail address (e.g. M.Name@wlv.ac.uk)

--

4. Enter your daytime contact telephone number in case we need to contact you.

--

5. Enter the name of your Project Supervisor, Director of Studies, or Principal Investigator.

Dr Linda Devlin

6. Which subject area is your research / project located? Please ✓ all that apply

		✓
1	FEHW	✓
2	Education	
3	Health	
4	Sport	
5	Psychology	
6	FSE	
7	FOSS	
8	FOA	
9	COLT	
10	Cross University Project	
	Other – Please give details below:	

7 Please indicate if this study is

	✓
Staff Research (Externally funded)	
Staff Research (University funded)	

8. Which Category of Project Are You Applying For?

Categories are outlined in the handbook from the RPU (www.wlv.ac.uk/rpu) Please tick ✓

Category A	✓	Category B		Category 0	
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9. Give details of service user involvement

--

SECTION TWO

10. What is the title of your project?

The immediate and short-term impact of a five-day RAF Adventurous Personal Development Training intervention on Psychological, Physical, Social and Spiritual Resilience Growth

11. Give details of any proposed research questions/hypothesis

The hypothesis for the research is that RAF Adventurous Personal Development Training (APDT) interventions develop resilience and conceptual skills for participants. However, there are no research studies that demonstrate the immediate impact of these RAF interventions have on the participant's resilience growth and professional effectiveness within their primary roles and wider Defence.

12. Briefly outline your project, stating the rationale, aims and expected outcomes. (300 words)

The aim of the project is to understand the impact that a five-day RAF APDT intervention has on the immediate development of participant's psychological, physical, social and spiritual resilience. The indicative results from the period of study will inform RAF stakeholders on the impact the intervention has on participants and how to develop the programmes as part of a holistic approach to better protect and insulate RAF personnel from the unique stressors of military service. The RAF run 19 separate five-day interventions that are aligned to the RAF's Generic Performance Statement that further outline the educational requirements of its personnel.

The Connor Davidson Resilience Scale will be administered to 250 personnel at the start of the five-day intervention and then after the intervention to capture the perceived immediate impact the intervention had on the participants. There will be a group discussion after six months as part of a sequential explanatory mixed methodology. The findings from the research will then be used to demonstrate how the FD/APDT interventions can be used within a professional context throughout a RAF service-person's career.

13. How will your research be conducted? (750 words max.)

**Describe the methods so that it can be easily understood by the ethics committee.
Please ensure you clearly explain any acronyms and subject specific terminology.**

The 250 volunteer participants for the study will be RAF personnel with varying lengths of service, age, gender and background. This demographic data will not be used within the study as the focus will be on the 'RAF recruit,' irrespective of demographic specifics. Using the Connor Davidson Resilience Scale, the study will follow the proposed resilience growth of 250 subjects before and immediately after their initial exposure to a five-day Adventurous Personal Development Training intervention with a group discussion conducted six months after the intervention.

The questionnaires will be conducted face to face to provide quantitative data that will be analysed alongside the comprehensive existing qualitative narrative within the field of APDT and Educational Enquiry within the RAF. The group discussions will be conducted within similar social groups (approx 30-50 RAF trainees) who took part in the intervention within six months. This research will inform future research and programme design to positively affect RAF personnel's resilience growth through these APDT interventions.

The research aims to couple research to inform the future APDT programme design and contribute to the wider APDT academia. This is essential if the RAF is to actively apply its theories and constructs into a 'through-career' resilience pathway. Furthermore, the role of the APDT programme's impact on military sociology and RAF retention remains an un-researched area. Due to this lack of past research on resilience development through APDT within the RAF, it is essential to review the available literature from the theory of resilience, theoretical issues surrounding resilience development, military application, contextualisation of resilience interventions, training and education gaps and the use of APDT programmes in developing resilience.

14. How will your data be analysed?

Using the Connor-Davidson Resilience Scale-25 and group discussions as the main data collection methods, the individual 25 questions will be split into the four resilience factors (psychological, physical, social and spiritual) as per the questionnaire's design and analysis of pre and post intervention recorded for each individual question. These will then be collated under the themes and presented within the results. These themes will then be expanded on during the group discussions.

In accordance with the research ethics and data protection, no personal details will be recorded and the questionnaires will be destroyed as soon as the data has been analysed and recorded.

15. Is ethical approval required by an external agency? (e.g. NHS, company, other university, outside organisation, etc.)

- 2. YES – Ethical approval from the MOD Ethics Committee has been sought and approved.
- 3. YES - see contact details below of person who can verify that ethical approval has been obtained)

██████████
RAF Scientific Assessment Committee
RAF Centre of Aviation Medicine
RAF Henlow
Bedfordshire
SG16 6DN
Secretariat:
██
██
██

16. What in your view are the ethical considerations involved in this project? (e.g. confidentiality, consent, risk, physical or psychological harm, etc.) Please explain in full sentences. Do not simply list the issues. You should also make it clear how you are going to deal with issues with regard to your own welfare and safety.

Areas	✓	Intervention
Confidentiality		
Consent		
Participants Under 18		

17. Have participants been/will participants be, fully informed of the risks and benefits of participating and of their right to refuse participation or withdraw from the research at any time?

- 1. YES (Outline your procedures for informing participants in the space below.)

The participants will be briefed on the outline of the study and that they can withdraw at any time without prejudice. There are no risk associated with the data gathering and research and that all of their questionnaires will be anonymous.

18. How will you ensure that the identity of your participants is protected (See RPU website (www.wlv.ac.uk/rpu) and follow link to Ethical Guidance pages for guidance on anonymity)

In accordance with the research ethics and data protection, no personal details will be recorded and the questionnaires will be destroyed as soon as the data has been analysed and recorded.

19. How will you ensure that data remains confidential ((See RPU website (www.wlv.ac.uk/rpu) and follow link to Ethical Guidance pages for definition of confidentiality)

In accordance with the research ethics and data protection, no personal details will be recorded and the questionnaires will be destroyed as soon as the data has been analysed and recorded. Notes taken during the group discussion will also be destroyed once the data has been collated.

20. How will you store your data during and after the project? (See RPU website (www.wlv.ac.uk/rpu) and follow link to Ethical Guidance pages for definition of and guidance on data protection and storage).

The data is to be stored in the Commanding Officer's lockable cabinet within the Robson Resilience Centre in which the questionnaires are being completed. The questionnaires will all be shredded after collation of the data.

SECTION THREE

The following questions must be answered otherwise your form will not be reviewed and it will need to be resubmitted to the panel at a later date.

21. Does Your Research Involve Children Under 18 years of Age?

Please delete and leave your response below

1. No

22. Are participants in your study going to be recruited from a potentially vulnerable group? (See RPU website (www.wlv.ac.uk/rpu) and follow link to Ethical Guidance pages for definition of vulnerable groups)

No

23. Does your research fit into any of the following security-sensitive categories? (For definition of security sensitive categories see RPU webpages (www.wlv.ac.uk/rpu) follow links to Ethical Guidance). If so please complete questions 22-26

	Security Sensitive Categories	If YES, please tick below. ✓	If NO, please tick below. ✓
1	Commissioned by the military	Yes	
2	Commissioned under an EU security call		
3	Involve the acquisition of security clearances		
4	Concerns terrorist or extreme groups		

24. Does your research involve the storage on a computer of any records, statements or other documents that can be interpreted as promoting or endorsing terrorist acts? Please delete and leave your response below.

NO

25. Will your research involve the electronic transmission (e.g. as an email attachment) of any records or statements that can be interpreted as promoting or endorsing terrorist acts? Please delete and leave your response below.

NO

26. Do you agree to store electronically on a secure University file store any records or statements that can be interpreted as promoting or endorsing terrorist acts. Do you also agree to scan and upload any paper documents with the same sort of content? Access to this file store will be protected by a password unique to you. Please confirm you understand and agree to these conditions.

1. YES I understand and agree to the conditions

27. Do you agree NOT to transmit electronically to any third party documents in the University secure document store?

1. YES I agree

28. Will your research involve visits to websites that might be associated with extreme, or terrorist, organisations? (for definition of extreme or terrorist organisations see RPU webpages (www.wlv.ac.uk/rpu) and follow links to Ethical Guidance.

2. NO

29. You are advised that visits to websites that might be associated with extreme or terrorist organisations may be subject to surveillance by the police. Accessing those sites from University IP addresses might lead to police enquiries. Do you understand this risk?

1. YES I understand

30. Appendices (All submissions) Please list the items that you are submitting with this document. (These will need to be submitted to FEHWRsearch@wlv.ac.uk) You may want to include additional information that will help the panel with their decision such as your proposal. You need to provide examples of research instruments, recruitment posters and leaflets, information sheets (age appropriate) assent forms (for children), consent forms, risk assessment if research is carried out abroad .

1. MOD Research Ethics Cttee endorsing letter (below)

Section 4

CONFIRMATION OF ETHICAL APPROVAL AND FEEDBACK ON SUBMISSION

TO BE COMPLETED AS INDICATED, BY MODULE LEADER, SUPERVISOR AND/OR HEAD OF ETHICS PANEL

CATEGORY A PROPOSALS:

I confirm that the proposal for research being made by the above student/member of staff is a category A proposal and that s/he may now continue with the proposed research activity:

For a student's proposal – Name of module leader or supervisor giving approval	
--	--

For a member of staff's proposal – name of Head of Ethics panel giving approval	
Signed	
Date	

CATEGORY B PROPOSALS:

I confirm that the proposal for research being made by above student/member of staff is a category B proposal and that all requirements for category B proposals have been met.

On behalf of students (only):

Name of module leader or supervisor	
Signed	
Date	

On behalf of members of staff and students

I confirm that the proposal for research being made by above student/member of staff is a category B proposal and has the following decision

<p>Approved with no conditions/ amendments. Continue with study.</p>
<p>Approved subject to conditions. Make minor/major amendments.</p>
<p>Not Approved – Substantial re-write. Resubmit as New application</p>

Signed	
Name of Chair of Ethics Panel	
Date	

Checklist of submissions required for Category B proposals:

Outline summary: rationale and expected benefits from the study, with a statement of what the researcher is proposing to do and how	
Explanation of the methodology to be used	
An information sheet and copy of a consent form to be used with subjects	
Details of how information will be kept	
Details of how results will be fed back to participants	
Letter of consent from any collaborating institutions	
Letter of consent from head of institution wherein any research activity will take place	

ALL PROPOSALS:

Office Use Only:	
Submission Number	
Date of Review	
Identified Category	
Decision	
Comments and Feedback	
Proposed Actions	
Date of Further Review	
