A multi-method approach to investigating psychological resilience in a conscripted basic military training environment

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A Multi-method Approach to Investigating Psychological Resilience

in a Conscripted Basic Military Training Environment

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I declare that the entire work presented in this thesis is the result of my own work.

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Abstract

While research on psychological resilience has spanned almost five decades, discrepancies remain in the way the construct is conceptualised, operationalised, and measured. The can be attributed to the context-dependent nature of the construct; adversity experienced may vary across situations and populations, and positive adaptation is manifested differently under various conditions. As there is little research being carried out to examine psychological resilience in a conscripted military environment, this research was conducted with Army conscripted recruits from the Singapore Armed Forces to address the gap in knowledge. Specifically, this research focused on the basic military training (BMT) phase when recruits were newly enlisted. To better understand psychological resilience in the military context, a systematic review (Study 1) was first conducted to examine how military communities around the world had conceptualised, operationalised and measured psychological resilience. Subsequently, four studies were conducted to: (1) conceptualise and operationalise psychological resilience specifically in the BMT context; (2) measure the recruits' psychological resilience in BMT; (3) assess the criterion validity of psychological resilience in BMT; and (4) examine how psychological resilience in BMT could be enhanced. Study 2, a qualitative study, examined what the recruits considered as adversities in BMT and what helped them to adapt positively. Thematic analysis using data from semi-structured interviews conducted with the recruits (n=22) elicited a number of themes which were then mapped to 10 psychological variables such as optimism, five skills including goal setting and three external sources of support (e.g., peer support), and these were found to have helped the recruits to adapt positively during BMT. Consequently, psychological resilience in BMT was conceptualised and operationalised as an internal capacity and psychological process. As an internal capacity, psychological resilience is made up of multiple internal psychological variables or protective factors (e.g., pride and optimism) and as a psychological process, it involves the recruits appraising the adversities and how internal and external protective factors facilitate them to adapt positively. To keep this research focused and to better understand the internal factors, Studies 3, 4 and 5 examined psychological resilience as an internal capacity. A questionnaire was subsequently developed to measure the internal psychological variables found in Study 2, and psychological resilience and performance in BMT. Study 3 found that the recruits' (n=378) sense of pride, hope, perseverance, purpose and optimism were positively related

to psychological resilience and performance in BMT as measured by self-report, peer appraisal and qualification for leadership training. Study 4 further found that psychological resilience in BMT was a higher-order construct that comprised pride, perseverance, purpose and optimism and it was also positively related to the recruits' (*n*=437) performance. Finally, Study 5, a group randomised trial (GRT), examined whether psychological resilience in BMT could be enhanced with a targeted training intervention. The recruits in the treatment group (*n*=242) took lesson on how to enhance their pride, perseverance, purpose and optimism while the recruits in the control group (*n*=238) learnt deep breathing and visualisation. A 2 x 2 repeated measures factorial ANOVA was carried out using time of measurement (before and after intervention) and whether the recruits took part in the training intervention as the independent variables, and psychological resilience scores as the dependent variable. It was found that the recruits' psychological resilience scores improved following the training for the treatment group but not for the control group. The theoretical and research implications, limitations of the research and possible future research directions, and implications for organisation practices are discussed in the concluding chapter of this thesis.

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Chapter 1:   Introduction

This chapter provides the background and rationale of the research to present the case for studying psychological resilience specifically in a basic military training environment involving conscripts. The chapter introduces the construct of psychological resilience and advocates a context-dependent approach to study it. The detail of the research environment is then provided to highlight the context of this research. Finally, the chapter sets out the aim, broad research approach, research questions, and concludes with a guide to the thesis structure.

1.1.   Psychological resilience – definitions, conceptualisation and theories

Individuals generally experience multiple challenges and setbacks in the course of their lives ranging from daily school, work, and family stressors to more traumatic life events such as involvement in life-changing accidents, being diagnosed with serious illnesses and experiencing the passing of loved ones. In a study to examine the frequency and impact of exposure to trauma involving a non-clinical sample of 3,575 adults, Ogle, Rubin, Berntsen and Siegler (2014) found that 90% had experienced one or more such potentially traumatic events in their lifetime. The word "potentially" indicates differences in how individuals appraise such events, and then cope and adapt. To illustrate, an 11-year-old Singaporean boy decided to jump 17 floors from his bedroom window in 2016 after receiving his examination results. The State Coroner concluded that the boy appeared to have "*buckled under his parents' pressure*" (Chelvan, 2016). Athletes such as Andy Murray continue to compete despite suffering multiple defeats and injuries over the years; it was revealed in 2017 that he had to manage his hip problem for at least seven years before his Wimbledon title defence (Pisani, 2019). Against all odds, Corporal Dipprasad Pun, a Gurkha soldier, single-handedly defeated more than 30 Taliban fighters instead of hiding or running away (Bingham, 2011). These are the phenomena and personal experiences that researchers studying psychological resilience in recent years seek to understand.

Numerous theories have been developed over the years by different researchers to explain psychological resilience. For example, Garmezy, Masten and Tellegen (1984) theorised that risk and protective factors, both internal and external to the individuals, can have influences on how they adapt to an adversity, and impact the outcome following exposure to the adversity. These risk factors aggravate the effects of exposure to the

adversity while the protective factors buffer the individuals against the negative effects. Furthermore, resilience researchers in general agree that risk factors have a cumulative effect and a greater number of risk factors increases the risk of worse coping and poorer outcome. For example, Rutter (1979) found that there was a higher probability of psychiatric disorder with an increased number of risk factors; 1% for one risk factor and 21% for multiple risk factors. Masten and Narayan (2011) labelled this as the "*dose effect*" (p. 227), with higher the dose, the worse the outcome. Kumpfer (1999) added that protective factor also has the same cumulative effect in that the more protective factors an individual has, the more likely he or she can cope better and arrive at a more positive outcome following exposure to adversity.

Most resilience theories address specific population [e.g., patients with mental disorders (King, King, Fairbank, Keane, & Adams, 1998) or children growing up with poverty (Werner and Smith, 1982)] and research aim [e.g., to uncover what risk and protective factors can influence psychological resilience (O'Dougherty-Wright, Masten, Northwood, & Hubbard, 1997) or to examine the range of possible resilience outcomes (Bonanno & Diminich, 2012)]. Hence, it has led researchers such as Fletcher and Sarkar (2013) to suggest that some of these theories may not be applicable in another context because the nature and intensity of adversity vary in different settings and the presence of protective factor is dependent on what is available in the environment. However, there is a generic metatheory of resilience and resiliency proposed by Richardson (2002) which is widely cited by researchers across different settings over the years (see e.g., Connor & Davidson, 2003; Kumpfer & Bluth 2004; Luthans, Vogelgesang & Lester, 2006; Galli & Vealey, 2008; Davydov, Stewart, Ritchie & Chaudieu, 2010; Fletcher & Sarkar, 2013; Kossek & Perrigino, 2016).

Richardson (2002) suggested that biopsychospiritual balance or homeostasis allows individuals to adapt to current life circumstances and this adaptation involves the body, mind, and spirit. This homeostasis is constantly being challenged by stressors, adverse events, or what Richardson labels as "*life prompts*" (p. 311). He added that individuals' ability to cope and adapt to these stressors or adverse events are influenced by internal resilient qualities, protective factors and previous experience or resilient reintegrations. The interaction between daily stresses and protective factors determines whether serious disruptions will occur and impact the individuals. The model illustrates

a psychological resilience process that begins with a state of biopsychospiritual homeostasis (see Figure 1.1). This is considered a comfortable zone where an individual is physically, mentally, and spiritually balanced. When stressors, adversities or life events occur, the protective factors buffer an individual against the negative effects. Next, a disruption from this homeostatic state occurs if and when the protective factors fail to protect the individual. The individual who is disrupted will begin to adjust and reintegrate. This reintegration process can result in four different outcomes: (1) resilient reintegration with the attainment of additional protective factors and a higher level of homeostasis; (2) homeostatic reintegration when the individual remains in his or her comfort zones for the disruption to dissipate; (3) reintegration with loss where there is loss of protective factors and a lower level of homeostasis; and (4) dysfunctional reintegration when the individual resort to destructive behaviours.
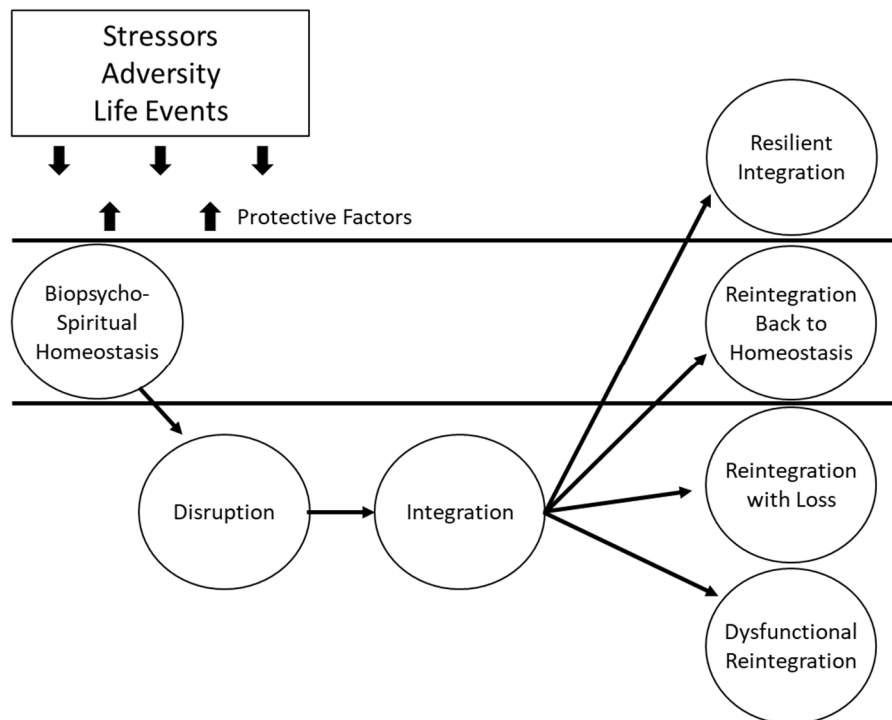
Figure 1.1: Richardson's resiliency model. Adapted from "The metatheory of resilience and resiliency." by G. E. Richardson, 2002, *Journal of Clinical Psychology, 58*, p. 307. Copyright 1999-2019 by John Wiley & Sons, Inc.

The resilient reintegration process involves experiencing new insights and these may lead to improvement and growth. Reintegration can also lead to the strengthening of existing protective factors or identification of new ones. To illustrate, suppose a soldier was confronted with rocket attacks during a combat deployment. His homeostatic state

was disrupted because he appraised the adversity to be life-threatening. External protective factors such as a cohesive section might buffer the soldier against the negative impact of the experience as the soldier knew that he could rely on his peers for physical help and emotional support. Consequently, resilient reintegration could occur as his homeostasis state was enhanced, and the soldier might gain an additional protective factor in the form of closer relationship with a particular peer who came to help. Homeostatic reintegration occurred when the soldier, while concerned about his safety, did not get adversely affected by the event possibly because he had encountered this previously, and remained in his comfort zone for the disruption to go away after the rocket attacks threat was lifted. Reintegration with loss occurred with a lower level of homeostasis when the soldier was overwhelmed with fear, broke down and lost his self-confidence; loss of protective factor. Finally, dysfunctional reintegration could occur if the soldier resorted to destructive behaviours such as turning to alcohol or drug to lessen his disappointment in himself.

Unlike long-established individual difference constructs such as personality which are associated with generally prevalent and accepted theories including McCrae and Costa's Big Five personality traits (McCrae & Costa, 1997), psychological resilience is a more disputed concept. There are vast differences in views about psychological resilience as the construct has been defined, conceptualised and operationalised differently by various researchers over the years. For example, Garmezy (1991) defined psychological resilience as "... *the capacity for recovery and maintained adaptive behaviour that may follow initial retreat or incapacity upon initiating a stressful event.*" (p. 459). He conceptualised the construct as an internal capacity and in this perspective, psychological resilience can be considered as an ability, trait or state. Bonanno, however, defined psychological resilience as "... *very simply as a stable trajectory of healthy functioning after a highly adverse event.*" (Southwick, Bonanno, Masten, Panter-Brick & Yehuda, 2014, p. 2); merely an observable outcome. Yet another different definition was provided by Richardson; "... *the process of coping with stressors, adversity, change, or opportunity in a manner that results in the identification, fortification, and enrichment of protective factors.*" (Richardson, 2002, p. 308). This definition identifies the construct as a psychological process that involves interactions between individuals and factors in the environment such as the adversity or stressor and external protective factor.

In a more recent plenary session involving prominent resilience researchers that took place at the 2013 meeting of the International Society for Traumatic Stress Studies, it was noted that defining resilience was one of the most pressing current questions in the field of resilience research (Southwick et al., 2014). The panel concluded that as psychological resilience is a complex construct, it may be defined differently depending on the research context (Southwick et al., 2014). Hence, when studying psychological resilience, it is important for researchers to highlight whether the construct is being conceptualised as an internal capacity, outcome or psychological process.

A more extensive discussion of the theories, definitions, conceptualisations and operationalisation of psychological resilience is provided in Chapter 2 (literature review) to draw attention to the discrepancy in views.

1.2. Context is a key consideration in the study and understanding of psychological resilience

While there is no consensus in the definition and conceptualisation of psychological resilience, most researchers would agree on the presence of common phenomena. These include: (1) adversity; (2) risk factors that can aggravate the effects of exposure to the adversity and protective factors that can buffer individuals against the negative effects of exposure the adversity; and (3) and the notion of coping or adaptation following exposure to the adversity. These appear important for understanding psychological resilience in the right context (e.g., Rutter, 2013; Fletcher & Sarkar, 2013; Southwick et al., 2014).

Context is an important consideration in resilience research because the nature and intensity of adversity differ between different settings, and individuals' appraisal of how stressful an adversity is will vary depending on individual differences. For example, in an academic setting, adversity in the form of examination stressor can induce students to be mentally pressured, but in a combat operational environment, the challenges can be more physical in nature where there is potential risk of injury and even death. Psychological resilience is also contextual in terms of what risk and protective factors are available both internal and external to the individuals. For example, soldiers may have been trained to self-regulate their emotions and this skill can serve as an internal protective factor to help them manage the stressors during operation, but students may not have this skill because it may not be taught in school. Context is also an important

consideration in resilience research because positive adaptation can be manifested in different forms and the focus on what behaviours to observe will vary depending on the research aim and question. For example, in the military operation context where soldiers can experience extremely traumatic event during combat, researchers may observe and consider positive adaptation as the absence of PTSD upon returning home (Maguen, Turcotte, Peterson, Dremsa, Garb, McNally & Litz, 2008). However, in the teaching environment where the adversities are relatively less intensive, researchers may investigate adaptation in relation to the teachers' stress levels to predict attrition, and positive adaptation may be demonstrated when the teachers stay on the job (Buchanan et al., 2013). Adversity, risk and protective factors, and adaptation are similarly discussed in detail in the literature review (Chapter 2).

1.3. Context – Singapore Armed Forces, National Service and Basic Military Training

The Singapore Armed Forces (SAF) was established in 1965 following the independence of the country. It consists of three services: (1) the Singapore Army; (2) the Republic of Singapore Air Force (RSAF); and (3) the Republic of Singapore Navy (RSN). The mission of the SAF is to enhance Singapore's peace and security through deterrence and diplomacy, and should these fail, to secure a swift and decisive victory over the aggressor. To prepare itself for war, however unlikely it may occur, the SAF engages in training both locally and overseas, participates in bilateral and multilateral exercises with other armed forces, and deploys its personnel for missions both locally and in aid of other countries overseas. These missions include: (1) protection of local key installations that are under potential threat from terror attack; (2) peace support operations (PSO; e.g., UN peacekeeping mission in Timor-Leste); (3) multinational reconstruction efforts in countries including Iraq and Afghanistan; (4) counter-piracy effort such as those in the Gulf of Aden; (5) search and locate operations (missing Malaysia Airlines Flight MH370); and (4) humanitarian assistance and disaster relief (HADR) missions in Indonesia, Thailand, Nepal, New Zealand and more.

With Singapore's small population and the need to channel resources to develop the country's economy, it was decided at the onset that the country's defence must be placed in the hands of citizen soldiers. Conscription in the form of NS was approved by the Parliament and established in 1967. The first batch of recruits were enlisted for full-

time NS on 17 August 1967. Today, all medically fit male citizens are enlisted when they turn 18 years old and will serve out full-time NS for two years. Exemption is only granted to those with severely permanent physically or mental health conditions. Thereafter, they will be considered fully operational and must serve out another 10 years for up to 40 days a year akin to reserve service.

All recruits, upon enlistment, have to first undergo different types of basic military training (BMT) and they are assigned based on their physical and mental status after a thorough medical examination. The standard BMT lasts about eight weeks with the initial three weeks spent in confinement (i.e., not allowed to leave the training camp even on weekends). BMT is conducted in Pulau Tekong, an isolated island located in the north-east of Singapore, by the Basic Military Training Centre (BMTC). The sole purpose of the centre is to conduct BMT and generate soldiers to be deployed to active SAF units or other more advance training centres such as leadership training institutions.

On the very first day of BMT, the recruits have their heads shaved, issued with uniforms, and denied privacy and the use of first names. Their daily routine is highly controlled and their whereabouts are dictated by the trainers. The recruits' sleep and wake cycles are determined by the trainers, and they have to march from point to point. They must ask permission for almost everything including going to the washroom or even to speak. There are prescribed ways for the recruits to fold their uniforms, where to place their toothbrush and toothpaste in the cupboard, and how to make their beds. All these are done to condition them to conform to military norms. Any deviation will be met with punishments that can include longer period of confinement, restriction of privileges such as not being allowed to visit the canteen or summary punishment including push-ups on the spot.

During the eight-week BMT, the recruits will be taught individual-level soldering skills including weapon handling, grenade throwing and negotiating obstacle course. The physical training involves swimming, running, weights training and route marches. All these training will culminate into the final week of field camp where the recruits will spend five days out in the field learning individual field crafts including camouflaging themselves, judging distance and combat movements. They will be deprived of basic comfort like shower or a proper bed and be subjected to the mercy of the weather and other living beings such as snakes, spiders, scorpions and wild boars. During field camp,

they will also be expected to dig a shell scrape each on their own, and the activity can last for hours or even days for some. Finally, prior to graduating after eight weeks of intensive training, the recruits will have to march 24km in full combat gears. Most recruits will find the BMT experience physically, mentally and emotionally challenging. However, all recruits who graduate from BMT will leave Pulau Tekong with newfound confidence, more friends and new skill sets as they transformed from being civilians to soldiers.

As BMT can often be physically demanding and mentally stressful for some recruits, it is inevitable that a number of them will drop out of training from time to time. Reasons for recruits dropping out of training can include but not limited to physical exhaustion or injury sustained during training, being given medical certificate (MC) because of sickness such as high fever or serious flu, or mentally too stressed out to continue participating in certain activity. While it is not uncommon for recruits to drop out of some training during BMT for these reasons, missing too many important lessons or activities can result in them being taken out of the course and not graduating after eight weeks. Depending on the nature of attrition, those recruits who failed to complete BMT will either have to attend it again at some point during their NS or be downgraded in their Physical Employment Standard (PES) status such that they cannot be deployed in combat vocation. If the recruits have to be re-coursed, it represents time and resources wasted for them and the SAF, and if they are downgraded in PES status, the SAF loses resources for deployment. Hence, it is in the interest of the recruits and the organisation that attrition rate be kept low.

1.4.   The case for studying psychological resilience in this research

While psychological resilience has been studied in the military environment (e.g. Hendin & Haas, 1984; Solomon, Elder & Clipp, 1989; Aldwin, Levenson & Spiro, 1994; Bartone, 1999; Maguen et al., 2008; Bartone, Hystad, Eid & Brevik, 2012; William et al., 2016), the construct has not been studied extensively in a basic training environment involving conscripted recruits. As highlighted, context is an important consideration in resilience research. Here, the focuses are on the contextual differences: (1) basic training instead of more advance training or operational environment; (2) conscripts instead of career soldiers; and (3) new recruits instead of seasoned soldiers.

The nature and intensity of adversity can differ between a basic training and more advance training or operational environment. For example, in a study conducted by

Stretch et al. (1996) to assess the effects of war on the psychological health of 1,524 military personnel deployed to the Persian Gulf during Operations Desert Shield/Desert Storm in Iraq, the authors found that among other stressors, boredom was reported by up to 85% of the veterans to be a source of stress as they dealt with waiting and inactivity. In the basic training environment, which this research was undertaken, adversity can be in the form of rigorous training regime whereby the recruits participate in numerous activities with limited breaks in between. In this example, the nature and intensity of adversity differ between the two environments; boredom and inactivity versus rigorous training tempo.

The context between a basic training and operational environment can also defer in terms of what constitutes positive adaptation in each setting and what are the outcomes of interest to study in each condition. For example, absence of PTSD symptoms has been widely studied in the military environment as a sign of positive adaptation following operational deployment (e.g., Hendin & Haas, 1984; Solomon, Mikulincer & Ehud, 1988; Casella & Motta, 1990; Aldwin, Levenson & Spiro, 1994; Neria, Solomon & Dekel, 1998; Maguen et al., 2008). However, PTSD symptoms are significantly less prevalent in the context of basic training and hence positive adaptation is often examined and considered to be manifested in the form of better performance during training, positive adjustment to the environment and good attitudes (e.g., Williams et al., 2004; Cohn & Pakenham, 2008; Adler, Williams, McGurk, Moss & Bliese, 2015).

There is also contextual consideration in studying conscripts versus career soldiers. For example, numerous studies have established links between motivation and psychological resilience. When studying Olympics champions, Fletcher and Sarkar (2012) found that motivation protected the athletes from the potential negative effect of stressors. The research participants reported that what motivated them initially was passion for the sport. The authors also noted that the world's best athletes "*actively chose*" (p. 673) to participate. Passion is not usually a term one would associate with conscription and as choice is related to motivation (Patall, Cooper & Robinson, 2008), unlike career soldiers who volunteered, in the context where military service is compulsory, conscripts may not be as motivated initially.

Furthermore, context can be different when examining new versus seasoned soldiers. The notion of newcomer adjustment is not unique to the military environment

and the phenomenon is examined in other context including work socialisation (Ashforth & Saks, 1996) and organisational commitment (Meyer, Bobocel & Allen, 1991). Immediately following enrolment into the armed forces, new recruits must swiftly adjust to an unfamiliar, stressful, and unusual environment (Williams et al., 2004). However, because of the harsh military environment and rigorous training regime, recruits often find it challenging to transit from being civilians to soldiers in a short period of time (Wintre & Ben-Knaz, 2000). This probably explains why basic training typically attracts high rate of attrition (Kiernan, Repper & Arthur, 2015).

Hence, studying psychological resilience in this research can shed light on what specific adversities are present in a basic training environment, how positive adaptations are manifested and what help the recruits to be psychologically resilient. This research also has practical implication as a better understanding of psychological resilience can lead to the development of appropriate interventions to improve the recruits' mental well-being (Davydov, Stewart, Ritchie & Chaudieu, 2010). These interventions can potentially strengthen their psychological resilience so that they can cope better during training, reduce the likelihood of them dropping out, and as a result, have a more positive NS experience.

1.5. Research aim, broad approach to the research and key research questions

1.5.1. Aim of the research

As the current research examined psychological resilience specifically with new conscripts in a basic training context, it aimed to advance the understanding of the construct: (1) in a basic training environment instead of operation setting where most military resilience studies are conducted; (2) with conscripts who have no choice and possibly lacking in motivation initially compared to career soldiers who are also most often studied in military research in general; and (3) with new soldiers who are confronted with an unfamiliar and unusual environment and hence needing to adjust quickly versus seasoned soldiers who do not necessarily need to deal with this additional source of stress as they are already in the organisation which almost always trains and prepares them for various forms of transitions (e.g., transition from training to operation and from being soldiers to civilians after the end of their service).

1.5.2. Broad approach to the research

Examined the criterion validity of psychological resilience. This research intended to examine the criterion validity of psychological resilience. Otherwise, studying the construct on its' own adds limited value to the field if it is not related to some form of tangible outcome. It is akin to assessing personality without relating it to behaviours at work or other settings, or measuring cognitive ability without using the scores to predict certain task performance. This approach is evident since the early years of resilience research. For example, Garmezy (1974) studied the children of mothers with severe mental illness and related psychological resilience to developmental outcomes such as competence and disruptive behaviours. Likewise, Werner and Smith (1977) studied a cohort of children from Kauai, Hawaii growing up with parents who were alcoholic or mentally ill and linked psychological resilience to future destructive behaviours including chronic unemployment, substance abuse, and out-of-wedlock births. Resilience research in the military setting also follows this approach of relating psychological resilience to tangible outcomes such as soldier's mental well-being (Eisen et al., 2014) and coping behaviours (Cunningham et al., 2014). Hence, this research followed suit and was envisaged to add research value to the performance-oriented environment by studying psychological resilience in relation to military performance during training.

Measuring psychological resilience and performance outcome. As this research intended to examine psychological resilience in relation to performance, it was necessary to find ways to quantitatively measure both the construct and performance outcome so that the relation can be assessed objectively. After more than four decades of resilience research, numerous measures have been developed to measure the construct. In a more recent systematic review conducted by Pangallo, Zibarras, Lewis and Flaxman (2015), the authors found as many as 17 instruments measuring psychological resilience and this is excluding those designed for specific occupations (e.g., the military risk and resilience inventories). The approaches and considerations in measuring psychological resilience are discussed in more detail in Chapters 2 (Literature review) and 3 (Systematic review of psychological resilience measurement in the military environment).

Focusing on development. Understanding psychological resilience without being able to improve it does little justice to the research effort and has bare utility in improving the organisation or positively influencing the well-being of individuals. In settings such

as sports, the emphasis and value-adds of resilience research have been on enhancing psychological resilience to improve performance both at the individual level and more global level of pushing the boundary of human limits (Fletcher & Sarkar, 2012; Galli & Gonzalez, 2015). Hence, this research aimed to examine if and how psychological resilience in BMT could be enhanced in a similar performance-oriented environment. As mentioned, if this research could lead to the development of intervention that strengthen the recruits' psychological resilience in BMT, it would help them to cope and perform better during training and reduce the attrition rate.

1.5.3. Key research questions

The key research questions were developed based on the aims of this research. It was important to first conceptualise and operationalise psychological resilience in this specific research context and environment as this would form the basis in thinking about the approach to measure it and intervene. Hence, the first research question was:

1.　　How can psychological resilience be conceptualised and operationalised in the BMT environment involving conscripted recruits?

As mentioned, this research intended to examine the criterion validity of psychological resilience. While BMT is physically demanding and mentally challenging, it has not known to adversely impact the mental health of recruits. As such, in a learning and performance-oriented environment, it was envisaged that performance in BMT would be a more relevant criterion. As such, the second research question was:

2.　　Is psychological resilience related to performance during BMT?

In order to link psychological resilience in BMT to performance outcome, it was necessary to find ways to measure the construct, and given that context is important, the third research question was:

3.　　How can psychological resilience be measured in the BMT environment involving conscripted recruits?

Lastly, as this research aimed to find ways to enhance psychological resilience, the fourth research question was:

4.　　How can psychological resilience in BMT be enhanced through a targeted training intervention?

These key research questions were developed at the onset of the research. Subsequently, five studies were designed and conducted, and more specific research questions and hypotheses related to the respective studies were developed in the process. They are discussed in detail in Chapters 4 to 7 which contained each study.

1.6.   Reflexivity in research

Reflexivity is an important consideration in this research as one of the planned studies employed a qualitative approach. In addition, the researcher's senior position in the organisation where the data were collected from, and his familiarity with the research environment and topic warranted such an attention and deliberate thought process.

Increasingly, reflexivity has been recognised as an important exercise in the process of carrying out qualitative research (D'Cruz, Gillingham & Melendez, 2007) as it can serve as a means to balance the tension between involvement and detachment of the researcher and enhance the rigor of the study and its ethical considerations (Gemignani, 2011). Reflexivity, an exercise of continual internal reflection and dialogue, is a process that involves the researcher critically self-evaluating his or her position in the research, and explicitly acknowledging that this position may affect the research process and consequently the outcome (Guillemin & Gillam, 2004). A researcher's position can be related to his or her personal characteristics such as race, language spoken, religious affiliation, age and generation, personal experience, values and beliefs, biases and preferences, and theoretical stance (Berger, 2015). Akin to self-appraisal, the researcher focuses the research lens back onto himself or herself to recognise and be accountable for his or her own position within the research and the influence that this may have on the environment, the research participants being studied, the questions being asked, and the data being collected and interpreted.

A researcher's position may affect the research in several ways. For the current research, it was initially envisaged that the researcher's position might impact the research process and outcome in at least two ways. Firstly, the researcher has been working with the SAF for more than two decades, and hence is familiar with the military environment and most aspects of soldiering. Specifically, as an ex-conscript, he completed BMT when he was enlisted in the 1990s, and as a career soldier, he had conducted numerous batches of BMTs. Furthermore, he is also familiar with the construct of psychological resilience as he had written a dissertation on the topic during his post-graduate study. These might

cause him to be bias and influenced the way he developed the research questions, designed the various studies and data collection approaches, interpreted the findings and consequently shape the conclusions of this research in the direction that he is familiar with instead of being receptive of all possibilities (Kacen & Chaitin, 2006). To illustrate the use of reflexivity, the data collection strategy in Study 2 is used. The researcher exercised reflexivity and recognised that given his relative seniority and experience compared to the research participants (i.e., recruits), and familiarity with the topic of psychological resilience, it was possible that he might consider the recruits' perspectives as less valid compared to his and unintentionally allowed it to influence the way he interpreted the recruits' account of their BMT experience and ran the risk of drawing the wrong conclusion. In addition, the recruits might fake good or bad during the one-to-one interviews and thus not candidly answered the questions (Law, Bourdage & O'Neill, 2016). Hence, while the primary research participants were the recruits, the researcher decided it was necessary to mitigate against the risk by planning for data triangulation through supplementing his findings with additional sources of information. This led him to use another approach to collect data (i.e., focus group discussions instead of one-to-one interview) from the recruits' trainers on separate occasions. As some of the trainers were as senior as the researcher, he was less likely to have considered their perspectives as less valid. The detail is elaborated in the introduction paragraph of Chapter 4 section 4.3.

Secondly, as the researcher held a senior rank in the SAF (i.e., Lieutenant Colonel), his position would have an impact on the nature of the researcher–researched relationship given that the research participants, being recruits, were the most junior members in the organisation. This effect is considerable in the military environment where there is a high-power distance culture; power is distributed unequally and conformation to hierarchy is accepted. Consequently, the recruits might feel compelled to participate in the research even when they were given the option not to (Koslowsky, Schwarzwald & Ashuri, 2001). This would have implication on ethics if this issue was not addressed deliberately. In addition, the recruits might respond in ways to please the researcher such that they were seen in a good light and thus invalidated the findings of the research. Being mindful of the impact of his position, the researcher exercised reflexivity throughout the research, and this led to different decisions being made for the various studies. To illustrate the different decisions, the data collection approaches for

Study 2 and Study 5 are used. In response to Pillow's (2003) call to be non-exploitative and compassionate toward the research participants, the researcher did not disclose his rank and position in the SAF for study 2, a qualitative study involving one-to-one interviews. It was thought that the recruits might feel intimidated or stressed out during the interviews or pressurised to take part in the research if the researcher introduced himself as a Lieutenant Colonel. The researcher was also cognisant that he must not deceive the research participants. No deception was involved as the researcher was conducting the interviews purely for the purpose of research and in his capacity as a researcher, and not as an SAF officer to assess the recruits' performance or well-being. However, for Study 5, the researcher decided that it was necessary to disclose his rank in order to establish source credibility (Clark-Hitt, Smith & Broderick, 2012) as he had to conduct a training session. Again, the researcher exercised reflexivity about the impact of his position and deduced that, unlike Study 2 where the interaction with the recruits was one-to-one, conducting a workshop with up to 250 recruits was unlikely to cause them to be intimidated or stressed out. In addition, to mitigate against the risk of the recruits feeling compelled to take part in the research and fill in the questionnaire, the researcher asked the recruits to just leave the finished or unfinished questionnaire on the table at the end of the session instead of physically handing them in. The recruits' identity and responses were also kept anonymous as they were not required to provide their names or any form of identification. Documentation of the outcomes of reflexivity is provided in the chapters that contained the respective studies.

1.7. Thesis structure

The structure of this thesis and summary of the five studies are included in the following sub-sections.

1.7.1. Chapter 1 – introduction

Chapter 1 provides the background and rationale of this research to present the case for studying psychological resilience specifically in a conscripted basic military training environment. The chapter introduces the theories, definitions and conceptualisations of the construct and advocates a contextual perspective by providing detail of the research environment. Next, the chapter argues the need to study the psychological resilience of conscripted recruits specifically in BMT as there is currently a gap in the field. The focuses were on the contextual differences: (1) training instead of

operational environment; (2) conscription instead of voluntary service; and (3) new recruits instead of seasoned soldiers. The aims of this research, broad research approach and key research questions are also provided. To conclude, a guide to the thesis structure is outlined to offer summaries of each chapter.

1.7.2. Chapter 2 – literature review

Chapter 2 is a traditional narrative theoretical literature review. It begins by highlighting the purpose and approach to the literature review. Next, it provides a brief historical account of the study of psychological resilience. This is followed by a description of the four waves of resilience research as identified by Wright, Masten and Narayan (2013) to examine how the study of the construct was initiated, what were the focuses of resilience research during each wave, and to understand how the research approach had evolved over the years. The various theoretical perspectives and definitions of psychological resilience are then offered. These then formed the basis to discuss the points of divergence and convergence in resilience research. On one hand, the points of divergence are highlighted as differences in views about whether psychological resilience is an internal capacity, a psychological process or merely an outcome. On the other hand, the points of convergence are discussed in relation to the agreed concepts encapsulated within psychological resilience (i.e., adversity, risk factor, protective factor and positive adaptation). Next, the chapter highlights that context is a key consideration in resilience research based on the divergence in views. Thereafter, the literature review examines some widely used resilience measures to provide an initial insight on what is currently available that this research could potentially adopt. Several concepts and constructs similar or related to psychological resilience are then discussed. As psychological resilience is context-dependent, the chapter next examines resilience studies conducted specifically in the military environment to understand the approach taken to study the construct. In addition, this chapter also reviewed existing resilience intervention programmes that have evidences to show that they worked. Finally, Chapter 2 closes with a discussion on the key findings of the literature review and their implications for this research.

1.7.3. Chapter 3 – systematic review of psychological resilience measurement in the military environment (Study 1)

Chapter 3 describes the conduct and highlights the findings of the systematic review. The main aim was to identify if an appropriate resilience measure was available for the current research to adopt. Using the PRISMA-P as a guide, a review protocol was first developed to specify the research questions, search terms, search strategy with inclusion and exclusion criteria, and data extraction process. The databases used for the search included PsycARTICLES, PsychINFO, PsychTESTS and MEDLINE. Following a sequential process of title, abstract, and full-text review of the studies, 26 studies were eventually included in the review. Key information such as study aim and design, sample, resilience measure used, and study findings were then extracted for analysis (see Table 3.3).

The systematic review found that even in the military setting alone, there was little agreement about psychological resilience in terms of the way that the construct was conceptualised, operationalised and measured by various military communities around the world. There were differences in opinions about whether psychological resilience is an internal capacity, psychological process or outcome, one-dimensional or multi-faceted, and whether it is stable or susceptible to change. The review found that 13 different instruments were used. Some studies used existing measures that were developed in other setting with different population including the Connor-Davidson Resilience Scale (CD-RISC 25), while others chose to create new ones such as the Military Training Mental Toughness Inventory (MTMTI). The study also found that in the military context, psychological resilience was often studied in relation to important outcomes such as military performance, soldiers' mental well-being, leadership style and coping mechanism.

The systematic review did not find any suitable existing resilience measure that could meet the context of the current research. Hence, it was concluded that as psychological resilience is context-dependent, in order to specifically address the SAF BMT context (i.e., mainly consisting of conscribed soldiers aged between 18 and 22, and in a training instead of operational environment), follow-on study should aim to first conceptualise and operationalise psychological resilience based on this unique context.

1.7.4. Chapter 4 – inductive qualitative study to examine resilience directly from the recruits' perspectives (Study 2)

Study 2 is a qualitative study that adopted an inductive approach to understand the recruits' BMT experience. The main aim was to conceptualise and operationalise psychological resilience specifically in the SAF BMT context. The study examined what the recruits considered as challenges or adversities in the BMT environment and what internal and external protective factors helped them to adapt positively during the training. Twenty-two one-to-one semi-structured interviews were conducted with soldiers who had recently completed BMT. Two focus group discussions were also conducted with BMT trainers for the purpose of data triangulation. Braun and Clarke's (2006) thematic analysis framework was used to separately analyse the data collected from each recruit. Subsequently, matrices were developed to synchronise all the data collected from the 22 recruits, and this was guided by the approach established by Miles and Huberman (1994).

Study 2 found that the challenges recruits faced are episodic and chronic, ranging from a single, short duration but intense activity (e.g., route marches and physical training) to longer duration event or treatment that can be mild but emotionally draining in nature (e.g., 5-day field camp and change in environment). The BMT environment was reported to be regimental, fast-paced and packed full of structured activities where the recruits had little rest, freedom, privacy, and were physically cut off from their families and loved ones. The recruits must quickly adjust and adapt to a harsh new environment where they were subjected to authority, uncertainty, rough treatment and sometime physically challenging environments. In essence, BMT was characterised by daily hassles, moments of intense stress, prolonged pressure and was physically demanding, mentally stressful and emotionally challenging.

The findings on what helped the recruits to adapt positively during BMT identified several internal psychological variables, skills and behaviours, and external sources of support. These included 10 internal psychological variables: (1) authentic pride; (2) hope; (3) perseverance; (4) purpose; (5) optimism; (6) acceptance; (7) desire to improve; (8) passion; (9) competitiveness; and (10) altruism, five internal skills or behaviours: (1) setting goal; (2) positive appraisal of situation; (3) creating psychological markers; (4) not giving excuses; and (5) keeping oneself occupied, and external sources of support from family and loved ones, peers, and the trainers.

Based on the findings of Study 2, psychological resilience in the BMT context involving conscripted recruits can be conceptualised as an internal capacity and psychological process. It can be conceptualised as an internal capacity as all the recruits reported various internal psychological variables that helped them to adapt positively or be resilient in the face of adversities. In operationalising psychological resilience in this perspective, it is an internal capacity that is made up of multiple internal psychological variables or protective factors, and in this particular study, they included: (1) pride; (2) hope; (3) perseverance; (4) purpose; (5) optimism; (6) acceptance; (7) desire to improve; (8) passion; (9) being competitive; and (10) altruism. Psychological resilience can also be conceptualised as a process as there were interactions involving the recruits with the adversities and protective factors in their environment. In operationalising psychological resilience in this viewpoint, there are processes that involved the recruits' appraisal of the adversities and what internal protective factors they possessed and another process where positive adaptation is facilitated by external protective factors in the forms of support from loved ones, help from peers and encouragement from trainers.

Chapter 4 then recommended follow-on study to examine ways to measure these internal psychological variables, skills and behaviours, and external sources of support and relate them to psychological resilience and performance in BMT.

1.7.5. Chapter 5 – examining relations of the internal psychological variables with resilience and performance (Study 3)

Study 3 is a quantitative study that focused on measuring the internal psychological variables identified in Study 2 and examined their relations with psychological resilience and performance in BMT. It was decided that the study should focus on examining the internal psychological variables as the SAF was already teaching the recruits some of the skills identified in the previous study. Likewise, the SAF was also strengthening the external support with efforts to engage the recruits' parents and encouraging them to support their sons, building cohesion among the recruits, and emphasising to trainers on the need to care for soldiers by training the recruits hard and at the same time providing support.

Six out of 10 internal psychological variables were eventually chosen as they were also reported by the trainers during the focus group discussions. These included pride, hope, perseverance, purpose, optimism and acceptance. Selected items from six

established scales such as the Adult Hope Scale (Snyder et al., 1991) and the Orientation to Life Scale (Antonovsky, 1987) were modified to separately measure these six psychological variables. Psychological resilience in BMT was assessed with self-report and peer appraisal while performance was measured with self-report, peer appraisal and qualification for leadership training.

While some items were removed from the original scales and others were modified to fit the BMT context, the six measures were found to be reliable in measuring what they were developed to measure as their internal consistency (George & Mallery, 2003), test-retest reliability (Evans, 1996) and agreement (Koo & Li, 2016) were sound.

In examining the six internal psychological variables separately, correlation matrices showed that other than acceptance, the rest of them had positive relations with psychological resilience and performance as measured by self-report and peer appraisal. Multinomial logistic regressions also found that higher scores on pride and hope significantly improved the recruits' odds of qualifying for officer training (Tier 1 leadership training) and higher scores on pride, hope, perseverance, purpose and optimism significantly improved the recruits' odds of qualifying for specialist training (Tier 2 leadership training).

Subsequently, multiple linear regressions that excluded acceptance were performed. It was found that the five remaining psychological variables could account for substantial amount of variance in psychological resilience and performance in BMT respectively as measured by self-report. For peer appraisal, while the variance accounted for in both psychological resilience and performance in BMT were lower, the results were nonetheless significant.

As five out of six psychological variables were positively related to psychological resilience in BMT individually, and they could collectively account for substantial amount of variance in the construct, it was possible that psychological resilience in BMT was a higher-order construct that comprised several lower-order internal psychological variables. Hence, Chapter 5 recommended the follow-on study to examine if psychological resilience in BMT was a higher-order construct that encompassed these internal psychological variables and continue to relate it to performance.

1.7.6. Chapter 6 – examining resilience in BMT as a higher-order construct that included pride, perseverance, purpose and optimism (Study 4)

Study 4 examined psychological resilience in BMT as a higher-order construct that encompassed several lower-order internal psychological variables. For Study 4, only pride, perseverance, purpose and optimism were included. Acceptance was excluded because Study 3 did not manage to find any relation between acceptance and psychological resilience and performance. Hope was also excluded because it did not meet the minimum level of tolerance of .20 while surpassing the VIF threshold of five which signalled the presence of multicollinearity.

Confirmatory factor analysis results showed that the proposed model fitted well with the data with all predetermined fit indices meeting the cut-off criteria. To verify that the model was sound, the same analysis was performed with data collected from Study 3. Likewise, the result showed that the model fitted the data well. In testing for convergent validity, it was found that the Psychological Resilience Questionnaire-Basic Military Training (PsyResQ-BMT[1]) correlated strongly with the widely used 10-item Connor-Davidson Resilience Scale (CD-RISC 10) and conscientiousness (Big-Five factor markers). Likewise, the PsyResQ-BMT's internal consistency, test-retest reliability and agreement were excellent.

Correlation analyses found that PsyResQ-BMT had a significant positive relation with the recruits' performance as measured by self-report and so were its constitute parts. Multinomial logistic regressions also found that higher scores on PsyResQ-BMT significantly improved the odds of recruits being qualified for officer training or specialist training. In addition, the results of several hierarchical multiple regressions showed that psychological resilience in BMT had a relatively stronger relation with performance than each of the psychological variable.

As up to this point, the research had managed to propose a suitable way to measure psychological resilience in BMT by assessing its constituent parts and related it to performance, Chapter 6 recommended follow-on study to address if psychological resilience in BMT could be enhanced with a targeted intervention.

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[1] Psychological Resilience in Basic Military Training (PsyResQ-BMT) is used to refer to the measure while psychological resilience in BMT is used to refer to the construct or phenomenon.

1.7.7.   Chapter 7 – determining how psychological resilience in BMT could be enhanced through a targeted training intervention (Study 5)

Study 5 is a group randomised trial (GRT), a form of randomised controlled trial (RCT). The recruits, at company level, were randomly assigned to either the control or treatment group. The recruits in the treatment group took part in a new training intervention that was developed to specifically target pride, perseverance, purpose and optimism to improve psychological resilience while the recruits in the control group took lesson on combat breathing and visualisation. The mode of delivery involved a mixture of lecture and individual-level exercises. All of them completed the PsyResQ-BMT before and after the training intervention.

The reliability of the PsyResQ-BMT and higher-order nature of psychological resilience in BMT were replicated in Study 5. A 2 x 2 mixed measures factorial ANOVA found a significant interaction between time of measurement and whether or not the recruits took part in the new training intervention. An examination of the line graph also showed that the PsyResQ-BMT scores of both the trained and non-trained groups were quite close before the training intervention but after the training intervention, PsyResQ-BMT scores were considerably higher for recruits who attended the new training intervention. Furthermore, it was found that PsyResQ-BMT scores were not significantly different in the control group compared to the intervention group at the beginning of the training intervention, but the scores were significantly different at the end of the training intervention. Similar results were found when using the scores of most constituent parts of psychological resilience in BMT; there were significant interactions between time of measurement and whether or not the recruits took part in the new training intervention when using the scores of pride, perseverance and optimism individually as the dependent variables. These suggested that psychological resilience in BMT could be enhanced with targeted training intervention and it affirmed the approach in specifically targeting the constituent parts to improve the overall psychological resilience in BMT.

1.7.8.   Chapter 8 – Discussion and conclusion

Chapter 8 connects all the information presented in the entire thesis to provide a holistic and coherent discussion of the whole research endeavour. Firstly, the key findings of this research as a whole are discussed in relation its aims. These include: (1) provide better clarity about the context of this research with the findings on what adversities were

present in the BMT environment and what internal and external protective factors were available to the recruits; (2) conceptualise and operationalise psychological resilience in BMT to address controversies surrounding these issues and pave the way to measure psychological resilience in BMT and intervene; (3) develop a customised measure of psychological resilience in BMT as there is currently no suitable measure; (4) establish the criterion validity of psychological resilience in BMT by relating it to performance; and (5) develop a targeted intervention to enhance the recruits' psychological resilience in BMT. Next, the theoretical and research implications, limitations of the research and possible future research directions, and implications for organisation practices are submitted. Specifically, the theoretical and research implications considered existing psychological resilience theory concerning the roles and nature of protective factors, highlighted the importance of having a positive self-concept, and addressed issues related to the conceptualisation, operationalisation and measurement of the construct. The implications for organisation practices then proposed ways to supplement existing selection and development protocols and suggested approaches to intervention. Finally, a reflection of the contributions of this research was provided in the concluding section. Figure 1.2 outlines the sequence of this research.

Study 1
Systematic review of psychological resilience measurement in the military environment

Research questions
1. How is psychological resilience conceptualised and operationalised in the military context?
2. How is psychological resilience measured in the military context?
3. What are the psychometric properties of these measures?
4. What tangible outcomes of interest were studied in relation to psychological resilience in the military context?

Key finding and recommendation
a. Various military communities around the world conceptualised and operationalised psychological resilience differently either as an internal capacity , a process or outcome.
b. A total of 13 scales were used by the 24 studies reviewed.
c. No scale was found suitable for the current research to adopt as the 13 scales either: (1) measure psychological resilience merely as an outcome; (2) assess only one dimension of psychological resilience; (3) examine the construct as a trait; or (4) did not demonstrate sound psychometric properties consistently across the different studies or failed to show predictive validity.
d. It is recommended for follow-on study to develop a customised measure of psychological resilience that specifically addresses the context of the current research.

Study 2
Inductive qualitative study to examine psychological resilience specifically in the basic military training environment involving conscripted recruits

Research questions
1. What do recruits consider as adversities in the BMT environment?
2. What protective factors, both internal and external, helped the recruits to adapt positively to the adversities during BMT?
3. how can psychological resilience be conceptualised and operationalised in the BMT context involving conscripted recruits?

Key finding and recommendation
a. Adversities in BMT were episodic, chronic and characterised by daily hassles, moments of intense stress, prolonged pressure and were physically demanding, mentally stressful and emotionally challenging.
b. Study 1 found 10 internal psychological variables, five skills or behaviours, and three external sources of support that helped the recruits to adapt positively during BMT.
c. Psychological resilience in BMT could be conceptualised as an internal capacity and process.
d. Follow-on study to examine ways to measure these internal psychological variables, skills and behaviours, and external sources of support and relate them to psychological resilience and performance in BMT.

Study 3
Examining the relations of the internal psychological variables with psychological resilience and performance in BMT

Hypotheses
1. Pride, hope, perseverance, purpose, optimism and acceptance are positively related to psychological resilience and performance during BMT.
2. All the psychological variables that have positive relations with psychological resilience and performance will collectively explain substantial amount of the variance in psychological resilience and performance during BMT.

Key finding and recommendation
a. Other than acceptance, the rest of the psychological variables had positive relations with psychological resilience and performance. Multinomial logistic regressions also found that higher scores on some psychological variables improved the odds of recruits been qualified for officer or specialist training.
b. The five remaining psychological variables could account for substantial amount of variance in psychological resilience and performance in BMT.
b. The next study should examine if resilience is a higher order construct that comprises various primary psychological variables.

Study 4
Examining psychological resilience in BMT as a higher-order construct that includes pride, perseverance, purpose and optimism

Hypotheses
1. Psychological resilience in BMT is a higher-order construct that comprises secondary psychological variables including pride, perseverance, purpose and optimism.
2. The recruit's level of psychological resilience in BMT is positively related to performance in BMT.
3. The recruit's level of psychological resilience in BMT has a relatively stronger positive relation to performance than each of the individual psychological variable.

Key finding and recommendation
a. Confirmatory factor analysis results showed that the proposed model fitted well with the data with all predetermined fit indices meeting the cut-off criteria and the PsyResq-BMT correlated strongly with the widely-used 10-item Connor-Davidson Resilience Scale (CD-RISC 10).
b. Correlation analyses found that psychological resilience in BMT had a significant positive relation with the recruits' performance and so were its constitute parts. Multinomial logistic regressions also found that higher scores on PsyResq-BMT significantly improved the odds of recruits been qualified for officer training or specialist training.
c. The results of several hierarchical multiple regressions showed that psychological resilience in BMT had a relatively stronger relation with performance than each of the psychological variable.

Study 5
Determining if psychological resilience in BMT can be enhanced with targeted training intervention

Hypothesis
1. Psychological resilience in BMT can be enhanced through targeted training intervention.

Key finding and recommendation
a. The reliability of the PsyResq-BMT and higher-order nature of psychological resilience in BMT were confirmed.
b. There was significant interaction effect between time of measurement and whether or not the recruits took part in the new training intervention.
c. Psychological resilience in BMT could be enhanced with targeted training intervention and the approach in specifically targeting the constituent parts to improve the overall psychological resilience in BMT was sound.

Figure 1.2: Sequence of research

Chapter 2:   Literature review

Chapter 2 begins by describing the approach to the literature review (section 2.1). Next, the chapter provides a brief historical account of the study of psychological resilience to trace the genesis of the research (section 2.2). Three seminal studies separately conducted by Garmezy (1971), Rutter (1979) and Werner and Smith (1982) are also highlighted given their impact in the field, and they continue to influence resilience research today. This leads into an outline of the four waves of resilience research identified by Wright, Masten and Narayan (2013) (section 2.3). The intent was to examine how the study of the construct was initiated, what were the focuses of resilience research during each wave, and to understand how the research approach had evolved over the years. The theoretical perspectives and definitions of the construct are then offered in section 2.4. Next, section 2.5 highlights how psychological resilience was conceptualised and operationalised by different researchers and this is discussed as points of divergence in the field. The points of convergence (section 2.6) are next discussed in relation to commonly agreed concepts related to psychological resilience (i.e., adversity, risk factor, protective factor and positive adaptation). As one of the research objectives was to measure psychological resilience, section 2.7 lists seven commonly used resilience scales to provide an initial insight into how this was achieved.

Alongside research on psychological resilience, various researchers have proposed analogous constructs sharing similar features including hardiness, grit, ego-resilience and psychological capital. They are discussed in section 2.8 with respect to their similarities and differences in relation to psychological resilience, and argument is made that the psychological resilience is distinct and worthwhile studying further. As psychological resilience is context-dependent (see section 2.6), the next section then examines resilience studies conducted specifically in the military environment to outline the approaches taken and identify possible gaps (see section 2.9). This would inform the current research on where it could potentially add knowledge to the field. As mentioned in Chapter 1, another objective of this research was to examine how to improve psychological resilience. Hence, section 2.10 examines existing resilience intervention programmes specifically developed in the military setting. The intent was to provide some initial thoughts on potential design of subsequent studies for this research and how to develop resilience intervention programme. Finally, Chapter 2 closes with a discussion on the key findings of the literature review and their implications for this research.

2.1.   Approach to the literature review

In the early 1970s, a considerable amount of research has shown that, contrary to expectation, certain children who were exposed to hardship and adversity in their early years were able to thrive as adults (Garmezy, 1974; Garmezy & Streitman, 1974). This phenomenon was later labelled as psychological resilience. Subsequently, the research on psychological resilience in the earlier days was extended to examining the construct in other adversities including socioeconomic disadvantage background and associated risks (Garmezy, 1991, 1995; Rutter, 1979; Werner & Smith, 1982, 1992), maltreatment (Beeghly & Cicchetti, 1994), urban poverty and community violence (Luthar, 1999; Richters & Martinez, 1993), and catastrophic life events (O'Dougherty-Wright et al., 1997). More recently, the study of the construct has expanded to other settings such as post-disaster (e.g., Bonanno, Galea, Bucciarelli & Vlahov, 2006), in the sports domain (e.g., Galli & Vealey, 2008), with law enforcement agency (e.g., Arnetz, Nevedal, Lumley, Backman & Lublin, 2009), and the military environment (e.g., Palmer, 2008). Given the diversity in settings in which psychological resilience was studied, it was inevitable that the construct was theorised, conceptualised, operationalised, defined and measured differently by various researchers.

All these research, conducted in various environments and timepoints, sum up to almost 50 years of cumulated knowledge surrounding the body of work. Hence, this traditional narrative theoretical literature review began by taking a broad approach to examine the various theories, definitions, conceptualisation, operationalisation and ways to measure psychological resilience. The intent was to keep the review's coverage as wide as possible in order to derive a more comprehensive understanding of the construct. As the review progressed, it became evident that context is an important consideration in resilience research (see section 2.6). As such, this review progressed to focus on studies and interventions that were carried out in the military environment so that the information found would be more relevant to the context of the current research. This literature review would lay the groundwork for the overall research endeavour. Crucially, it was expected to inform the current research on where it could potentially contribute to adding new knowledge to the field.

2.2.   History of resilience research

The study of psychological resilience in psychology and developmental science has a founding base in child development research, clinical sciences and individual differences (Masten, 2014). The genesis of resilience research is also closely linked to the history of developmental psychopathology studies and developmental systems theory that seek to understand differences in individuals' adaptation over their lifetimes (Sameroff, 2000). Few would argue that three of the most prominent early resilience researchers who set the stage for others to follow are Norman Garmezy, Emmy Werner and Michael Rutter (Masten, 2014). They share something in common; surviving World War II (WWII) and witnessing the horror and devastations caused to properties and more importantly, human lives. During the war, Garmezy served as a young soldier in Europe, Werner experienced the conflict in Europe as a young German girl, and Rutter, at the age of 7, was evacuated from England to North America in 1940. One can only imagine how big an impact WWII must have had on Garmezy, Werner and Rutter and that it influenced them to research resilience from a common angle; studying the effects of risk factors on children's development. In three separate seminal studies, they found that contrary to expectations, some children who were exposed to severe risk factors did not grow up with negative developmental outcomes.

Garmezy (1971), often referred to as the founding father of resilience research, studied children of parents with schizophrenia. He hypothesised that the presence of protective factors can help individuals to mitigate the negative impact of stressors and promote positive development. He found that while children whose parents were diagnosed with schizophrenia could increase their risk of developing the same illness, an astonishing 90% of the children involved in his study did not. In fact, to the contrary, he discovered that these resilient children had good academic achievements, good relations with peers, successful work histories and set purposeful life goals. Intrigued by what he found, Garmezy urged other researchers to shift the focus away from risk factors to study "*the forces that move such children to survival and to adaptation*" (Garmezy, 1971, p. 114).

Rutter (1979), on the Isle of Wight, studied children of mentally ill parents and found a similar phenomenon. He discovered that despite growing up in adverse conditions, approximately half of all children involved in his study did not exhibit

maladaptive behaviours or become mentally ill. This led him to conclude that the school environments had served as an important protective factor that shielded them from the negative effects of adversity. Rutter (1984) also found that having good relationships with teachers or fellow classmates, holding positions of responsibility in school or achieving sporting and musical success served as protective factors. He added that the school environment had provided students a sense of achievement and fostered their personal growth.

In a four-decade longitudinal study involving close to 700 children in Kauai, Hawaiian, Werner and Smith (1982) identified one-third of them as having four or more risk factors present in their lives and labelled them as high-risk. However, one-third of these high-risk children demonstrated good outcomes by adolescence. Further down the road when these children entered their early 30's, two-thirds of those who had problems during adolescence were classified as successful adult by Werner and Smith. Throughout the study period, Werner and Smith examined the protective factors in the lives of those resilient individuals and concluded that these protective factors existed both internally and externally. These included dispositional factors, good family ties, and a supportive external environmental. With regards to the external factors, Werner and Smith found family cohesion, family size of less than four children, availability of care-givers within the household, adequate attention given to children when they were young, having a network of good friends, and having supportive teachers contributed to resilient outcomes.

These early seminal studies that continue to influence resilience research today offer valuable insights to past and current resilience researchers. Firstly, children having risk factors present in their early life does not necessarily lead them to have negative developmental outcomes in later years. Secondly, presence of protective factors, both internal and external to the individuals, can help to mitigate against the negative effects of risk factors and facilitate positive developmental growth. Third and most importantly, these early research offer hope as they showed that individuals can be resilient or achieve positive outcomes in the face of adversity.

2.3. Four waves of resilience research

In their effort to consolidate the body of work surrounding resilience research since the 1970s, Wright et al., (2013) identified four waves of resilience research. The

following sub-sections (sub-sections 2.3.1 to 2.3.5) document the focuses of each of these four waves of resilience research and summarise their contributions in advancing the understanding of the construct.

2.3.1. Wave 1 – risk and protective factors

The first wave of resilience research was focused on identifying what factors are related to or can predict positive adaptation in the face of risk or adversity (Wright et al., 2013). Hence, early researchers were keen to assess factors at the individual level, and the different situations that these individuals were in, to account for differences in outcomes following exposure to negative life events. The terms risk and protective factors were first coined during this wave. In the context of studying psychological resilience among adolescents, risk factors can include parental divorce, parental mental illness, and poverty while protective factors were thought to be internal characteristics and external circumstances that can moderate the impact of adversity on adaptation. Hence, in the same context, protective factors can include positive coping styles, stable home environment with caring parents, supportive community with helpful neighbours, and conducive school environment with teachers who offer encouragements. This wave of resilience research also established that for psychological resilience to be demonstrated, significant threat to development or adversity must be present, and individuals must show positive adaptation despite this threat or risk exposure. During this first wave of research, disagreement emerged primarily about how to define psychological resilience (i.e., as an internal capacity, a process or outcome). There were also debates about what exactly constitutes positive adaptation (Masten & Reed, 2002). For example, is a child living with poverty consider psychologically resilient if he or she remains in school despite the family's low income or is psychological resilience demonstrated when the child leaves school to find work to supplement the family's income?

2.3.2. Wave 2 – resilience as a process

While the first wave of resilience research mainly focused on studying the individual, the second wave was more concerned about psychological resilience as a process. Here, the emphasis moved from asking questions about the 'what' to the 'how' (Masten, Best & Garmezy, 1990). This wave sought to understand the complex interactions between the individuals, the environment, the way individuals made sense of the situation and how these shaped the different outcomes following exposure to adversity

(Cicchetti, 2010; Yates, Egeland & Sroufe, 2003). Wright et al. (2013) attributed this shift in paradigm to the broader transformation occurring in the sciences concerning developmental psychopathology, in which there was greater focus on context and dynamic nature of change. In resilience research, this wave saw more emphasis on the role of relationships and factors outside the family context (e.g., school and community environments). In addition, there were emerging attempts to integrate the biological, social, and cultural aspects of the resilience processes (Cicchetti & Curtis, 2007; Luthar, 2006).

2.3.3. Wave 3 – resilience intervention

In the third wave, the focus began to move towards the development of resilience preventative and resilience building interventions. This focus of resilience intervention was initially driven by theory but as resilience research progressed with more experiments being conducted, the approach became more evidence driven. This was facilitated by researchers recognising that experiments aimed at preventing problems among individuals with high developmental risk and promoting positive adaptation can represent a robust approach in testing resilience theory (Wright et al., 2013). This wave also witnessed the design of experiments with randomised control or comparison groups to examine the effectiveness of various resilience interventions (e.g., Sandler, Wolchik, Davis, Haine, & Ayers, 2003). Consequently, these led to the development of a multitude of interventions including the Seattle Social Development Project (SSDP) that aimed at building resilience among adolescents and young adults to prevent or reduce negative behaviours such as delinquency, substance use and violence. The intervention equipped teachers with skills to proactively manage classroom conflicts and promote cooperative learning among students, trained parents on how to manage their children's behaviours, and imparted students with skills to solve problems and manage interpersonal relations (Hawkins, Kosterman, Catalano, Hill, & Abbott, 2008).

2.3.4. Wave 4 – multi-disciplinary approach to resilience

The fourth wave in resilience research focused on multilevel dynamics and the various processes that linked gene identification, neurobiological adaptation, brain development, and human behaviour. This was influenced by the notion that human development arises from probabilistic epigenesis; neural structures are developed and activated either based on individuals' genetic makeup or their interactions with the

environment. This wave was facilitated by discovery of new research methods in areas including gene assessment, the study of brain structure and function, and advance statistics for modelling growth and change (Wright et al., 2013). This wave also witnessed the coming together of different disciplines including psychology, sociology, ecology, public health, management, and emergency services in studying psychological resilience. This was partly a result of the rise in global threats such as natural disasters, terrorism, global warming, and flu pandemic that require integrative solutions (Wright et al., 2013).

2.3.5. Summary

The first wave of resilience research, focusing on examining risk and protective factors, was concern with assessing individual differences and the effects of the environment on individuals' adaptation to adversity. Also, during this wave, disagreement emerged about how to define psychological resilience and exactly what constitutes as positive adaptation. However, this wave contributed to the field by identifying key elements of psychological resilience (i.e., adversity, risk factor, protective factors, coping or adaptation) and highlighted the importance of studying them in detail.

Resilience research then moved on to the second wave where the construct was studied from a process perspective. Studies in this wave mostly focused on understanding the interactions between the individuals and their environment, the way individuals appraised the situations they were in, and how these consequently shaped the different outcomes. The contribution of this wave of resilience research highlighted the complex nature of psychological resilience, in that the individuals' coping or adaptation processes involved dynamic interactions between various internal and external factors. Hence, instead of studying the factors or elements in isolation, a holistic approach was needed in order to better understand what and how the different outcomes were shaped.

Next, the third wave shifted the focus of resilience research on to resilience intervention. Instead of passively observing, researchers took on a more active approach in intervening. This resulted in the development of various programmes that helped the individuals and organisations to build and enhance psychological resilience which in turn increased the likelihood of positive outcomes in the face of adversity.

Lastly, the fourth wave of resilience research witnessed different disciplines coming together to study psychological resilience. This multi-disciplinary approach led

researchers and practitioners to study the construct and intervene from more angles. This was expected to provide a more integrated and holistic solution in dealing with the negative impacts of adverse events (e.g., terror attack or natural disaster).

2.4. Theories and definitions of psychological resilience

For almost 50 years, psychological resilience has been studied by numerous researchers in different settings. Furthermore, these researchers had different backgrounds (e.g., developmental psychology, clinical psychology and psychiatry) and research aims [e.g., identify risk and protective factors (Martinez-Torteya, Bogat, Eye & Levendosky, 2009), study aspects of individual differences (Waugh, Fredrickson & Taylor, 2008), and examine the range of outcomes following exposure to adversity (Bonanno & Diminich, 2012)]. Consequently, there is no universally agreed theory or definition of psychological resilience. The following sub-sections (sub-sections 2.4.1 to 2.4.7) highlight these theories and definitions. Specifically, these included the perspectives of prominent resilience researchers such as Norman Garmezy, Suniya Luthar, Ann Masten, Michael Rutter and Emmy Werner, whose work continue to have major influence over resilience research today.

2.4.1. Garmezy's theory and definition of psychological resilience

Garmezy initiated a series of Project Competence studies at the University of Minnesota to examine the linkages between adversity, risk and protective factors such as competence, internal functioning, and a range of individual and family attributes (Masten & Powell 2003). The first study involved a school cohort of 205 children attending third to sixth grades elementary schools and they were chosen because they were representative of the public-school population at the time. It began as a cross-sectional study, but further studies were conducted after 7, 10, and 20 years as Garmezy felt that following the children over time would provide more insights. Additional studies were also added, and they included a cohort of children born with congenital heart defects, a cohort with physical handicaps and another cohort of children living in homeless shelters. These studies showed that competence in key developmental tasks was associated with past, future competence and adaptive resources including intellectual skills and competent parents. Negative emotionality also had strong linkage to competence problems. Likewise, the participants' conduct, which was highly stable, had a strong correlation with academic performance over time. Antisocial behaviours during childhood negatively

influenced academic achievement and in turn contributed to later problems in numerous competence areas and mental well-being. However, those children who suppressed these negative behaviours early did not have developmental problems.

Project Competence studies led Garmezy and colleagues (Garmezy, Masten & Tellegen, 1984) to develop three complementary models to explain psychological resilience and highlight the relationship between stress and adaptation:

(1)   *Compensatory model*. A compensatory factor is one that neutralises the exposure to risk factor. It does not interact with the risk factor but has an independent influence on the outcome. This is an additive model whereby compensatory factor and risk factor add up to influence the outcome of exposure. For example, a child may come from a broken family and often experience conflict at home. However, the child may have an active approach to solving problems or an optimistic outlook. If the outcome is positive and the child is resilient, it may be because these personal attributes or compensatory factors compensated for the home environment.

(2)   *Protective model*. This model assumes that there is an interactive relationship between risk factors and protective factors (i.e., a protective factor interacts with a risk factor to influence the outcome). Protective factors can include a child's cognitive ability, adequate care from parents or caring teacher in school. For example, a child in high poverty may have parents who showed adequate care and this care interacts with the poverty to decrease the risk of poor developmental outcome. The protective model is different compared to the compensatory model in that there is an interaction between factors.

(3)   *Challenge model*. This model sees the potential of risk factor or stressor in enhancing resilience. While too much stress can break a child down, too little stress is not challenging enough for growth. The right level of stress provides challenge and when the child overcomes it, his or her psychological resilience is strengthened. The basis of this model is that challenges are helpful as they can develop coping skills and encourage the child to muster internal and external resources that are available. The idea is that psychological resilience is developed by success in overcoming the risk and not by avoiding it.

Garmezy (1991) defined resilience as "... *the capacity for recovery and maintained adaptive behaviour that may follow initial retreat or incapacity upon initiating a stressful event.*" (p. 459). He added that one needs to display "*functional adequacy (the maintenance of competent functioning despite an interfering emotionality) as a benchmark of resilient behaviour under stress.*" (p. 459) to be considered resilient.

2.4.2. Luthar's theory and definition of psychological resilience

In 1991, Luthar studied 144 adolescents from an inner-city public school as they were usually underprivileged and had higher rates of behaviour problems. Luthar examined their demographic variables, stress levels, competence and various dispositional variables such as intelligence, locus of control and social skills (Luthar, 1991). She also examined six aspects of social competence such as warmth, expressiveness and spontaneity. Luthar considered nine children to be psychologically resilient; experiencing high stress but demonstrated high competence. She found that psychological resilience was positively related to internal locus of control and social expressiveness (Luthar, 1991). Luthar suggested that children with an internal locus of control felt that they had the power to control and change events happening in their lives and this might have positive influences especially in an underprivileged neighbourhood.

In the late 1990s, Luthar and colleagues also studied children and adolescents with more affluent background. They studied 900 adolescents from high-income communities and assessed their well-being, anxiety, depression, substance use and rule breaking behaviours (Luthar and Latendresse, 2005). They also examined these adolescents' relationships with their parents including closeness to parents, parents' involvement in their upbringing, expectations and criticism. The authors found that protective factors that mitigated risk included quality of relationships with mothers, parents' expectations and criticism, parents' containment of substance use and parents' knowledge of their children's whereabouts (Luthar and Latendresse, 2005).

Luthar and colleagues proposed that there are three types of protective factors (Luthar, Cicchetti & Becker, 2000) involved in the resilience process as they interact with the adversity: (1) protective-stabilising; (2) protective-enhancing; and (3) protective but reactive. Protective-stabilising factors are those that help individuals to remain stable in their competence despite increasing risk, protective-enhancing factors are those that allow individuals to engage with stress such that their competence is enhanced with increasing

risk, and protective but reactive factors provide individuals with advantages but less so when risk levels are high. Luthar and colleagues also suggested that psychological resilience is multidimensional and context-dependent in that individuals can show competence in some areas or be resilient in certain situations but not in others (Luthar et al., 2000). For example, some individuals may have '*educational resilience*' (p. 549) but not '*emotional resilience*' (p. 549), or they may show '*behavioural resilience*' (p. 549) but not '*educational resilience*' (p. 549). The authors added that it is unrealistic to expect individuals to be competent in all areas and be successful in all situations consistently.

Luthar and colleagues defined resilience as "*… a dynamic process encompassing positive adaptation with the context of significant adversity.*" (Luthar et al., 2000, p. 543).

2.4.3. Masten's theory and definition of psychological resilience

In a longitudinal study, Masten et al. (1999) examined competent outcomes in late adolescence in relation to adversity over time, antecedent competence and psychosocial resources in order to better understand psychological resilience. The data were collected from 205 children when they were between eight to 12 years of age and again seven to 10 years later. Various types of data were collected (e.g., interviews with children and their parents, school records, teachers' ratings, peers' ratings and examination results) to measure three key areas of competence (i.e., academic achievement, conduct, and peer social competence), numerous aspects of adversity, and psychosocial resources. Three groups were subsequently defined: (1) Resilient (adequate competence, high adversity); (2) Competent (adequate competence, low adversity); and (3) Maladaptive (low competence, high adversity) individuals. The authors found that good outcomes across the three competence areas were associated with better intellectual functioning and parenting quality (Masten et al., 1999). These appeared to have served as protective factors especially against antisocial behaviours. On one hand, Resilient individuals had much in common with their low adversity Competent peers including average or better IQ, parent quality and psychological well-being. On the other hand, Resilient individuals differed substantially from their high adversity Maladaptive peers who had fewer resources and higher negative emotionality (Masten et al., 1999).

Masten and colleagues (Masten, Cutuli, Herbers & Reed, 2009) later suggested that two criteria must be present for individuals to be considered psychologically resilient; presence of conditions that threaten to disrupt adaptation and positive adaptation or

development. According to the authors, positive adaptation or development involves accomplishing developmental tasks and the presence of fundamental human adaptation systems (Masten et al., 2009). On one hand, developmental tasks represent the expectations of a particular culture or society imposed on individuals' behaviour at different ages and situations. These include studying, working and involvement in romantic relationships. On the other hand, fundamental human adaptation systems include self-regulatory systems for emotion, arousal and behaviour, family system, cultural belief systems, religion and spirituality.

According to Masten (2001), risk factors are known predictors of negative outcomes (e.g., low birth weight, poverty, maltreatment etc). Masten and colleagues also suggested that most risk factors are cumulative as they tend to occur together (Masten et al., 2009). Furthermore, a greater exposure to risk factors is associated with more negative symptoms and outcomes (Masten, 2011). Masten proposed the notion of a risk gradient, whereby it is possible to calculate the number of risk factors to categorise the risk level; more risk factors equate to higher level of risk (Masten, 2011, Masten et al., 2009). Masten also argued that most risk factors and protective resources are bipolar in nature and hence, a higher risk on the risk gradient indicates fewer protective resources (Masten, 2011).

Masten and colleagues (Masten et al., 2009) stated that protective factors or processes are basic human protective systems. They added that children who are not psychologically resilient typically do not have the experience, opportunities or resources to allow them to develop these systems. This position led them to suggest the need to focus interventions on preventing damage to, restoring, and compensating for threats to these basic human protective systems. They added that resilient outcomes can be achieved by having more protective resources to counterbalance the high level of risk factors.

Masten (2014) defined psychological resilience as "*The capacity of a dynamic system to withstand or recover from significant changes that threaten its stability, viability, or development.*" (p. 4).

2.4.4. Rutter's theory and definition of psychological resilience

One of Rutter's most influential studies is the Isle of Wight study conducted between 1964 and 1965 (Rutter, 1979). He compared children from the Isle of Wight with

children from an underprivileged area in London. He identified six risk factors; parental criminality, mothers with psychiatric disorder, parental marital conflict, large family size and low socioeconomic status. The study showed that the more of these risks the children were exposed to, the more likely they were to develop psychiatric disorder. Rutter found that with no risk or just one risk, there was a 1% chance of developing psychiatric disorder. However, with four or more risks, the chances of developing psychiatric disorder increased to 21% (Rutter, 1979). The study also included some twins whose mother were diagnosed with schizophrenia. Hence, Rutter investigated the relationship between these children and their parents to examine its impact on psychopathology. He found that when a twin experience affection and had good relationship with either parent, they had a 25% chance of developing psychiatric disorder. However, the chances of developing psychiatric disorder increased to 75% when a twin lacked a relationship with either parents (Rutter, 1979). Rutter also compared the schools in the Isle of Wight and London that were involved in his study. He found significant differences in the children's behavioural problems, attendance rates and academic achievements in these schools regardless of the children's background and attributes. The findings showed that schools with lower rates of problem had better classroom management, emphasised the importance of homework and exams, empowered the children to take responsibility for their actions and encouraged prosocial behaviours (Rutter, 1979). These suggested that the school environment had significant influences on the children.

According to Rutter, psychological resilience is not related to any psychological trait and positive adaptation can be achieved if an individual is given the right resources (Rutter, 2013). He also suggested that individual differences in resilience may have a genetic or physiological basis that makes some individual more or less easily affected by risks present in the environment. Rutter added that certain aspects of individual differences including genetics and temperament can create differences in how each individual responds to the external risk and protective factors. Rutter also argued that resilience is contextual, and the same risk and protective factors can affect people differently. He stressed that instead of assuming all risk and protective factors have the same effects on all people under all conditions, it is more important to examine each individual's need in relation to a specific circumstance (Rutter, 2013).

Rutter suggested that certain mechanisms exist in protecting individuals against the negative psychological effects of exposure to adversity, and discussed this in relation to four key processes:

(1)   ***Reduction of risk impact***. The risk impact may be reduced by altering exposure to the risk or by changing the way individuals appraise the risk. As most risk factors are not absolute and can vary in intensity, reducing the intensity of certain risk exposure such that the individual can successfully cope with the risk may change the way the individual appraises it. As the individual has achieved success and changed the way the risk is perceived, the impact of the actual risk may be reduced.

(2)   ***Reduction of negative chain reactions***. This protective mechanism is concerned with reducing the negative chain reactions that follow certain risk exposure. The idea is about preventing the perpetuation of the risk effects. For example, the loss of one parent may lead to a higher probability of institutional treatment for a child. This may have a chain reaction and subsequently affects the child's development.

(3)   ***Establishment and maintenance of self-esteem and self-efficacy***. Rutter suggested that the establishment and maintenance of self-esteem and self-efficacy are important. He added that these can be achieved by developing secure relationships and achieving success in completing tasks that are important to the individuals. This will result in improved self-worth and create a positive self-concept, and in turn gives the individuals confidence that they can cope with the stressful demands in life.

(4)   ***Opening up of opportunities***. The final mechanism involves the opening up of opportunities to obtain experiences that may mitigate the effect of risk factors. Rutter related this to turning points in individuals' lives and used education experience to illustrate the point. He posited that academic success at various timepoints allow individuals to progress through the education ladder and gain better credentials for skilled jobs. Unfortunately, those who drop out of the education system will not have similar experiences or opportunities.

Rutter (2006) defined psychological resilience as "*An interactive concept that is concerned with the combination of serious risk experiences and a relatively positive psychological outcome despite those experiences.*" (p. 2).

2.4.5. Werner's theory and definition of psychological resilience

One of Werner's research focuses was on the protective factors that facilitated psychological resilience at the individual, family and community level (Werner, 1989). These protective factors can include dispositional factors and external factors such as good family ties and a supportive external environmental. Werner conducted a longitudinal study of 698 infants born in 1955 on the island of Kauai (Werner, 1982) with the aim to examine the children's developmental outcomes. A multidisciplinary team including nurses, paediatricians and psychologists were involved to assess various aspects of development; physical, intellectual and social. The first set of data was collected when the children were 18 months and 30 to 32 months of age and it showed that one-third of the children were considered 'at risk' (e.g., being born into poverty, raised by mothers with little education and growing up in a troubled family characterised by discord, divorce, alcoholism or mental illness). Werner and colleagues considered about 10% of the infants to be resilient. They were more likely to be very active and had fewer eating and sleeping problems. The girls were also more affectionate while the boys were good-natured.

As toddlers, the resilient children demonstrated greater awareness and autonomy, were more sociable and adventurous, and possessed more advanced communication and physical skills. When these resilient individuals were in elementary school, they reasoned and read better, had more hobbies and related better with their peers. In high school, these resilient children had more positive self-concept and internal locus of control, and were more responsible and achievement-oriented. They also had at least one and often more close friends. Furthermore, they were more likely to experience less separations from parents and had close bond with their caregivers. Some resilient children also had favourite teacher and other informal networks of support.

These findings led Werner to believe that these individual, family and community protective factors can increase an individual's capacity to cope effectively with both internal and external stresses. She posited that protective factors could operate either directly or indirectly (Werner, 1989). To illustrate the indirect effect, external support

systems in the form of accommodating work environment or help from extended family network can provide support to a caregiver which in turn can increase the caregiver's capacity to pay adequate attention to the child. Werner also suggested that the more stress an individual experienced, the more protective factors were needed (Werner, 1982). She held an ecological view about psychological resilience and believed that instead of relying on some form of resilience intervention, children may benefit more if they work with or work around the environment that they are in. However, if and when intervention becomes necessary, it should address the balance of both the risk and protective factors; decreasing the number or intensity of the stressors and increasing the number or efficacy of the protective factors.

Werner and colleague (Werner & smith, 1982) defined psychological resilience as the "*capacity to cope effectively with the internal stresses of their vulnerabilities (such as labile patterns of autonomic reactivity, developmental imbalances, unusual sensitivities) and external stresses (such as illness, major losses, and dissolution of the family).*" (p. 4).

2.4.6. More recent definitions of psychological resilience

In a more recent plenary session involving resilience researchers that took place at the 2013 meeting of the International Society for Traumatic Stress Studies, it was noted that defining psychological resilience was still one of the most pressing current questions in the field of resilience research (Southwick, Bonanno, Masten, Panter-Brick & Yehuda, 2014). During the discussion, Bonanno defined psychological resilience "… *very simply as a stable trajectory of healthy functioning after a highly adverse event.*" (p. 2). He explained that he and his colleagues often focused their work on acute life events, and they were interested in following people over time. Consequently, they were able to map out the trajectories of people's responses to those events. In response to Bonanno's assertion, Yehuda conceptualised psychological resilience as a process of moving forward and not returning back. She went on to define psychological resilience as "… *a reintegration of self that includes a conscious effort to move forward in an insightful integrated positive manner as a result of lessons learned from an adverse experience.*" (p. 3). She claimed that the notion of moving forward was a significant part of being resilient because it highlighted people's refusal to succumb to adversity. A third definition was provided by Masten who saw psychological resilience as "… *the capacity of a*

dynamic system to adapt successfully to disturbances that threaten the viability, the function, or the development of that system." (p. 4). She felt that this way of defining psychological resilience will aid people who are trying to prepare populations for dealing with disasters in thinking about building the capacity to adapt. The final definition, given by Panter-Brick, stated that psychological resilience "*… is a process to harness resources to sustain well-being.*" (p. 4). She chose to define psychological resilience as a process because this implied that the construct is not just an attribute or capacity. The panel concluded that as psychological resilience is a complex construct, it may be defined and studied differently depending on the research context.

Table 2.1 summarises the various theories, definitions and ways in which psychological resilience is conceptualised.

Table 2.1

Theory, definition and conceptualisation of psychological resilience

Author/s	Theory	Definition	Conceptualisation of Resilience
Garmezy (1991)	• Compensatory model – compensatory factor neutralizes the effects of exposure to risk factor. • Protective model – protective factor interacts with risk factor to influence the outcome following exposure to adversity. • Challenge model – risk factor can potentially enhance resilience; right level of stress provides challenge and if individuals overcome it, his or her resilience is strengthened.	*"Resilience is designed to reflect the capacity for recovery and maintained adaptive behaviour that may follow initial retreat or incapacity upon initiating a stressful event."*	Internal capacity
Luthar et al. (2000)	• Protective-stabilising factors help individuals to remain stable in their competence despite increasing risk. • Protective-enhancing factors allow individuals to engage with stress such that their competence is enhanced with increasing risk. • Protective but reactive factors provide individuals with advantages but less so when risk levels are high. • Psychological resilience is multidimensional and context-dependent in that individuals can show competence in some areas or be resilient in certain situations but not in others.	*"… a dynamic process encompassing positive adaptation with the context of significant adversity."*	Process
Masten (2014)	• Two criteria must be present for individuals to be considered resilient; presence of adversity and positive adaptation or development. • Positive adaptation or development involves accomplishing developmental tasks and presence of fundamental human adaptation systems. • Risk factors are known predictors of negative outcomes, and they are cumulative as they tend to occur together.	*"The capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability, or development."*	Internal Capacity

	• It is possible to calculate the number of risk factors to categorise the risk level using a risk gradient, and higher risk on the risk gradient also indicates less protective factors.		
Rutter (2006)	• Reduction of risk impact – risk impact may be reduced by altering exposure to the risk or by changing the way individuals appraise the risk. • Reduction of negative chain reactions – risk exposure can initiate negative chain reactions, but this can be prevented by providing individuals with alternate resources. • Establishment and maintenance of self-esteem and self-efficacy - self-esteem and self-efficacy are important internal protective factors and they can be developed by having secure relationships and achieving success in completing tasks that are important to the individuals. • Opening up of opportunities – experiences gain from opening up of opportunities can mitigate the effects of future risk factors.	*"An interactive concept that is concerned with the combination of serious risk experiences and a relatively positive psychological outcome despite those experiences."*	Outcome
Werner & Smith (1982)	• Protective factors exist at the individual, family and community level, and these can increase an individual's capacity to cope effectively with both the internal and external stresses they faced. • Positive outcome can be achieved through reducing the number or intensity of risk factors and increasing the number or efficacy of protective factors.	*"The capacity to cope effectively with the internal stresses of their vulnerabilities and external stresses."*	Internal capacity

2.4.7. Summary

As evident, there is no consensus on a single unifying theory or definition of psychological resilience. Furthermore, various researchers also conceptualised the construct differently; internal capacity, process or outcome. While Werner and colleague (1989), Garmezy (1991) and Masten (2014) considered psychological resilience as an internal capacity, Rutter (2006) approached the construct from an outcome perspective and Luthar (2000) understood it as a process. These points of divergence are discussed in the next section (section 2.5). Despite these differences in perspective about what psychological resilience is, there were agreements about the presence of certain factors and phenomenon related to the construct; adversity, risk factor, protective factor, coping or adaptation. These are discussed in section 2.6.

2.5. Points of divergence in resilience research

The previous section highlighted that there are differences on how psychological resilience has been theorised, defined and conceptualised by various researchers over the years. These differences led to arguments over whether it is an internal capacity, process or outcome. In order to better understand psychological resilience as a capacity that is internal to individuals, this literature review provides more insight by examining the construct in relation to various aspects of individual differences such as abilities, traits and states. This is discussed in sub-section 2.5.1. Next, researchers who adopted the perspective that resilience is a process argued that adaptation to adversity often involves complex interactions between various factors that are internal and external to the individuals, how individuals appraise the adversity and relate with the environment. As these interactions are complex and involved numerous components, psychological resilience as a process is best illustrated using visual models or frameworks. Specifically, sub-section 2.5.2 introduces and discusses two widely cited model and framework in resilience research. Lastly, as the perspective that psychological resilience is merely an outcome adds limited understanding to the study of the construct, sub-section 2.5.3. highlights and discusses these limitations.

2.5.1. Psychological resilience as an internal capacity

Cognitive ability and psychological resilience. According to Ross (1972), individuals with higher cognitive ability possess better self-help skills. Likewise, these individuals are expected to be able to cope better with stress (Cederblad, Dahlin, Hagnelt

& Hansson, 1995). Sternberg (1998) also asserted that better cognitive ability is related to superior analytical and practical problem-solving abilities. These suggest that cognitive ability should have a strong positive relation with psychological resilience. However, studies that examined psychological resilience in relation to cognitive ability have failed to establish any link between the two. For example, Luthar (1991) found that cognitive ability was not a consistent protective factor in relation to stress. While at low stress levels, cognitive ability was positively related to school grades and classroom assertiveness, when stress was high, children with better cognitive ability were performing similarly to those considered less intelligent. The author posited that children with better cognitive ability tended to have higher levels of sensitivity to their surroundings and this might predispose them to be highly susceptibility to the stressors present in their environments. Similarly, using data collected from 482 applicants to military college, Friborg, Barlaug, Martinussen, Rosenvinge and Hjemdal (2005) found no relation between various aspects of psychological resilience as measured by the Resilience Scale for Adults (RSA)[2] and four separate measures of cognitive ability: (1) Raven Advanced Matrices to measure non-verbal abstract and analytical intelligence; (2) Word Comprehension from WAIS to measure of verbal intelligence; (3) Number Series to measure mathematical reasoning; and (4) Mathematics to measure mathematical knowledge and skills. This literature review also noted that there is little research conducted to examine psychological resilience in relation to cognitive ability.

Personality and psychological resilience. One of the earliest studies examining personality in relation to psychological resilience was conducted by Friborg and colleagues (2005). It is the same study mentioned above. The authors found that emotional stability was most related to RSA-personal strength of perception of self ($r = .79$, $p < 0.001$) and perception of future ($r = .57$, $p < 0.001$), extroversion was related to RSA-social competence ($r = .41$, $p < 0.001$), and conscientiousness was related with RSA-structured ($r = .83$, $p < 0.001$). Similarly, using the Connor-Davidson Resilience Scale (CD-RISC 25; Connor & Davidson, 2003) to measure psychological resilience with 132 undergraduates, Campbell-Sills, Cohan and Stein (2006) found that the three aspects of personality most related to psychological resilience were neuroticism ($r = -.65$, $p <$

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[2] *The RSA measures five aspects of resilience as conceptualised by Hjemdal, Friborg, Martinussen and Rosenvinge (2001); (1) personal strength; (2) social competence; (3) structured style; (4) Family cohesion; and (5) social resources.*

0.001), extraversion ($r = .61$, $p < 0.001$) and conscientiousness ($r = .46$, $p < 0.001$). More recently, using the CD-RISC 25 to measure psychological resilience with 201 healthy adults in Germany, Sarubin and colleagues (2015) also found significant relations between psychological resilience and neuroticism ($r = -.48$, $p < 0.001$) and extraversion ($r = .55$, $p < 0.001$).

In a meta-analysis conducted by Oshioa, Takub, Hiranoc and Saeed (2018) to synthesise existing studies examining the relations between personality and psychological resilience, 30 studies involving 15,609 participants were included in their analysis. These studies used various self-report measures of psychological resilience and personality. The authors found that the estimated average correlation coefficients for psychological resilience were: (1) $r = -.46$[3] (neuroticism); (2) $r = .42$ (conscientiousness); (3) $r = .42$ for (extraversion); (4) $r = .34$ (openness); and (5) $r = .31$ (agreeableness). It was interesting to note that the authors made a distinction between two types of resilience; ego-resiliency and trait resilience. They highlighted that the former is an ability while the latter is a trait. When the measurement of psychological resilience was teased apart in their analysis, the authors found that, compared to trait resilience, ego-resilience had a stronger negative relationship with neuroticism, and stronger positive relationships with openness and agreeableness. There was no difference for conscientiousness and extraversion. Collectively, these studies showed that unlike cognitive ability, significant relations exist between certain aspects of personality and psychological resilience.

Self-concept, core self-evaluations and psychological resilience. Self-concept refers to how individuals perceive and evaluate themselves. Baumeister (1997) defined self-concept as "… *the totality of inferences that a person has made about himself and herself.*" (p. 681). Rogers (1959) argued that self-concept has three separate but related components: (1) self-image; (2) self-esteem; and (3) ideal-self. Self-image is the view that individuals have about themselves but may not necessarily reflect reality. For example, an individual with anorexia may think that he or she is fat but in reality, it is the opposite. Self-image can be influenced by individuals' past experiences, the environment, culture and personality. Self-esteem is about how much value individuals place on themselves and it is related to the extent to which individuals like and approve of ourselves. As such, self-esteem involves some degree of self-evaluation and it can either

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[3] *P-values are not reported as they vary between the different studies included in the meta-analysis.*

be positive or negative. Ideal-self refers to how individuals wish they really are. If there is a discrepancy between how individuals see themselves (self-image) and what they really want to be (ideal-self), there is incongruence and individuals' self-esteem may be affected. Individuals can have self-concept in various aspects including how clever they are, how good looking they are, how able they are in achieving certain task and how resilient they are.

Judge, Locke and Durham (1997) proposed a similar concept called core self-evaluations (CSE) and described them as "*fundamental premises that individuals hold about themselves and their functioning in the world.*" (p. 168). The authors argued that unlike self-concept, CSE are all-encompassing in that all situationally specific evaluations depend on these core evaluations. They further asserted that self-concept should not be an accrual of favourable self-evaluation in multiple aspects of the self but should instead be a global evaluation. The authors claimed that both concepts overlap with each other considerably and that there is no practical utility to make a distinction between them. Hence, they used the terms interchangeably. They added that CSE is a general personality construct that consists of four specific traits: (1) self-esteem; (2) generalised self-efficacy; (3) locus of control; and (4) emotional stability or non-neuroticism. In a meta-analysis involving 12 samples of approximately 15,000 participants, Judge et al. (1997) found that the four traits correlated highly with one another and they loaded strongly on a single factor. These led the authors to conclude that instead of studying the four traits separately to explain human behaviours, they should be combined as a construct; CSE. The authors argued that CSE can also predict job performance through its link to motivation to perform, and this made it a motivational trait. Judge et al. (1997) further asserted that CSE can be consider an ability in some instance. They substantiated their claim by citing two studies conducted by Judge, Thoresen and Pucik (1996) and Wanberg and Banas (2000) that showed that managers with positive CSE had the ability to cope or adapt more effectively with changes in their organisations and this helped them to perform better.

More recently, Kammeyer-Mueller and Judge (2009) conducted two studies to examine CSE in relation to individual differences in coping process, which is a key concept in resilience research. The first study, a meta-analysis, involved 81 studies and 100 different samples. The authors found that individuals with positive CSE reported

fewer stressors and less strain compared to individuals with negative CSE. Moreover, individuals with positive CSE exhibited more problem-solving coping behaviours, less avoidance coping behaviours and emotion-focused coping behaviours. The second study, a daily diary study, involved 252 working adults. The authors found that participants with high CSE reported fewer stressors, suffered less strain after controlling for stressors, and exhibited less avoidance coping behaviours.

Various research have shown that individuals with positive CSE or self-concept are more resilient, and this can often lead to better performance. For example, in two studies conducted by van Doorn and Hülsheger (2015), the authors found that CSE moderated the relationship of job demands including emotional job demands, workload, and shift work with psychological distress. In their first study using a sample of 68 employees from a transportation organisation in the Netherlands, van Doorn and Hülsheger (2015) measured CSE using a Dutch version of the Core Self-Evaluations Scale (CSES) developed by Judge, Erez, Bono and Thoresen (2003). Job demands were measured with a shortened version of the Questionnaire on the Experience and Evaluation of Work (VBBA) and depression as a manifestation of psychological distress was measured with the Patient Health Questionnaire (PHQ-9). The authors found that workload and emotional job demands were positively related to depression while CSE was negatively related to depression. This showed that compared to employees with low CSE, employees with high CSE experienced less psychological distress (i.e., more resilient). Furthermore, CSE moderated the relationship of workload and emotional job demands with psychological distress. The second study involved 172 employees from a German hospital. CSE was measured with a German version of the CSES. Arguing that shift work is a well-known stressor, the authors assessed this aspect of job demand by identifying whether the employees were involved in shift work or not. Irritation, as a form of psychological distress, was measured using the German Irritation Scale. The authors found a negative correlation between CSE and irritation (i.e., individuals with high CSE are less susceptible to irritation and hence less distress psychologically); more resilient. Furthermore, CSE moderated the relationship between shift work and irritation. The authors concluded that CSE functioned as a personal resource and acted as a buffer between job demands and psychological distress.

In another study, Mummery, Schofield and Perry (2004) found that positive self-concept of physical endurance is related to psychological resilience. The authors conducted the study with 272 competitive swimmers. Self-concept of physical endurance was measured with the Physical Self-Description Questionnaire (PSDQ) developed by Marsh, Richards, Johnson, Roche and Tremayne (1994) and participants completed the questionnaire three days before the start of the competition. Resilience was measured using objective performance data. The participants were categorised into three groups: (1) initially successful performance; (2) resilient performance (initial failure, followed by subsequent success); and (3) non-resilient performance (initial failure followed by continued failure). The initially successful performance group consisted of swimmers who recorded a personal best time on the initial swim of the competition compared to their entry time that qualified them for the competition. The second group, resilient performance, consisted of swimmers who failed to achieve an equal or better time in the first swim of the competition compared to their earlier entry time, but subsequently recorded a best time in their second swim. The final group, non-resilient performance, consisted of swimmers who failed to achieve a best time on both their first and second swim of the competition compared to their initial entry time. Mummery and colleagues performed a discriminant function analysis on the grouping variable with the PSDQ and found that the resilient performance group was discriminated from the other two groups (χ^2 (42) = 71.13, p <.01), and the resilient performance group showed higher self-concept of physical endurance than both the initially successful performance and non-resilient performance groups.

Summary. In conceptualising psychological resilience as an internal capacity from an individual differences perspective, this literature review found that the construct is not related to cognitive ability. This suggested that psychological resilience is not an ability or is dependent on how intelligent one is, and therefore it can potentially be developed. Psychological resilience is however related to some aspects of personality. Specifically, it is most related to emotional stability, followed by conscientiousness, then extraversion, thereafter openness and finally agreeableness. Likewise, psychological resilience is related to self-concept or core self-evaluation. These suggested that psychological resilience is not fixed and can potentially be influenced by individuals' traits, styles and views about themselves. Therefore, it is susceptible to change and can potentially be improved.

2.5.2. Psychological resilience as a process

Resilience researchers who favour the conceptualisation of psychological resilience as a process recognised the critical roles played by the interactions between individuals and their external environment. Conceptualised as a process, psychological resilience is not seen as a static state of existence. This process is also dynamic as it can develop over time in the context of person-environment interactions (Egeland, Carlson & Sroufe, 1993). According to Luthar and Cicchetti (2000), it is this dynamic interaction that results in an individual's adaptation following exposure to a given adversity. As these interactions are complex and involve numerous components, this process is best understood using some form of visual illustrations. Various resilience models and frameworks have been developed over the years to study psychological resilience as a process. This literature review highlights and explains two widely cited model and framework; Richardson's resilience model and Kumpfer's resilience framework. Next, the model and framework are discussed with respect to their commonalities and differences, and insights provided to the study of psychological resilience.

Richardson's resilience model. Richardson argued that biopsychospiritual balance or homeostasis allows individuals to adapt to current life circumstances and this adaptation involves the body, mind, and spirit. This homeostasis is constantly being challenged by stressors, adverse events, or what Richardson labels as "*life prompts*". He added that individuals' ability to cope and adapt to these stressors or adverse events are influenced by internal resilient qualities, protective factors and previous experience or resilient reintegrations. The interaction between daily stresses and protective factors determines whether serious disruptions will occur and impact the individuals.

Richardson's (2002) model illustrates a resilience process that begins with a state of biopsychospiritual homeostasis (see Figure 2.1). This is considered a comfortable zone where an individual is physically, mentally, and spiritually balanced. When stressors, adversities or life events occur, the protective factors will start to buffer an individual against the negative effects. Next, a disruption from this homeostatic state occurs when the protective factors failed to protect the individual. The individual who is disrupted will begin to adjust and reintegrate. This reintegration process can result in four different outcomes: (1) resilient reintegration with the attainment of additional protective factors and a higher level of homeostasis; (2) homeostatic reintegration when the individual

remains in his or her comfort zones for the disruption to dissipate; (3) reintegration with loss where this is loss of protective factors and a lower level of homeostasis; and (4) dysfunctional reintegration when the individual resort to destructive behaviours.
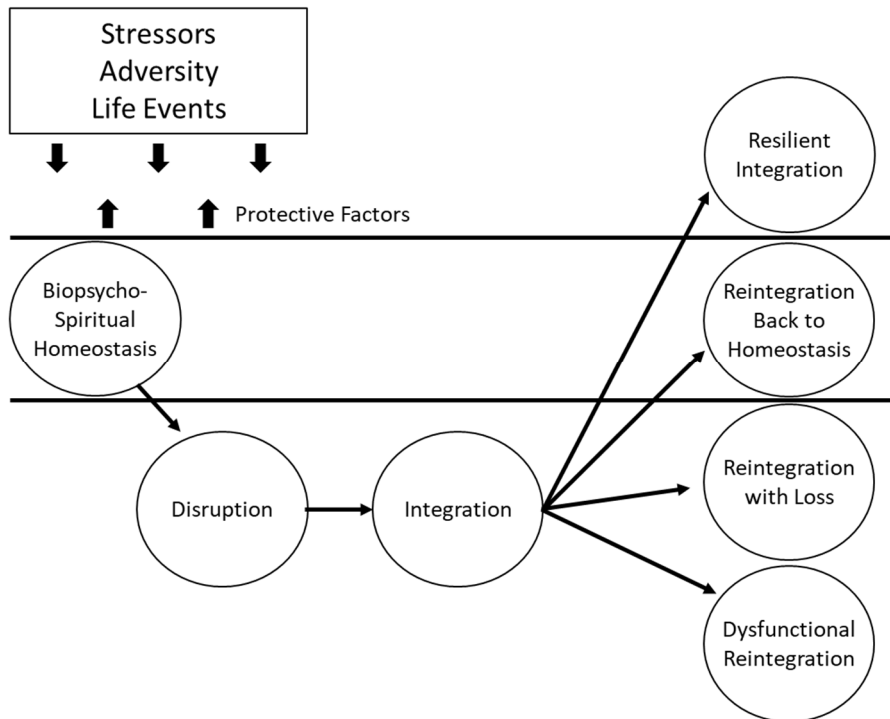
Figure 2.1: Richardson's resiliency model. Adapted from "The metatheory of resilience and resiliency." by G. E. Richardson, 2002, *Journal of Clinical Psychology, 58*, p. 307. Copyright 1999-2019 by John Wiley & Sons, Inc.

The resilient reintegration process involves experiencing new insights and these may lead to improvement and growth. Reintegration can also lead to the strengthening of existing protective factors or identification of new ones. To illustrate, suppose a soldier is confronted with the negative event of failing a physical test. His homeostatic state is thus disrupted. The soldier may turn to a peer or trainer for emotional support to overcome the disappointment. Consequently, resilient reintegration can occur with his homeostasis state strengthened with the attainment of additional protective factors in the form of closer relationship with the peer or trainer. Homeostatic reintegration occurs when the soldier, while disappointed, does not get adversely affected by the event and remains in his comfort zone for the disappointment or disruption to go away with the passage of time. Reintegration with loss occurs with a lower level of homeostasis when the soldier is overcome with sadness and consequently loses his self-esteem (loss of protective factor).

Finally, dysfunctional reintegration can occur if the soldier resorts to destructive behaviours like turning to alcohol or drug to temporarily lessen his pain.

Kumpfer's resilience framework. Kumpfer (1999) posited that resilience studies in general discuss resilience factors or processes as many different constructs. Hence, she developed what she called "*organizational framework or model of resilience*" (p. 183) to facilitate a better understanding of psychological resilience as a process. Her work was partly influenced by Bronfenbrenner and Crouter (1983) who recommended the use of person-process-context model to examine the complex relationship between risk, individual attributes, protective factors and processes involved.

Kumpfer's (1999) resilience framework consists of four domains of influence and two transactional points. The four domains of influence include stressors or challenges, the environmental context (risk and protective factors), internal resiliency factors (cognitive, emotional, physical behavioural and spiritual factors), and adaptation that can be either considered resilient reintegration or maladaptive reintegration. The two transactional points are the person-environment transactional processes and resiliency processes. Figure 2.2 illustrates the linear relation between the four domains of influence and two transactional points.
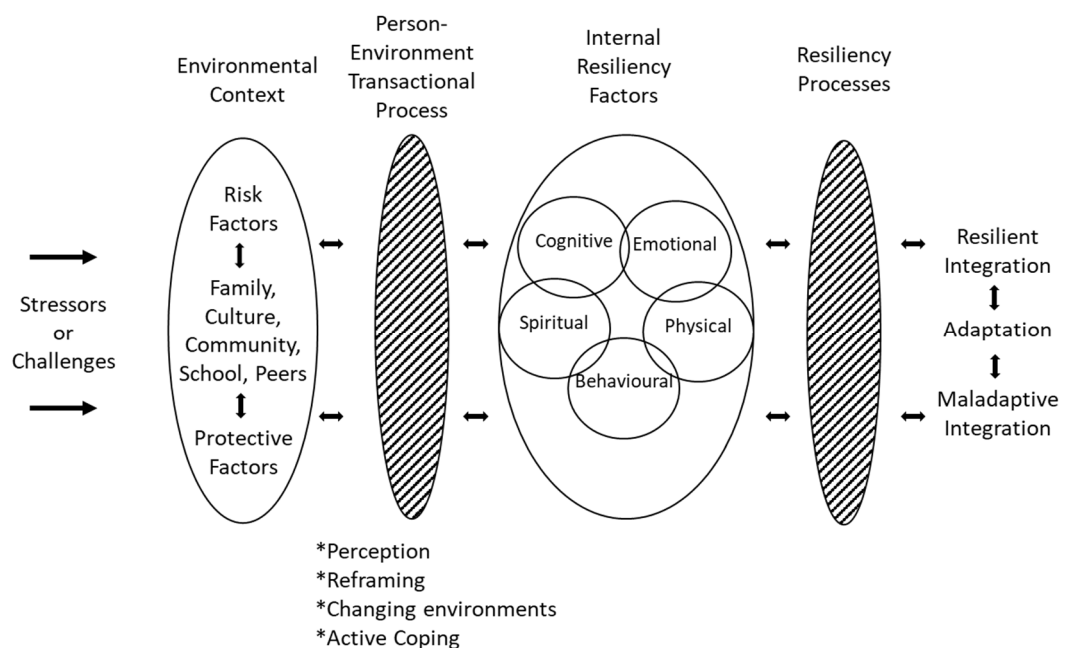
Figure 2.2: Kumpfer's resilience framework. Adapted from "Factors and processes contributing to resilience." by K. L. Kumpfer, 1999, *Resilience and development: positive life adaptations*, p. 185. Copyright 2002 by Springer Science+Business Media New York.

The stimuli in the form of stressors or challenges activates the process which creates a disruption in the homeostasis state of an individual. How stressed the individual feels is dependent on how the individual appraises and interprets the stressor or challenge. The individual interacts with the environment and this involves the individual's internal resiliency factors (cognitive, emotional, physical behavioural and spiritual factors). The external environment includes risk and protective factors that interacts with one another. These interactions lead to resilience processes that involve the individual coping with stressors or challenges either in a short or long term. Consequently, the adaptation is either positive or negative.

This framework is illustrated with the same example as above. The stressor or challenge is the failure to pass a physical test. The soldier's level of stress will be determined by how he appraises and interprets the failure. One on hand, the soldier can be extremely stressed if he thinks and knows that this failure will affect his overall course performance or that he will be confined over the weekends for remedial training. On the other hand, the soldier may think nothing of it if most of his peers also failed the test or that there is another test opportunity on the following day. As he is dealing with the disappointment, risk and protective factors in the environment can either aggravate or improve his situation. Risk factors in this example can be tough trainers who will dish out punishments for those who failed the test or unhelpful peers who laugh and criticise the soldier for being weak. Protective factors can come in the form of a caring parent or loved one who can provide a listening ear or encourages the soldier to persevere and do better next time. In terms of adaptation, the soldier can decide to go absence without leave (AWOL) to avoid punishment or confinement, or he can find some learning points in the experience and set a goal to do better in future test.

Commonalities and differences between Richardson's model and Kumpfer's framework. Both Richardson's model and Kumpfer's framework examine psychological resilience as a process and the process is activated by a stimulus; stressor, adversity, life event or challenge. The stimulus in the model and framework can potentially disrupt the homeostasis state of an individual. The word "potentially" suggests that this stimulus may

or may not affect the individual as there are individual differences in the way stressor, adversity, life event or challenge are appraised and interpreted. While Richardson explained that "*Perceived seriousness of the stimulus depends on resilient qualities and previous resilient integrations.*" (p. 311) and Kumpfer stated that "*The degree of stress perceived by the individual depends on perception, cognitive appraisal and interpretation of the stressor as threatening or aversive.*" (p. 183), both model and framework do not adequately describe the process of exactly how individuals appraise and interpret the stimulus.

Both authors recognised that the environment plays a part in the process, involving the individual actively interacting with it. They also highlighted the presence of external protective factors that can have an impact on the individual and the eventual outcome of exposure. This is an important proposition in many respects. Firstly, taking the emphasis away from the individual internal factor gives people, organisation and society the hope that as far as achieving resilience is concern, individuals are not in it alone. They can reach out to external sources of support to overcome the adversity. Secondly, it can better inform resilience intervention initiatives as other than dealing with the individual, the intervention can be more holistic in covering other salient external aspects.

While Richardson and Kumpfer adopted the process view of resilience, they also acknowledged the importance of individuals' internal attributes. Richardson called them internal resilient qualities while Kumpfer referred to them as internal resilience factors. On one hand, according to Richardson, resilient qualities include traits, states, characteristics, conditions and virtues that are considered strengths or assets that can help individuals to cope with adversity. They can include adaptability, tolerance, achievement-orientation and self-esteem (Werner, 1982), easy temperament, self-mastery, self-efficacy and planning skills (Rutter, 1985), and positive outlook, internal locus of control, self-discipline and critical thinking skills (Garmezy, 1991). On the other hand, Kumpfer categorised resilience factors into cognitive, emotional, physical, behavioural and spiritual competencies or strengths required to be successful in different developmental tasks, cultures and environments. It is important to not label these qualities or factors as abilities because it suggests that they are susceptible to change and development, which can in turn positively influence the outcome of exposure to adversity.

Lastly, both framework and model are linear in nature. This can potentially be a limitation as interaction between people and their environment is usually thought to be a more dynamic process. Moreover, adversity or stressor usually does not occur in isolation. For example, poverty can exist with threats to personal health because of malnutrition and there may be physical danger due to homelessness. Neither Richardson's model nor Kumpfer's framework addresses the complex interplay between various related or unrelated risk and adversity, and examine their combined effects. Furthermore, the linear nature of the model and framework also does not examine what or how the outcome or adaptation can influence the internal protective factor. For example, a positive outcome of exposure to adversity can potentially improve an individual's self-concept (i.e., post-traumatic growth).

There are some differences between Richardson's model and Kumpfer's framework. Firstly, Kumpfer's framework includes risk factors which can have aggravating effects on the individuals while it is absent in Richardson's model. Next, while Kumpfer's framework examines the individual from the cognitive, emotional, physical, behavioural and spiritual aspects, Richardson only focus on the body, mind and spirit. However, these approaches in studying and understanding the individual have benefits as it allows researchers and potential intervention initiatives to take a more targeted effort in addressing the specific aspects of the individual (i.e., physically, cognitively or behavioural). Another difference is that Richardson's model distinguishes between four different possible outcomes while Kumpfer only has two. Kumpfer's framework is simplistic in categorising the outcomes into either positive or negative while Richardson's model classified the outcomes based on the degree of how positive or negative they are. Furthermore, Richardson's model also emphasises the potential effects on the protective factors (i.e., loss or strengthen) and possible changes to the level of homeostasis after reintegration.

2.5.3. Psychological resilience as an outcome

Beside Rutter (2006), there are other resilience researchers who adopted the perspective that psychological resilience is an outcome. These include Dunkel and Dolbier (2011) who suggested that positive resilience outcomes may include healthy psychological functioning in different life domains, and emotional, behavioural and biological responses to acute stressors. More narrowly, resilience is conceptualised as

outcome patterns or trajectories following potentially traumatic events by Bonanno and Mancini (2012). It is interesting to note that one of Masten's (2001) earlier definitions of psychological resilience adopted an outcome perspective as she referred to the construct as *"… a class of phenomena characterized by good outcomes in spite of serious threats to adaptation or development."* (p. 228).

While the outcome approach simplifies the study of psychological resilience and makes it easy to understand for the laypeople whom the research are supposed to benefit, Kaplan (1999) observed that a major limitation is that it is tied to the normative judgments of the definition of particular outcomes. Bartelt (1994) had the same concern and shared the following:

"Several representatives of Hispanic community organizations have put the following question to me: If family income is lower for Puerto Rican communities, if the day-to-day needs of the household for additional economic resources are strongly present; and if there is a strong pro-family ideology within the community that is threatened by continued poverty; why should we not expect that our teenagers will seek to leave school and obtain full-time employment as soon as possible? In turn I must ask myself, isn't this a form of resilience as we have come to define it? How then do we distinguish academic success as resilience from dropping out as resilience" (p. 103)?

Other than making the judgement subjective, Bartelt's illustration also suggests that resilience research is contextual (e.g., academic success is generally considered as resilient but dropping out of school to seek full-time employment in order to supplement family income can also be considered as resilient in some circumstances). Hence, researchers should be mindful in considering what exactly constitutes positive outcome given that differences exist in various situations, cultures, societies, and points in time. To illustrate, a soldier coming out of cover to expose himself to the enemies so that he can draw their fire in order for his own forces to identify the enemies' locations is seen as a resilient outcome in the military context. However, this would be considered suicidal by most people in a more civilised world away from the battlefield. A non-resilient outcome would be for the soldier to hide in self-preservation because it is a matter of time before the enemies call for artillery on the soldier and his own forces' location or overrun the soldier's position eventually.

Rosenberg and Yi-Frazier (2016) posited that the outcome approach is also problematic because if psychological resilience is defined solely as an outcome, it is difficult to consistently identify it across different populations and contexts. They added that when examining the positive side of resilience outcomes alone, they can be tremendously heterogeneous. These can include either the absence of psychopathology, good physical functioning, good quality of life and positive psychological growth or thriving.

Moreover, in defining psychological resilience as an outcome without considering other aspects of individual differences or the roles of the environment can create an impression that psychological resilience cannot be changed or influenced. Instead of allowing individuals to benefit from resilience research, assuming that psychological resilience is merely an outcome may create a sense of learnt helplessness in them.

2.5.4. Summary

One of the controversies in resilience research is the disagreement surrounding how the construct is conceptualised. Some researchers argued that it is an internal capacity, some study it from a process prospective while others see it as merely an outcome. In considering psychological resilience as an internal capacity, this literature review found no relation between the construct and cognitive ability. Psychological resilience is however associated with aspects of personality and self-concept or core self-evaluations. These suggested that psychological resilience is not static and can potentially be improved. When psychological resilience is examined as a process, it often involves individuals actively interacting with factors internal and external to themselves which can have impacts on how the individuals appraise the adversities confronting them, and this process eventually influences how individuals cope and adapt. However, there appears to be gap in the literature regarding exactly how these processes play out in various situations. Finally, studying psychological resilience solely as an outcome does not explain how the various outcomes are derived and provides limited insight for the purpose of intervention.

2.6. Points of convergence in resilience research

While there is no consensus in defining and conceptualising psychological resilience, most researchers would agree on the presence of various factors and phenomenon related to the construct. These include adversity, risk factors that can

aggravate the effects of exposure to the adversity, protective factors that can buffer individuals against the negative effects of exposure to the adversity, and the notion of coping or adaptation. Most researchers also agree that it is important to examine these factors and phenomenon in detail in order to better understand psychological resilience.

2.6.1. Adversity

Many terms are used interchangeably to refer to adversity. Richardson (2002) interchanged adversity with stressor, life event and "*life prompt*" and Kumpfer (1999) referred to it as stressor or challenge. Other terms include adverse or traumatic event, acute or chronic stressor, and risk. However, it is agreed that adversity is a precursor to resilience (e.g., Masten et al., 2009), and it is adverse in nature and hence has negative effects on individuals. There are generally two approaches in considering whether an event is an adversity. Sameroff and Rosenblum (2006) suggested that adversity is any common everyday event that is highly taxing in general (e.g., involvement in car accident). Others argued that adversity should be defined by the person experiencing the event, such that the event is only considered an adversity if the individual deems it sufficiently stressful (Jackson, Firtko, & Edenborough, 2007). The second approach is person-centred and also highlights the contextual nature of psychological resilience in relation to the different types of adversity.

In examining the impact of exposure to adversity, some studies only looked at a single adverse event (e.g., Dean & Stain, 2010) while others seek to understand the combined impact of several related adverse events (e.g., Hjemdal et al., 2006). The second approach adopts the view that adverse event rarely occurs in isolation (e.g., being sacked from work, fell behind in rent payment, spouse decided to leave you). In addition, some researchers would suggest that the impact of exposure to adversity or adversities should be examined in terms of the severity of stress placed on individuals instead of the number of adversities. This is because resilience mechanisms, coping or adaptation processes may vary in relation to the severity of the adversities in question as these adversities can range from milder ones like daily family or work stressors to intensive ones like having to deal with the passing of a loved one (Davydov, Stewart, Ritchie and Chaudieu, 2010).

While adversity is generally stressful in nature and often has negative effects on individuals who are exposed to them, there may be positive effects on the individuals. In Richardson's model, individuals may experience a resilient reintegration following

exposure to the adversity, and this can result in attainment of additional protective factors and a higher level of homeostasis (Richardson, 2002). According to Rutter (1987), adversity can have a '*steeling*' (p. 326) effect on individuals as they successful cope or adapt to the adversity. This notion is similar to stress inoculation (Foa, Ehlers, Clark, Tolin & Orsillo, 1999). The idea is that new insights are gleaned, and lessons are learnt from the experience which become additional resources for the individuals to use when they encounter similar adversity in the future.

2.6.2. Risk and protective factors

Risk and protective factors are factors both internal and external to the individuals that can have influence on how they cope or adapt with an adversity, and shape the outcome following exposure to the adversity. On one hand, risk factors increase individuals' vulnerability to, or likelihood of experiencing undesirable outcome that may compromise health, psychological well-being, or social performance (Jens & Gordon, 1991; Murry & Brody, 1999). Protective factors, on the other hand, moderate and help individuals to derive positive responses to stress or adversity (Ryff & Singer, 2003). So, in general, risk factors are those that aggravate the effects of exposure to the adversity while protective factors are those that buffer the individuals against the negative effects. To illustrate, assuming that throwing a hand grenade is a highly stressful event for Recruit A and hence he considers it as an adversity. An internal risk factor can include a low self-concept of the ability to accomplish this particular task because of a previous failed attempt to throw the hand grenade accurately into the designated area. An external risk factor can be a harsh instructor who is known to often berate and manhandle the recruits, and this instructor has been assigned to observe Recruit A. The adversity alone is stressful enough for Recruit A to cope, yet these risk factors put additional stress on him. He may then decide to malinger and report sick in the morning just to avoid participating in the activity. An internal protective factor can be a high level of self-confidence as Recruit A has visualised the activity multiple times and an external protective factor can be a helpful peer who helps the recruit to practise throwing hand grenade using a dummy one. These protective factors have buffering effects on Recruit A and the outcome can be different.

Resilience researchers in general agree that risk factors have a cumulative effect and a greater number of risk factors increases the risk of worse coping and poorer outcome. Rutter (1979) found that there was a higher probability of psychiatric disorder

with an increased number of risk factors; 1% for one risk factor and 21% for multiple risk factors. Masten and Narayan (2012) labelled this as the "*dose effect*" (p. 227), with the higher the dose, the worse the outcome. Kumpfer (1999) suggested that protective factors also have the same cumulative effect in that the more protective factors an individual has, the more likely he or she can cope better and arrive at a more positive outcome following exposure to adversity.

Over the years, a long list of generic risk and protective factors has been proposed by various resilience researchers (e.g., Dahlberg, 1998; Hawkins, Catalano & Miller, 1992; O'Connell, Boat, & Warner, 2009). However, Luthar and Zelazo (2003) questioned the generalisability of these risk and protective factors and suggested that these factors operate differently given the specific context and population under study. Likewise, Rutter (2013) had doubts about the utility of such a list as he stated that it is important to understand individuals' needs in relation to specific situations instead of assuming that all risk and protective factors have the same influence on all the individual under all circumstances. To illustrate, being posted to a new platoon because of conflict with existing platoon mates may be a risk factor to Recruit A's ability to cope with training because he is unfamiliar with his new platoon mates and they may see he as the source of the conflict and ostracise him. However, it can turn out to be a protective factor if Recruit A's previous platoon was extremely dysfunctional and this affected his training. Now in the new platoon, Recruit A can have a fresh start and possibly make new friends who are more willing to support him. Similar to adversity, this also highlights the contextual nature of psychological resilience in relation to the different types of risk and protective factors.

2.6.3. Positive adaptation

In studying psychological resilience in the context of post-traumatic stress disorder (PTSD), positive adaptation is manifested when there is an absence of psychopathology (Masten & Powell, 2003). Likewise, as noted by Kaplan (1999), some researchers suggested that positive adaptation is merely the absence of a given condition in a situation in which the presence of such a condition is known to occur. To illustrate, if the at-risk population identified is children of depressed parents, a positive adaptation would be identified in those who did not display depressive symptoms (Luthar & Zelazo, 2003). However, if positive adaptation in resilience research in general is defined in

binary terms such as the presence or absence of certain condition, or successful or failure, then this conceptualisation ignores the complexity and possible range of differences in human adaptive functions. This does not suggest that the absence of psychopathology or depressive symptoms cannot be considered as a form of positive adaptation, instead, it is meant to highlight that positive adaptation can be manifested in many forms depending on the context.

Luthar and Brown (2007) proposed a more comprehensive approach to examine adaptation. They suggested that in order to define positive adaptation, the indicator used to represent the range of adaptation must be specific and appropriate to the adversity in question. To illustrate, on one hand, in the military operation context where soldiers' experience is traumatic in nature, an appropriate indicator of positive adaptation can be the absence of PTSD. On the other hand, in the military basic training context where the focus is on learning, conditioning and inoculation, a relevant indicator of positive adaptation can be whether the recruits have gained new insight, got more familiar with the nature of the adversity or acquired more protective resources and becoming more stress-resistant in the process. Hence, in the context of military basic training, positive adaptation is more than just the absence of a known condition, but the possible strengthening or improvement of various aspects of recruits' life. More generally in other settings, this can be expanded to include enhanced social resources, enhanced personal resources, or the development of new coping skills as a result of having dealt with the adversity (Schaefer & Moos, 1992). Similar to adversity and risk and protective factor, the exact manifestation of positive adaptation is contextual.

2.6.4. Summary

As a precursor to psychological resilience, adversity is generally stressful in nature and hence potentially has negative effects on individuals. However, it can also strengthen the individuals with new insights gleaned and lessons learnt from the exposure. It is important to note that adversity is contextual, and individuals' appraisal of a given adversity and the extent of its intensity are dependent on the specific nature of the adversity and various aspects of individual differences. On one hand, risk factors are those that aggravate the effects of exposure to the adversity and on the other hand, protective factors are those that have buffering effects on individuals against the negative effects. In addition, both risk and protective factors can have cumulative effects and a greater

number of either factors can increase the impact they have on individual's coping and subsequent outcome. Similarly, risk and protective factors are context-dependent in that there are internal individual differences and it depends on what is present and absent in the various external environment. In order to more accurately identify positive adaptation, it is important to use appropriate indicators that are specific to the adversity in question. Furthermore, as human functions are complex, positive adaptation is rarely binary in nature and it can include a wide range of different pathways. Manifestation of positive adaptation is also contextual, and it depends on the nature of the adversity and the focus of the research.

2.7.   Measuring psychological resilience

In measuring psychological resilience, the approaches are as varied as the way the construct has been defined and conceptualised by researchers in different contexts. In a systematic review conducted by Pangallo et al. (2015), they found 17 instruments measuring the construct as of 2014. This is excluding measures that were designed for specific occupations (e.g., the military risk and resilience inventories) as the authors wanted to find generic measures that can be used with different populations across different settings. As one of the objectives of the current research was to measure psychological resilience, this literature review examined some of the more commonly used scales. The intent was to provide an initial insight on how psychological resilience has been operationalised by the different developers in various contexts and examined what aspects of psychological resilience are measured with these instruments. Sub-sections 2.7.1 to 2.7.7 introduce seven widely used measures and Table 2.2 provides the details of these measures and their psychometric properties.

2.7.1. Resilience Scale (RS)

The Resilience Scale (RS) was developed by Wagnild and Young in 1993. The authors wanted to identify the degree of individual psychological resilience or positive personality characteristic that enhances individual adaptation. The scale was developed from a qualitative study involving 24 women whom the authors considered to have adapted well following a major life event. The women were asked to describe how they managed a self-identified loss. Consequently, five protective factors were listed: (1) equanimity; (2) perseverance; (3) self-reliance; (4) meaningfulness; and (5) existential aloneness. Five items were developed for each of the factors which resulted in a 25-item

scale. It is scored on a 7-point scale ranging from 1 = strongly disagree to 7 = strongly agree.

The authors reported an internal consistency of .91 but did not report test-retest reliability. They also established a 2-factor structure: (1) personal competence comprising self-reliance, independence, determination, invincibility, mastery, resourcefulness and perseverance; and (2) acceptance of self and life comprising adaptability, balance, flexibility and a balanced perspective of life. In the study involving 810 adults, the authors found that psychological resilience has positive relations with adaptational outcomes including physical health (r = .26, p < .001), morale (r = -.28, p < .001), life satisfaction (r = .30, p < .001), and negative relation with depression (r = -.37, p < .001).

2.7.2. Ego-Resiliency Scale (ER89)

There are several versions of the Ego-Resiliency Scale. The version reviewed here was developed by Block and Kremen in 1996 and they wanted to measure psychological resilience in a non-psychiatric context. The scale was developed with 210 young adults aged between 18 and 23. Unlike the RS, the ER89 is one-dimensional. It contains 14 items answered on a 7-point scale ranging from 1 = never to 7 = always.

The authors reported the ER89's internal consistency to be .76, and test-retest correlations were r = .67, p < .05 for a female sample and r = .51, p < .05 for the male sample. The authors reported that the self-report scores and observer scores on ego-resilience correlated highly for both women (r = .69, p < .05) and men (r = .84, p < .05).

2.7.3. Connor-Davidson Resilience Scale (CD-RISC 25)

The Connor-Davidson Resilience Scale (CD-RISC 25) was developed by Connor and Davidson (2003). It was developed in a clinical setting where the authors wanted to examine individual differences in psychological resilience in relation to treatment results for conditions including anxiety, depression and stress reactions (Connor & Davidson, 2003). The developmental samples included patients from primary care outpatients, psychiatric outpatients, anxiety disorder study sample and PTSD clinical trial participants (Connor & Davidson, 2003). The scale measures resilience characteristics or protective factors across 17 domains of functioning (e.g., commitment, recognition of limits of control, viewing stress/change as a challenge/opportunity and tolerance of negative

affect). Items were scored on a 5-point Likert scale ranging from 0 = not true at all to 4 = true nearly all the time.

The authors reported an internal consistency of .89 and a test-retest reliability of $r = .87$, $p < .05$ for the scale. The authors also found a 5-factor structure to the scale: (1) personal competence, high standards, and tenacity; (2) trust in one's instinct, tolerance of negative effects, and strengthening effects of stress; (3) positive acceptance of change and secure relationships; (4) control; and (5) spiritual influences. The authors found positive relations between the CD-RISC 25 and hardiness ($r = .83$, $p < .0001$), social support ($r = .36$, $p < .0001$) and negative relation with two measure of perceived stress ($r = .76$, $p < .0001$ and ($r = .32$, $p < .0001$).

2.7.4. Connor-Davidson Resilience Scale (CD-RISC 10)

The Connor-Davidson Resilience Scale (CD-RISC 10) was developed by Campbell-Sills and Stein (2007) as they could not replicate the 5-factor structure of the CD-RISC 25. The authors developed this version with undergraduates from San Diego State University. The scale is one-dimensional. The measure contains 10 items scored on a 5-point Likert scale ranging from 0 = not true at all to 4 = true nearly all the time.

The authors reported an internal consistency of .89. but did not report its test-retest reliability. They found that the CD-RISC 10 correlated strongly with the 25-item version ($r = .92$, $p < .001$) and scores on the CD-RISC-10 moderated relationship between childhood maltreatment and psychiatric symptoms ($R = .56$, $R^2 = .31$, $F (3, 126) = 19.00$, $p < .001$).

2.7.5. Resilience Scale for adults (RSA)

The Resilience Scale for Adults (RSA) was developed by Friborg, Hjemdal, Rosenvinge and Martinussen (2003). The authors wanted to measure the presence of protective factors that promotes psychological resilience in adults. The scale was developed using psychiatric patients and normal adults. It measures five protective factors: (1) personal competence; (2) social competence; (3) personal structure; (4) family coherence; and (5) social support. It contains 33 items answered on a 7-point semantic differential scale in which each item has a positive and a negative attribute at each end of the scale continuum.

The authors reported internal consistency of .90, .83, .67, .87 and .83 respectively for the five different factors but did not report test-retest reliability. They found that RSA-social competence correlated with agreeableness ($r = .69$, $p < .01$), extroversion ($r = .60$, $p < .01$), and social intelligence ($r = .88$, $p < .01$), RSA-social resources correlated with agreeableness ($r = .66$, $p < .01$), and RSA-structured style correlated with conscientiousness ($r = .83$, $p < .01$).

2.7.6. Brief-Resilience Coping Scale (BRCS)

The Brief-Resilient Coping Scale (BRCS) was developed by Sinclair and Wallston (2004). The authors wanted to measure the tendency to cope with stress in highly adaptive manner. The developmental sample used in their study consisted of individuals with rheumatoid arthritis. The scale is one-dimensional. The scale contains four items answered on a 5-point Likert scale ranging from 1 = does not describe me at all to 5 = describes me very well.

The authors reported the scale to have internal consistency ranging from .64 to .76 for the multiple times it was used in their study. The test-retest reliability was established at $r = .71$, $p < .05$ for a five to six weeks time gap, and $r = .68$, $p < .05$ for three months. They also found that scores on the scale correlated positively with optimism ($r = .50$, $p < .01$), self-efficacy ($r = .48$, $p < .01$), pain coping reappraisal ($r = .60$, $p < .01$), active problem solving ($r = .57$, $p < .01$), social support ($r = .24$, $p < .05$), positive affect ($r = .50$, $p < .01$), life satisfaction ($r = .25$, $p < .05$), and negatively with negative affect ($r = -.28$, $p < .01$), helplessness ($r = -.32$, $p < .05$) and catastrophizing ($r = -.38$, $p < .01$).

2.7.7. Brief Resilience Scale (BRS)

The Brief Resilience Scale (BRS) was developed by Smith et al. in 2008. The authors wanted to determine whether it was possible to assess psychological resilience as bouncing back from stress and important health outcomes. The scale was developed with three different samples: (1) undergraduates; (2) cardiac rehabilitation patients; and (3) women who had fibromyalgia. The scale is one-dimensional. It contains six items answered on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree.

The authors reported the internal consistency ranging from .80 to .91 and test-retest agreement was $r = .69$, $p < .001$ after 1 month and $r = .62$, $p < .001$ after 3 months. They also found that scores on the scale correlated positively with ego-resiliency ($r = .49$,

$p < .01$ to $r = .51$, $p < .01$), CD-RISC ($r = .59$, $p < .01$), optimism ($r = .45$, $p < .01$ to $r = .69$, $p < .01$), social support ($r = .27$, $p < .05$ to $r = .40$, $p < .01$), active coping ($r = .31$, $p < .05$ to $r = .41$, $p < .01$), and negatively with pessimism ($r = .32$, $p < .05$ to $r = .56$, $p < .01$), perceived stress ($r = .60$, $p < .01$ to $r = .71$, $p < .01$), anxiety ($r = .46$, $p < .01$ to $r = .60$, $p < .01$) and depression ($r = .41$, $p < .01$ to $r = .66$, $p < .01$).

Table 2.2

Details of the seven scales including how psychological resilience is conceptualised, the developmental samples, number of items, reliability, validity and factor structure

Scale and Conceptualisation of the Construct	Developmental Sample	Number of Items	Reliability Reported	Claim of Validity	Factor Structure
Resilience Scale (RS) (Wagnild & Young, 1993) Internal Capacity	Women who adapted well following a major life event	25	$\alpha = .91$ Test-retest not reported	Scores on the RS has positive relations with physical health ($r = .26$, p < .001), morale ($r = -.28$, p < .001) and life satisfaction ($r = .30$, p < .001), and negative relation with depression ($r = -.37$, p < .001).	Two factors: (1) personal competence comprising self-reliance, independence, determination, invincibility, mastery, resourcefulness and perseverance (2) acceptance of self and life comprising adaptability, balance, flexibility and a balanced perspective of life
Ego-Resiliency Scale (Block & Kremen, 1996) Internal Capacity	Young adults age 18 and 23	14	$\alpha = .76$ Test-retest: $r = .67, p < .05$ (female) $r = .51, p < .05$ (male)	Self-report scores and observer scores on ego-resilience correlated highly for both women (r = .69, p < .05) and men (r = .84, p < .05)	One-dimension
Connor-Davidson Resilience Scale (CD-RISC 25) (Connor & Davidson, 2003) Internal Capacity	Patients from primary care outpatients, psychiatric outpatients, anxiety disorder study sample and PTSD clinical trial participants	25	$\alpha = .89$ Test-retest: $r = .87, p < .05$	Scores on CD-RISC 25 correlated positively with hardiness ($r = .83$, p < .0001) and social support ($r = .36$, p < .0001), and negatively with two measure of perceived stress ($r = .76$, p < .0001 and $r = .32$, p < .0001).	Five factors: (1) personal competence, high standards, and tenacity (2) trust in one's instinct, tolerance of negative effects, and strengthening effects of stress

				(3) positive acceptance of change and secure relationships (4) measuring control (5) spiritual influences
Connor-Davidson Resilience Scale (CD-RISC 10) (Campbell-Sills & Stein, 2007) Outcome	Undergraduates	10	α = .85 Test-retest not reported	The CD-RISC 10 correlated with the 25-item version (r = .92) and scores on the CD-RISC-10 moderated relationship between childhood maltreatment and psychiatric symptoms (R = .56, R^2 =.31, F (3, 126) = 19.00, p < .001).	One-dimension
Resilience Scale for Adults (RSA) (Friborg, Hjemdal, Rosenvinge & Martinussen, 2003) Process	Psychiatric patients and normal adults	33	α = .90, .83, .86, .87 and .83 respectively for the five factors Test-retest not reported	RSA-social competence correlated with agreeableness (r = .69, p < .01), extroversion (r = .60, p < .01), and social intelligence (r = .88, p < .01), RSA-social resources correlated with agreeableness (r = .66, p < .01), and RSA-structured style correlated with conscientiousness (r = .83, p < .01).	Five factors: (1) personal competence (2) social competence (3) personal structure (4) family coherence (5) social support
Brief-Resilient Coping Scale (BRCS) (Sinclair & Wallston, 2004) Outcome	Rheumatoid arthritis Patients	4	α = .64 and .76 at two time points Test-retest: r = .71, p < .05 (five to six weeks time gap) r = .68, p < .05 (three month time gap)	Scores on the scale correlated positively with optimism (r = .50, p < .01), self-efficacy (r = .48, p < .01), pain coping reappraisal (r = .60), active problem solving (r = .57, p < .01), social support (r = .24, p < .01), positive affect (r = .50, p < .01), life satisfaction (r = .25, p < .01), and negatively with negative affect (r = .28, p < .01), helplessness (r =	One-dimension

.32, p < .01) and catastrophizing ($r =$ .38, p < .01).

Brief Resilience Scale (BRS) (Smith, Dalen, Wiggins, Tooley, Christopher & Bernard, 2008) Outcome	Undergraduates, cardiac rehabilitation patients and women who had fibromyalgia	6	$\alpha = .89$ to 91 Test-retest: $r = .69, p < .001$ after 1 month $r = .62, p < .001$ after 3 months	Scores on the scale correlated positively with ego-resiliency ($r = .49, p < .01$ to $r = .51, p < .01$), CD-RISC ($r = .59, p < .01$), optimism ($r = .45, p < .01$ to $r = .69, p < .01$), social support ($r = .27, p < .05$ to $r = .40, p < .01$), active coping ($r = .31, p < .05$ to $r = .41, p < .01$), and negatively with pessimism ($r = .32, p < .05$ to $r = .56, p < .01$), perceived stress ($r = .60, p < .01$ to $r = .71, p < .01$), anxiety ($r = .46, p < .01$ to $r = .60, p < .01$) and depression ($r = .41, p < .01$ to $r = .66, p < .01$).	One-dimension

2.7.8. Summary

This literature review found that with just seven scales alone, it was demonstrated that the approaches in conceptualising and measuring psychological resilience vary considerably among different researchers. Different researchers have dissimilar research aims and this led them to conceptualise the construct differently as either an internal capacity, process or outcome. For example, Connor and Davidson (2003) wanted to examine individual differences in psychological resilience in relation to treatment results for conditions including anxiety, depression and stress reactions, Friborg et al. (2003) wanted to measure the presence of protective factors that promotes psychological resilience in adults while Smith et al. (2008) were more concerned with determining whether it was possible to assess psychological resilience as bouncing back from stress. Hence, Connor and Davidson adopted the internal capacity perspective, Friborg et al. examined psychological resilience as a process while Smith and colleagues assumed the outcome position. This is evident from the items in their respective scale. An example item from the CD-RISC 25 includes "I have a strong sense of purpose", the RSA includes "I have some friends/family members who back me up" and the BRS includes "I tend to bounce back quickly after hard times". Even among those researchers who adopted the same perspective, differences exist in what internal capacity they thought constitutes psychological resilience. For example, Wagnild and Young (1993) measured personal competence and acceptance of self and life, and Connor and Davidson (2003) added control and spiritual influences. These suggest that context is important, and it is essential to conceptualise and operationalise psychological resilience in the context in which the research is conducted.

The developmental samples used in the construction of the various scales differ too and this may have added more discrepancy in the way psychological resilience is measured. For example, the CD-RISC 25 was developed using mainly psychiatric patients and the factor structure of the scale could not be replicated by Campbell-Sills and Stein (2007) using undergraduates. This led Campbell-Sills and Stein to develop the CD-RISC 10 using their pool of samples instead. Again, this suggests that context is an important consideration as a scale measuring psychological resilience developed using one particular sample may not be suitable for use with another population.

2.8. Constructs that are conceptually similar to or related to psychological resilience

This literature review noted that some resilience researchers interchanged psychological resilience with other constructs such as hardiness and grit (e.g., Bartone, Ursano, Wright & Ingraham, 1989; Maddi, Matthews, Kelly, Villarreal & White, 2012). Others argued that there are different types of resilience; ego-resilience and trait resilience (Oshioa et al., 2018). The construct is also folded into what some researchers argued to be a higher order concept such as psychological capital (PsyCap; Luthans, Avolio, Avey, & Norman, 2007). This section first reviews these constructs that are conceptually similar to or related to psychological resilience. Next, an argument on why psychological resilience is different from these constructs is provided.

2.8.1. Hardiness

The concept of hardiness was first introduced by Kobasa (1979) who labelled it a personality trait. The author was interested to examine the relation between personality and stressful life events that can lead to illness. In her study involving 161 middle and upper level executives who reported high levels of stress in the previous three years, Kobasa found that compared to those who fell ill, the executives who did not were more hardy (i.e., having a strong sense of commitment to self, finds meaning in things they do, engages more actively with the environment and exercises internal locus of control). Other researchers such as Maddi (2004) claimed that it is an attitude or belief that individuals have about themselves in relation to their interactions with the environment while Bartone, Kelly and Matthews (2013) argued that hardiness is a personality quality that healthy individuals possess, and it helps them to perform well under different stressful conditions. Hardiness has also been described as a personality style and labelled as dispositional resilience (Bartone et al., 1989).

The research on hardiness has matured over the years and researchers in the field adopt the perspective that it is a personal capacity or attribute that comprises three constructs or fundamental tenets; sense of commitment, control and challenge (Maddi & Kobasa, 1991). Commitment involves individuals actively engaging with people, things and contexts in what they do instead of being detached or isolated. Individuals who are high on commitment believe that this is the best way to learn from their experiences. Control is about having influence over outcomes of events and individuals high on control

believe that an active approach to life can result in more desired outcomes. Challenge is about believing that change is normal and can be stressful, but it serves to stimulate growth that is achieved through experiencing uncertainties and even threats.

Hardiness affects the ways individuals responds to life events and it has a buffering effect against the negative impact of adverse events. Individuals who are hardy are able to handle various stresses related to daily life, family and work better than those less hardy (Azeem, 2010). Studies have shown that hardiness protects individuals against the negative effects of stress and may serve as a predictor of mental well-being (e.g., Bartone, 1999). Azeem (2010) also found that teachers who were hardy had a lower probability of experiencing burnout. The teachers felt that they were in control of their actions and environment, and responded to change positively. In studying a group of Vietnam veterans, King, King, Fairbank, Keane and Adams (1998) found that there was a negative relation between hardiness and PTSD. Furthermore, the authors observed that those who were hardy were more likely to proactively reach out for help in times of need. This allowed them to build bigger support networks that often facilitate more effective recovery following exposure to traumatic events. Other studies have also shown that this internal capacity or attribute could lead to increased performance at work, improved health due to diligence in dieting and exercising, and having better relationships with others (Maddi & Kobasa, 1984). In special forces selection context, Bartone, Roland, Picano and Williams (2008) found that soldiers who passed the selection were more hardy than those who failed. The authors concluded that higher level of hardiness allowed the soldiers to perform better under the extreme environment.

2.8.2. Grit

Duckworth, Peterson, Matthews and Kelly (2007) were keen to understand why some individuals accomplish more than others of the same level of intelligence. They noted that aspects of individual differences such as emotional intelligence, self-confidence, emotional stability, extraversion and creativity can contribute to this difference. According to the authors, some traits are however more important for specific vocations (e.g., extraversion may be crucial to a career in sales but less relevant to a career in creative writing). They defined grit as *"… perseverance and passion for long-term goals."* (p. 1087). This definition captures four fundamental tenets of grit: (1) love or deep desire for an activity; (2) presence of goal; (3) long-term instead of short-term goal; and

(4) determination or stamina in the face of obstacles or adversity. The authors found that grit was highly correlated with the Big Five conscientiousness trait. However, they argued that grit and conscientiousness differ in terms of effort; grit is about long-term stamina while conscientiousness is about short-term intense effort. Von Culin, Tsukayama and Duckworth (2014) later added that grit is a personality trait that "… *describe tendencies to act, think, and feel that are relatively stable across time and situation…*" (p. 306).

In developing the construct, Duckworth et al. (2007) interviewed professionals in investment banking, painting, journalism, academia, medicine and law, and asked them what qualities distinguish top performers in their respective fields. These professionals cited grit or a close synonym as often as talent. The authors claimed that many of these professionals were surprised by the accomplishments of those who were not thought to be talented at first but stood out in terms of their commitment to their goals. Moreover, those initially thought to be talented were not observed to progress as well as their counterparts who were grittier. Duckworth et al. (2007) suggested that grit involves placing a tremendous amount of effort in pursuit of goals and maintaining this effort and interest after a long period despite facing adversity and experiencing plateaus in performance and failure. Duckworth et al. (2007) added that grit is as important as cognitive ability and more important than conscientiousness in predicting performance.

Various studies have found that grit is linked to well-being, academic and work-related performance. For example, Salles, Cohen and Mueller (2014) claimed that well-being of residents in general surgery is an important factor in their success during training. Therefore, to manage attrition rate, it is important to identify those with low levels of well-being at the soonest. The authors found that grit could predict later psychological well-being as measured by the Psychological General Well-Being Scale and the Maslach Burnout Inventory. In another study conducted with undergraduate students at the University of Pennsylvania, Duckworth et al. (2007) found that students who scored high on grit scale scored higher in their grade point average (GPA) compared to their less gritty counterparts. Interestingly, the authors also found that while GPA was also associated with Scholastic Assessment Test (SAT) score which they used to measured general mental ability, grit score was associated with lower SAT score. The authors suggested that among elite undergraduates, smarter students may be less gritty than their peers. In a separate study conducted by the same authors with cadets from the West Point military

academy, they found that grit could predict completion of the military training better than any other predictor including self-control and Whole Candidate Score[4] (Duckworth et al., 2007).

However, in a meta-analysis conducted by Credé, Tynan and Harms (2016) based on 584 effect sizes of 88 independent samples including 66,807 participants, the authors found that the higher-order structure of grit is not replicated, and grit is only moderately correlated to performance. Furthermore, grit correlated strongly with conscientiousness. Also, perseverance has significantly stronger validity than interest, and perseverance explains variance in academic performance even after controlling for conscientiousness. Credé et al. (2016) concluded that the construct validity of grit questionable.

2.8.3. Ego-resilience

Block and Block (1980) conceptualised personality as an affect processing system which consists of two related components; ego-resiliency and ego-control. The authors were interested in their influences on human behaviours such as performance in certain task. In this processing system, ego-control is responsible for controlling individuals' impulses in various situations while ego-resiliency serves as a dynamic capacity which influences control and thus optimising the processing system (Block & Kremen, 1996). Block and Kremen (1996) defined ego-resilience as *"… capacity of an individual to modify a characteristic level of ego control, as a function of the demand characteristics of the environmental context, to preserve or enhance system equilibration."* (p. 351).

Ego-control refers to individuals' characteristic response to behavioural impulses. Ego-control can be undercontrol (i.e., low threshold for impulse expression) or overcontrol (i.e., high threshold for impulse expression), and it relates to the degree to which individuals control their urges. On one hand, ego undercontrol is associated with impulsivity and a range of behaviours including aggression, delinquency, and hyperactivity. On the other hand, ego overcontrol is associated with behavioural inhibition and tendencies to internalise problems which can be manifested as depression, anxiety, and social problems (Block & Block, 1980). The two extremes of ego-control reflect personal styles and has been found to be unrelated to adjustment or competence

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[4] *Whole Candidate Score consists of a weighted combination of standardized test scores, high school rank (corrected for class size), number and level of extracurricular and athletic activities, physical fitness, and a series of ratings from high school teachers.*

since both tend to be maladaptive (Laufer, Johnson & Hogan, 1981). Ego-resilience refers to the general capacity of individuals to be flexible and adaptive to internal and external stressors (Klohnen, 1996). Hence, ego-resilience is related to aspects of personality that are associated with adjustment and coping (Block & Block, 1980). Individuals low on ego-resilience tend to be less flexible and show little adaptive behaviours when confronted with unfamiliar environment or stressful event. Therefore, they are expected to have greater difficulty in coping and recovering from stress. Conversely, individuals high on ego-resilience are often more adaptive as they tend to be able to more easily adjust their behaviours to response to the environment (Block & Block, 1980).

Studies have shown that ego-resilience predicted individuals' adjustment and development of behaviour problems. For example, in a longitudinal study, Causadias, Salvatore, and Sroufe (2012) followed groups of preschool and elementary school children through to adulthood. The authors found that ego-resilience, but not ego-control, was a salient predictor of adaptive functioning of these children when they turned 19 and 26. Furthermore, high ego-resilience was also related to less behaviour problems at ages 16, 23, 26, and 32 years. They interpreted these findings as evidence that ego-resilience, flexibility and adaptability, served to promote successful adaptation in these individuals. Studies have also found a positive relation between ego-resilience and academic achievement (e.g., Swanson, Valiente, Lemery-Chalfant & O'Brien, 2010; Alessandri, Zuffianò, Eisenberg & Pastorelli, 2017).

2.8.4. Psychological capital

In the early 2000s, there was a focus to understand positive organisational scholarship (POS) and behaviours (POB) with the aims to examine positive traits, states, processes, dynamics and outcomes related to performance in the work context (Luthans & Youssef-Morgan, 2017). This led to the development of psychological capital (PsyCap) which Luthans et al. (2007) defined as "*An individual's positive psychological state of development that is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals, and when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resiliency) to attain success.*" (p. 388). Embedded within PsyCap is the concept of

psychological resilience which Luthan (2002) earlier defined as *"… the positive psychological capacity to rebound, to 'bounce back' from adversity, uncertainty, conflict, failure or even positive change, progress and increased responsibility."* (p. 12). Luthans et al. (2007) argued that PsyCap is a distinct construct in relation to other constructs including character strengths and virtues (CSVs), personality and core self-evaluations because it is a state-like attribute and not a trait. The authors added that the key difference is that PsyCap, being a state-like attribute, is not as stable and are therefore more susceptible to change and development compared with trait.

Studies on PsyCap have generally being confined to the work-place environment. PsyCap has been shown to predict work-related employee outcomes including job satisfaction, organisational commitment and performance. For example, in a study involving engineers and technicians from a manufacturing firm and employees in an insurance services firm, Luthans et al. (2007) found significant positive relations between PsyCap and job satisfaction and performance. Performance was measured with objective data gathered independent of the study. For the sample from the manufacturing firm, these included quality and quantity of their work on electrical subsystem designs that are measured by whether there was error, whether it was rejected and whether schedule was met. For the sample from the insurance firm, these included objective data such as number of claims processed. In another study conducted by Youssef and Luthans (2007) using sample from a wide range of industry including manufacturing, services, public sector and NGOs, the authors found that optimism was positively related to performance and hope was positively related to employee job satisfaction, work happiness, and organisational commitment. The authors suggested that psychological resilience did not correlate with any performance outcome because the construct may be more relevant in organisations in extreme conditions or undergoing crises.

2.8.5. Summary – psychological resilience is a distinct construct

Psychological resilience is different from hardiness, grit, ego-resilience and PsyCap because of two main reasons. Firstly, the separate authors who originally proposed the four constructs argued that they are internal capacities: (1) hardiness is a personality trait (Kobasa, 1979); (2) grit is a personality trait (Von Culin et al., 2014); (3) ego-resilience is an individual capacity (Block & Kremen, 1996); and (4) PsyCap is an individual psychological state (Luthans et al., 2006). While psychological resilience has

been studied by some researchers as an internal capacity (e.g., Werner & Smith, 1982), others have tried to examine the phenomenon as a process (e.g., Richardson, 2002) or outcome (e.g., Rutter, 2006). It may be the case that psychological resilience is better understood as an internal capacity but maybe researchers simply could not agree with one another and hence there is divergence in view about what the construct exactly is. However, evidences have suggested that psychological resilience is indeed a complex construct that warrants investigation of it as an internal capacity [e.g., spirituality, recognised as personal trait, was found to be a major predictor of resilience and positive adaptation (Dunn, 1994)], process [e.g., Rutter (1984) found that having good relationship with teacher can lead to better adaptation and developmental outcome for children, and this involves a process of interaction] and outcome [e.g., Bonanno et al., (2002) found four different outcomes following exposure to traumatic events (i.e., resilience, recovery, chronic dysfunction and delayed grief or trauma)]. It may also be the case that hardiness, grit, ego-resilience and PsyCap are processes and outcomes, but researchers in the respective fields chose to label them as internal capacities. Furthermore, the perspectives that hardiness, grit, ego-resilience and PsyCap are internal capacities were not challenged over the years.

Secondly, if psychological resilience is indeed merely an internal capacity like the other four constructs, it is still different because it is possibly comprised of many more factors compared to hardiness (comprising commitment, control and challenge), grit (comprising perseverance and passion) and ego-resilience (one-dimension). It may be possible that psychological resilience is also made up of commitment, control, challenge, perseverance and passion. However, there are evidences to suggest that psychological resilience is much more. For example, Friborg et al., (2003) found that resilience is made up of personal competence, social competence, personal structure, family coherence and social support. Clearly psychological resilience is different from PsyCap as the former is subsumed under the latter.

2.9. Resilience research in the military environment

As discussed in section 2.6, psychological resilience is context-dependent in that the adversities present in different environments and situations vary in nature and intensity. For example, in an academic setting, stress can come from preparing for a very difficult examination but in a military operation setting, the challenges can be more

physical in nature where there is potential risk of injury and even death. Psychological resilience is also contextual in terms of what risk and protective factors are available both internal and external to the individuals. For example, soldiers may have been trained to self-regulate their emotions and this skill can serve as an internal protective factor to help them manage the stressors during training and operation, but students may not have this skill because it may not have been taught in school. Context is also an important consideration in resilience research because positive adaptation can be manifested in different forms. For example, in the military operation context where soldiers can experience extremely traumatic event during combat, positive adaptation could be the absence of PTSD upon returning home. However, in the teaching environment where the adversities are relatively less intensive, teachers' positive adaptation could be related to absence of stress symptoms such as not sleeping or eating well. As such, this section examined studies that have been conducted specifically in the military environment. The intent was to understand the approach taken to study psychological resilience in this particular environment and identify where possible gaps are. This would inform the current research on where it could potentially add knowledge to the field. In this section, studies were reviewed and included when they incrementally add to the scope of resilience research in the military setting. These studies are organised and discussed in terms of how psychological resilience is related to PTSD (sub-section 2.9.1), maladaptive coping behaviours (sub-section 2.9.2), post-traumatic growth (sub-section 2.9.3), individual-level and unit-level performance outcomes (sub-sections 2.9.4 and 2.9.5) and whether it can be developed (sub-section 2.9.6). The details of these studies are summarised in Table 2.4.

2.9.1. Psychological resilience in relation to PTSD

In the early days of resilience research in the military setting, the focus was on examining the construct in relation to PTSD. The first published work on psychological resilience was conducted by Hendin and Haas (1984). While the authors did not specifically used the term, they were clearly studying a key phenomenon in resilience research; positive adaptation. The study involved 10 Vietnam War veterans who did not develop PTSD following the war and hence the authors considered them to have adapted positively. The data were collected via five sessions of clinical evaluation for each participant. The objective was to uncover what protected the veterans from the negative effects of combat exposure. The authors found these traits or behaviours: (1) calmness

under pressure; (2) intellectual control; (3) acceptance of fear; (4) and a lack of excessively violent or guilt-arousing behaviours. These are what resilience researchers today would consider as internal capacities or protective factors. While the sample size is small, this study represents one of the earliest efforts in identifying internal capacities and protective factors that contributed to psychological resilience in the military setting. This paved the way to examine the construct not as a static phenomenon but as one that can potentially be changed and improved.

Another study involving service personnel who had developed PTSD during active duties was conducted by Solomon, Mikulincer and Ehud (1988). The authors examined the relations between coping, locus of control, and social support with PTSD symptoms. They followed 262 Israeli soldiers who suffered combat stress reaction during the 1982 Lebanon war over a three-year period after the war. Locus of control was measured using the Internal-External Locus of Control Scale (Rotter, 1966), coping was measured using the Ways of Coping Checklist (Folkman & Lazarus, 1980), and perception of social support was assessed using a scale developed by the authors based on Mueller's (1980) social network interview schedule. Using correlation analyses, the authors found positive relations between locus of control, coping, and social support with PTSD symptoms at two time points; two and three years after the war. The authors also found that the number and intensity of PTSD symptoms decreased from time point two to time point three. According to the authors, this reflected a process of recovery. They also found that over the two time points, participants' locus of control became more internal, emotion-focused coping was less pervasive and there was an increase in perceived social support. This study represents one of the first empirical studies to examine psychological resilience in a military setting. Again, while the authors did not specifically used the term psychological resilience, they were studying coping style or adaptation that is central to resilience research. This study is also the first to examine the construct in relation to external protective factor; social support. This promoted the notion that individuals facing challenges do not have to suffer alone or in silence as they can rely on external resources to help them achieve more positive outcomes. This study, however, could not test the direction of the causal relations between variables because the participants had already developed PTSD before the study. While PTSD may have influenced individuals' coping style, it is equally possible that coping style contributed to PTSD.

Using the same sample from the study conducted by Solomon et al. (1988), Mikulincer and Solomon (1988) specifically examined soldiers' attribution styles during combat in relation to PTSD. The authors used an 8-item questionnaire to examine attribution styles; internal and external attribution styles were represented by four items each. The participants were asked to recall a failure or bad event and successful experience or good event, and to rate the influence of each of the eight items on the occurrence of the event. Using correlation analyses, the authors found positive relations between attribution styles and PTSD two and three years after the war. The number and intensity of PTSD symptoms and problems in social functioning two and three years after the war were found to be positively related to attribution of good events to more external and uncontrollable causes, and attribution of bad events to more internal, stable, and controllable causes. The authors concluded that the use of adaptive attribution styles protected the soldiers' mental health while the use of maladaptive attribution styles did the exact opposite. This and the previous study highlight the notion that adversity is less important than individuals' appraisal of that adversity. This again reinforces the point that psychological resilience is context-dependent because of individual differences, and different people will appraise the adversity or event and its impact on them to different degrees.

The next study introduced personality to the research of psychological resilience in the military setting. Casella and Motta (1990) studied 107 veterans from Vietnam War to examine personality and locus of control in relation to PTSD. The authors labelled those who did not develop PTSD as individuals with "… *exceptional emotional strength and resilience.*" (p. 595). Personality was measured with the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) and locus of control was measured with the Nowicki-Strickland Internal-External Control Scale (Nowicki & Duke, 1974). The authors found that veterans who did not develop PTSD had lower scores on neuroticism. They claimed that this indicated emotional strength and resiliency. In addition, the authors also reported that veterans who did not developed PTSD tended to show internal locus of control. They suggested that these veterans may have felt more control over their lives and environment which may have helped them cope more positively. This is the first study that examined psychological resilience, non-occurrence of PTSD, in relation to specific aspect of personality. However, it is not clear whether PTSD led to higher score

on neuroticism or the reverse as the veterans had already developed the disorder before the study.

Studies on psychological resilience in the military environment also examined the construct in relation to how service personnel viewed their experiences in the armed forces. One such study was conducted by Aldwin, Levenson and Spiro (1994). The authors studied whether appraisals of desirable and undesirable effects of military service mediated the effect of combat stress on PTSD symptoms in later life with 1,287 veterans of WWII, Korean War and Vietnam War. Appraisals of the effects of military service were measured using the 28-item scale developed earlier by Elder and Clipp (1989) which listed the positive and negative outcomes commonly associated with of military experience. Using path analyses, the authors found that appraisals of the effects of military service were independent and opposite mediators, with undesirable effects increasing and desirable effects decreasing the relations between combat exposure and PTSD. In addition, the veterans reported more desirable effects of military service than undesirable ones and both increased with greater exposure to combat. The authors concluded that although lifelong negative consequences of combat exposure were observed, positive appraisals of the effects of military service mitigated the stressful experience of combat. As this study was partially influenced by the work of Elder and Clipp (1989), it also found evidence to suggest that positive outcomes can result from exposure to adversity. It is interesting to note the positive extent to which the veterans viewed their military experience; having maturational effects, broadening their perspective, enhancing their coping skills and self-esteem, and increasing both self-discipline and independence.

The next study is one of the earliest one to be conducted with veterans from the more recent Persian Gulf War. It was conducted by Sutker, Davis, Mark, Madeline and Shelly (1995) and involved 775 veterans. The study examined the relations between personal and environmental resources with psychological outcomes following exposure to the war zone. The authors measured hardiness or dispositional resilience[5] using the 45-item Dispositional Resilience Scale (DRS) developed by Bartone et al. (1989) and coping strategies with the Ways of Coping Checklist (Folkman & Lazarus, 1985). Environmental

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[5] Studies examining hardiness were included as researchers such as Bartone and colleagues (1989) considers it as dispositional resilience.

resources in the form of social support and family support were measured using the Social Support Questionnaire (Sarason, Sarason, Shearin, & Pierce, 1987) and Family Relationship Index (Holahan & Moos, 1991) respectively. Using regression analyses, the authors found that hardiness, avoidance coping, and perceived family cohesion emerged as consistent predictors of PTSD diagnosis. They suggested that both internal and external resources protected the veterans from the negative effects of exposure to war stressors. This is one of the first study to directly measure hardiness.

Similar to the previous study, the next study also examined external social support as a protective factor. It was conducted with 353 Israeli war veterans 18 years after the 1973 Yom Kippur War. Neria, Solomon, and Dekel (1998) were interested in studying the effects of social support on veterans' likelihood of developing PTSD and avoidance symptoms. Social support in the form of positive or negative response received specifically during homecoming was self-reported by the veterans. Avoidance symptoms were measured with the Impact of Event Scale (Horowitz, Wilner & Alvarez, 1979). Using regression analysis, the authors found that those veterans who experienced positive responses during homecoming had fewer PTSD and avoidance symptoms. Negative reactions at homecoming were also associated more PTSD symptoms. The authors suggested that a warm reception at homecoming may have served as a protective factor against the negative effects of exposure to adverse events. This is one of the few studies that took the focus away from the individuals and examined social support as a protective factor that mitigated the negative effects of exposure to trauma. Specifically, it examined the homecoming event as an important and positive experience for returning veterans. Organising homecoming reception is today practised by armed forces around the world as a celebration of victory and an end to ordeal.

The next study represents one of the most comprehensive studies to be conducted on psychological resilience in the military setting at the time. King, King, Fairbank, Keane and Adams (1998) investigated the relationships between hardiness, stressful life events, war-zone stressors, social support and PTSD with 1,632 Vietnam War veterans. The authors measured hardiness with 11 items chosen from a larger pool of items developed by Kobasa, Maddi and Kahn (1982). Stressful life events were assessed using two indices and occurrence of marital disruptions and death of child. The contemporaneous stressor index included experiences of job interruption, legal or

financial difficulties, criminal victimization, and death or serious illness of a relative and the traumatic stressor index included events such as serious vehicular accidents, natural disasters, physical assaults, and fires and explosions. War zone stressors were measured using four scales. The first scale was developed by King, King, Gudanowski and Vreven (1995) consisting of 36 items intended to assess the extent to which the veteran reported being exposed to circumstances including receiving enemy fire, seeing injured or dead Americans, going on special missions or patrols. The second scale consisted of nine items which examined exposure to atrocities or abusive violence that were considered beyond normal war experiences (e.g., killing of non-combatants, mutilation of bodies etc). The third scale, perceived threat, contained nine items which measured whether the veterans felt that there were threats to personal safety. The final scale contained 18 items examining the veterans' environment and daily living conditions such as amount of privacy, quality of food, climate, insects and diseases. Social support was measured with a questionnaire constructed by the authors which captured structural social support, perceived emotional sustenance (functional social support) and instrumental assistance or tangible aid (functional social support). Using structural equation modelling (SEM), the authors found that stressful life events and war zone stressors have negative impacts on hardiness. Furthermore, hardiness had both direct and indirect effects on PTSD through structural and functional social support. This study examined in detail the nature of adversity, war-zone stressors, to better understand exactly what veterans went through during war. This is important because psychological resilience is context-dependent as discussed in section 2.6. In doing so, the authors gained a better appreciation of the adversity that service personnel went through, understood the intensity and effects that the various experience can have on them, and how they appraised these events. These served to facilitate the authors in contextualising their findings. This study also captured two key components in the resilience process; internal capacity in the form of hardiness or psychological resilience and the role played by the external environment in the form of social support.

In a follow-up study, King, King, Foy, Keane, and Fairbank (1999) used the same sample to examine the relations between pre-trauma risk factors (e.g., family instability, childhood antisocial behaviour etc), war-zone stressors, post-trauma resilience-recovery variables (hardiness and social support), and PTSD symptoms. War-zone stressors and post-trauma resilience-recovery variables were assessed using the same measures from

the previous study. The pre-trauma risk factors were assessed by interviews and self-report questionnaire. Using SEM, the authors found that hardiness and social support mediated the effects of pre-war risk factors and war-zone stressors on PTSD symptoms. In addition, higher levels of hardiness and social support were also associated with fewer PTSD symptoms. This study extended the scope of the previous one to include individual predisposition in the form of risk factors. Hence, it added coverage in terms of not just studying the effects of external protective factor but also exploring the influences of internal risk factors and examining these in relation to individuals' capacity to cope or adapt.

In another follow-up study using the same sample of Vietnam War veterans, an additional dimension was added; physical health. Taft, Stern, King, and King (1999) examined the relations of hardiness, social support, physical health with PTSD symptoms. Hardiness and social support were similarly measured using the same scales employed in the previous two studies. For physical health, the veterans were asked to report presence of conditions from a list that included cardiovascular, gastrointestinal, respiratory, and musculoskeletal conditions. Using several multiple regression analyses, the authors found that hardiness was negatively correlated with PTSD symptoms and poor physical health conditions. Furthermore, hardiness was positively correlated with social support. Using path analysis, they found that hardiness and social support were intermediary variables between combat exposure and PTSD symptoms. This study was driven by an increased interest in understanding the relations between exposure to highly stressful events and poor physical health and there was initial evidence to suggest that such a relation existed (Wolfe, Schnurr, Brown & Furey, 1994).

Unlike previous studies, the next study was conducted before service personnel went for deployment. Maguen et al. (2008) studied pre-deployment risks, positive and negative affects, and psychological resilience in relation to PTSD symptoms with 328 military medical personnel preparing for deployment to Iraq. Pre-deployment risks were measured using the 13-item scale developed by Litz, King, King, Orsillo and Friedman (1997). It included items assessing risks such as financial problems and health problems of family members. Positive and negative moods were assessed using the 20-item Positive and Negative Affectivity Schedule (Watson, Clark & Tellegen, 1988). Psychological resilience was measured using the CD-RISC 25 developed by Connor and Davidson

(2003). Using regression analyses, the authors found that PTSD symptoms that were present pre-deployment were most strongly associated with risk factors. In addition, positive affect was most strongly associated with psychological resilience while negative affect was associated with both risk factors and psychological resilience. As mentioned, this study stands out from those reviewed earlier in that it was conducted with service personnel who have yet to be deployed. The context is different as the aims were to use the findings to inform on personnel selection or screening initiatives and to potentially develop programmes aimed at improving psychological resilience. These are expected to improve performance both at the individual and unit levels. This is in line with the third wave of resilience research as the focus has shifted toward intervention. This study is also one of the first few to employ the CD-RISC 25 (Connor & Davidson, 2003) which measures psychological resilience as an internal capacity.

2.9.2. Psychological resilience in relation to maladaptive coping behaviours

The next three studies examined psychological resilience in relation to maladaptive coping behaviours including alcohol, drug misuse and suicide ideation; rising problems in the US military since the onset of combat operations in Iraq and Afghanistan. The first was conducted by Bartone, Hystad, Eid and Brevik (2012) to study the relation between hardiness, coping styles and stress-related problem drinking. The authors collected data from 7,555 Norwegian military defence personnel. Hardiness was measured using the DRS-15 (Bartone et al., 1989). Avoidance coping was measured with 10 items from the avoidance coping subscale drawn from the Coping Style Questionnaire (Joseph, Williams & Yule, 1992). Alcohol use patterns were assessed using the 4-item self-report instrument CAGE (Ewing, 1984). Using regression analyses, the authors found that low hardiness and high avoidance coping significantly predicted alcohol abuse. Furthermore, the challenge factor of hardiness predicted risk of alcohol abuse among veterans who were recently deployed. While the authors suggested that the findings from this research can inform on screening initiative to identify alcohol abuse in the military, it also has the potential to influence the development of intervention programmes to address this issue.

The second study was conducted by Eisen et al. (2014) to examine hardiness and social support in relation to subsequent mental health problems, alcohol, and drug use following deployment. The research participants were 512 service personnel deployed

during OIF and OEF. Hardiness was measured using the DRS-15 (Bartone et al., 1989). Post-deployment social support was assessed with a 15-item module from the Deployment Risk and Resilience Inventory (DRRI; King, King & Vogt, 2003). Mental health, alcohol and drug use were assessed using the Mental Component Score of the 12-item Veterans RAND Health Survey (Weathers, Huska & Keane, 1991), Alcohol Use Disorders Test-Consumption (Bush, Kivlahan, McDonell, Fihn & Bradley, 1998) and the Drug Abuse Screening Test (Cocco & Carey, 1998) respectively. Using regression analyses, the authors found that greater hardiness predicted better mental health and lower levels of alcohol use. Also, post-deployment social support predicted better mental health and less PTSD symptoms, alcohol and drug use. This study extended the scope to examine another rising problem or maladaptive behaviour in the military community; drug misuse. The context is potentially different because the study involved veterans who have returned from participating in OIF and OEF which exposed them to a variety of adversities. These operations defer from previous conflicts in that on one hand, the service personnel had to engage in combat to overcome the enemies and on the other hand, they had to maintain peace and patrol the streets in an environment full of civilians that did not allow them to easily differentiate between friends and foes. The authors also suggested that interventions to enhance hardiness and promote better social support have the potential to protect veterans from the negative effects of exposure to combat and improve their mental health.

In this third study, Bryan, Ray-Sannerud and Heron (2015) examined the protective effects of psychological flexibility, a resilience resource, on emotional distress and suicidal ideation with 168 Air Force service personnel. Psychological flexibility was measured using the Acceptance and Action Questionnaire-I (Bond et al., 2011). Suicidal ideation was assessed with the Suicidal Behaviours Questionnaire-Revised (Osman et al., 2001). Using generalised estimating equations with repeated measurements, the authors found that service personnel scoring high on psychological flexibility reported less suicidal ideation. The authors suggested that psychological flexibility served a protective factor that mitigated the service personnel against the negative effects of emotional distress and depression. It solely focused on one aspect of psychological resilience; psychological flexibility.

2.9.3. Psychological resilience in relation to post-traumatic growth

This study conducted by Elder and Clipp (1989) represents the first attempt at examining psychological resilience in relation to post-traumatic growth following exposure to traumatic events. The study involved 149 veterans from both WWII and the Korean conflict. The authors constructed a list of 14 positive and 14 negative outcomes commonly associated with military experience. The participants were asked to select the three most positive and three most negative outcomes of their experience. The authors found that the three positive outcomes reported most often were: (1) learning to cope with adversity; (2) having more self-discipline; and (3) gaining a broader perspective. The three negative outcomes reported most often were: (1) separation from loved ones; (2) combat anxiety; and (3) loss of friends. This is an interesting study in that it took a positive perspective on the effects of exposure to trauma and that good outcomes can result from confrontation with adversity. This is in line with Rutter's notion of the '*steeling*' effects (p. 326) of adversity when individuals emerged stronger after the experience.

The second was conducted by Waysman, Schwarzwald, and Solomon (2001) and it examined the role of hardiness in relation to post-traumatic growth following exposure to traumatic events. The authors examined two models, direct and both direct and moderating, of hardiness in relation to long-term positive and negative changes following exposure to traumatic events. Participants included 164 Israeli POWs from the 1973 Yom Kippur War and 184 combat controls who fought at the Syrian and Egyptian fronts in the same year. Hardiness was measured using the Hebrew version of the Personal Views Survey (Hardiness Institute, 1985). Long-term positive and negative changes were measured using the Hebrew version of the Trait, Attitude, and Behaviour Change questionnaire developed by Sledge, Boydstun and Rahe (1980). Extent of combat exposure was assessed using a scale the authors developed for the study which included items such as experience of killing the enemy and counting dead bodies. Using regression analyses, the authors found that hardiness had both direct and moderating effects on long-term positive and negative changes. Hardiness was found to be associated with lower vulnerability to negative changes and higher levels of positive change among the POWs. The authors argued that hardiness had served as a protective factor that mitigated the POWs against the negative effects of their experience and an internal resource that enhanced the POWs' ability to experience post-traumatic growth. This study provided evidence to show that hardiness can function both as a protective factor in relation to

negative outcomes and enhancing factor to promote post-traumatic growth in relation to positive outcomes. Furthermore, the study showed how hardiness work; moderates against the negative effects of stress (moderating effect) and contributes to mental well-being (direct effect).

2.9.4. Psychological resilience and individual-level outcome – performance and leadership

The next two studies specifically examined hardiness in relation to performance outcomes in a peacetime training context. The first study examined the construct in relation to a specific military activity; 250-km ski march. In this study, Johnsen et al. (2015) examined the effects of hardiness, coping and self-appraisal on the performance of 178 service personnel from the Norwegian Armed Forces. Hardiness was measured using the DRS-15 (Bartone et al., 1989). Two 10-cm visual analog scales (VAS) were used to assess subjective coping and self-appraisal. The participants had to respond on a horizontal bar with poles marked as not at all to very much. Using hierarchical regression analysis, the authors found that hardiness score predicted successful completion of the ski march after controlling for nutrition factors, physical fitness and sensation seeking. In addition, the commitment factor of hardiness was the best predictor of ski march success. Analyses of daily measurement on the VAS also showed that higher scores on the commitment factor were positively associated with highest levels of positive coping and better self-appraisal on performance. Unsurprisingly, the commitment factor emerged as the strongest predictors of successful performance as the 250-km ski march was a rigorous activity that lasted 9 days in the Arctic winter conditions.

In the second study, Johnsen, Eid, Pallesen, Bartone and Nissestad (2009) examined whether hardiness can predict peer ratings of leadership style with 71 Norwegian Navy officer cadets. Hardiness was measured using the DRS-15 (Bartone et al., 1989). Leadership style was assessed using the Norwegian version of the Multifactor Leadership Questionnaire–Short Version (Avolio & Bass, 2002). In addition, leadership performance was assessed using the Military Development (leadership) grades that the officer cadets obtained at the end of each year at the academy. These grades were given by three to four supervisors. Using regression analyses, the authors found that hardy commitment factor predicted peer ratings of all leadership styles before and after and intensive military exercise. The hardy challenge factor was positively related to

transformational and transactional leadership styles while negatively related to passive-avoidant leadership styles. In addition, transformational leadership style predicted leader performance, and they authors found that hardiness has a mediation effect on the relation between transformational leadership style and leader performance.

2.9.5. Psychological resilience and unit-level outcome – cohesion

The next two studies examined psychological resilience in relation to cohesion, a key area of military psychology research, and cohesion is one of the two predictors of combat motivation and performance (Kellett, 1982). The other being lower echelon leadership. In the first study, Thomassen et al. (2015) examined the effects of hardiness and cohesion on mental health of 144 Norwegian service personnel serving in a peacekeeping operation in Kosovo. Hardiness was measured using the DRS-15 (Bartone et al., 1989). Cohesion was assessed with the Norwegian version of the 20-item Platoon Cohesion Index developed by Siebold and Kelly (1988). The Norwegian version of the General Health Questionnaire (GHQ-30; Goldberg & Hillier, 1979) was used to assess the peacekeepers' mental health complaints and the authors posited that less mental health complaints signalled greater stress resilience. Using multivariate regression analyses, the author found that both hardiness and cohesion were related to lower levels of reported mental health complaints. There was also an interaction effect between hardiness and cohesion, suggesting that the influence on the mental health of peacekeepers was over and above individual variables. In addition, cohesion influenced the levels of mental health complaints for those peacekeepers who scored low on hardiness but not for those who scored high.

In the second study, William et al (2016) examined the development of unit cohesion over time in relation to psychological stress, sleep problems, resilience, confidence in managing one's own mental health, state of mind and performance of 2,517 recruits participating in Basic Combat Training (BCT). Unit cohesion was assessed using a 3-item measure developed by Podsakoff and MacKenzie (1994). Psychological distress was assessed using the Kessler 6 (Kessler et al., 2002) and sleep problems were assessed with the 4-item scale developed by Bliese, Wright, Adler, Hoge, and Prayner (2005). Resilience as an outcome was measured using the 2-item version of the CD-RISC (Vaishnavi, Connor, & Davidson, 2007). The authors developed an 11-item scale to measure confidence in managing one's own mental health. Five items adapted from the

Positive States of Mind Scale (Adler, Horowitz, Garcia, & Moyer, 1998) were used to measure the recruits' state of mind. The authors found that unit cohesion improved over a 10-week period, and the improvement was associated with decreases in psychological distress and sleep problems, and increases in resilience, confidence in managing stress and positive states of mind. The authors concluded that cohesion may play an important role in the development of psychological health among recruits. In recognising that the context of this study is different, the authors specifically mentioned that the findings are possibly only representative of their study population; recruits who are new to the military environment. This highlights two implicit points. Firstly, the nature of adversity may be different in that the recruits were in a training environment which is different from an operational environment, and hence the actual threat levels and the recruits' appraisal of them can differ. Also compared to their seasoned counterparts in more advance training phases who were in the establishment longer, the recruits were possibly confronted with greater needs to adjust as they transformed from being civilians to soldiers. Secondly, there may be individual differences when psychological resilience is considered as internal capacity. As the recruits were new, it is intuitive to consider that they may be less fit physically, less resilient mentally and unit cohesion may have different effects on them. It is also interesting to note that the previous study (Thomassen et al., 2015) found that cohesion influenced the levels of mental health complaints for those peacekeepers who scored low on hardiness but not for those who scored high.

2.9.6. Examining whether psychological resilience can change over time and be developed

This last two studies examined whether psychological resilience can change over time and be developed. The first study is longitudinal, and it involved 295 Norwegian officer cadets over a 3-year period (Hystad, Olsen, Espevik & Säfenbom, 2015). Hardiness was measured using the DRS-15 (Bartone et al., 1989). The officer cadets completed the DRS-15 during the first week of their training, and then again at the end of each year, yielding four sets of data. Using random-effects regression modelling, the authors found that officer cadets initially low on hardiness significantly increased their hardiness scores while officer cadets initially high on hardiness showed significant decreases over time. While hardiness can improve over time, it can also deteriorate for a variety of reasons. This study is significant in that it provided evidence to show that

hardiness or dispositional resilience as an internal capacity can change over time. This raises the prospect that this internal capacity can be built and developed.

In the second study, Adler et al. (2015) examined whether resilience training has the potential to mitigate mental health symptoms. Specifically, they studied the impact of resilience training on US soldiers' well-being and attitudes during Basic Combat Training (BCT) with a large sample of 1,939 recruits. The soldiers were randomly assigned to the treatment and control group. During the first few days of BCT, the soldiers in the treatment group were provided with training in improving resilience while the control group took lesson on military history. The training encouraged the recruits to think optimistically and flexibly, and imparted skills including how to manage unhelpful cognitive, emotional, and physical reactions, and anxiety reduction techniques such as deep breathing. Anxiety was measured using the 7-item General Anxiety Disorder Scale (Spitzer, Kroenke, Williams, & Loewe, 2006) and Depression symptoms were assessed by the 9-item Patient Health Questionnaire for Depression (Spitzer, Kroenke, & Williams, 1999). Sleep problems were assessed with the a 4-item scale developed by Bliese, Wright, Adler, Hoge and Prayner, 2005). Cohesion was measured using the 3-item scale adapted from Podsakoff and MacKenzie (1994). Finally, confidence in helping others was assessed using 11 items developed by the authors. All these measurements were taken before and after the training. Using latent growth modelling (LGM), the authors found that while anxiety symptoms decreased in both groups, the rate of decrease was faster for the treatment group. In addition, resilience training was associated with greater confidence in helping others. However, the group that received resilience training had a slower rate of increase in group cohesion over time than the control group. The authors concluded that the brief resilience training that they had developed for the study had some utility in supporting mental health and peer support but may not benefit group cohesion. This study adopted the perspective that resilience is an outcome and hence the authors did not specifically measure resilience. Instead, they considered the absence of anxiety and depression as a resilient outcome or the manifestation of positive adaptation. This study also provided evidence that resilience as an outcome can be facilitated with a brief resilience training intervention. The study would undoubtedly shed more light on whether psychological resilience as an internal capacity did improve after the training if the authors had used other scale to measure the construct as an internal capacity (e.g., CD-RISC 25 and DRS-15)

Table 2.3

Details of the resilience studies conducted in the military environment

Study	Sample Characteristics	Theoretical Framework Adopted	Key Findings
<u>Psychological Resilience in Relation to PTSD</u>			
Combat Adaptations of Vietnam Veterans without Post-traumatic Stress Disorder (Hendin & Haas, 1984)	10 Vietnam War veterans	Individual characteristics such as control, acceptance are internal protective factors that can mitigate against the negative impacts of exposure to stressful events.	(1) calmness under pressure; (2) intellectual control; (3) acceptance of fear; (4) and a lack of excessively violent or guilt-arousing behaviours protected the veterans from the negative effects of combat exposure.
Coping, Locus of Control, Social Support, and Combat-Related Post-traumatic Stress Disorder: A Prospective Study (Solomon et al., 1988)	262 Israeli soldiers from the 1982 Lebanon war	Internal protective factors (positive coping style and internal locus of control) and external protective factor (social support) can buffer against the negative effect of exposure to adversity.	(1) Positive relations existed between locus of control, coping, and social support with PTSD symptoms at two time points; two and three years after the war. (2) The number and intensity of PTSD symptoms decreased from time point two to time point three. (3) Over the two time points, participants' locus of control became more internal, emotion-focused coping was less pervasive and there was an increase in perceived social support
Attributional Style and Combat-related Post-traumatic Stress Disorder (Mikulincer & Solomon, 1988)	262 Israeli soldiers from the 1982 Lebanon war	External attribution for good events and internal attribution for bad events reduces individuals' self-esteem and promote depressive cognitions.	(1) Positive relations existed between attribution styles and PTSD two and three years after the war. (2) The number and intensity of PTSD symptoms and problems in social functioning two and three years after the war were found to be positively related to attribution of good events to more external and uncontrollable

			causes, and attribution of bad events to more internal, stable, and controllable causes.
Comparison of Characteristics of Vietnam Veterans with and without Post-traumatic Stress Disorder (Casella & Motta, 1990)	107 veterans from Vietnam War	Aspects of individual differences such as emotional stability and internal locus of control serve as protective factor against the stressful impact of exposure to adversity.	(1) Veterans who did not develop PTSD have lower score on neuroticism. (2) Veterans who did not developed PTSD tended to show internal locus of control.
Vulnerability and Resilience to Combat Exposure: Can Stress have Lifelong Effects? (Aldwin et al., 1994)	1,287 veterans of WWII, Korean War and Vietnam War	Differences exist in individuals' appraisal styles and positive appraisal style improves personal mastery and self-esteem.	(1) Appraisals of the effects of military service were independent and opposite mediators, with undesirable effects increasing and desirable effects decreasing the relations between combat exposure and PTSD. (2) Veterans reported more desirable effects of military service than undesirable ones and both increased with greater exposure to combat.
War Zone Stress, Personal Resources, and PTSD in Persian Gulf War Returnees (Sutker et al., 1995)	775 Persian Gulf War veterans	Internal protective factor of hardiness and external protective factor of family cohesion serve to buffer individuals against the negative impacts of traumatic experience.	Hardiness, commitment, avoidance coping, and perceived family cohesion emerged as consistent predictors of a PTSD diagnosis.
An Eighteen-Year Follow-up Study of Israeli Prisoners of War and Combat Veterans (Neria et al., 1998)	353 Israeli war veterans from the 1973 Yom Kippur War	External protective factor of family support facilitate individuals' adjustment following exposure to traumatic event.	(1) Veterans who experienced positive responses during homecoming had fewer PTSD and avoidance symptoms. (2) Negative reactions at homecoming were associated more PTSD symptoms.
Resilience-Recovery Factors in Post-traumatic Stress Disorder among Female and Male Vietnam Veterans:	1,632 Vietnam War veterans	Exposure to highly stressful life events can have long-term implications for mental and physical.	(1) Stressful life events and war zone stressors have negative impacts on hardiness.

Hardiness, Postwar Social Support, and Additional Stressful Life Events (King et al., 1998)		Social support, as an external protective factor, can help buffer against the negative impacts of traumatic exposure.	(2) Hardiness had both direct and indirect effects on PTSD through structural and functional social support.
Post-traumatic Stress Disorder in a National Sample of Female and Male Vietnam Veterans: Risk Factors, War-Zone Stressors, and Resilience-Recovery Variables (King et al, 1999)	1,632 Vietnam War veterans	Exposure to highly stressful life events can have long-term implications for mental and physical. Social support, as an external protective factor, can help buffer against the negative impacts of traumatic exposure.	(1) Hardiness and social support mediated the effects of pre-war risk factors and war-zone stressors on PTSD symptoms. (2) Higher levels of hardiness and social support were also associated with fewer PTSD symptoms.
Modelling Physical Health and Functional Health Status: The Role of Combat Exposure, Posttraumatic Stress Disorder, and Personal Resource Attributes (Taft et al., 1999)	1,632 Vietnam War veterans	Exposure to highly stressful life events can have long-term implications for mental and physical. Social support, as an external protective factor, can help buffer against the negative impacts of traumatic exposure.	(1) Hardiness was negatively correlated with PTSD symptoms and physical health conditions. (2) Hardiness was positively correlated with social support. (3) Hardiness and social support were intermediary variables between combat exposure and PTSD symptoms.
Description of Risk and Resilience Factors among Military Medical Personnel before Deployment to Iraq (Maguen et al., 2008)	328 military medical personnel preparing for deployment to Iraq	Negative affect has an adverse impact on mental well-being while positive emotion serves as a protective factor that promotes positive coping, mental health and overall well-being.	(1) PTSD symptoms that were present pre-deployment were most strongly associated with risk factors. (2) Positive affect was most strongly associated with resilience while negative affect was associated with both risk factors and resilience.

Psychological Resilience in
Relation to Maladaptive
Coping Behaviours

Psychological Hardiness and Coping Style as Risk/Resilience Factors for Alcohol Abuse (Bartone et al., 2012)	7,555 Norwegian military defence personnel	Hardiness, an individual resilience resource, can prevent maladaptive behaviours such as stress-related problem drinking. Avoidance coping style does the opposite.	Low hardiness and high avoidance coping significantly predicted alcohol abuse.
Post-deployment Resilience as a Predictor of Mental Health in Operation Enduring Freedom/Operation Iraqi Freedom Returnees (Eisen et al., 2014)	512 service personnel deployed during OIF and OEF	The internal protective factor of hardiness can prevent maladaptive behaviours such as problem drinking and drug misuse. Social support, as an external protective factor, helps to mitigate against the negative effect of stress.	(1) Challenge factor of hardiness predicted risk of alcohol abuse among veterans who were recently deployed. (2) Greater hardiness predicted better mental health and lower levels of alcohol use. (3) Post-deployment social support predicted better mental health and less PTSD symptoms, alcohol and drug use.
Psychological Flexibility as a dimension of resilience for Post-traumatic Stress, depression, and risk for suicidal ideation among Air Force Personnel (Bryan et al., 2015)	168 Air Force service personnel	Psychological flexibility is a resilience resource that insulates individuals from emotional distress.	Service personnel scoring high on psychological flexibility reported less suicidal ideation.
Psychological Resilience in Relation Post-traumatic Growth			
Combat Experience and Emotional Health: Impairment	149 veterans from both WWII and the Korean conflict	While adversity typically has negative impacts on individuals, it can also strengthen their stress tolerance capacity.	(1) The three positive outcomes reported most often were: learned to cope with adversity; self-discipline; and a broader perspective.

and Resilience in Later Life (Elder & Clipp, 1989)			(2) The three negative outcomes reported most often were: separation from loved ones; combat anxiety; and loss of friends.
Hardiness: An Examination of Its Relationship with Positive and Negative Long Term Changes Following Trauma (Waysman et al, 2001)	164 Israeli POWs from the 1973 Yom Kippur War and 184 combat controls	While exposure to traumatic event is a risk factor for somatic, social, cognitive, and emotional problems, it can also lead to positive changes in individuals.	(1) Hardiness had both direct and moderating effects on long-term positive and negative changes. (2) Hardiness was found to be associated with lower vulnerability to negative changes and higher levels of positive change among the POWs.

Psychological Resilience and
Individual-level Outcome –
Performance and Leadership

Psychological Hardiness Predicts Success in a Norwegian Armed Forces Border Patrol Selection Course (Johnsen et al., 2015)	178 service personnel from the Norwegian Armed Forces	Commitment facet of hardiness can predict performance.	(1) Hardiness score predicted successful completion of the ski march after controlling for nutrition factors, physical fitness and sensation seeking. (2) The commitment factor of hardiness was the best predictor of ski march success. (3) Higher scores on the commitment factor were positively associated with highest levels of positive coping and better self-appraisal on performance.
Predicting Transformational Leadership in Naval Cadets: Effects of Personality Hardiness and Training (Johnsen et al, 2009)	71 Norwegian Navy officer cadets	Personality factors such as hardiness can predict leadership styles and performance.	(1) Hardy commitment factor predicted peer ratings of all leadership styles before and after and intensive military exercise. (2) Hardy challenge factor was positively related to transformational and transactional leadership styles

while negatively related to passive-avoidant leadership styles.

(3) Transformational leadership style predicted leader performance, and hardiness has a mediation effect on the relation between transformational leadership style and leader performance.

Psychological Resilience and
Unit-level Outcome –
Cohesion

The Combined Influence of Hardiness and Cohesion on Mental Health in a Military Peacekeeping Mission: A Prospective Study (Thomassen et al., 2015)	144 Norwegian service personnel serving in a peacekeeping operation in Kosovo	Hardiness (internal protective factor) and unit cohesion (external protective factor) are associated with mental health in a military context.	(1) Hardiness and cohesion were related to lower levels of reported mental health complaints. (2) There was an interaction effect between hardiness and cohesion. (3) Cohesion influenced the levels of mental health complaints for those peacekeepers who scored low on hardiness but not for those who scored high.
Unit Cohesion, Resilience, and Mental Health of Soldiers in Basic Combat Training (William et al., 2016)	2,517 recruits on BCT	Unit cohesion is related to physical and psychological outcomes such as general mental health, sense of belonging, satisfaction of personal needs, self-identity, and moderation of the negative effects of stress.	Unit cohesion improved over a 10-week period, and the improvement was associated with decreases in psychological distress and sleep problems, and increases in resilience, confidence in managing stress and positive states of mind.

Examining Whether
Psychological Resilience Can
Change Over Time and be
Developed

On the Stability of Psychological Hardiness: A Three-Year Longitudinal Study (Hystad et al., 2015)	295 Norwegian officer cadets	Hardiness as a trait-like factor is less stable than trait and hence can change over time.	Officer cadets initially low on hardiness significantly increased their hardiness scores while officer cadets initially high on hardiness showed significant decreases over time.
Resilience Training with Soldiers during Basic Combat Training: Randomisation by Platoon (Adler et al, 2015)	1,939 recruits on BCT	Psychological resilience is related to well-being and attitude and it can be developed through targeted intervention.	(1) While anxiety symptoms decreased in both groups, the rate of decrease was faster for the treatment group. (2) Resilience training was associated with greater confidence in helping others. (3) The group that received resilience training had a slower rate of increase in group cohesion over time than the control group.

2.9.7. Summary

The literature review noted that the study of psychological resilience has been comprehensive in many aspects. Firstly, both qualitative (e.g., Hendin & Haas, 1984) and quantitative (e.g., Casella & Motta, 1990) approaches have been adopted. Secondly, psychological resilience has been studied as an internal capacity (e.g., Bartone, 1999), process (e.g., Waysman et al., 2001) and outcome (e.g., Adler et al., 2015), and this is in line with the widely accepted conceptualisations of the construct. Thirdly, various researchers also approached the studies from the risk factor (King et al., 1999) and protective factor (Thomassen et al., 2015) perspectives. Fourthly, they examined these factors as internal attributes (e.g., locus of control; Solomon et al., 1988) and external environmental influences (e.g., social support; Sutker et al., 1995). The fifth aspect is that the research questions and approaches were wide-ranging: (1) psychological resilience was examined in relation to personality (Casella & Motta, 1990) attribution styles (Mikulincer & Solomon, 1988), post-traumatic growth (Elder & Clipp, 1989), positive and negative affects (Maguen et al., 2008); (2) whether psychological resilience can predict mental health (Eisen et al., 2014), physical health (Taft et al., 1999), leadership styles (Johnsen et al., 2009), military performance (Johnsen et al., 2015); (3) whether psychological resilience is related to maladaptive behaviours including suicide (Bryan et al., 2015), alcohol (Bartone et al., 2012) and drug misuse (Eisen et al., 2014); and (4) whether psychological resilience can change over time (Hystad et al., 2015). As the scope of resilience research is wide-ranging, it leads to the final point that an extensive set of statistic analyse techniques were used in resilience research in the military setting: (1) correlation analysis (e.g., Solomon et al., 1988); (2) regression analysis (e.g., Neria et al., 1998); (3) SEM (e.g., King et al., 1998); and (4) LGM (e.g., Adler et al., 2015).

2.10. Resilience intervention programmes

In Chapter 1, it was highlighted that one of the key objectives of this research was to examine if psychological resilience in basic military training could be built or enhanced through a targeted training intervention. As such, it was envisaged that part of this research would involve developing a resilience intervention programme in one of its studies. In order to achieve this, this section reviews existing resilience intervention programmes to provide an initial insight on how to approach this task. As mentioned in sub-section 2.3.3, the third wave of resilience research was focused on the development of resilience preventative and resilience building interventions. Consequently, a multitude

of programmes were created to help individuals and organisations to build and enhance psychological resilience in various settings.

In a systematic review conducted by Macedo et al. (2014) on interventions in non-clinical samples of adults, the authors found 13 of such programmes. Leppin et al. (2014) conducted a meta-analysis and found 25 programmes that claimed to improve the mental health and capacity of normal adults and those with chronic diseases. In another meta-analysis conducted by Vanhove, Herian, Perez, Harms and Lester (2015), the authors found 37 programmes that targeted various audience including children, normal adults, patients with PTSD and soldiers. In a recent systematic review, Chmitorzae et al. (2018) found a total of 43 resilience intervention programmes that targeted even a wider range of audience. These included managers in sale industry, female doctoral students, Israeli citizens living in Sderot and restaurant workers.

As these programmes were developed in a wide-ranging setting with different audiences under different contexts, they differ in many aspects. For example, the mode of delivery ranges from one-on-one coaching, to classroom-based group delivery involving discussions and exercises and computer-based learning. Furthermore, the focuses of these programmes also differ in terms of their contents. For example, some programmes teach practical skills including active coping and problem-solving (e.g., Abbott, Klein, Hamilton & Rosenthal, 2009), others encourage the audience to think optimistically (e.g., Sadow & Hopkins, 1993), and certain programme specifically foster social support (e.g., Kent, Davis, Stark & Stewart, 2011). Perhaps more importantly, these programmes also differ in achieving different outcomes [e.g., help female doctoral students complete their study (Bekki, Smith, Bernstein & Harrison, 2013), facilitate restaurant workers in dealing with problem co-workers (Petree, Broome & Bennett, 2012), improve PTSD patients' positive emotional and cognitive functions (Kent et al., 2011) etc].

As this literature review has thus far found that context is an important consideration in resilience research, this section only examined resilience training programmes developed for the military community. This ensured that the general approach, mode of delivery, content and desire outcomes were more in line with the context of the current research. In addition, only programmes that have evidence to show that they worked in achieving the intended outcomes were included (e.g., results from

randomized controlled trials). For example, the US Army's Comprehensive Soldier Fitness (CSF) and Comprehensive Soldier Fitness 2 (CSF2) were not included in this review because there was no conclusive evidence to show that they work. While the US Army had produced a report on a longitudinal study which showed that the programme worked, there were criticism about the methodology of the study (Eidelson, 2012) and general concerns about how the programmes were developed and implemented (Quick, 2011; Eidelson, Pilisuk & Soldz, 2011). Likewise, the UK Royal Air Force's Social, Personal and Emotional Awareness for Resilience programme (SPEAR) was also not included in this review as Jones et al. (2018) did not find any evidence that it benefited the mental health and well-being of recruits. Programmes that aimed to improve the mental health of patients with mental disorder were also excluded as the profile of the target audience differs from that of the current research. In addition, interventions that were reactive in nature (i.e., conducted after exposure to adversity) were similarly excluded from this review as the current research is focused on preparing recruits for the challenges of basic training and not to treat them after traumatic experience or to neutralise the impacts that were already affecting the individuals after exposure. For example, the US Army's Battlemind debriefing and Battlemind training were excluded from this review because the only study that aimed to evaluate their efficacy was conducted after US soldiers returned from a year-long deployment to Iraq (Adler, Bliese, McGurk, Hoge & Castro, 2009).

While in general, the aim of psychological intervention is to help improve human functioning and well-being, or to treat certain mental conditions, it is possible that it may cause psychological harm if it is not designed, conducted or supervised properly (Lilienfeld, 2007). For example, in the Cambridge-Somerville Youth Study of delinquent adolescents, it was found that a larger proportion of those assigned to the intervention group subsequently committed more crimes than those in the control group (Powers & Witmer, 1951). Likewise, Bergin (1963) found evidence in seven studies that showed that certain psychotherapy programmes actually produced negative changes in patients, and five to 10 percent of the patients consistently deteriorated in functioning. However, this literature review noted that there was no research being published on the negative impact of resilience training, possibly because there was less motivation to highlight nil or negative effects, and efforts were often made to determine the efficacy of the programmes rather than to explicitly prove that they did not work. As the aim of this research was to

build and enhance psychological resilience, this literature review did not focus on examining the negative impact of resilience training or to review any programme that did not work.

2.10.1. Boot Camp Survival Training for Navy Recruits-A Prescription

Williams et al. (2004) described the Boot Camp Survival Training for Navy Recruits-A Prescription (BOOT STRAP) as a cognitive-behavioural intervention. The programme adopted the position that response to a stressor is predicated on the appraisal of the intensity of the stressor. According to the authors, Navy recruit training is physically, psychologically, intellectually and interpersonally challenging. Therefore, the recruits are required to use various coping mechanisms to ensure success in training. The authors added that some recruits have difficulty doing this and consequently show maladaptive behaviours in terms of cognitive, affective, interpersonal, and performance functioning. By applying this cognitive behavioural intervention on recruits who are identified to be at risk for these problems, they may be able to cope better and subsequently perform better during training. The programme comprised cognitive and behavioural strategies that inform the recruits about useful coping tactics including correcting faulty thought patterns, promoting peer relationships and a sense of belonging, self-assessment of emotion and stress management.

Williams et al., (2004) examined the effects the BOOT STRAP intervention had on stress, depression, situational events, interpersonal factors, and training performance with 801 Navy recruits. During the first week of training, the recruits completed the Beck Depression Inventory (BDI; Beck, Steer & Brown, 1996) and Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983). The recruits who scored 18 or higher on the BDI and 30 or higher on the PSS were considered to be at risk. The recruits were then randomly assigned to either the treatment or control group, and the recruits who were not classified as at-risk were considered the comparison group. The recruits in the treatment group were put into groups of 10 to 15. Each week, the groups met with clinical psychologists for approximately 45 minutes. During the sessions, facilitated by the clinical psychologists, recruits read the BOOT STRAP manual, discussed and practiced the techniques contained in it. An example exercise included Use Thought Substitution where the recruits were encouraged to substitute negative thoughts such as "I am a total failure." with a positive one such as "I'm often successful at the things I do." To improve

the sense of belonging, the recruits were instructed to actively follow such instructions as "Each week, get to know better one of your shipmates by talking to the shipmate, not criticizing the shipmate, showing interest and listening."

The recruits' sense of loneliness was measured using the Revised UCLA Loneliness Scale (Russell, Cutrona, Rose & Yurko, 1984) and the sense of belonging was assessed with the Sense of Belonging Inventory-Psychological (SOBI-P; Hagerty, Lynch-Sauer, Patusky, Bouwsema & Collier, 1992). To assess the recruits' coping style, the Coping Styles Questionnaire (CSQ; Haines & Williams, 1997) was used. In addition, the recruits' sense of attachment was measured using the Attachment Style Questionnaire (ASQ; Bowlby, 1982). Williams et al., (2004) found that the treatment group significantly increased their sense of belonging, felt less loneliness, used more problem-solving coping skills, and decreased their insecure attachment by the end of the 9-week training. Furthermore, the percentages of recruits who successfully completed the training were 86% for treatment group, 74% for the control group and 84% for the comparison group. The authors concluded that the BOOT STRAP intervention had improved the recruits' overall functioning and helped to reduce the attrition rate. A follow-up study was conducted by Williams et al. in 2007. The study involved 1,199 Navy recruits and the procedure was similar. The authors found that the percentages of recruits who did not complete their training was 10.33% for the control group and only 5.17% for the treatment group.

2.10.2. Cognitive-behavioural Therapy Intervention

Cohn and Pakenham (2008) developed the Cognitive-behavioural Therapy Intervention (CBTI) to examine the efficacy of the brief programme in modifying recruits' attribution styles, expectancy of control, coping strategies, and psychological adjustment during recruit training. According to the authors, recruit training is one of the most crucial time for a soldier's development and hence they focused their research in this phase of military training. The programme is predicated on coping and attribution. The authors cited the work of Johnsen, Laberg and Eid (1998) where it was found that recruits using avoidance coping strategies showed significantly more emotional distress than those who practised problem-focused coping and emotion-focused coping strategies. Interestingly as noted by the authors, the recruits who used more emotion-focused approach coping strategies reported less emotional distress compared to those who used

more problem-focused coping strategies. Johnsen et al. (1998) suggested that problem-focused coping was not as effective during recruit training as recruits had less control over their environment and failed attempt at using this strategy consequently led to emotional distress. Cohn and Pakenham (2008) mentioned that attribution retraining has been shown to influence feelings, future expectancies and actions, and decrease depressed mood (Green-Emrich & Altmaier, 1991).

The CBTI consisted of two 40-minute sessions and were conducted in a classroom by a psychologist. During the first session, the recruits were thought how to restructure their attribution (e.g., the recruits' difficulties in completing certain task were caused by controllable factors such as poor strategy and not because they have no aptitude). The session involved the use of examples, role play and whiteboard exercises. During the second session, the recruits were encouraged to use adaptive coping strategies (e.g., if the recruits felt that their difficulties were caused by poor strategy, controllable factor, they were advised to use problem-focused coping but if they felt that their difficulties were caused by external factors that they had no control over, then they should use emotion-focused coping). During the session, the recruits were also taught that avoidant coping strategies were ineffective in their training context. Similarly, the second session involved the use of examples, role play and whiteboard exercises.

For the study, 174 recruits were randomly assigned to the treatment and control groups, and the control group participated in a discussion about their training experience. Data were collected before and after the intervention, and at the end of recruit training 23 days later. Attribution styles were assessed using a modified version of the Real Events Attributional Style Questionnaire (Norman & Antaki, 1998)) and coping strategies were examined using the Brief COPE (Carver, 1997). The General Health Questionnaire-12 (GHQ-12; Banks et al., 1980) was used to assess psychological distress. The authors found that compared to the control group, the recruits in the treatment group reported more flexible attribution styles, less self-blame coping, and lower psychological distress.

2.10.3. Resilience Training

Adler et al., (2015) examined the effectiveness of Resilience Training (RT) on US soldiers' well-being and attitudes during Basic Combat Training (BCT). The RT taught recruits evidence-based skills that promote mental health to prevent adjustment problems and to enhance adaptation. The training followed approaches from cognitive-behavioural

treatments for depression and anxiety with the aim to improve coping. The RT began with highlighting to the recruits the importance of realistic expectations, normalising common reactions, and encouraging optimistic thinking. The RT next addressed stress reactions including loss of appetite, difficulties in staying motivated, and mood swings. The recruits were then taught skills to manage unhelpful cognitive, emotional, and physical responses. The RT also highlighted the differences between stressors that were under the recruits' control and those that were not and the importance of flexible coping. Deep breathing and grounding exercises were also taught to the recruits to reduce their levels of anxiety. The session also involved discussions on practical examples on how these skills might help the recruits, their buddies and enhance peer relations.

The study involved 1,939 recruits who were randomly assigned to attend the RT and military history lesson, and these sessions were conducted during the first week of BCT. Anxiety was measured using the 7-item General Anxiety Disorder scale (GAD-7; Spitzer et al, 2006). Group cohesion was assessed by a 3-item measure adapted from Podsakoff and MacKenzie (1994). Confidence in helping peers was measured using a scale developed specifically for the study. These measurements were taken over three time points. The authors found that while anxiety decreased in both groups, the rate of decrease was faster in the treatment group. Furthermore, the RT was associated with greater confidence in helping peers. Interestingly, the treatment group showed a slower rate of increase in group cohesion over time compared to the control group. The authors concluded RT may be effective in improving the recruits' mental health and confidence in supporting peers but may be beneficial for group cohesion.

2.10.4. Summary

This literature review noted that while many programmes have been developed over the years to build and enhance service personnel's psychological resilience, not many of them have evidence to suggest they work (e.g., CSF, CSF2, SPEAR etc). This review found three interventions that have evidence to show that they were effective. Perhaps there are more such programmes available, but efforts were not made to test their efficacy or to openly publish the research findings. Interestingly, the three studies all involved recruits; same as the participants of the current research. All three programmes were conducted at the group level and they involved discussions, exercises and case studies. They also adopted principles related to CBT. These included changing the

recruits' thinking pattern and behaviours through modifying the coping and attribution styles. Specifically, BOOTSTRAP focused on aspects such as correcting faulty thought patterns, promoting peer relationships and a sense of belonging, and stress management. CBTI highlighted what styles of coping, problem-focused or emotion-focused, were more useful in different situations. Finally, the RT urged recruits to have realistic expectations and to think optimistically. In addition, the programme also imparted practical skills such as deep breathing and grounding exercises. This review also noted that the CBTI only took up a total of 80 minutes of the recruits' time over two sessions and the RT involved just one session during the first week of basic training.

2.11.   Discussion and summary

While the study of psychological resilience has its' root in research in child development, clinical sciences and individual differences, it has evolved over the years in terms of the research approach, focus and which population was study under what context. From an initial focus of identifying risk and protective factors in children, resilience research evolved to study the construct as a process. Subsequently, instead of passively observing the subjects or phenomenon, resilience researchers began to find ways to intervene such that positive outcomes are more probable. Today, psychological resilience is studied in a wide range of different settings, and different disciplines are coming together to better understand the construct in a bid to develop more holistic and integrated solutions to deal with various types of adversities and their effects on individuals and organisations. While most theories developed in the early years of resilience research involved studying children or conducting research in clinical environment, they remain relevant today and continue to influence research in the field. Until this point, this traditional narrative theoretical literature review has informed the research in the following ways:

No consensus on the definition and conceptualisation of psychological resilience. As discussed in section 2.4, there is no consensus on the definition and conceptualisation of psychological resilience. While some researchers see it as an internal capacity (e.g., Werner & Smith, 1982; Garmezy, 1991; Masten 2014), others posit it as either an outcome (e.g., Rutter, 2006; Bonanno & Mancini, 2012) or process (e.g., Kumpfer (1999); Luthar & Cicchetti, 2000). There is however some agreement in acknowledging key elements of psychological resilience and the need to examine them

in detail (i.e., adversity, risk factors, protective factors, coping or adaptation), and that psychological resilience involves positive adaptation in the face of adversity (e.g., Kaplan 1999; Luthar & Brown, 2007; Masten et al., 2009).

Resilience is an internal capacity, process and outcome. While some resilience researchers are rigid about how psychological resilience should be conceptualised (Southwick et al., 2009), this research takes a more inclusive and conciliatory approach to adopt the position that psychological resilience can be conceptualised as an internal capacity, process and outcome. As mentioned, spirituality, as a personal trait, was found to be a major predictor of psychological resilience and later positive life adaptation (Dunn, 1994). Hence spirituality can be termed as an internal resilience capacity. A fully functional individual does not live in a world of his or her own as he or she appraises the adversity and interacts with the environmental factors (Egeland et al., 1993). Clearly, this interaction constitutes a process (i.e., the resilience process). Likewise, Richardson's (2002) conceptualisation of resilient reintegration, homeostatic reintegration, reintegration with loss and dysfunctional reintegration can be simply labelled as resilience outcomes. While argument creates creative tension for improvement, focusing on resilience intervention is perhaps more constructive and beneficial. As an internal capacity, psychological resilience has not been shown to relate to cognitive ability. It is however associated with aspects of personality and self-concept or core self-evaluations. As a process, psychological resilience involves individuals actively interacting with factors internal and external to them which can have impacts on how they appraise the adversities, and this process eventually influences how individuals cope and adapt. While psychological resilience or adaptation can be observed from an outcome perspective, doing so in isolation adds little insight on how the various outcomes are derived and provides limited value for the purpose of intervention.

Context is a key consideration in resilience research. Although the seminal works of early prominent researchers have led to significant advances in the understanding of psychological resilience from a developmental perspective, the findings may not be entirely representative to other settings. This is mainly because the majority of these research studied children's psychological resilience in relation to chronic longer-term adversities (e.g., poverty, maltreatment, community violence and parents with psychiatric disorder or marital conflict) instead of acute shorter-term events (accident,

work-related stress or bereavement) which are more commonly applicable to the studies of adults' psychological resilience (Bonanno, 2004). Resilience in the face of chronic adversities focuses on examining the construct over a long duration and tends to assess longer-term outcomes (Masten & Narayan, 2012). For example, a child growing up in poverty or suffering from family abuse could be considered resilient if the child grew up and became successful in accordance to societal norms (e.g., graduated from university, had a stable job or blissfully married). However, most research on psychological resilience in adults involves acute shorter-term adversities (Bonanno & Mancini, 2012). Hence, the focus is on assessing relatively more immediate adaptation patterns or outcomes. For instance, a soldier could be considered as resilient if he or she continued to assault the objective despite enemy fire or witnessed a buddy being killed. Hence, resilience researcher must exercise due care in interpreting the findings of studies conducted in different settings as psychological resilience can be conceptually and definitionally different.

Context is a key consideration in resilience research because adversity varies in its nature and intensity depending on the setting (e.g., classroom versus battlefield). Likewise, risk factors and protective factors are present depending on the condition and what is available in the environment. Also, positive adaptation is manifested differently depending on how individuals cope in relation to varies types of adversity. As Southwick et al. (2014) have acknowledged, given that the context and the population under study can vary, different research approaches and findings may arise from specific outcomes in specific contexts. Hence, it is important for resilience researchers to examine and highlight the context in which they carry out their research so that the findings can be interpreted more meaningfully.

No basis to conclude which resilience measure was best suited for the current research. As one of the objectives of this research was to measure psychological resilience, seven most commonly used resilience scales were reviewed. This literature review found that the approaches in operationalising psychological resilience vary considerably and as a result, these scales measure different aspects of the construct. This is mainly due to differences in the setting in which the scales were developed [e.g., clinical setting (Conner & Davidson, 2003) versus non-clinical setting (Block & Kremen, 1996)], the researchers' aims [e.g., measure the presence of protective factors that

promotes psychological resilience (Friborg et al., 2003) versus assess psychological resilience as bouncing back from adversity (Smith et al., 2008)], conceptualisation of psychological resilience [e.g., internal capacity (Conner & Davidson, 2003) versus outcome (Smith et al., 2008)], and developmental samples used [e.g., undergraduates from San Diego State University (Sills & Stein, 2007) versus women who adapted well following a major life event (Wagnild & Young, 1993)]. Even among those researchers who adopted similar perspective, differences exist in what aspects of psychological resilience they examined. For example, both Wagnild and Young (1993) and Connor and Davidson (2003) conceptualised psychological resilience as an internal capacity, the former assessed personal competence and acceptance of self and life while the latter examined control and spiritual influences. Consequently, resilience scales developed in a particular setting using a specific sample may not be suitable for use in another setting involving a different population. These suggest that context is important, and it is essential to conceptualise and operationalise psychological resilience in the context in which the research is conducted. At this point of the research, there was no evidence to suggest which resilience measure was the best or which was better than another. Hence, there was no basis to conclude which resilience measure was best suited for this research.

While resilience research in the military environment is comprehensive, little research has been carried out to specifically examine the psychological resilience of conscripted recruits in a basic training environment. Resilience research in the military environment is comprehensive in that the construct has been studied as an internal capacity (e.g., Bartone, 1999), process (e.g., Waysman et al., 2001) and outcome (e.g., Adler et al., 2015). Furthermore, the construct has been studied in relation to various aspects of individual differences including personality (Casella & Motta, 1990) attribution styles (Mikulincer & Solomon, 1988), post-traumatic growth (Elder & Clipp, 1989) and positive and negative affects (Maguen et al., 2008). Psychological resilience is also measured to examine if it can change over time (Hystad et al., 2015), be developed (Williams et al., 2004), and whether it can predict mental health (Eisen et al., 2014), physical health (Taft et al., 1999), leadership styles (Johnsen et al., 2009) and military performance (Johnsen et al., 2015). However, this literature review did not find any study that specifically examine conscripted recruits' psychological resilience in a basic training environment.

Psychological resilience can be enhanced. In reviewing interventions targeting psychological resilience specifically in the military environment, this literature review found three programmes that had evidences to show that they were effective. These included BOOT STRAP, CBTI and RT. For BOOT STRAP, significantly more recruits in the treatment group who participated in the programme successfully completed the basic training compared to the control group. For CBTI, it was shown that recruits who took part in the programme reported more flexible attribution styles, less self-blame coping, and lower psychological distress compared to the control group. Finally, recruits benefited from RT as their level of anxiety decreased faster compared to their peers who did not go through the training. These showed that either the recruits' psychological resilience improved, or they had adapted more positively during training. All three programmes were conducted at the group level and they adopted principles related to CBT. These included changing the recruits' thinking pattern and behaviours through modifying their coping and attribution styles.

Implication for future research. While psychological resilience has been studied with recruits in the context of training (e.g., Williams et al., 2004; Cohn & Pakenham, 2008; Adler et al., 2015), these studies involved career soldiers who voluntarily opted for military service. This literature review did not find any study that involves conscripts. Numerous studies have established links between motivation and psychological resilience. For example, Fletcher and Sarkar (2012) studied Olympics champions and found that motivation protected the athletes from the potential negative effect of stressors. As choice is associated with motivation (Patall et al., 2008), unlike career soldiers who volunteered, in the context where military service is compulsory, conscripts may not be as motivated initially because their enlistment into the armed forces is not voluntary. Hence, it is worthwhile investigating psychological resilience in this specific context. Furthermore, as noted by Williams et al. (2004), recruits are confronted with drastic need to adjust as they are placed in an unfamiliar, stressful, and unusual environment. This probably explains why basic training typically attracts high rate of attrition (Kiernan et al, 2015). Hence, studying psychological resilience in this research also had practical purpose as one of the objectives of this research was to find ways to enhance the recruits' resilience so that they can perform better and stay in training. For the organisation, it can potentially benefit from a lower attrition rate and better performing soldiers.

Several commonly used resilience scales were reviewed to provide an initial insight on how the construct was conceptualised and operationalised, and what aspects of psychological resilience or protective factors were being measured. However, this literature review did not find evidence to suggest that there was a best measure of psychological resilience available. Likewise, at this point, there was no basis to decide which scale was the most appropriate one to be adopted for the current research. As psychological resilience is context-dependent, it would be insightful to examine how various military communities around the world measured psychological resilience specifically in this context. This effort would also allow the current research to better understand how these military communities conceptualised and operationalised the construct in their organisations. Hence, a review of resilience measurement in the military environment was recommended.

Chapter 3:   Systematic review of psychological resilience measurement in the military environment (Study 1)

One of the key conclusions from the literature review was that there is no consensus on how psychological resilience is defined, conceptualised, operationalised and measured. Likewise, the was neither evidence to suggest that there was a best scale nor basis to decide on which was the most appropriate one to be adopted for the current research. As psychological resilience is context-dependent, a systematic review was recommended to examine how the construct has been measured specifically within the military environment.

This chapter contains the details of the systematic review. Section 3.1 highlights the aim and research questions (section 3.1). Next, the rationale for adopting the systematic review approach and why this review is necessary are provided (section 3.2). The method section (section 3.3) highlights the review protocol developed based on the Preferred Reporting Items for Systematic review and Meta-analysis Protocols (PRISMA-P; Shamseer et al., 2015), the search terms and data source, how various studies were included and excluded from the review, the search process, and how data were extracted. The results (section 3.4) are presented in relations to: (1) how military communities around the world conceptualised and operationalised psychological resilience; (2) what scales were used in the included studies and their psychometric properties; (3) what tangible military outcomes of interest were predicted by or were related to the construct (e.g., mental health and well-being, and performance).

3.1.   Aim of the systematic review and research questions

This systematic review aimed to examine if a suitable measure of psychological resilience is available for this research to use. It was essential to first understand how the construct is conceptualised and operationalised by military communities around the world as these are the basis for measurement. Hence, the first research question was:

(1)   How is psychological resilience conceptualised and operationalised in the military context?

As the SAF did not have a systematic way to measure psychological resilience, it was useful to examine what other military communities around the world used. Therefore, the second research question was:

(2)   How is psychological resilience measured in the military context?

In order to ascertain the suitability of available measures, it was important to examine their psychometric properties. As such, the third research question was:

(3)   What are the psychometric properties of these measures?

As mentioned in Chapter 1, one of the objectives of this research was to examine the criterion validity of psychological resilience. Hence, this systematic review also took the opportunity to examine what tangible outcomes of interest were studied by the military communities around the world. The fourth research question was:

(4)   What tangible outcomes of interest were studied in relation to psychological resilience in the military context?

3.2.   Rationale for adopting the systematic review approach and why this review is necessary

Systematic review, a replicable methodology, is an explicit and systematic approach in identifying, evaluating and synthesising relevant studies related to a specific research question (Khan, Kunz, Kleijnen, & Antes, 2003). When conducted with rigour, systematic review also allows researchers to uncover areas of uncertainty, identify areas where little or no relevant research has been done, and provides insight on what new studies may be needed (Petticrew & Roberts, 2006). Compared to the traditional narrative theoretical literature review, systematic review can also reduce researcher bias to only seek out information which might be familiar or easily available, and hence allowing a more thorough understanding of the topic (Rojon, McDowall, & Saunders, 2011).

To determine if a similar review has been conducted before, a search was conducted in the PubMed, Cochrane and PROSPERO databases. It was found that there were three previous attempts at reviewing psychological resilience measures. The first systematic review of psychological resilience measurement was conducted in 2006 and it only included measures that were suitable for use with adolescents (Ahern, Kiehl, Sole & Byers, 2006). As psychological resilience is context-dependent, the measures reviewed and findings from the study might not be applicable to the current research involving soldiers. The second systematic review conducted by Windle, Bennett and Noyes (2011) limited the measures to those developed before 2009. As these two studies reviewed measures that were developed more than 10 years ago, it was possible that newer ones

might have been developed in this time gap. While the third systematic review was conducted more recently by Pangallo et al. (2015), the authors excluded measures that were specifically developed for particular populations including military personnel who are the exact group that this research intended to examine. Hence, this systematic review was conducted to provide insight that was directly relevant to the current research context.

3.3. Methods

3.3.1. Review protocol

Two reviewers were involved in this systematic review; the researcher and his supervisor. Before conducting the systematic review, a review protocol was developed based on the PRISMA-P (Shamseer, et al., 2015). This latest guide from the PRISMA Group contains a 17-item checklist that required researchers to highlight the details of their study. These include: (1) administrative information such as who the study is registered with and the sponsor of the study; (2) an introduction to the study describing the rationale and objectives; and (3) methods such as information sources, search strategy and data collection process. By following a protocol, the researchers will be able to plan the review carefully and anticipate potential problems, record what is planned and enable other researchers to compare the protocol and completed review, prevent arbitrary decision, and reduce duplication of efforts (Shamseer, et al., 2015).

3.3.2. Search terms and data source

Search terms. Three elements were identified to facilitate the search; resilience, military and measure. Next, free text terms were generated for each of these elements. These included alternate terms, synonyms and spelling variants. The elements and their respective free text variants are shown in Table 3.1.

Table 3.1

Search terms used for each element

Element	Free text variant
Resilience	wild card "resilien*" to capture "resilient", "resilience" and "resiliency"
Military	"military" OR "armed force" OR "armed service" OR "defence force" OR "national guard" OR "army" OR "navy" OR "air force"

OR "troop" OR "soldier" OR "airman" OR "airmen" OR "sailor" OR "rating" OR "marine"

Measure	"measure" OR "instrument" OR "scale" OR "test" OR "question" OR "survey" OR "inventory" OR "assess"

Data sources. The search was undertaken in August 2018. The following databases were used: (1) PsycARTICLES; (2) PsychINFO; (3) PsychTESTS; and (4) MEDLINE).

3.3.3. Selection of studies

The inclusion and exclusion criteria were established with reference to the research questions and related to types of study, study population and study setting. Only English language peer-reviewed studies were included although it was noted that this restriction could be a potential source of bias that reduced the generalisability of the findings (Petticrew & Roberts, 2006). Qualitative studies were excluded as they were not relevant to the purpose of the review. As the review focused on studies involving normal functioning active duty personnel, studies involving servicemen with mental health condition, veterans who had left service, and spouse and children of servicemen were excluded. Studies involving conceptually related constructs were included as some of these constructs were interchanged in the literature or were concepts sometime confused with psychological resilience (e.g., hardiness and ego-resilience).

Table 3.2

Criteria for inclusion and exclusion

Inclusion criteria	Exclusion criteria
- Study population: adults (18+) - Time period: unrestricted - Publication criteria: English; peer-reviewed - Conceptually related constructs	- Qualitative studies - Study population: servicemen with mental health condition - Study population: spouse & children - Study population: veterans who were no longer in active service

3.3.4. Search process

The systematic search process involved screening by title, abstract and full-text. Figure 3.1 outlines the selection process.
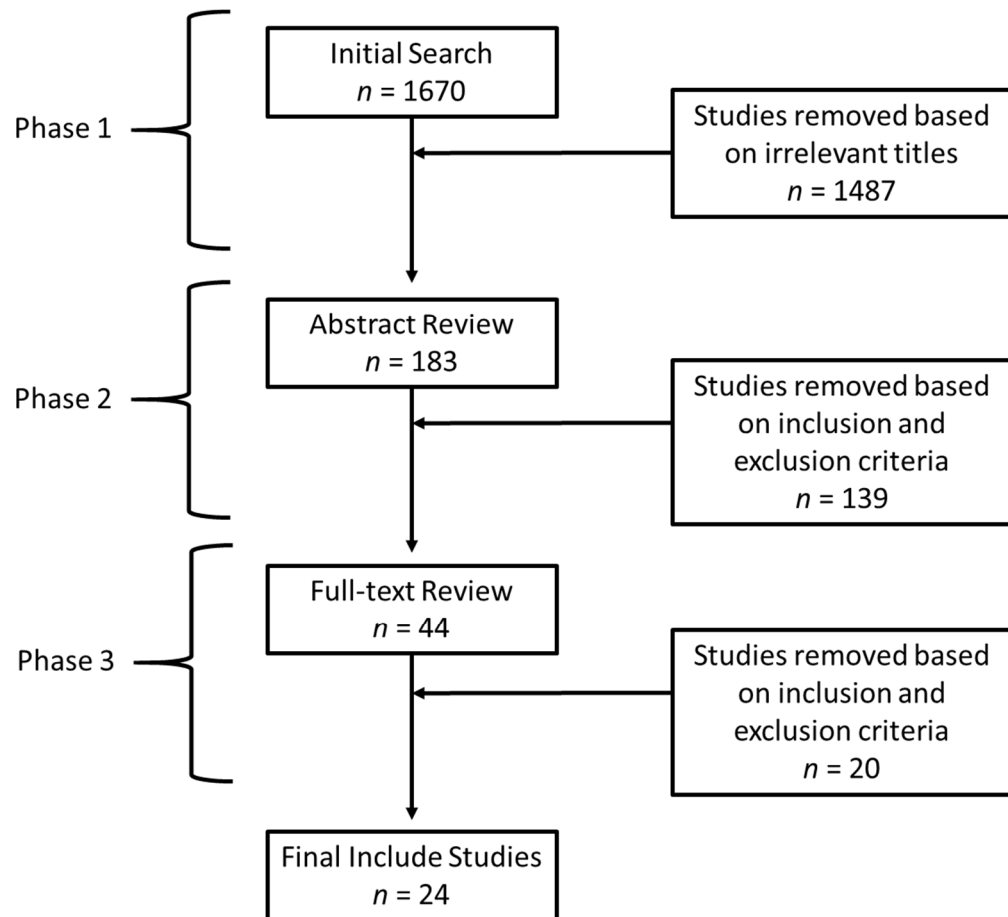
Figure 3.1: Flow chart of selection process

Phase 1 - Title review. The initial search yielded 1,670 potential studies. The record was then exported to referencing software. The title of each article was then reviewed. Studies that were duplicates or did not measure psychological resilience were removed. Consequently, 1,487 articles were removed, leaving 183 articles for the next phase of review.

Phase 2 - Abstract review. All 183 abstracts were then reviewed to ascertain if these studies met the inclusion and exclusion criteria. Consequently, 149 articles were rejected. A total of 44 studies appeared to measure psychological resilience and have met the inclusion and exclusion criteria.

Phase 3 - Full-text review. The full articles of all 44 studies were subsequently retrieved and reviewed. Consequently, 20 studies were discarded. Nine of these studies did not measure resilience (e.g., Adler et al., 2015; King et al., 2006). Another 10 studies were removed either because they were conducted in clinical setting with patients with mental conditions or involved veterans who were already discharged from service (e.g., Zimmermann et al., 2014). The last study was removed because it was at the proposal stage of attempting to develop a resilience model (Lee, Sudom & Zamorski, 2013). Twenty-four studies that met all the criteria were eventually included in this final stage of the systematic review.

3.3.5. Data extraction

According to Higgins & Deeks (2011), the data extraction phase of a systematic review should be performed in a clear and consistent manner to improve the reliability and validity of the review. Hence, a data extraction form was customised for this systematic review, so that all the details required from the included studies were captured to address the research questions of this review. The details needed from the studies included: (1) study information (e.g., article title, author and date of publication); (2) study aim and design; (3) sample characteristics (e.g., sample size and drawn from which country); (4) how was psychological resilience conceptualised and operationalised; (5) measure used and its psychometric properties; and (6) key findings (e.g., what military outcome of interest was predicted or related to psychological resilience).

3.4. Results

The basic details of the 24 included studies are provided in Table 3.3. They are listed according to which countries the samples were drawn from and in chorological order. These studies were published between 2005 and 2018. This systematic review noted that while there were studies measuring psychological resilience in the military setting before 2005, they were conducted either in clinical settings where the aim was to predict mental health (e.g., Sutker et al., 1995) or with patients with existing mental health conditions such as PTSD (e.g., King et al., 1998). Hence, these studies met the exclusion criteria and were removed during phases 2 and 3. This systematic review found that one study was conducted in the Netherlands, one in Belgium, two in the UK, seven in Norway, 11 in the US, one in China, and the last one in both the US and Norway. While this systematic review noted that all except one study were conducted in the West, it was not

thought to be of concern as the current research did not aim to examine psychological resilience from a cultural differences perspective.

Table 3.3

Basic details of included studies

Study	Country Sample Recruited From	Sample Size and Characteristics	Study's Aim in Measuring Psychological Resilience
A model of resilience and meaning after military deployment: Personal resources in making sense of war and peacekeeping experiences (Schoka, Kleberb & Lensvelt-Mulders, 2010)	Netherlands	$N = 1,561$ war veterans from various war or conflict such as the Korean War, United Nations Advance Mission In Cambodia etc	To examine whether the specific personal resources of self-esteem, optimism and perceived control, combined in the latent variable called resilience, were associated with cognitive processing of war-zone experiences.
Hardiness promotes work engagement, prevents burnout, and moderates their relationship (Bue, Taverniers, Mylle & Euwema, 2017)	Belgium	$N = 147$ service members involved in the International Security and Assistance Force (ISAF) operation	To examine the relationships between hardiness, psychological resilience, work engagement, and burnout.
Development and validation of a Military Training Mental Toughness Inventory (Arthur, Fitzwater, Hardy, Stuart & Bell, 2015)	UK	Study 1 ($n = 435$) Study 2 ($n = 104$) Study 3 ($n = 106$) - Infantry recruits	To validate a mental toughness instrument for use in military training environments.
"The tough get tougher": Mental skills training with elite military recruits (Fitzwater, Arthur & Hardy, 2018)	UK	Treatment ($n = 83$) Control ($n = 90$) - elite soldiers	To examine the impact of a psychological skills intervention on observer-rated mental toughness and performance in an elite military context.
Resilience in relation to personality and intelligence (Friborg, Barlaug, Martinussen, Rosenvinge & Hjemdal, 2005)	Norway	$N = 482$ applicants to military college	The Resilience Scale for Adults (RSA) was cross-validated and compared with measures of personality, cognitive abilities and social intelligence.
Dissociation, Hardiness, and Performance in Military Cadets Participating in Survival Training (Eid & Morgen, 2006)	Norway	$N = 80$ officer cadets at the Royal Norwegian Naval Academy	To examine the relationship between peritraumatic dissociation, hardiness, and military performance in Norwegian Navy officer cadets after a simulated prisoner of war (POW) exercise.

Predicting transformational leadership in Naval cadets: Effects of personality hardiness and training (Johnsen, Eid, Pallesen, Bartone & Nissestad, 2009)	Norway	N = 71 officer cadets at the Royal Norwegian Naval Academy	To investigate whether personality hardiness predicts peer ratings of leadership style in Navy officer cadets.
Psychological hardiness and coping style as risk/resilience factors for alcohol abuse (Bartone, Hystad, Eid & Brevik, 2012)	Norway	N = 1,402 military personnel from the Norwegian Armed Forces	To evaluate the potential role of psychological hardiness, an individual resilience resource, to stress-related problem drinking in a military population.
Psychological hardiness predicts success in a Norwegian Armed Forces border patrol selection course (Johnsen et al., 2013)	Norway	N = 178 trainees from Norwegian Armed Forces border patrol selection course	To investigate the effects of psychological hardiness and successful completion of a rigorous 250-km ski march over 9 days in Arctic winter conditions.
The combined influence of hardiness and cohesion on mental health in a military peacekeeping mission: A prospective study (Thomassen et al., 2015)	Norway	N = 144 Norwegian personnel serving in a peacekeeping operation in Kosovo	To investigate the combined effect of hardiness and cohesion in a prospective design, controlling for baseline levels of symptoms among Norwegian personnel serving in a peacekeeping operation in Kosovo.
On the stability of psychological hardiness: A three-year longitudinal study (Hystad, Olsen, Espevik & Säfenbom, 2017)	Norway	N = 295 officer cadets from three different Norwegian military academies	To examine whether psychological hardiness can be trained.
Description of risk and resilience factors among military medical personnel before deployment to Iraq (Maguen et al.,2008)	US	N = 328 military medical personnel preparing for deployment to Iraq	To examine pre-deployment risk in relation to resilience factors.
Resilience to traumatic exposure among soldiers deployed in combat (Schaubroeck, Riolli, Peng & Spain, 2011)	US	N = 633 soldiers from U.S. Army who participated in the war in Iraq	To examine the influence of positive psychological capital (PsyCap), a metaconstruct that combines established psychological predispositions to be resilient to stress, on the well-being of soldiers during combat deployment.

Protective factors and risk modification of violence in Iraq and Afghanistan war veterans (Elbogen et al.,2012)	US	*N* = 1,388 Iraq and Afghanistan war veterans	To identify variables empirically related to decreased risk of community violence among veterans.
The role of resilience and social support in predicting post-deployment adjustment in otherwise healthy Navy personnel (Cunningham et al., 2014)	US	*N* = 132 Navy service members	To determine if resilience, social support, and exposure to combat, stressful deployment environments, and additional stressful life events predicted short-term (12 months or less) post-deployment adjustment in a relatively healthy subset of Navy service members.
Post-deployment resilience as a predictor of mental health in Operation Enduring Freedom/Operation Iraqi Freedom returnees (Eisen et al., 2014)	US	*N* = *512* veterans who participated in Operation Enduring Freedom/Operation Iraqi Freedom	To determine whether military service members returning from Afghanistan and Iraq who exhibit higher levels of resilience, including hardiness (encompassing control, commitment, and challenge), self-efficacy, and social support after returning from deployment are less vulnerable to subsequent mental health problems, alcohol, and drug use.
Alcohol misuse and psychological resilience among U.S. Iraq and Afghanistan era veterans (Green, Beckham, Youssef & Elbogend, 2014)	US	*N* = 1,388 U.S. military veterans who served on or after September 11, 2001	To investigate the longitudinal effects of psychological resilience against alcohol misuse adjusting for socio-demographic factors, trauma-related variables, and self-reported history of alcohol abuse.
Examining the factor structure of the Connor–Davidson Resilience Scale (CDRISC) in a post-9/11 U.S. military veteran sample (Green et al., 2014)	US	Study 1 (*n* = 990) Study 2 (*n* = 991) - U.S. veterans with military service since September 11, 2001	To examine the structural validity of the 25-item Connor-Davidson Resilience Scale (CD-RISC) in a large sample of U.S. veterans with military service since September 11, 2001.

Grit and hardiness as predictors of performance among West Point cadets (Kelly, Matthews & Bartone, 2014)	US	N = 1,558 officer cadets from the U.S. Military Academy, West Point	To examine the predictive validity of grit and hardiness, and their sub-facets, on retention and performance through the full 4-year West Point program.
Psychological flexibility as a dimension of resilience for posttraumatic stress, depression, and risk for suicidal ideation among Air Force personnel (Bryan, Ray-Sannerud & Heron, 2015)	US	N = 168 Air Force convoy operators	To investigate the protective effects of psychological flexibility on emotional distress and suicidal ideation in active duty Air Force convoy operators.
Unit Cohesion, Resilience, and Mental Health of Soldiers in Basic Combat Training (Brown, Goodell, Olmsted & Adler, 2016)	US	N = 1,939 recruits participating in Basic Combat Training	To assess the development of unit cohesion across the 10-week BCT period, and the relation of cohesion to stress, resilience, mental health measures, and BCT outcomes.
Initial validation of the U.S. Army Global Assessment Tool (Vie, Scheier, Lester & Seligman, 2016)	US	N = 40,000 soldiers from the US Army	To examine the factorial validity and reliability of the GAT.
The psychometric evaluation of the Connor-Davidson Resilience Scale using a Chinese military sample (Xie, Peng & Li, 2016)	China	Study 1 (n = 1,573) Study 2 (n = 2,784) - China Army, Marines and Special Forces	To examine the psychometric properties of the Connor-Davidson Resilience Scale (CD-RISC) with a Chinese military population with the aim of finding a suitable instrument to quantify resilience in Chinese military service members.
Hardiness, avoidance coping, and alcohol consumption in war veterans: A moderated-mediation study (Bartone, Johnsen, Eid, Hystad & Laberg, 2017)	US & Norway	Study 1 (n = 357) soldiers from the U.S. Army National Guard who participated deployed in Afghanistan Study 2 (n = 230) Norwegian Army soldiers deployed to Kosovo	To explore how psychological hardiness, avoidance coping, and stress exposure may interact to influence alcohol consumption patterns in soldiers following deployment.

This systematic review noted that the included studies measured psychological resilience of a wide range of populations within the different military communities. These included military personnel:

(1)   from difference services such as the Army (e.g., Schaubroeck et al., 2011), Navy (e.g., Cunningham et al., 2014), Air Force (e.g., Bryan et al, 2015) and Marines (e.g., Xie et al, 2016);

(2)   with different degrees of experience such as applicates who had yet to be enlisted (e.g., Friborg et al., 2005), recruits (e.g., Arthur et al., 2015), officer cadets (e.g., Kelly et al., 2014) and war veterans (e.g., Elbogen et al., 2012); and

(3)   at various stages of military service such as during training (e.g., Eid & Morgen, 2006), before operation (e.g., Maguen et al., 2008), during operation (e.g., Thomassen et al., 2015) and after operation (e.g., Schoka et al., 2010).

Likewise, the research aims in measuring psychological resilience were extensive. For example, to:

(1)   examine individual differences in the appraisal of adversity (e.g., Schoka et al., 2010);

(2)   understand the relation between psychological resilience and maladaptive coping such as suicidal ideation (e.g., Bryan et al., 2015) and alcohol abuse (Bartone et al., 2012);

(3)   ascertain if psychological resilience can predict military performance (e.g., Johnsen et al., 2013); and

(4)   whether psychological resilience can be developed (e.g., Fitzwater et al., 2018).

These showed the wide-spread interest among the military communities in measuring psychological resilience and demonstrated the relevance of studying the construct in the military context.

To facilitate this systematic review in addressing the study aim and research questions, the results are presented as follows: (1) to examine how psychological resilience is conceptualised and operationalised (sub-section 3.4.1); (2) to list the

measures used and their psychometric properties (sub-section 3.4.2); and (3) to report military outcomes of interest (sub-section 3.4.3).

3.4.1. How is psychological resilience conceptualised and operationalised in the military context

This systematic review found that, consistent with research on psychological resilience in general, researchers within the military communities differed in the ways they conceptualised the construct (see Table 3.4). Sixteen studies conceptualised psychological resilience as an internal capacity (e.g., Schoka et al., 2010) while only two studies considered it as merely an outcome (e.g. Green et al., 2014). Three studies conceptualised it as both an internal capacity and outcome (e.g., Arthur et al., 2015) and two studies posited it as both an internal capacity and process (e.g., Eisen et al., 2014). One study conceptualised the construct as an internal capacity, process and outcome (Vie et al., 2016). Most proponents who conceptualised psychological resilience as an internal capacity operationalised the construct as multi-dimensional and encompassed a set of attributes or attitudes such as personal competence, having sense of control and high standards, trust in one's instinct, tolerance of negative effects and positive acceptance of change (e.g., Elbogen et al., 2012). One study operationalised it as a one-dimensional internal capacity; psychological flexibility (Bryan et al., 2015). In addition to studying attributes or attitudes, advocates of the process perspective also examined external factors such as family cohesion and social support (e.g. Friborg et al., 2005). Finally, those who conceptualised the construct as merely an outcome operationalised it as positive adaptation and bouncing back following exposure to adversity.

Table 3.4

Conceptualisation and operationalisation of psychological reseilience in the military context

Study	Conceptualisation of Psychological Resilience	Operationalisation of Psychological Resilience
A model of resilience and meaning after military deployment: Personal resources in making sense of war and peacekeeping experiences (Schoka et al., 2010)	Internal capacity	Self-esteem, sense of control and optimism are personal resources that contribute to psychological resilience.
Hardiness promotes work engagement, prevents burnout, and moderates their relationship (Bue et al., 2017)	Internal capacity	Sense of control, commitment and viewing adversity as a challenge contribute to psychological resilience.
Development and validation of a Military Training Mental Toughness Inventory (Arthur et al., 2015)	Internal capacity and outcome	Mental toughness, a single-dimension ability, contributes to psychological resilience and individuals' optimal performance.
"The tough get tougher": Mental skills training with elite military recruits (Fitzwater et al., 2018)	Internal capacity and outcome	Mental toughness, a single-dimension ability, contributes to psychological resilience and individuals' optimal performance
Resilience in relation to personality and intelligence (Friborg et al.,2005)	Internal capacity and Process	Psychological resilience is influenced by internal and external factors including: (1) confidence in one's abilities and judgements, self-efficacy and realistic expectations; (2) ability to plan ahead, having a positive outlook, and goal-oriented; (3) social competence and positive use of humour; (4) preference for routines and being organised; (5) family cohesion; and (6) availability of social support.
Dissociation, Hardiness, and Performance in Military Cadets Participating in Survival Training (Eid & Morgen, 2006)	Internal capacity	Hardiness leads to increased psychological resilience and it has three dimensions: (1) Sense of control; (2) commitment; and (3) and viewing adversity as a challenge.

Predicting transformational leadership in Naval cadets: Effects of personality hardiness and training (Johnsen et al., 2009)	Internal capacity	Hardiness is considered as dispositional resilience and it encompasses sense of control, commitment and viewing adversity as a challenge.
Psychological hardiness and coping style as risk/resilience factors for alcohol abuse (Bartone et al.,2012)	Internal capacity	Hardiness is an individual resilience resource comprising of three dimensions: (1) control; (2) commitment; and (3) and challenge.
Psychological hardiness predicts success in a Norwegian Armed Forces border patrol selection course (Johnsen et al., 2013)	Internal capacity	Sense of control, commitment and viewing adversity as a challenge contribute to psychological resilience.
The combined influence of hardiness and cohesion on mental health in a military peacekeeping mission: A prospective study (Thomassen et al., 2015)	Internal capacity	Sense of control, commitment and viewing adversity as a challenge contribute to psychological resilience.
On the stability of psychological hardiness: A three-year longitudinal study (Hystad et al., 2017)	Internal capacity	Hardiness is associated with psychological resilience and it consists of sense of control, commitment and viewing adversity as a challenge.
Description of risk and resilience factors among military medical personnel before deployment to Iraq (Maguen et al.,2008)	Internal capacity	Psychological resilience as a higher order construct is made up of: (1) personal competence, high standards, and tenacity; (2) trust in one's instinct, tolerance of negative effects; (3) positive acceptance of change and secure relationships; (4) sense of control; and (5) spirituality.
Resilience to traumatic exposure among soldiers deployed in combat (Schaubroeck et al.,2011)	Internal capacity	Psychological resilience consists hope, optimism and ego-resilience.
Protective factors and risk modification of violence in Iraq and Afghanistan war veterans (Elbogen et al.,2012)	Internal capacity	Resilience is a domain of well-being that consists of a set of characteristics or qualities across various domains of functioning (e.g., commitment, recognition of limits of control, viewing

		stress/change as a challenge/opportunity and tolerance of negative affect).
The role of resilience and social support in predicting post-deployment adjustment in otherwise healthy Navy personnel (Cunningham et al., 2014)	Internal capacity	Resilience is a set of characteristics or qualities across various domains of functioning (e.g., commitment, recognition of limits of control, viewing stress/change as a challenge/opportunity and tolerance of negative affect).
Post-deployment resilience as a predictor of mental health in Operation Enduring Freedom/Operation Iraqi Freedom returnees (Eisen et al., 2014)	Internal capacity and process	Psychological resilience consists of various factors comprising intrinsic individual and extrinsic family, unit, and community factors. Hardiness, as an individual resilience factor, has three dimensions: (1) control; (2) commitment; and (3) and challenge.
Alcohol misuse and psychological resilience among U.S. Iraq and Afghanistan era veterans (Green et al., 2014)	Outcome	Psychological resilience is demonstrated through positive adaptation.
Examining the factor structure of the Connor–Davidson Resilience Scale (CDRISC) in a post-9/11 U.S. military veteran sample (Green et al., 2014)	Internal capacity and outcome	Psychological resilience is demonstrated through positive adaptation and it is a higher order construct made up of: (1) personal competence, high standards, and tenacity; (2) trust in one's instinct, tolerance of negative effects; (3) positive acceptance of change and secure relationships; (4) sense of control; and (5) spirituality.
Grit and hardiness as predictors of performance among West Point cadets (Kelly et al., 2014)	Internal capacity	Sense of control, commitment, viewing adversity as a challenge, perseverance and passion contribute to psychological resilience.
Psychological flexibility as a dimension of resilience for posttraumatic stress, depression, and risk for suicidal ideation among Air Force personnel (Bryan et al., 2015)	Internal capacity	Resilience is an ability, perception, or set of beliefs which buffers individuals from negative effects of adversity and psychological flexibility contributes to resilience.
Unit Cohesion, Resilience, and Mental Health of Soldiers in Basic Combat Training (Brown et al., 2016)	Outcome	Psychological resilience is demonstrated through positive adaptation to change and bouncing back after illness or hardship.

Initial validation of the U.S. Army Global Assessment Tool (Vie et al., 2016)	Internal capacity, process and outcome	As an internal capacity, psychological resilience consists of: (1) self-management; (2) positive affect; (3) work engagement; (4) organizational trust; (5) loneliness; negative cognitions; (6) hostility; (7) negative emotions; (8) emotion-focused coping; (9) character strengths including intellect, warmth, civic strengths and temperance).
		As a process, psychological resilience is influenced by how meaningful the activities individuals participate in are.
		As an outcome, psychological resilience is manifested when depressive symptom is absence.
The psychometric evaluation of the Connor-Davidson Resilience Scale using a Chinese military sample (Xie et al., 2016)	Internal capacity	Psychological resilience is a personality trait that reflects the capability to cope successfully and recover from adversity and it consists of secondary factors including competency, toughness and adaptability.
Hardiness, avoidance coping, and alcohol consumption in war veterans: A moderated-mediation study (Bartone et al., 2017)	Internal capacity	Sense of control, commitment and viewing adversity as a challenge contribute to psychological resilience.

3.4.2.   Scales used to measure psychological resilience in the military context – reliability and validity

This systematic review found that 22 of the studies used existing scales including the Dispositional Resilience Scale (DRS-15R) and Connor-Davidson Resilience Scale (CD-RISC 25) to measure psychological resilience, while the remaining two studies involved the development of new ones. These scales were evaluated based on their reliability and validity (see Tables 3.5).

Dispositional Resilience Scale (DRS-15R). Ten studies used either the English or Norwegian versions of this scale. The DRS-15R was developed by Bartone (1995). It consists of 15 items with five items each measuring the hardiness dimensions of control, commitment and challenge. It is scored on a 4-point Likert scale from 0 = not at all true to 4 = completely true. In a review of hardiness theory and research, Funk (1992) recommended the instrument as the best available instrument to measure hardiness at that time. Furthermore, Sinclair and Tetrick (2000) were able to replicate the 3-factor structure of the DRS-15R with the three dimensions nested under a more general hardiness construct. The Norwegian version was translated in 1998. The 10 studies reported the DRS-15R's internal consistency of between .62 and .83. Only one included study reported the split-half reliability coefficient to be .75 (Johnsen et al., 2009).

Nine studies reported that: (1) low hardiness was a significant predictor of alcohol abuse, and the challenge facet of hardiness predicted risk of alcohol abuse among respondents with recent deployment experience, and the effect is greater for those with harsh deployment experiences (Bartone et al., 2012); (2) low hardiness was a significant predictor of increased alcohol use and this relation is mediated by avoidance coping (Bartone et al., 2017); (3) the challenge dimension of hardiness was negatively associated with peritraumatic dissociation in response to stressful situation (Eid & Morgan, 2006); (4) greater hardiness predicted several indicators of better mental health and lower levels of alcohol use (Eisen et al., 2014); (5) the commitment dimension of hardiness predicted peer ratings of leadership styles, the challenge dimension was a positive predictor of transformational and transactional leadership, and was negatively related to passive-avoidant leadership (Johnsen et al., 2009); (6) hardiness total score predicted successful completion of the ski march and the commitment dimension was the most significant predictor (Johnsen et al., 2013); (7) commitment dimension of hardiness predicted

attrition from Cadet Basic Training and the control dimension predicted College Entrance Exam Rank (Kelly et al., 2014); (8) hardiness was positively related to dedication and vigour, and negatively related to cynicism and emotional exhaustion (Bue et al., 2017); and (9) hardiness contributed to increased stress resiliency as measured by a lower level of reported mental health complaints (Thomassen et al., 2015). In addition, one study found that cadets low in hardiness at time-point 1 improved their hardiness at time-point 2 while cadets high in hardiness at time-point 1 suffered decrease at time-point 2 (Hystad et al.,2017). These led the authors to conclude that hardiness can be trained, but it can also be fragile and susceptible to deterioration.

Connor-Davidson Resilience Scale (CD-RISC). Four versions of this scale were used in seven studies; the original 25-item version, 10-item version, 2-item version, and a version that was translated into Chinese using the original version. The CD-RISC 25 developed by Connor and Davidson (2003) contains 25 items measuring resilience characteristics or protective factors across 17 domains of functioning (e.g., commitment, recognition of limits of control, viewing stress/change as a challenge/opportunity and tolerance of negative affect). Items are scored on a 5-point Likert scale ranging from 0 = not true at all to 4 = true nearly all the time. The highest possible score is 100. The 10-item one-dimensional version was developed by Campbell-Sills and Stein (2007) and the authors highlighted it as a more efficient measurement of resilience. The 2-item version was developed by Vaishnavi and the original authors (Vaishnavi et al., 2008) to measure adaptation to change and bouncing back after exposure to adversity. The Chinese version was developed by translators employed by Connor and Davidson.

For the 25-item version of the CD-RISC, the studies in this systematic review reported internal consistency ranging from .93 to .96. One study reported the internal consistency of the 10-item version to be .93. For the one study that used the 2-item version, it did not report the internal consistency. The Chinese version has an internal consistency of .94. Only one study reported a test-retest reliability of $r = .66$.

Five studies reported that: (1) greater resilience predicted better post-deployment adjustment (Cunningham et al., 2014); (2) greater resilience was linked to reduced odds of physical aggression (Elbogen et al., 2012); (3) lower level resilience was related to alcohol misuse (Green et al., 2014); (4) resilience had a strong association with positive affect (Maguen et al., 2008); and (5) resilience was associated with unit cohesion. Of the

two studies that examined the factor structure of the CD-RISC, one reported a two-factor model comprising of adaptability and self-efficacy (Green et al., 2014), while the other study found a three-factor solution composed of competency, toughness and adaptability (Xie et al., 2016).

Military Training Mental Toughness Inventory (MTMTI). Two studies used the MTMTI. It was developed by Arthur et al., (2015) to assess the recruits' ability to maintain optimal performance under pressure from a range of different stressors experienced during infantry basic training in the UK. It consists of six items measuring how well recruits can maintain their level of performance when faced with different stressful situations during training. It is scored on a 7-point Likert scale from 1 = never to 7 = always. Unlike the previous two measures, all six items are scored by the recruits' instructor.

One of the included studies in this review was the study that developed this measure and the authors reported internal consistency of between .87 and .91. The test-retest reliability was established at $r = .72$ (Arthur et al., 2015). The internal consistency reported by the other included study was .93. The study that developed the MTMTI reported that the measure predicted the recruits' individual performance in two different training contexts involving two separate samples; infantry and parachute regiment recruits. The other study was a quasi-experimental trial with treatment and control conditions examining the impact of a psychological skills intervention on the scores of the MTMTI. The authors found that there were significant differences in the treatment group between pre- and post-intervention (Fitzwater et al., 2018).

Acceptance and Action Questionnaire-I (AAQ-I). The authors of one included study posited that psychological flexibility is a dimension of resilience that served to protect against the negative effects of exposure to adversity (Bryan et al., 2015). They used the Acceptance and Action Questionnaire-I (AAQ-I) developed by Bond et al., (2011). It consists of seven items and is answered on a 7-point Likert scale ranging from 1 = never true to 7 = always true. Higher scores on the questionnaire indicate greater flexibility and acceptance. The internal consistency for the scale was reported to be .87 in this study (Bryan et al., 2015). Test-retest reliability of the questionnaire was not reported.

The study found that servicemen with higher level of psychological flexibility reported less severe depression than those with less psychological flexibility (Bryan et al., 2015). There was also an association between psychological flexibility with suicide risk and this significantly moderated the effects of depression on suicidal ideation. The authors concluded that psychological flexibility can help protect against emotional distress among servicemen and buffer the effects of depression on suicide risk.

Army Global Assessment Tool. The Army Global Assessment Tool (GAT) was developed for the Comprehensive Soldier Fitness programme established by the US Army with the Positive Psychology Centre of the University of Pennsylvania. It consists of various abridged versions of validated scales and new items:

(1)   Brief COPE scale comprising five items assessing active or problem-focused coping skills and three items assessing emotion-focused coping strategies that involve venting or displacement and disengagement (Carver, 1997; Carver, Scheier, & Weintraub, 1989);

(2)   three items developed to assess adaptability, ability to alter one's course, and perceived cognitive flexibility (Martin & Rubin, 1995);

(3)   10 items adapted from the Positive and Negative Affect Schedule Expanded Form assessing general positive affect and 11 items assessing general negative affect (Watson & Clark, 1994);

(4)   seven items from the Attributional Style Questionnaire (Peterson et al., 1982) assessing the stable, global, and internal attributions individuals make in response to negative events;

(5)   four items from the revised Life Orientation Test (Scheier & Carver,1985; Scheier, Carver, & Bridges, 1994) assessing dispositional optimism;

(6)   eight items adapted from the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001) assessing depressive symptoms;

(7)   three items from the UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1978) assessing subjective feelings of loneliness;

(8)   four items assessing feeling one's work is fulfilling and socially useful (Wrzesniewski, McCauley, Rozin, and Schwartz, 1997);

(9)   five items adapted from Mayer, Davis, and Schoorman (1995) and Sweeney, Thompson and Blanton (2009) assessing the three dimensions of organizational trust including ability, benevolence and integrity;

(10)   five items from the Purpose in Life Scale assessing meaning (Crumbaugh, 1968); and

(11)   abbreviated Character Strengths Test (Peterson & Seligman, 2004) measuring six character virtues of wisdom and knowledge, courage, humanity, justice, temperance and transcendence.

The GAT is scored on a 5-point Likert scale.

The study initially reported a 11-factor model comprising self-management, positive affect, meaning, work engagement, organizational trust, loneliness, negative cognitions, hostility, negative emotions, depressive symptoms and emotion-focused coping (Vie et al., 2016). The authors reported internal consistency of .69 to .95 for the 11 factors separately. They subsequently found a 2-factor solution that also fitted the data well; positive and negative psychosocial competencies. Test-retest reliability of the scale was not reported.

Grit Scale. One study used the Grit Scale developed by Duckworth et al. (2007). The scale consists of 12 items measuring two factors; consistency of interests and perseverance of effort. It is scored on a 5-point Likert scale ranging from 1 = not like me at all to 5 = very much like me. Respondents have to indicate how much the 12 statements are like him or her. The internal consistency reported for the Grit Scale was .85. Test-retest reliability of the scale was not reported. The authors found that the interest dimension of grit could predict attrition from Cadet Basic Training while the effort dimension predicted persistence across a 4-year period. Grit interest was also associated with academic performance.

Resilience Scale for Adults (RSA). The original version of RSA was developed by Friborg et al. (2003) and the version used in the included study consists of 33 items (Jowkar, Friborg, & Hjemdal, 2010). It uses a 7-point semantic differential scale in which

each item has a positive and a negative attribute at each end of the scale continuum. Higher scores indicate higher levels of protective resilience factors. The RSA has six factors:

(1)   perception of self that measures confidence in one's abilities and judgements, self-efficacy and realistic expectations;

(2)   planned future that measures the ability to plan ahead, have a positive outlook, and be goal oriented;

(3)   social competence that measures levels of social warmth and flexibility, ability to establish friendships and the positive use of humour;

(4)   structured style that measures the preference of having and following routines, being organised, and the preference of clear goals and plans before undertaking activities;

(5)   family cohesion that measures whether values are shared or discordant in the family and whether family members enjoy spending time with each other, have an optimistic view of the future, have loyalty toward each other, and have the feeling of mutual appreciation and support; and

(6)   social resources that measure availability of social support, whether one has a confidante outside the family, and whether one may turn to someone outside the family for help if needed.

The included study in this review found a 5-factor solution instead; personal strength, social competence, structured style, family cohesion and social resources (Friborg et al., 2005). The internal consistency of the five factors were between .76 to .87. The authors found that all resilience factors were positively correlated with the well-adjusted personality profile. Furthermore, RSA-personal strength was most associated with 5PFs-emotional stability, RSA-social competence with 5PFs-extroversion and 5PFs-agreeableness, RSA-structured style with 5PFs-conscientiousness. The authors also found that measures of RSA-family cohesion and RSA-social resources were related to personality, and the RSA was not related to cognitive abilities.

The Rosenberg Self-Esteem List, Mastery Scale and Life Orientation Test. One of the included studies proposed that resilience, as a latent variable, is made up of personal

resources including self-esteem, optimism and perceived control. The Rosenberg Self-Esteem (RSE) List (Rosenberg, 1965) was used to measure self-esteem in this study. The measure consists of 10 items which measure attitudes towards the self, such as self-acceptance and self-worth. It is answered on a 4-point Likert scale from 1 = strongly agree to 4 = strongly disagree. Higher scores on the RSE indicate higher levels of self-esteem. The internal consistency for the scale was reported to be .83 (Schoka et al., 2010). Test-retest reliability of the scale was not reported.

The Pearlin and Schooler's Mastery Scale (MS) developed by Pearlin and Schooler (1978) assesses global beliefs of perceived control or beliefs regarding one's ability to control events rather than being controlled by fate. It consists of seven items to be answered on a 5-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree. Higher scores on the scale indicate higher levels of perceived control. The internal consistency for the scale was reported to be .81 (Schoka et al., 2010). Test-retest reliability of the scale was not reported.

The Life Orientation Test (LOT) was used to measure dispositional optimism (Scheier & Carver, 1985). The version used in this study consists of eight items. Higher scores indicate higher levels of dispositional optimism. It is answered on a 5-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree. The internal consistency for the scale was reported to be .81 (Schoka et al., 2010). Test-retest reliability of the scale was not reported.

Using structural equation modelling, the authors reported that the latent variable of resilience was made up of the three secondary factors. They also found higher level of resilience predicted more personal growth, less distrust in others and the world, and less intrusions and avoidance after military deployment (Schoka et al., 2010).

Trait Psychological Capital (Trait PsyCap). The final scale was developed by Schaubroeck et al., (2011) for one of the included studies of this systematic review. The authors combined established measures including hope (Snyder, Cheavens, & Sympson, 1997), optimism (Scheier & Carver, 1985) and ego resilience (Block & Kremen, 1996) to measure what they termed as trait psychological capital (Trait PsyCap). The Trait PsyCap consists of 22 items. The authors did not mention whether they have made any change to the response scale. Hence, it was assumed that they have adopted the same

protocol; measuring hope using 8-point Likert scale ranging from 1 = definitely false to 8 = definitely true, measuring optimism using 5-point Likert scale ranging from 0 = strongly disagree to 4 = strongly agree, and measuring ego resilience using 5-point Likert scale ranging from 1 = does not apply at all to 4 = applies very strongly. The internal consistency reported in this study for hope measure was .85, optimism measure was .85 and ego resilience measure was .79 (Schaubroeck et al., 2011). Test-retest reliability of the scale was not reported.

The study found that cognitive appraisal of stress mediated the effects of Trait PsyCap on health symptoms (Schaubroeck et al., 2011). There was also an indirect effect through appraisal, which was moderated by levels of exposure to potentially traumatic stimuli. The authors also found that Trait PsyCap covaried more strongly with cognitive appraisals, and had stronger indirect effects through appraisal on health, among soldiers in units with higher levels of potentially traumatic exposures.

Table 3.5

Scales used, number of items, what dimensions they measured and their reliabilities

Resilience Measure Used	Number of Items	Dimensions Measured	Reliability	Validity
Dispositional Resilience Scale (DRS-15R) (used by 10 studies)	15	(1) Control (2) Commitment (3) Challenge	α = .62 to .83 Intraclass correlation coefficient: r = .62 Split-half reliability: r = .75 (only one study reported split-half reliability)	Hardiness was positively related to dedication and vigour, and negatively related to cynicism and emotional exhaustion (Bue et al., 2017). A subscale of the personality hardiness measure (challenge) was negatively associated with peritraumatic dissociation in response to both the mild stress situation and the more stressful POW exercise (Eid & Morgen, 2006). Hardy commitment facet predicted peer ratings of all leadership styles both before and after and intensive military exercise. The challenge facet was a positive predictor of transformational and transactional leadership and was negatively related to passive-avoidant leadership (Johnsen et al., 2009). Low hardiness and high avoidance coping were significant predictors of alcohol abuse. The challenge facet of hardiness predicted risk of alcohol abuse among respondents with recent deployment experience, and this effect was greater for those with harsh deployment experiences (Bartone et al., 2012). Successful completion of ski march was predicted by hardiness score. Commitment facet of hardiness was the most significant predictor of ski march success (Johnsen et al., 2013). Hardiness contributed to increased stress resiliency. Individuals who scored low on hardiness reported lower levels of mental health (Thomassen et al., 2015). Cadets low in hardiness at baseline significantly increased their hardiness scores. Hardiness can be trained (Hystad et al., 2017).

				Hardiness predicted several indicators of better mental health and lower levels of alcohol use 6 to 12 months later (Eisen et al., 2014). Hardiness commitment predicted attrition from CBT. Hardiness control predicted academic performance (Kelly et al., 2014).
				Hardiness was a significant (negative) predictor of increased alcohol use and this relation is mediated by avoidance coping (Bartone et al., 2017).
Connor-Davidson Resilience Scale (CD-RISC 25) (used by seven studies)	25	(1) Personal competence, high standards, and tenacity (2) Trust in one's instincts, tolerance of negative affect, and strengthening effects of stress (3) Positive acceptance of change, and secure relationships (4) Control (5) Spiritual influence	α = .93 to .96 Test-test reliability: r = .67 (only reported by one study)	Positive affect was associated with resilience factors. Pre-deployment negative affect was associated with resilience factors (Maguen et al., 2008). High score on resilience was linked to reduced odds of physical aggression (Elbogen et al., 2012). High score on resilience predicted better post-deployment adjustment (Cunningham et al., 2014). Results supported a two-factor model of resilience, comprised of adaptability (8-item) and self-efficacy (6-item) themed items (Green et al., 2014). A three-factor model was found; competency, toughness, and adaptability (Xie et al., 2016).
Military Training Mental Toughness Inventory (MTMTI) (used by two studies)	6	Mental toughness	α = .87 to .93 Test-test reliability: r = .72 (only reported by one study)	The MTMTI predicted performance in two different training contexts with two separate samples (infantry and Para recruits; Arthur et al., 2015). There are significant differences in the treatment group between pre- and post-intervention in the use of psychological skills and observer-rated mental toughness (Fitzwater et al., 2018).

Connor-Davidson Resilience Scale (CD-RISC 10) (used by one study)	10	Measure psychological resilience as a one-dimensional construct	$\alpha = .93$ Test-test reliability not reported	Lower baseline resilience was related to alcohol misuse (Green et al., 2014).
Connor-Davidson Resilience Scale (CD-RISC 2) (used by one study)	2	Measure adaptation to change and bounce back following exposure to adversity as one construct	α not reported Intraclass correlation coefficient: $r = .04$	Increase in unit cohesion was associated with increase in resilience (Brown et al., 2016).
Resilience Scale for Adults (RSA) (used by one study)	33	(1) Personal strength (2) Social competence (3) Structured style (4) Family cohesion (5) Social resources	$\alpha = .76$ to .87 (for five separate sub-scales) Test-test reliability not reported	A 5-factor model was found, and all resilience factors were positively correlated with the well-adjusted personality profile. RSA-personal strength was most associated with 5PFs-emotional stability, RSA-social competence with 5PFs-extroversion and 5PFs-agreeableness, as well as TSIS-social skills, RSA-structured style with 5PFs-conscientiousness. Measures of RSA-family cohesion and RSA-social resources were also related to personality (Friborg et al., 2005).
Grit Scale (used by one study)	12	(1) Consistency of interests (2) Perseverance of effort	$\alpha = .85$ Test-test reliability not reported	Grit interest predicted attrition from CBT, and grit effort predicted persistence. Grit interest predicted academic performance. Grit effort predicted physical performance (Kelly et al., 2014).
Army Global Assessment Tool (GAT) (used by one study)	95	(1) Active or problem-focused coping skills and emotion-focused coping strategies (2) Adaptability, ability to alter one's course, and perceived cognitive flexibility (3) Positive and negative affect (4) Attributional style (5) Dispositional optimism (6) Depressive symptoms (7) Feelings of loneliness	$\alpha = .69$ to .95 (for 12 separate sub-scales) Test-test reliability not reported	An 11-factor solution was found; self-management, positive affect, meaning, work engagement, organisational trust, loneliness, negative cognitions, hostility, negative emotions, depressive symptoms, emotion-focused coping) and character strengths of intellect, warmth, civic strengths, and temperance. A 2-factor model also fitted well with the data; positive and negative psychosocial competencies (Vie et al., 2016).

		(8) Feeling one's work is fulfilling and socially useful (9) Organizational trust (10) Meaning (11) Character strengths of wisdom and knowledge, courage, humanity, justice, temperance and transcendence		
Acceptance and Action Questionnaire-I (AAQ-I) (used by one study)	7	Psychological flexibility	$\alpha = .87$ Test-test reliability not reported	Greater psychological flexibility was also associated with decreased suicide risk (Bryan et al., 2015).
Rosenberg Self-Esteem List and	10	Self-acceptance and self-worth	$\alpha = .83$ Test-test reliability not reported	Resilience is a latent variable that comprises personal resources of self-esteem, optimism and perceived control (Schoka et al., 2010).
Mastery Scale and	7	Perceived control	$\alpha = .81$ Test-test reliability not reported	
Life Orientation Test (used by one study)	8	Dispositional optimism	$\alpha = .81$ Test-test reliability not reported	
Trait Psychological Capital Measure (used by one study)	22	(1) Hope (2) Optimism (3) Ego resilience	$\alpha = .79$ to $.85$ Test-test reliability: $r = .72$	Cognitive appraisal of stress mediated the effects of trait PsyCap on health symptoms. Trait PsyCap covaried more strongly with cognitive appraisals, and had stronger indirect effects through appraisal on health, among soldiers in units with higher levels of potentially traumatic exposures (Schaubroeck et al., 2011).

3.4.3. What tangible military outcomes of interest are related to psychological resilience

As mentioned in Chapter 1, studying psychological resilience on its own without examining its criterion validity adds limited value to the research. It is akin to assessing personality without relating it to behaviours or measuring cognitive ability without using the scores to predict certain task performance. Hence, while the main aim of this systematic review was to explore if a suitable scale was available for the current research to adopt, opportunity was also taken to examine what tangible military outcomes of interest were studied by the military communities around the world. The intent was to gain some insight into what psychological resilience was associated with or could predict in a performance-oriented environment.

This systematic review found a wide range of tangible military outcomes related to psychological resilience. Various studies were able to establish relations between psychological resilience and military personnel's coping behaviours. For example, Cunningham et al. (2014) found that high score on psychological resilience predicted better post-deployment adjustment, Elbogen et al. (2012) reported that high scores on resilience were linked to reduced odds of physical aggression and Green et al. (2014) related lower baseline resilience to alcohol misuse. Psychological resilience was also related to military personnel's well-being including general mental health (Eisen et al., 2014) and depression symptoms (Bryan et al., 2015). Johnsen et al. (2009) found that hardiness or psychological resilience correlated positively with transformational and transactional leadership style while the challenge dimension of the construct correlated negatively with the passive-avoidant leadership style among Navy officer cadets. Military performance could also be predicted by psychological resilience. For example, Johnsen et al. (2013) found that scores on hardiness or psychological resilience could predict specific performance such as successful completion of ski marches and Arthur et al. (2015) predicted the general course performance of recruits at the end of a 26-week Combat Infantryman's Course (CIC). Lastly, increase in scores of psychological resilience was associated with increased level of unit cohesion in the study conducted by Brown et al. (2016).

3.5. Discussion and summary

To achieve the aim of finding a suitable scale to measure psychological resilience in the current research, this systematic review first examined how the construct was conceptualised and operationalised in the military context by various military communities. Next, 13 scales were reviewed in relation to their psychometric properties and what aspects of psychological resilience they measured. Finally, this systematic review sought to identify what tangible outcomes of interest were studied by military communities in relation to psychological resilience.

3.5.1. Different ways in conceptualising and operationalising psychological resilience

This systematic review found that, consistent with research on psychological resilience in general, different military communities conceptualised the construct as either an internal capacity, process or outcome. This review noted that this discrepancy was evident even in the studies conducted in US alone. Proponents who conceptualised psychological resilience as an internal capacity operationalised it either as multi-dimensional (e.g., Elbogen et al., 2012) or one-dimensional (Bryan et al., 2015). The process advocates operationalised it as a dynamic interaction between various factors internal and external to the individuals while the outcome proponents operationalised it as positive adaptation or bouncing back following exposure to adversity. Consequently, different studies used various scales to measure psychological resilience based on how they conceptualised and operationalised the construct. This review also noted that majority of the included studies conceptualised the construct as an internal capacity instead of process or outcome. This was possibly because it was what the researchers could measure and change. Studying psychological resilience as a process might not have much utility as the military communities had no direct influence over external factors such as family cohesion and hence could not intervene. Also, as mentioned in Chapter 2, defining psychological resilience as merely an outcome without considering other aspects of individual differences or the role that the environment plays can run the risk of giving the impression that it is a phenomenon that cannot be changed.

3.5.2. No suitable scale found

This review found that 13 scales were used in the 24 included studies. The most widely used scale was the DRS-15 (10 studies), followed by CD-RISC 25 (five studies) and MTMTI (two studies). The remaining scales were used by just one study each. To

facilitate assessing whether the scales reviewed were suitable to be adopted, exclusion criteria were established with consideration of the aim and context of the current research. In addition, the European Federation of Psychologists' Associations Test Review Model (EFPA, 2013) was used to guide the evaluation of these scales. For example, the model stipulated the need to examine the reliability and criterion validity of psychological scales. In order for a scale to be considered reliable, the size of coefficient should be at least .7 for test-retest reliability while for criterion validity, the relation between the scale and criteria should have a coefficient of at least .35.

Table 3.6

Criteria for exclusion of scale for adoption

Exclusion criteria
• Measure other established construct
• Measure psychological resilience as a trait
• Measure psychological resilience as an outcome
• Poor psychometric properties
• Criterion validity not established

The CD-RISC 10 and CD-RISC 2 were deemed to be unsuitable for the current research as they measure psychological resilience as an outcome. A limitation in adopting the outcome perspective is that the approach does little to explain how various outcomes are derived and what factors are related to psychological resilience. Hence it provides limited insight for the purpose of intervention which was one objective that the current research sought to meet. As the AAQ-2, MTMTI, Rosenberg Self-Esteem List, Mastery Scale and Life Orientation Test were developed specifically to measure five different constructs, the scales on their own do not address all possible dimensions of psychological resilience. Likewise, the Grit Scale is also considered inadequate as it only measures interest and perseverance. While the Trait PsyCap Measure includes ego-resilience, it clearly adopts a trait perspective that psychological resilience as an internal capacity is stable and less susceptible to change. As this research aimed to find a targeted way to improve soldiers' psychological resilience, assuming a trait stance would be contradictory. With 95 items, the GAT is clearly one of the most comprehensive measure found in this systematic review. However, its reliability had not been clearly demonstrated as some of the factors such as emotion-focused coping had low internal

consistency and the test-retest reliability was not reported. Furthermore, there was no evidence to suggest that it could predict or was related to some tangible military outcome. While both DRS-15 and CD-RISC 25 were widely used, they were also thought to be unsuitable. One on hand, the DRS-15 measures hardiness or aspects of psychological resilience as a trait and hence was also not in alignment with the intervention focus of this research. On the other hand, the psychometric properties of the CD-RISC 25 were not consistent. For example, the 5-factor structure was not replicated in many studies (e.g., Campbell-Sills & Stein, 2007; Yu & Zhang, 2007; Green et al, 2014) and the CD-RISC 10 found in this review was developed because of this.

3.5.3. Tangible military outcomes of interest

In examining the tangible outcomes of interest studied in the military context, this systematic review found that psychological resilience was related to or could predict military personnel's coping behaviours in response to adversity (e.g., Green et al., 2014), mental well-being (e.g., Eisen et al., 2014), leadership styles (e.g., Johnsen et al., 2009) and unit level phenomenon such as cohesion (e.g., Brown et al., 2016). The most relevant outcome related to the current research was in the area of performance which could also be influenced by psychological resilience (e.g., Arthur et al., 2015). These showed the interests and relevance of studying the construct in the military context.

3.5.4. Limitations of the systematic review

Three limitations were identified. Firstly, only English language studies were included in the review. This restriction could be a potential source of bias that reduced the generalisability of the findings (Petticrew & Roberts, 2006). In addition, by only including studies published in the English language, this review could potentially limit the actual number of studies being conducted to examine this topic. Secondly, there was no direct contact with authors of the 24 studies. As such, if they did not explicitly highlight the way they conceptualised and operationalised psychological resilience in their studies, they were deduced from the measures used in the studies. Thirdly, this systematic review only searched studies from the following databases: (1) PsycARTICLES; (2) PsychINFO; (3) PsychTESTS; and (4) MEDLINE). There might be more relevant studies featured in other databases.

3.5.5. Implications for future studies

As one of main objectives of the current research was to find a way to measure psychological resilience, it was important to first conceptualise and operationalise the construct in a way that could fit the context of this research (i.e., whether psychological resilience is an internal capacity, process or outcome). Hence, it was recommended that the next study addressed this requirement as a priority. Since this systematic review did not find any suitable measure for the current research to use, the implication was that subsequent studies would have to focus on developing a customised way to measure psychological resilience that specifically addressed the objectives of this research. This systematic review did find that most of these scales measured various internal and external protective factors as lower-order factors of psychological resilience (e.g., psychological flexibility, optimism and commitment). As such, one possible option was to consider measuring the psychological resilience in relation to some of these factors. However, these scales were developed using different samples and under various conditions that were different from that of the current research. Therefore, they might not be as relevant. As psychological resilience is context-dependent, in deciding which aspects of individual differences or factors to measure, future studies would have to first understand the specific context of this research by examining the adversity, risk and protective factors specifically in the BMT environment involving conscripted recruits.

Chapter 4:   Inductive qualitative study to examine psychological resilience specifically in the basic military training environment involving conscripted recruits (Study 2)

The systematic review (Study 1) found that as various military communities around the world conceptualised and operationalised psychological resilience differently, numerous scales were used to measure the construct either as an internal capacity, process or outcome. While as many as 13 scales were reviewed, none was found suitable to be adopted based on the context of the current research (see Chapter 3, sub-section 3.5.2). Hence, it was recommended for follow-on study to develop a customised measure of psychological resilience that specifically addresses the context of the current research.

Chapter 4 begins by highlighting the aims of Study 2 and the associated research questions (section 4.1). Next, it provides the rationale for adopting a qualitative research method for the study, highlights the philosophical stance adopted, and explains how this influenced the design of the study and data collection approach (section 4.2). This is followed by an account of the preparation stage of the study including how one-to-one interview and focus group discussion were designed and pilot tested (section 4.3). The methods section (section 4.4) describes the ethical considerations, participant characteristics, and how data were collected, analysed and synthesised. Next, the key findings of the study are presented in section 4.5. Finally, a discussion of the findings of Study 2 and the implications for the future research are provided (section 4.6).

4.1.   Study aims and research questions

Study 2 aimed to conceptualise and operationalise psychological resilience in a way that could fit the context of the current research (i.e., BMT environment involving conscripted recruits) to inform the research on whether to measure the construct as an internal capacity, process or outcome. As the 13 scales evaluated in the previous study were developed in various settings using samples different from that of the current research, the internal and external protective factors they measured might not be relevant to the current research. Hence Study 2 also aimed to identify the protective factors that were directly related to the context of the current research.

As discussed in Chapter 2, section 2.6 (Points of convergence in resilience research), one of the reasons why psychological resilience is context-dependent is because adversity varies in its nature and intensity based on how individuals appraise it.

Hence, it was important to first identify what adversities were present in the BMT environment. The first research question was:

(1)   What do recruits consider as adversities in the BMT environment?

Another reason why psychological resilience is context-dependent is that risk factor and protective factor are related to individual characteristics and what is available in the environment. As one of the objectives of the current research was to examine if psychological resilience could be enhanced through targeted intervention, Study 2 focused on identifying the protective factors instead of risk factors. This is also in alignment with Garmezy's proposal to move pass the fixation on uncovering risk factors to instead understand what helps individuals to cope and adapt (Garmezy, 1971). Hence, the second research question was:

(2)   What protective factors, both internal and external, helped the recruits to adapt positively to the adversities during BMT?

The third reason why psychological resilience is context-dependent is that positive adaptation is manifested differently under various conditions. Unfortunately, as Rosenberg and Yi-Frazier (2016) observed, the range of positive adaptation can be extremely heterogeneous (e.g., absence of psychopathology, good physical functioning, good quality of life and positive psychological growth). As discussed in Chapter 2, sub-section 2.6.3 (Positive adaptation), Luthar and Brown (2007) proposed that the assessment of whether positive adaptation is manifested should be tied to the indicators that are specific and appropriate to the adversity and context in question. For the current BMT context where the focus is on learning and qualification to be full-fledged soldiers as outlined in Chapter 1, section 1.3 (Context – the SAF, NS and BMT), the relevant indicator of positive adaptation would be predicated on the recruits not dropping out of training and successful completion of BMT. Hence, positive adaptation was specifically outlined for this study so that the recruits could response in a more targeted fashion.

Before developing a new way to measure psychological resilience, it was important to conceptualise and operationalise the construct for the current research. Hence, the final research question was:

(3)   How can psychological resilience be conceptualised and operationalised in the BMT context involving conscripted recruits?

4.2.   Rationale for employing qualitative research method and the philosophical stance adopted for the collection of data in Study 2

Researchers have argued that adversity should be defined by the person experiencing the event, such that the event is only considered an adversity if the individual deems it sufficiently stressful (e.g., Jackson et al., 2007). For example, a physically less fit recruit of short stature might find scaling a wall in an obstacle course challenging and hence mentally stressful, but his fitter and taller peer might find the task easier to accomplish and therefore had little worry. Likewise, as Rutter (2013) has suggested, whether a protective factor is present and its influence on individuals varies depending on the individuals' needs in relation to specific situation or adversity. For example, a highly sociable Recruit A might have a protective factor in the form of encouragement from helpful peers because he could easily make friends with strangers during BMT, but this protective factor might not be available to Recruit B who was highly introverted and found communicating with fellow recruits difficult. Furthermore, as this stage of the overall research was exploratory in nature and the intent was to directly draw out the recruits' own accounts of their BMT experience, it was more appropriate to collect data using an inductive qualitative approach.

In qualitative research, there is a wide range of methodology and methods available to the researchers. These methodology and methods differ primarily due to the particular philosophical stance that they are attached to, that also have implication on the research design (Duberley, Johnson & Cassell, 2012). Cunliffe (2010) emphasised that *"Our metatheoretical assumptions have very practical consequences for the way we do research in terms of our topic, focus of study, what we see as "data", how we collect and analyse the data, how we theorise, and how we write up our research accounts."* (p. 3). Hence, it is important to have clarity over various issues and decision factors concerning the adoption of a philosophical stance.

Unfortunately, an issue that one will often encounter with social sciences philosophy is the problem of a lack of consensus on the precise labels or terminology used in discussing epistemology, ontology or theoretical perspectives. Crotty (1998) claimed that the terminology used in research literature is often confusing with terms like epistemologies, theoretical perspectives, methodologies and methods being used interchangeably. On one hand, Crotty stated that epistemology is concerned with the

theory of knowledge, or how we know what we know, but on the other hand, Guba and Lincoln (2005) called it paradigm. What Bryman (2008) called epistemology is referred to as positivist ontology by Buachanan and Bryman (2009). While it is useful for researchers to have an understanding of different epistemologies, ontologies or theoretical perspectives for the purpose of exploring the range of research methodology and methods, many authors advise against being too deterministic. For example, Hammersley (2004) suggested that that young researchers should be encouraged to become '*neither ostriches nor fighting cocks*' (p. 557).

Robson (2011) advised adopting a pragmatic approach to qualitative research, so that the focus is on getting on with the research rather than philosophizing. Similarly, Seale, Gobo, Gubrium and Silverman (2004) advocated a flexible approach to research design that takes account the aims and context of a study and choosing the approach that best fits the specific research question. While this study adopted a social constructionist philosophical stance specifically during data collection, it was also pragmatic when necessary.

4.2.1. Social constructionism

Gubrium and Holstein (2008) posited that the way we view the world, our lives and our place in it are not simply there but are constructed daily with the people and environment we interact with. Similarly, Burr (2003) submitted that many things we take for granted as given or fixed in our lives and the events we experience are socially constructed and socially maintained. They are constructed and perpetuated by us who share meanings by being members of a particular society or culture. Hence, according to social constructionism, there is no given or natural understanding of things. Instead, this understanding of reality as we see it and experience it is based on all the relevant symbolic interactions that are happening in the said society or culture. This is particularly relevant to the current research. For example, the term 'knock it down' might mean different things to the recruits before enlistment but after a couple of days in BMT, they would realise its special meaning in the SAF; punishment in the form of push-ups as in 'knock it down and give me 20'. Hence, the term was socially constructed within the SAF and the recruits learnt and shared its meaning through interaction with their trainers.

This study took on a social constructionist stance specifically during the data collection process because this standpoint takes a critical view toward taken-for-granted

knowledge and understanding. It views what and how we understand the world and things around us as historically and culturally specific. Hence, social constructionism is about understanding the world as the result of a social process of symbolic interactions. This was important for the current study because it aimed to be exploratory in examining the recruits experience directly from their accounts of BMT. Adopting this philosophical stance would reduce the likelihood of bias on the part of the researcher as he has had more than 20 years of service with the SAF. Another consideration was related to the recruits' transition from being civilians to solders. They would experience a huge culture change which would influence the way they made sense of the new environment and constructed meanings around the events and phenomenon they encountered. All these were done as the recruits related and interacted with their peers, trainers and the new setting.

4.3. Preparation for Study 2

Study 2 collected two separate but related sets of data. The first set of data was collected from the recruits to examine the BMT environment and experience directly from their own accounts. The second set of data was collected from the recruits' trainers. As the researcher has worked in the SAF for almost 25 years, he is familiar with BMT and the associated environment. Furthermore, he is also familiar with the construct of psychological resilience. These might cause him to be bias and influenced the way he interpreted the recruits' accounts and shaped his conclusions (Kacen & Chaitin, 2006). Having exercised reflexivity, the researcher recognised that given his relative seniority and experience compared to the recruits and familiarity with the topic of psychological resilience, it was possible that he might consider the recruits' perspectives as less valid compared to his. Hence, while the primary research participants were the recruits, the second set of data collected from the recruits' trainers, some as senior as the researcher, were used for the purpose of data triangulation. Furthermore, as the trainers communicated, observed and assessed the recruits on daily basis, they represent a rich source of information. It was envisaged that this data triangulation method would help the researcher to develop a more comprehensive understanding of the BMT environment and recruits' experience, and improve the validity of the data (Patton, 1999). This section descripts the preparation stage of Study 2 which involved the design of one-to-one semi-structured interview, focus group discussion questions and procedure, pilot study, and research participant recruitment plan.

4.3.1. Designing the one-to-one semi-structured interview questions and procedure – for collecting data from the recruits

As this study adopted a social constructionist philosophical stance, the semi-structured interviewing technique was chosen. Structured interview technique was deemed to contradict the social constructionist stance as questions are pre-determined and the researcher are expected to rigidly ask them in a pre-defined order. Hence, the data elicited from the participants are controlled tightly and the response categories are usually limited (Denzin & Lincoln, 2018). As this Study 2 was exploratory and inductive in nature, the structured interview technique was restrictive. Unstructured interview was also considered unsuitable as the researcher typical comes to the interview with no pre-defined framework or question, and instead, has a conversation with the participant. Consequently, different unstructured interviews might produce data with different structures and patterns (Zhang & Wildemuth, 2016). Hence, there is a possibility that this technique will run the risk of not answering the research questions.

While the semi-structured interviewing technique has some pre-defined questions, the sequence can be adjusted based on the participant's response (Robson, 2002). Hence, the semi-structured interview technique can strike a balance in that on one hand, the key research questions that needed to be answered can be inserted into the interview template and on the other hand, the exact flow of the session is guided by the participant's response. Furthermore, additional questions can be generated during the session based on each participant's response to allow the researcher to elicit more information when necessary. This way, the researcher is drawing out the participant's perspectives instead of directing them towards pre-defined answers. As the participant's interpretation of their experience is vital in an exploratory study, the semi-structured interview would allow the researcher to examine and understand the meaning of the participant's own experience within their specific context (Robson, 2002).

Data collection through one-to-one interview has many advantages such as offering researchers the opportunity to uncover information that is not accessible using other techniques such as questionnaires or observations. In addition, mutual understanding can be established between the interviewer and interviewee as questions can be rephrased or clarified during the process (Blaxter et al, 2006). However, the technique has some drawback. For example, one-to-one interview is both resource

intensive and time consuming (Kelley, Clark, Brown & Sitzia, 2003). In addition, the interviewee may only give information that they are prepared to reveal (Hammersley & Gomm, 2008), the information provided may be subjective and can change over time (Hammersley & Gomm, 2008), and the interviewee may have incomplete knowledge or memory (Walford, 2007).

The semi-structured interview used in this study also incorporated the critical incident technique. According to Chell (2004), the critical incident technique is a qualitative interview method which allows the researcher to examine significant events or incidents identified by the participant. This was thought to be particularly relevant to this study as adversity is considered significant and the method can draw out information about how the recruits cope with the adversity, what are the outcomes and how these come about. Furthermore, this method is particularly useful if the researcher wishes to better understand the interviewee's account from the cognitive, affective and behavioural perspectives (Chell, 2004).

The development of the initial semi-structured interview framework was mainly guided by the first and second research questions. Using the two research questions as the base, several secondary questions, thought to be able to elicit more information, were added. Other peripheral considerations were also taken into account in developing the full interview schedule (see Appendix A for the initial version of the interview schedule designed for the pilot study). These considerations included:

(1)   self-introduction and getting acquainted with the recruits;

(2)   introduce the topic, explain the aim of the overall research, and provide details about the current study;

(3)   ethical considerations (e.g., gain the recruits' consent and tell the recruits they can stop the interview anytime if they feel uncomfortable); and

(4)   create a positive experience for the research participant (e.g., include questions that can elicit positive response and evoke positive sentiment).

4.3.2.   Pilot study of the one-to-one interview

A pilot study is a smaller scale trial of the methods and procedures to be employed on the actual larger scale study (Leon, Davis & Kraemer, 2010). The purpose of

conducting a pilot study is to examine if an approach that is planned to be used in the actual larger scale study is feasibility. More importantly, a pilot study can provide warning about where the actual study may fail, where research protocols may be violated, whether proposed method is inappropriate, and whether question is too difficult to understand (Teijlingen & Hundley, 2001). Hence, a pilot study was conducted for Study 2 to:

(1)   examine the general conduct of the interview such as the flow of the interview process, sequencing of the questions, time taken to complete the interview and any problem encountered during the process;

(2)   check if the research participant understood the purpose of the study and the questions being asked;

(3)   verify whether the phasing of the questions and the way they were asked could elicit the appropriate responses from the participant;

(4)   consider ethical issues such as whether the research participant felt physically or psychological uncomfortable during the interview;

(5)   test the general efficacy of the recording methods, full video and plain voice recording, including whether they could effectively record the details of the interview and their effects on both the researcher and participant;

(6)   solicit direct feedback from the participant on all aspects of the interview; and

(7)   provide rehearsal before the main study.

A convenient sample of two participants were identified to take part in the pilot study. Both of them were male Chinese Singaporeans who had completed their NS and BMT. They were studying in the UK at the time. One of them was in his early twenties studying at the undergraduate level while the other one was in his early thirties studying at the postgraduate level. As both the participants went through BMT more than three years ago, additional step was taken to prime them to recollect as much memories as they could from their BMT experience.

The interviews were conducted at the researcher's residence. The procedure (see sub-section 4.4.3) for both interviews were exactly the same with the only differences being the recording method (i.e., video-recorded and voice-recorded) and for the second interview, the physical definition of resilience was provided as the first participant provided feedback that he was not sure whether his definition of the construct was correct. The video-recorded interview took approximately 60 minutes while the voice-recorded one lasted approximately 45 minutes. At the end of the interviews, the participants were invited to provide feedback about all aspects of the interview.

Overall, the pilot study was extremely useful in providing a good feel of the proceeding of the interview (i.e., how long the interview took, was the process smooth, and which questions were harder for the participants to answer). Furthermore, the pilot study allowed the opportunity for rehearsal before the main study. Most importantly, the practice opportunity and feedback received from the two participants had provided valuable insights on how the interview could be improved and which questions to revise. The following feedback was provided and taken into consideration for improving all aspects of the interview:

Duration of interview. The research participants felt that the 60-minute and 45minute interview durations were too long, and the process was exhausting towards the end. They commented that they were too drained mentally to recount their experience to answer the last few questions. It was also observed that the research participants both yawned several times towards the end of the interviews and were showing signs of disinterest and impatience (e.g., fidgeting and making less eye contact). Both participants also suggested that the interview duration should be reduced as the recruits, the actual participants of the study, who are used to the fast-paced BMT training environment, may not have the attention span at the point of the interview as they would be in the midst of their training routine. Furthermore, their trainers may be less supportive of the study as time spent at the interview is time spent away from training.

Method of recording. The research participant of the video-recorded interview commented that the process was somewhat intrusive and made him felt uncomfortable. While his consent was sought for the interview to be video recorded, he felt that he was being observed by many pairs of eyes. This distracted as he was always mindful of his physically appearance and behaviour and had to constantly adjust his posture or control

his movement. He also reminded the researcher that since the interviews would be conducted in military installation, the SAF would not grant permission to record video. The research participant of the voice-recorded interview did not report any discomfort during the course of the interview.

Flow of the interview. Both research participants commented that the flow of the interviews was smooth. Furthermore, they felt that the sequencing of the questions was in order and this made it easy for them to follow the entire interview process. They did suggest that each question should follow with a longer pause to allow the recruits time to recollect their memories and organise their thoughts. Both participants also felt that some prompt would be useful (e.g., "What exactly happened?", "Can you describe the environment?", "Was there anybody else involved?", "What was going through your mind?" and "How did you feel at that point?").

Understanding of the questions. Both participants felt that the questions were generally straightforward and easy to understand. However, the first participant highlighted that he suspected that not all recruits will have the same understanding of the definition of psychological resilience. He added that he had to constantly remind himself to be consistent in defining the construct for himself throughout the interview (e.g., whether it was about behaviour, personal attribute, or a state of mind). Following this feedback, the physical definition of resilience was provided to the second participant. The clarification and consistency would ensure that every interview in the main study examined the same phenomenon.

4.3.3. Designing the focus group discussion questions and procedure – for collecting data from the trainers

As mentioned earlier (section 4.3), upon exercising reflexivity, the researcher acknowledged that given his senior position in the organisation, he might be susceptible to bias about the perspectives of the recruits. Hence, it would be useful to collect data from another source (i.e., from the recruits' trainers) for the purpose of triangulation. To further mitigate the possible negative effects of the researcher's position, data could be collected via another method that was different from that used with the recruits. Hence, it was decided that data from the trainers could be collected via focus group discussion.

Morgan (1996) defines focus group discussion as a research method that collects data on a topic pre-defined by the researcher through group interaction. This definition highlights three critical features: (1) focus group discussion is a research and data collection method; (2) focus group discussion rely on group interaction to generate data; and (3) the researcher is an active part of this group interaction and discussion. Focus group discussion requires a facilitator to ask the participants a series of question, to provide guidance, and to moderate the conversation (Berg, 1998). The facilitator's contribution is of critical importance to the group process, and the fundamental role is to guide the group's discussion but not participate in it (Krueger, 1998). The facilitator is not supposed to share his or her view about the topic but instead facilitate the discussion such that the questions are addressed by the group (Krueger, 1998).

Focus group discussion can be used either independently or in combination with other methods to ensure that the overall data collection effort is more robust. Morgan (1996) noted that a content analysis of published research in Sociological Abstracts showed that in 60% of the cases where focus groups were used, they were conducted in combination with other research methods. Furthermore, as mentioned by Robinson (1999), focus group discussion has the following key advantages:

(1)   the method is efficient as the amount and range of data collected is increased since it involves several people at the same time;

(2)   it provides quality control on the data being collected as participants tend to provide checks and balances on each other and extreme views are minimised;

(3)   it provides focus on the important aspects of a particular topic and it is easy to assess level of agreement on specific issues; and

(4)   participants are mutually stimulated by the thoughts and comments from one another.

While focus group discussion has many advantages such as being more efficient, similar to one-to-one interview, it has its own limitations. For example, the discussion may not truly represent the collective views of the group if one or more members either talk too little (i.e., hesitant to speak up for various reasons) or talk too much (i.e., dominating the discussion) (Roller & Lavrakas, 2015). In addition, the success of a focus group discussion relies heavily on facilitated discussion by a skilled and well-trained

moderator (i.e., the quality of the discussion depends on the efficacy of the moderator) (Krueger & Casey, 2000). The moderator needs to be mindful of his own bias and the effects of his presence on the participants, continuously assess the quality of interactions between various participants, effectively manages the group dynamics, while maintaining the status of moderator and suppressing the urge to contribute idea which may influence the conversation.

As with the semi-structured interview, the focus group discussion framework was guided by the research questions. Using the two research questions as the base, several secondary questions, thought to be able to elicit more information, were added. Other peripheral considerations were also taken into account in developing the full discussion schedule (see Appendix B for the discussion schedule). These included:

(1)   self-introduction and get acquainting with the trainers;

(2)   introduce the topic, explain the aim of the overall research, and provide details about the current study; and

(3)   ethical considerations (e.g., gain the trainers' consent, tell them that they leave discussion anytime if they feel uncomfortable etc).

4.3.4. Participant recruitment considerations and administrative arrangements

Sandelowski (1995) stated that in qualitative research, determining sample size is ultimately a matter of judgement and decision is based on the evaluation of the quality of information collected. In addition, the depth of the data collected is often more important than the number of research participants recruited (Burmeister & Aitken, 2012) Mason (2010) also mentioned that the research samples should be large enough to ensure that most if not all of the potentially important information are uncovered, but not too large to the point that the data become too repetitive. In deciding how many research participants to eventually involved, Study 2 adhered to the notion of reaching saturation point where additional interview does not uncover any more insight on the various issues being investigated (Guest, Bunce & Johnson, 2006; Mason, 2010). While there is no established consensus on the exact number of research participants needed for different types of qualitative research, Mason (2010) found that an average sample of 30 was used in PhD theses using qualitative methods. Hence, it was initially decided that Study 2 should

recruit at least 30 research participants. The contingency plan was to recruit more participants subsequently if needed. The planned and eventual sample sizes are included in the method section (sub-section 4.4.2).

As the researcher was at that time based in the UK at the design and preparation stage of the study, all coordination and administrative arrangements were organised through the department that the researcher used to work in; Defence Psychology Department (DPD). One of the researcher's colleagues from DPD was assigned to support the study. The details of the study and sample size requirement were provided one month prior to the start of the study. As BMTC had just concluded training a batch of recruits and were waiting for the next batch to be enlisted, the researcher's colleague had to source for available units where the recruits were posted to shortly after BMT for the one-to-one interviews. One unit was subsequently identified, and contact was made with the unit commander to seek access to his soldiers[6] for the study. For the focus group discussions, BMTC provided the trainers. Meetings were set up with the respective commanders prior to the commencement of the study to allow the researcher to brief them on the overall research plan, the rationale and objectives of the current study. The commanders then assigned administrative officers to help with identifying participants for the one-to-one interviews and focus group discussions. All other administrative and logistics requirements were also coordinated by the same contact.

4.4. Methods

4.4.1. Ethical considerations

Ethical considerations were carefully thought through during the design stage of Study 2 and the study adhered to the British Psychological Society Code of Human Research Ethics. Approval was also granted from the research ethics officer of the Department of Organizational Psychology at Birkbeck, University of London and the department head of the DPD.

Research participants' informed consent and right to withdraw from study. Informed consent essentially involved the full knowledge and consent of the recruits. Three to five days before the interview, the recruits were provided with information sheet

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[6] As these soldiers have completed BMT, they were promoted to the rank of Private. However, to avoid confusing the reader, these soldiers were addressed as recruits throughout Study 1.

(see Appendix C) containing the details of the study. As there was no direct access to the recruits, this information sheet was disseminated through the recruits' trainers.

Prior to the start of each interviews, the same information contained in the information sheet was provided to the recruits and they were asked if they had any issue with taking part in the study, and whether they had any question. The recruits were then told that the interviews would be voice-recorded, and they were asked if they had any concern. The recruits were given the option to withdraw from the interview and go back to their training if they wished. The recruits could also cease the interview any time if they felt the need to. The consent forms were then handed out (see Appendix D) for the recruits to signed. Thereafter they were verbally asked for their consent to commence the interviews.

After the interviews were transcribed, the recruits had the opportunity to read them via email during the weekends when they were back at home and retracted any information if they wished. For the focus group discussions, the same information sheet was provided to the trainers. In addition, it was highlighted that while this group of participants represented an additional source of information, they had the same consenting and withdrawal rights as the recruits.

Confidentiality and data storage. All participants for both the semi-structured interviews and focus group discussions were assigned a unique identification number to replace their names or initials. Any information provided by the participants that might potentially compromise their identity were allocated pseudonyms or codes (e.g., the mentioning of another person and a particular place or activity). The recorded conversations were transcribed by the researcher. Only the researcher and his supervisor had access to the audio recordings. Once the transcripts had been completed and checked, the audio recordings were erased. All recording media and hardcopy papers containing interviews details were personally hand-carried by the researcher as they transited from Singapore to the UK. The data collected were used only for the purpose of this particular study. If data were to be used for future studies, further Research Ethics Committee approval would be sought.

Considerations to ensure the recruits and trainers were physically comfortable and psychologically safe. As mentioned in Chapter 1 (Introduction), the researcher held

a senior rank in the SAF (i.e., Lieutenant Colonel). It was envisaged that his position would have an impact on the nature of the researcher–researched relationship given that the primary research participants, being recruits, were the most junior members in the organisation. In the military environment where there is a high-power distance culture, the recruits might feel intimidated or stressed out during the interviews. Having exercised reflexivity, the researcher decided not to disclose his rank and position in the SAF. The recruits were not deceived as the researcher was conducting the interviews purely for the purpose of research and in his capacity as a researcher, and not as an SAF officer to assess the recruits' performance or well-being.

The semi-structured interviews took place in an interview room in the unit. It was generally quiet, conducive and away from disturbance. Hence, the recruits were physically comfortable. The recruits were also encouraged to report if they felt unwell or uncomfortable, and they could withdraw from the interview without having to provide a reason. As the interviews might make the recruits felt psychologically uncomfortable or embarrassed, they were told that they could refuse to answer any questions which they felt uncomfortable with. In the unlikely event that the recruits felt stressed or uncomfortable, they could stop the interview. Also, as part of his employment with the MINDEF, the researcher had been trained to recognise signs and symptoms of stress. If he picked up any of these signs and symptoms, he could stop the interview. If it was necessary, the researcher would have referred the recruits to their unit's para-counsellor or counsellor from the SAF Counselling Centre. After each interview, the recruits were told that if they needed assistance or to talk to someone, they were free to approach their buddy or commander. They could also talk to their unit's para-counsellor. In addition, the researcher also gave the recruits the number to the 24-hour SAF counselling hotline.

The focus group discussions took place in a large recreation room in BMTC. The same level of physical comfort was provided for the trainers. They were also advised to report if they felt unwell or uncomfortable, and they could withdraw from the discussion without having to provide a reason. For the focus group discussion, the trainers were not envisaged to feel any psychological discomfort or embarrassment as they were not expected to share their personal experience of their BMT encounters, but to provide their observations on the recruits they trained. Also, as trainers, this group of participants were

fully aware of the range of psychological and emotional support that could be provided by various agencies in the SAF.

Debriefing and feedback. At the end of the interviews, the participants for both the semi-structured interviews and focus group discussions were given the opportunity to ask question and seek clarification on any issue. They were also asked to provide feedback about the sessions if they had any. The debriefing sheet (see Appendix E) was then gave out and it contained thank-you notes and information that reiterated the rationale of the study, and how the findings would help in advancing the understanding of psychological resilience. The researcher and his supervisor's email addresses were also included.

4.4.2. Participants

For the one-to-one interviews, one of the SAF units that had recently received recruits after their BMT was identified to provide the participants. This unit consisted of 4 sub-units, and each sub-unit were asked to identity their top four and bottom four performers based on their BMT results. The rationale in differentiating the recruits was based on the assumption that resilience capacity or outcome present in the top performers could be absent in the bottom performers. This was envisaged to expand the range of responses from the recruits that can potentially help in data triangulation. This yielded an initial total of 32 potential participants; more than the number initially decided based on the what Mason (2010) found (see sub-section 4.3.4. for considerations for recruiting research participant). As the interview sessions progressed, it was felt that the data collected had reached a point of saturation (e.g., no new adversity or protective factor was mentioned) after 20 interviews. However, to err on the safe side, an additional two interviews were conducted. This brought the actual number of recruits involved in the study to 22 when it was assessed that additional interview did not yield new information. The 22 recruits were all conscripts, of Asian origin and were either Singaporean or permanent resident. They were all male with an age range from 18 to 23 years and the mean age was 18.95 years ($SD = 1.36$).

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┌─────────────────┐
│ Initial planned │
│  sample size    │        ┌──────────────────┐
│   n = >30       │◄───────│ Contact made with│
└─────────────────┘        │  unit commander  │
        │                  └──────────────────┘
        ▼
┌─────────────────┐
│Participants     │        ┌──────────────────┐
│initially        │◄───────│ First round of   │
│recruited        │        │  interviews      │
│   n = 32        │        └──────────────────┘
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│Participants     │
│involved in the  │        ┌──────────────────┐
│first round of   │◄───────│ Second round of  │
│interviews       │        │  interviews      │
│   n = 20        │        └──────────────────┘
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        │
        ▼
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│Total number of  │
│participants     │
│involved in Study 2│
│   n = 22        │
└─────────────────┘
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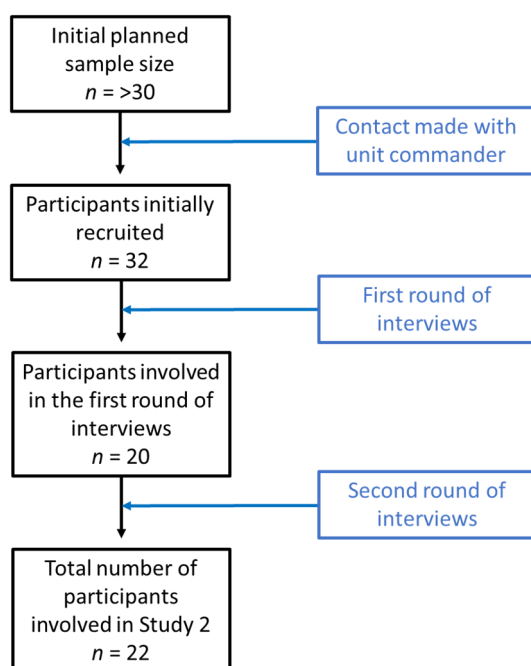
Figure 4.1: Flow chart of participants recruitment for Study 2

For the focus group discussions, the participants were provided by another training institute, BMTC. Specifically, two groups of trainers were identified; section commanders and platoon commanders. The section commander group, eight specialists or non-commissioned officers, was identified as they were the ones who were most intimately involved in training the recruits and had various opportunities to interact and observe the recruits. A separate group of platoon commanders, seven officers and warrant officers, was chosen as they were the ones who conducted the training and formally interviewed the recruits on regular basis. The participants were all male, of Asian origin and had at least conducted one BMT in full. Their age was not provided.

4.4.3. Procedure

One-to-one interview. The procedure of the semi-structured interviews was largely guided by the interview schedule (see Appendix F) that was improved after the pilot study. While the semi-structured interview group was given the information sheet 3 to 5 days before the sessions, the specific questions were not given to them in advance. This was envisaged to keep the interviews more flexible and inductive to encourage free flowing of ideas. Although interview in general is a two-way conversation, the interviews were approached at various points as a one-way communication process for the recruits to freely expressed their perspectives. This allowed the interviews to remain impartial and avoided seeding ideas into the minds of the recruits (Oppenheim, 1992). The interviews

were centred around a core set of questions that were expanded from the research questions, and more questions were added during the sessions when it was felt that more information was needed (Mitchell & Jolley, 2007). To ensure consistency across all interviews, the following nine steps were adhered to:

(1)   prepared the interview venue (e.g., ensured that table and chairs were arranged properly and drinks were available);

(2)   introduction (e.g., provided the researcher's background and explained why the researcher was conducting the research);

(3)   prepared the recruits (e.g., provided the recruits with details about the study from the information sheet, assured confidentiality, highlighted that the session would be recorded, checked that the research participants understood everything, handed out the consent form and asked for consent to start the interview);

(4)   built rapport with the recruits (e.g., asked the recruits to talk about themselves including education history, age, family background and hobbies);

(5)   examined the BMT context and asked the recruits what they thought were adversities (e.g., was it easy or hard, same or different from expectations and what aspects of BMT were most rewarding and tough);

(6)   using the critical incident technique, asked the recruits to recount a particular activity or event that they thought to be the most challenging, and examined how they adapted to the specific incident, and what was the outcome);

(7)   provided the physical definition of resilience and got the recruits to define psychological resilience using their own words;

(8)   drew out what protective factors helped or got in the way of them adapting positively during the incident; and

(9)   conclusion (e.g., reassured confidentiality, provided information on who the recruits can turn to if needed, briefly explained plan for analysing the data and ask for feedback).

4.4.4. Data analysis

The data were analysed using the thematic analysis approach. Thematic analysis identifies, analyses and interprets patterns of meaning or themes within the qualitative data (Braun & Clarke, 2006). This approach was preferred over others (e.g., grounded theory, discourse analysis, narrative analysis and interpretative phenomenological analysis) for numerous reasons. Firstly, Braun and Clarke (2012) described thematic analysis as an accessible and flexible method of qualitative data analysis that is suited for beginner qualitative researcher. It provides the beginner with a foundation in the basic skills needed to learn other approaches to qualitative data analysis (Braun & Clarke, 2012). This method suited Study 2 as the researcher was new to qualitative research. Secondly, thematic analysis is not tied to any theoretical framework and it does not come with constraints related to methodological stipulations such as how to sample or collect data (Braun, Clarke & Weate, 2016). This allowed the current study the flexibility to employ different data collection methods (i.e., semi-structured one-to-one interview and focus group discussion). In addition, since the method is atheoretical, it does not contradict the current study's social constructionist philosophical position. Thirdly, Braun and Clarke's Six Phases of Thematic Analysis method (Braun & Clarke, 2006) represents a structured and logical approach to examine the data, which provided the necessary guidance to the researcher as a beginner.

While Braun and Clarke (2006) outlined six phases to their method, there is provision to go forward and backward between the different phases to keep the analysis flexible. The ultimate aim of the analysis was to identify coherent themes or patterns across the data set. Adopting a social constructionist stance for the study, it examined the way in which the recruits made sense, interpreted their experiences and constructed meanings out of them, with the understanding that these were influenced by the cultural, social context as the recruits observed and interacted with their peers and trainers. In this section, the final theme of 'Field Camp', related to the research question of "What do recruits consider as adversities in the BMT environment?", is used as an example to illustrate the analysis process. The full findings are provided in section 4.5.

Phase 1 – Getting familiar with the data. As the researcher was the one who designed the interview schedule, conducted and transcribed the interviews, he had the opportunity to get familiar with the data at the very onset. This has allowed him to develop

initial thoughts about how to organise the data. While the interviews were all voice-recorded, notes were taken during the interviews to capture important aspects of the conversation. After conducting all the interviews, the researcher then listened to the voice recordings and used the notes as supplements. These helped the researcher to search for meanings and initial patterns in the data set. The voice recordings were subsequently transcribed.

Phase 2 – Generating initial codes. Having gotten familiar with the data, the researcher gained some initial insights on the ideas shared by the recruits that were relevant to the research questions. Initial codes were then generated from each interview separately.

To illustrate this phase of the analysis, Recruit A's account is used. Recruit A recollected his experience during the 5-day field camp and reported that digging shell scrape was the hardest activity for him. He mentioned that while it was extremely hot in the day, at night it became cold. He added that it was because out in the field, there was no shelter for him to take cover and the rain at night thoroughly drenched him. He also said that there was no opportunity to shower and he had to sleep in the shell scrape. He added that the floor was hard, dirty, and wet, and he was afraid that he might be bitten by snake or scorpion. He observed that some recruits took only 90 minutes to complete the task while others took the whole day. Some recruits were even seen digging the shell scrape the following day. He recounted that after finishing his shell scrape, he had to help his buddy to dig because his buddy was slow. When he completed the second shell scrape, the trainer then instructed him to help his other platoon mates. He felt that there was no end to the activity and the trainer just did not want him to rest. Recruit A also mentioned that the advice of his friend to treat digging the shell scrape like he was building his house helped him to complete the task faster and better. He also felt frustrated and irritated throughout because his fellow recruits were complaining and shouting at one another. He thought that these had a contagious negative effect on the rest who were just minding their own business while quietly digging their own shell scrape.

As the objective of this phase of the analysis was to capture as much information as possible from the recruits' accounts, a data-driven instead of theory-driven approach was adopted. Hence, the initial codes had a loose structure that included: (1) 'Hot in the day'; (2) 'Cold in the night'; (3) 'Rain'; (4) 'No shelter to hide'; (5) 'Not allowed to

shower'; (6) Sleeping in the shell scrape'; (7) 'Hard, dirty and wet'; (8) 'Digging shell scrape'; (9) 'Fear'; (10) 'Potential bite from snake or scorpion'; (11) 'Advice from friend'; (12) 'Help buddy'; (13) 'Help others'; (14) 'Buddy slow' (15) 'Not allowed to rest'; (16) 'Unreasonable'; (17) 'Frustration'; (18) 'Irritation'; (19) 'Recruits complaining during training'; (20) 'Recruits shouting at one another'; and (21) 'Bad influence from other recruits'. This process was repeated for the remaining 21 interviews.

Phase 3 – Searching for themes. After the initial codes were generated, the researcher moved on to examine the codes from a higher order perspective and to search for common themes. This was performed separately for each individual question. At this stage of the data analysis, close attention was paid to the codes to identify commonalities as well as differences, and it involved going back to the transcriptions to confirm what the recruits said. The initial themes included; (1) 'Extreme weather conditions' to capture 'Hot in the day', 'Cold in the night' and 'Rain'; (2) 'Absence of creature comforts" to capture 'No shelter to hide', 'Not allowed to shower', 'Sleeping in the shell scrape' and 'Hard, dirty and wet'; (3) "Physical challenges" to capture 'Fear' and 'Potential bite from snake or scorpion'; (4) 'Negative emotions' to capture 'Fear', 'Frustration' and 'Irritation'; (5) 'Digging shell scrape' to capture 'Help buddy', 'Help others', 'Not allowed to rest' and 'Advice from friend'; (6) 'Inadequate rest' to capture 'Digging shell scrape', 'Not allowed to rest', 'Help buddy' and 'Help others'; (7) 'Effects of tough training' to capture 'Recruits complaining during training' and 'Recruits shouting at one another'; and (8) 'Risk factors' to capture 'Buddy slow', 'Uncaring trainer' and 'Bad influence from other recruits'.

As the research question for this portion of the analysis was about identifying what the recruits thought to be adversities, as much as possible, the themes were labelled in a way that matched the research question. Since the analysis of the data was still exploratory at this phase, as many themes as possible were generated. Some of the initial codes were also allowed to cross-load into various themes as long as there were connections (e.g., 'Not allowed to rest' was captured in 'Digging shell scrape' and 'Inadequate rest'). The level of the themes was also not fixed (e.g., whether 'Inadequate rest' or 'Digging shell scrape' was a higher-level theme).

Phase 4 – Reviewing the themes. The next phase of the analysis involved reviewing the connections between the codes, themes, and different levels of themes. As

the data were collected using a number of pre-determined questions that had some structure instead of completely free-flowing, this structure was used to organise the data (e.g., the toughest activity or event mentioned will be the highest-level theme followed by the reasons identified). During the process, themes and codes that did not have enough data to support them or were not at all related to the research questions were set aside (e.g., 'Effects of tough training', 'Buddy slow' and 'Advice from friend'). Where appropriate, some themes were collapsed together while others were taken apart.

Next, thematic maps were generated for each research question of each interview to highlight the relationship between various themes. An example of thematic map, developed based on Recruit A's account, is provided in Figure 4.1. It is elaborated in the next sub-section.
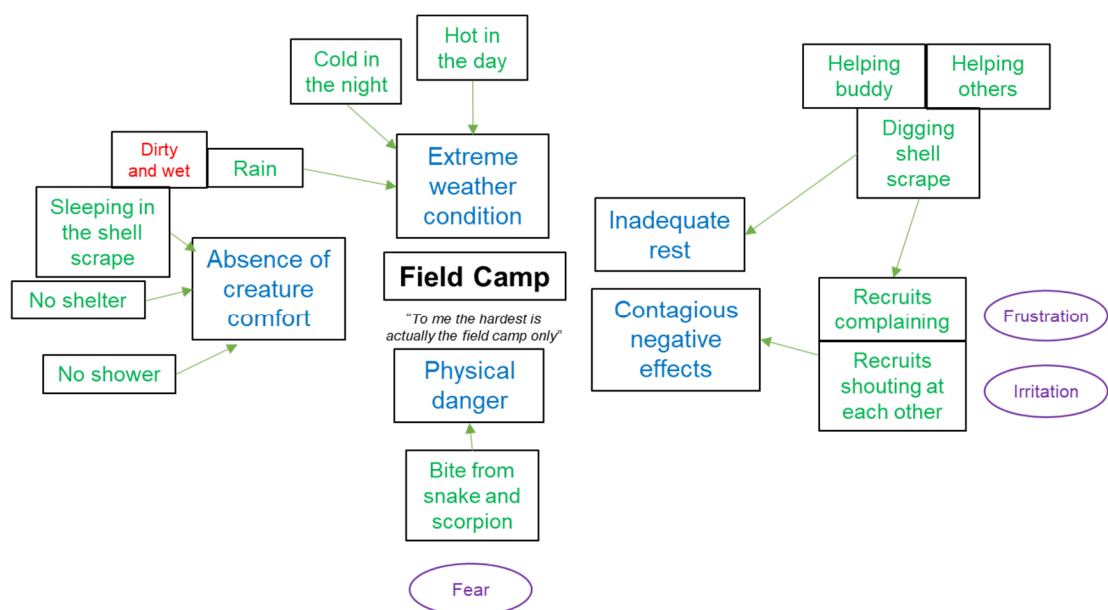
Figure 4.2: Example of thematic map

Phase 5 – Defining and Naming Themes. This phase of analysis was performed closely with Phase 4. As the thematic maps were being developed, the themes were at the same time being defined and named. To illustrate, Recruit A highlighted that "*To me the hardest is actually the field camp.*". He considered the extreme weather condition, inadequate rest, the contagious negative effects of his peers' behaviours, the physical danger and absence of creature comfort to be the reasons why he found field camp challenging. Recruit A thought the weather was extreme because it was hot in the day,

cold at night and it rained. He did not have adequate rest because he spent a lot of time digging his own shell scrape and helped his buddy and platoon mates dug theirs. He felt that the negative behaviours, complaining and shouting at one another, of his peers were contagious as he shouted back at them. These made him felt frustrated and irritated. Recruit A felt physical danger as he feared that he would be bitten by either snake or scorpion. Finally, he lamented the absence of creature comfort as there was no shelter for him to hide when it rained, he was not allowed to shower, and had to sleep in the shell scrape.

Phase 6 – Writing the report. This phase was carried out as part of the process of producing this thesis.

4.4.5. Data Synthesis

As the data were analysed at the individual level, to facilitate an appreciation of the collective view of the recruits, these data were synthesised. This process was guided by the works of Miles and Huberman (1994) in creating data matrices to allow the data to be made readily accessible for interpretation. According to the authors, matrix analysis offers a practical solution to identify commonalities between cases while at the same time allowing the preservation of the uniqueness of each case. To illustrate this process, the accounts of Recruits C, E and H are used. Recruit C mentioned that he feared disciplinary actions by the trainers during BMT while Recruit E felt that the trainers were harsh in the way they spoke and dealt with him and thought that they could do anything they wanted. Recruit H felt a sense of uncertainly as he did not know what to expect from the trainers or what they would do when he first met them. He also reported that when the trainers punished him, he was not sure about the intentions behind their actions. While the adversity reported by the three recruits were related to their trainers, the nature and reasons were different. Recruit C was fearful, Recruit E learnt to be helpless and Recruit H was uncertain or even confused. Table 4.1 illustrate how this adversity was synthesised using a data matrix.

Table 4.1

Example of data matrix to synthesise findings from different cases

Recruit	Trainers		
	Fearsome trainers	Harsh and wilful trainers	Uncertain trainers

Recruit C	feared disciplinary actions by the trainers	
Recruit E		- trainers spoke and dealt with him harshly - trainers could do anything they wanted
Recruit H		- did not know what to expect from the trainers - uncertain or confused about why trainers punished him

As the data were synthesised, it was possible to gain a collective perspective about how the recruits felt about their trainers. At the same time, the unique view of each recruit was retained. To make sense of how the adversities had affected the recruits, the impact was categorised into physical, mental or emotional. This is elaborated in the findings section (see Table 4.3).

4.5.   Findings

The full data sets were analysed and synthesised based on the procedure highlighted in sub-sections 4.4.4 and 4.4.5. The following three sub-sections summarise the findings related to the two research questions on "What do recruits consider as adversities in the BMT environment?" and "What factor, both internal and external, helped the recruits to adapt positively to these adversities?". While the primary approach of qualitative study is not to quantify the data, counting the occurrence of the particular adversities and protective factors helped the study to better understand how prevalent they were.

4.5.1. What do the recruits consider as adversities in the BMT environment?

The most prevalent adversity reported by the recruits was field camp followed by the change in environment, route march, punishment and physical training and being away from home. Table 4.2 provides the reasons why the recruits reported these as adversities and example quotes are also given. The adversities and their prevalence are summarised in Appendix G.

Table 4.2

Adversities reported by the recruits

Theme (Adversity)	Sub-theme (specific challenge)	Code	Example Quote

Field camp	Harsh environment	1. Hot in the day (2° hotter than main land)
		
		2. Cold at night
		
		3. Heavy rain
		
		    - eat and sleep in the rain
		
		    - uniform and boots perpetually wet
		
		    - muddy and dirty
		
		    - shell scrape flooded
		
		4. No shelter
		
		5. Potential bite from snake, spider, scorpion & insects
		
		6. Away from the comfort of bunk
		
		7. Having to re-adapt (i.e., just adapted from a civilian world to military environment, now must re-adapt from the camp environment to a field environment)
		
		8. Recruits' attitude changed (e.g., became more aggressive because of the harsh environment)
			"*Like have to sleep (out in the field) during rainy days. Like not used to the weather, sleeping outside.*"
			
			"*… 'cause raining, just nice, every night rain, very unlucky.*"
			
			"*… Tekong got snake, scorpion…*"
			
			"*Just adapted to BMT only, now have to adapt to field environment.*"

Sleeping on the floor	1. Dirty 2. Wet 3. Uneven ground 4. Uncomfortable 5. Hard to fall asleep 6. Inadequate sleep	*"Uncomfortable, didn't sleep well, still like have a long day to go."* *"The floor very hard to sleep, uneven, wet, cannot sleep enough."*
Not allowed to shower	1. Dirty and smelly 2. Developed rashes 3. Uncomfortable	*"Like cannot shower for five days."* *"Like you will have rashes, itchiness all these."*
Digging shell scrape	1. Physically demanding (i.e., can take up to a day) 2. Shoulder aching 3. Started in the middle of field camp (i.e., exhausted after 2 days) 4. Continuous work (i.e., helped others to dig theirs) 5. Hard to dig (i.e., rocky ground, roots in the ground) 6. Saw no real meaning in activity 7. Involving other concurrent activities (e.g., fire movement and artillery drills)	*"Shell scrape will be the most hardest, because that point in time think you really the most shack, in the middle of field camp."* *"Ya, the shell scrape, I kena the rock, the rocky rocky thing, like the hard stone, so I have to like dig until very long."* *"Some of us will do in two hours, some of us will take like one day. That means after the next day, still digging... you can see this steam coming out from your own body."*

Long training day	1. Physically demanding 2. Inadequate rest	"*The day like never end, the night before already not enough sleep, very tired.*"
Wearing combat gears	1. Abrasive 2. Heavy and uncomfortable (i.e., strenuous to the body) 3. Hot (i.e., developed heat rash - itchy and painful)	"*The full gear heavy, very uncomfortable, very hot, rub against the body...*"
Individual field craft	1. Physically demanding 2. Repetitive	"*IFC very tough, just keep on doing nonstop.*"
Eating combat ration	1. Cold food, no warm meal to look forward to 2. Unlike fresh ration	"*In camp got hot food, field camp eat combat ration, food is cold.*"
Sentry duties	1. Performed at night 2. Less time to sleep	"*The sentry duty is like extra. Already tired after a long day of training. At night still must do sentry… not enough sleep.*"
Cut off from outside world	1. Cannot use mobile to contact loved ones	"*In camp at night can use hamdphone… but field camp cannot.*"

Theme (Adversity)	Sub-theme (specific challenge)	Code	Example Quote
Change in environment	Regimentation and discipline	1. Having to report whereabout 2. Asking permission for everything 3. Having to strictly follow timings	"*Everything also must ask permission… must follow this follow that.*" "*Always rush from one thing to another thing.*"
	Fast pace	Rushing all the time	
	Harsh treatment	The way instructors spoke and handled them	"*Sometimes they just shout at you do things.*"
	Packed schedule	1. Activity after activity 2. No breathing space 3. Lesser personal time	"*No personal time. Rush from one activity to another.*"
	Change from being a civilian to soldier	Change in life style	"*Like before, I'm a civilian, I can do anything, anytime I want. Now cannot as soldiers.*"

	Accommodation	1. Wake up to see bunk mates instead of family members
		2. Share bunk with 15 others
		  - used to have own room
		  - crowded
		  - noisy
		  - no privacy
			"*Sometime feel strange. Last time wake up see parents, now wake up see other people… must share room with so many people.*"

- Share toilet with a lot of people

3. Owning only bed and cupboard

Theme (Adversity)	Sub-theme (specific challenge)	Code	Example Quote
Route march	Inadequate rest	1. Rest time not really 15 minutes as countdown started when the first man reached the rest point	"*I was the last man… by the time I reached, must walk again but the rest in front can rest.*"
		2. Have to remaining standing with the packs on until the last man arrived	
	Carry heavy load	Full gear (field pack, LBV, weapon and helmet)	"*Wearing the LBV and everything is very heavy… make you very hot… the hand numb also and can't breathe properly.*"
		- heavy	
		- restricted blood flow	
		- difficult to breath	
		- hot	
		- uncomfortable	
	Not allowed to drop out	1. Instructor accompanied them	"*They won't let you drop out… like my buddy, the instructor keep following you, shouting at you.*"
		2. Instructor kept shouting at them	
	Potential injury	Developed blisters from wearing boots	"*I walked until my leg got listers… the ground very rocky.*"

Uneven ground

Marching under the hot sun

Theme (Adversity)	Sub-theme (specific challenge)	Code	Example Quote
Punishment	'Tekan' by instructors	1. Leopard crawl	*"They still tekan us physically... very tiring."*
		2. Push-ups	*"To find back our bags, 'cause our bags won't labelled… to arrange our bags in platoon order… that was almost impossible… in the end, he told us to leopard crawl."*
		3. Rolling on floor	
		4. Knuckle push-up in parade square	*"Everything also do, leopard crawl, roll on the floor, running around, arti drill."*
		5. Change parade	
		6. Dashing around	
		7. Artillery drill	
	1-to-1 Interrogation	Mind game	*"It's like a mind game, very stressful…."*
	Can last for hours	Time wasted	*"It dragged on, keep doing, keep changing the way we have to do it."*
	Uncertainty	1. Do not know when it will cease (kept repeating)	*"Don't know what to expect, when this will all stop."*
		2. Do not know what to expect	

Theme (Adversity)	Sub-theme (specific challenge)	Code	Example Quote
	Inadequate rest (no time for recovery)	1. Packed training programme e.g. Mon IPPT, Wed route march 2. Short rest time between training	*"Like not enough time to rest. One training over, another training start."*
Physical training	Rigorous	1. Doing push-ups repeatedly 2. Doing sit-ups repeatedly 3. Running	*"Very siong, just keep doing and doing… push-up lah, running lah."*
	Injury	1. Physically painful 2. Existing injury impeded performance	*"I got injury before… very pain when I train… can't do my best."*

Theme (Adversity)	Sub-theme (specific challenge)	Code	Example Quote
Being away from home	Missed home	1. Missed family and loved ones 2. Thinking about home after a tough day makes it harder	*"Sometime at night cannot sleep… think about family, girlfriend… missed them lah."*

As mentioned in sub-section 4.4.5, attempts were made to understand how these adversities had affected the recruits. The nature of the adversities was categorised based on each recruit's account of their experience and how they described the adversities (see Table 4.3).

Table 4.3

Nature of adversities

Recruit	Nature of adversities		
	Physical	Mental	Emotional
Recruit A	✓	✓	✓
Recruit B	✓	✓	
Recruit C	✓	✓	✓
Recruit D	✓	✓	✓
Recruit E	✓	✓	✓
Recruit F	✓	✓	
Recruit G	✓	✓	✓
Recruit H	✓	✓	✓
Recruit I	✓	✓	
Recruit J	✓	✓	
Recruit K	✓	✓	✓
Recruit L	✓	✓	✓
Recruit M	✓	✓	✓
Recruit N	✓	✓	
Recruit O	✓	✓	
Recruit P	✓	✓	✓

Recruit Q	✓	✓	✓
Recruit R	✓	✓	✓
Recruit S	✓	✓	✓
Recruit T	✓	✓	
Recruit U	✓	✓	✓
Recruit V	✓	✓	✓
	22	22	15

To summarise, the adversities recruits faced were episodic and chronic, ranging from a single, short duration but intense activity (e.g., route marches and physical training) to longer duration event or treatment that could be mild but emotionally draining in nature (e.g., 5-day field camp and change in environment). The BMT environment was regimental, fast paced and packed full of structured activities where recruits had little rest, freedom, privacy, and were physically cut off from their families and loved ones. The recruits must quickly adjust and adapt to a harsh new environment where they were subjected to authority, uncertainty, rough treatment and sometime physically challenging environments. They needed to follow orders strictly, asked permission to do things, pushed themselves to the limit, and accomplished tasks with their buddies, section and platoon mates whom they might not necessarily liked or worked well with. As a whole, BMT was characterised by daily hassles, moments of intensive stress, prolonged pressure and was physically demanding, mentally stressful and emotionally challenging for the recruits.

4.5.2. What protective factors, both internal and external, helped the recruits to adapt positively to these adversities

It was found that 10 internal psychological variables[7], five skills and three external sources of support helped the recruits to adapt positively during BMT. The 10 internal psychological variables included: (1) pride; (2) hope; (3) perseverance; (4) purpose; (5)

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[7] To be consistent, these were labelled as internal psychological variables to better distinguish them from other protective factors.

optimism; (6) acceptance; (7) desire to improve; (8) passion; (9) being competitive; and (10) altruism. The five skills included: (1) setting goals; (2) positive appraisal of situations; (3) creating psychological markers; (4) not giving excuses; and (5) keeping oneself occupied. Finally, the three external sources of support included: (1) support from family or loved ones; (2) help from peers; and (3) encouragement from trainers. Table 4.4 summarises the protective factors that the recruits reported to have helped them to adapt positively to the adversities highlighted in the earlier sub-section (sub-section 4.5.1). Example quotes area also provided.

Table 4.4

Protective factors that helped the recruits to adapt positively during BMT

Protective factor	Internal or external	Prevalence	Example quote
Authentic Pride	Internal (psychological variable)	15	"*The idea of graduating in front of your parents.*"
			"*I have to be proud of myself that I can do it even though it still hurts.*"
			"*This guy managed to go through it, why can't I?" Like I also, I also think like, maybe I could be a better soldier than, soldier than he is.*"
Hope	Internal (psychological variable)	13	"*Reach there then can rest already.*"
			"*So, field camp was from week 6 to week 7. So, in a way right, if I get to go through, then it's 1 more week. Then it's over. So, in a way it also motivates me.*"
			"*You know that it's tough but it's going to end at some point.*"
Perseverance	Internal (psychological variable)	11	"*Just bear with it.*"
			"*Then, at that point of time, I'm already on like, the fourth day, I think the third and fourth day, so I think no point. No point giving up half way.*"
			"*Ok, just go through it, don't think of anything, don't think of the pain. Just think of, just finish. Ok, settle already.*"

Purpose	Internal (psychological variable)	10	"*Without us protecting the country, this kind of precious thing won't happen in the country.*"
			"*If we don't stand strong, then nobody is going to protect our family. Nobody is going to guard the country.*"
			"*If there's no NS now, from Mon to Fri, I'll just waste my life away. And at least when I'm here during the BMT phase, I was doing something so call productive, and I'm learning stuff.*"
Optimism	Internal (psychological variable)	9	"*… everything you do right, the things, the hard work you put, you put in in your work, something good will come out of it.*"
			"*I am very positive minded. Under the saddest situation, I can still be happy. The most down, the most stress situation, I still can find a reason for me to smile and laugh all these.*"
			"*Whatever they tell us to do, just do it, and then I believe that the outcome is good.*"
Acceptance	Internal (psychological variable)	7	"*You just start to accept that, "I'm already in field camp.*"
			"*Either you walk until you die or you give up then they punish you until you die.*"
			"*In the end, even if you don't do it now, you have to do it later also.*"
Desire to Improve	Internal (psychological variable)	4	"*Basically, to build stronger, to be a stronger person.*"
			"*But I am very harsh on myself because I always think I can do better. Because even though you are like at this level now, maybe you can do a bit more, then can go a bit higher.*"
			"*So, when come to Army, then all of a sudden you are doing good. Just shocks me. Then somehow I just want to really like try my best and do better for the next…*"

Passion	Internal (psychological variable)	1	*"I'm just, I'm just–I just love the, the life, of, a adventure. I just love the adventure. Love to learn new things."*
Competitive	Internal (psychological variable)	1	*"We always like to chal, challenge each other. Sometime, we go stadium challenge sprinting, everything. Challenge, just see who more better in somethings."*
Altruism	Internal (psychological variable)	1	*"Put others first. Also, during my time in NCC also, I have to put others first ahead of me."*
Setting goal	Internal (skill)	11	*"I also actually was aiming for SCS. But I didn't get the company best, I get platoon best only… then I wanted to go sergeant so much… after this, vocation training there's another way of going SCS. I was like, "Ok lah, aim for SCS."*
			"I like to challenge myself. My _____ (participant's relative) was a, a battalion's 10 best, for most improved soldier. So, I wanted to, be better."
			"I want to prove to them I'm able, I'm capable of protecting them."
Positive appraisal / reframing of situation	Internal (skill)	16	*"This, that kind of experience you only can get once in a life time."*
			"So, for me, whatever suffer I go through, it actually, it, it just make me gain something more. That's why when I, when I always think of it, is not for me to suffer. Just for me to gain an experience."
			"Other than that, also quite a good learning experience. We learnt a lot of things throughout throughout the, throughout the BMT."

Creating psychological markers	Internal (skill)	3	"*So, if the Friday is still far away, just look forward to the every meal, lunch, after lunch, then look forward to dinner. Dinner means end already, then you can go and sleep, or, do your own staff.*"
"*Then I was like looking at the time. Then setting different intervals like, ok breakfast is over, then lunch is over, then dinner is over. To try to motivate myself that the day is slowly ending.*"
"*Just the view that BMT is not actually that tough if you look forward to your book out every weekend.*"
Not giving excuses	Internal (skill)	2	"*My friends can do it, I also can do it.*"
"*… I have no excuse, to give up. Honestly. That's just my mentality.*"
Keeping oneself occupied	Internal (skill)	1	"*No lah if, you do more things than like, the time passed faster.*"
Family / loved ones	External	17	"*Every time I really want to like give up, I just think about my parents.*"
"*I think about my loved ones. I used my family, my mother, my dad to push myself. I did it for them.*"
"*It was my grandma also, 'cause she, she passed away during my first week of PTP. So somehow she gives me the strength to finish all the training even though it's very tough. Like there's a part of me that'll always remember her.*"
Section / platoon mates	External	15	"*We sing together, we finished together. That for me is like the best moment.*"

			"All encourage each other along the way, to preserve, even though, many a times, we all wanted to give up."
			"Then you got buddies beside you. So you look at your buddy, then you say, "If I want to give up, then my buddy also feel like giving up. So what makes him like carrying on is because everybody also like have to do it."
Trainers	External	3	*"Then along the way, the commanders was there to help us, to assist us."*
			"The one thing that didn't made me give up was my sergeants. Because most of the time when we were digging, my sergeant, my PC and my PS, they were walking around telling us how to do it the easier way. They telling us whether we–they keep asking us whether we are tired. If you are really tired, cannot do it, just take a breather, drink a lot of water and stuff like that, the encouragement they gave us."
			"My sir just keep talking to me to make me like distracted so I can continue."

4.5.3. Data triangulation with the findings from the focus group discussions

The data collected from the trainers were also analysed using Braun and Clarke's (2006) thematic analysis framework and followed the 6-phase process outlined in sub-section 4.4.4. As the research questions that guided the design and conduct of the focus group discussion were exactly the same, the findings could be immediately matched to the adversity and protective factor tables. Data synthesis was not performed on the trainers' perspectives as a whole because the levels of interaction between the section commanders and platoon commanders with the recruits were different. The interaction between the section commanders and recruits were more direct and personal as each section commanders would have about 10 recruits under their charge and they also acted as coaches to the recruits. The platoon commanders, typically responsible for about 50 recruits, had a more formal interaction with their recruits. Hence, it was envisaged that this might affect what they observed.

Adversity. Both the section and platoon commander groups highlighted that field camp, change in the environment, route march and physical training were the adversities that the recruits had to face in BMT. On one hand, the section commander group also reported confinement while the platoon commander group on the other hand mentioned punishment and having to get the recruits to cooperate. The details why the section commanders and platoon commanders thought so is included in Appendix H. Table 4.5 lists the adversities reported separately by the recruits, section commanders and platoon commanders.

Table 4.5

Adversities reported separately by the recruits, section commanders and platoon commanders

Adversities	Number of recruits reported	Section commanders	Platoon Commanders
Field camp	15	✓	✓
Change in environment	3	✓	✓
Route march	5	✓	✓
Punishment	1		

Physical training	6	✓	✓
Being away from home	8		
Injury	2		
Trainers	1		
Getting other recruits to cooperate	2		✓
Unreasonable standards	5		
Confinement	1	✓	

Protective factor. For the internal psychological variables, both the section and platoon commander groups reported that pride, hope, perseverance, purpose and optimism helped the recruits to adapt positively during BMT. In addition, the platoon commander group mentioned acceptance. For the skills, the section commander group observed goal setting, positive appraisal or reframing of situation and not giving excuses while the platoon commander group only identified goal setting. Both groups reported that family or loved ones' support, help from section or platoon mates and encouragement from trainers were important. The details why the section commanders and platoon commanders thought so is included in Appendix I. Table 4.6 lists the protective factors reported separately by the recruits, section commanders and platoon commanders.

Table 4.6

Protective factors reported separately by the recruits, section commanders and platoon commanders

Challenges or adversities	Number of recruits reported	Section commanders	Platoon Commanders
Authentic pride	15	✓	✓
Hope	13	✓	✓
Perseverance / Grit	11	✓	✓

Purpose	10	✓	✓
Optimism	9	✓	✓
Acceptance	7		✓
Desire to improve	4		
Passion	1		
Competitive	1		
Altruism	1		
Setting goal	11	✓	✓
Positive appraisal / reframing of situation	16	✓	
Creating psychological markers	3		
Not giving excuses	2	✓	
Keeping oneself occupied	1		
Family / loved ones	17	✓	✓
Section / platoon mates	15	✓	✓
Trainers	3	✓	✓

4.6. Discussion

The systematic review found that different scales were used by various military communities mainly because they had conceptualised and operationalised psychological resilience differently. Furthermore, it was recommended that this research should develop a customised measure because none of the measure evaluated was deemed to be suitable for the current research's context; involving conscripted recruits in a BMT environment and examining psychological resilience as an internal capacity that could be enhanced and not merely as an outcome. Hence, it was necessary for this research to first

conceptualise and operationalise psychological resilience. In resilience research, contextual differences exist between different environment because the nature of adversity, risk and protective factors, and ways in which positive adaptation are manifested differ. As such, Study 2 used an inductive qualitative approach to examine what the recruits considered as adversity in the BMT environment and identify what helped them to adapt positively.

4.6.1. Adversities in the BMT environment

Basic training was challenging not just because the activities were physically demanding as the recruits had to quickly adjust to a new environment that was unusual, unfamiliar and stressful (Williams et al., 2004). This probably contributed to the high attrition rate (Kiernan et al., 2015). While it is common knowledge that BMT was tough for conscripted male Singaporeans, the reason why the recruits thought and felt so was not previously established in a holistic fashion. Hence, the first contribution of Study 2 to the overall research endeavour was in pinpointing the exact source of stress directly from the recruits' accounts. These included:

(1)   the 5-day gruelling field camp experience when the recruits were exposed to the elements, deprived of basic creature comfort and engaged in faster pace of field training with minimal rest;

(2)   experience of drastic change in environment from a civilian one to a military one that was characterised by regimentation, discipline, loss of freedom, privacy and individual identity;

(3)   having to march long distances with full combat gear under scorching heat or in the dead of night;

(4)   enduring punishment or even harassment for the mistakes made or sometime for reasons unknown to the recruits;

(5)   the tough physical training that occurred on daily basis;

(6)   being isolated from home and cut off from the usual support from family, loved ones and friends; and

(7)   the risk of physical injury. This was made possible by synthesising the collective experiences of all the recruits involved in the study to paint a more complete picture of the BMT experience.

4.6.2. Internal and external protective factors that helped the recruits to adapt positively during BMT

The second contribution of the current study was in identifying what helped the recruits to adapt positively during BMT. To the researcher's knowledge, this was not previously established. In addition, in identifying these factors, it could potentially help the SAF to intervene by encouraging the recruits to: (1) take pride in their achievements and endeavours; (2) be hopeful and look forward instead of fixating on current situation that they may not have control over; (3) persevere no matter how tough and long their ordeals are because they will end at some point; (4) find meanings and create a sense of purpose in the things they do and about NS; (5) be optimistic about the outcomes of their efforts; and (6) accept the situation that they are in and focus their effort on things that they have control over. The SAF can also impart the recruits with life skills such as goal-setting and positive thinking strategy that can also help them to be more resilient during BMT. Furthermore, the recruits should know that they are not alone in these because they can always look to the support provided by their loved one, peers and trainers.

4.6.3. Conceptualising and operationalising psychological resilience in the BMT setting involving conscripted recruits

Based on the findings of Study 2, psychological resilience in the BMT context involving conscripted recruits can be conceptualised as internal capacity and process. It can be conceptualised as an internal capacity as all the recruits reported various internal psychological variables that helped them to adapt positively or be resilient in the face of adversities. In operationalising psychological resilience in this perspective, it is an internal capacity that is made up of multiple internal psychological variables, and in this particular study, they included: (1) pride; (2) hope; (3) perseverance; (4) purpose; (5) optimism; (6) acceptance; (7) desire to improve; (8) passion; (9) being competitive; and (10) altruism. Psychological resilience in BMT can also be conceptualised as a process and in operationalising the construct, there are various processes including but not limited to: (1) the recruits' appraisal of the adversities; (2) the recruits harnessing their internal protective factors to cope and adapt; and (3) external protective factors in the forms of

support from loved ones, help from peers and encouragement from trainers facilitated the recruits to achieve positive adaptation. Hence, the third contribution of the current study was in conceptualising and operationalising psychological resilience specifically in the BMT context involving conscripted recruits.

4.6.4. Limitations

One key limitation of Study 2 is that it involved only one coder; the researcher. As the researcher saw this research as a personal journey and the sponsoring organisation, the SAF, considered the data as confidential, he did not plan for additional coder. It was entirely possible that other coders might derive different codes and themes based on the data collected. Hence, Study 2 neglected the issue of inter-rater reliability. While this is highlighted as a limitation, attempts were made to mitigate against bias and improve trustworthiness. Firstly, the researcher exercised reflexivity and recognised the limitation, maintained a journal to keep track of the coding process and rationale, and performed two separate rounds of coding with a break of one month in between. Secondly, the researcher discussed the findings of his analyses after each phase with his supervisor before moving on to the next phase. These feedback opportunities continued to remind the researcher to exercise reflexivity in his research. In addition, the researcher ensured that his analyses and conclusions could always be substantiated with the research participants' quote verbatim.

Another limitation of Study 2 is that only 30 minutes was allowed for each one-to-one interview with the recruits. This is understandably so as time taken to participant in the interview was time not spent on training. Consequently, some of the interview lacked depth in the account of the BMT experience as it was not always possible to dive deeper into the recruits' thinking and emotion. This was especially so for some of the recruits who were less expressive and had to be probed repeatedly. Furthermore, access was granted only once for each recruit. Without such restriction, it might be possible to confirm with the recruits whether the analyses of their BMT experience were precise especially after Phase 5 (defining and naming themes).

4.6.5. Implication for future studies

While Study 2 had provided this research with a better understanding of what adversities were present in the BMT environment and identified numerous internal and external factors that contributed to helping the recruits to adapt positively or be resilient

during BMT, this stage of the overall research was still exploratory in nature. Hence it was recommended that future studies should corroborate these findings by adopting a quantitative approach. Furthermore, as psychological resilience in the BMT context had been conceptualised and operationalised as internal capacity and process, future studies could proceed to develop the customised measure based on this consideration. As most resilience measures examined in the systematic review (Chapter 3) assessed various internal and external protective factors and related them to psychological resilience, future studies could follow suit by examining those found in this study (e.g., internal protective factors such as pride, hope, purpose, perseverance optimism and acceptance and external protective factors such as support from peers, loved ones and trainers).

Chapter 5:   Examining the relations of the internal psychological variables with psychological resilience and performance in BMT (Study 3)

Study 2 found that 10 internal protective factors or psychological variables, five skills and three external protective factors helped the recruits to adapt positively or be resilient in the face of adversities. However, as it was a qualitative study, follow-on study should corroborate these findings by adopting a quantitative approach to measure these protective factors.

Chapter 5 begins by highlighting the aims of Study 3 and the associated hypotheses (section 5.1). Next, the internal psychological variables included in the study are introduced (section 5.2). The methods section (section 5.3) describes the participant characteristics and explains the approach in measuring these internal psychological variables. The procedure of Study 3 and the data analysis plan are also provided in the same section. The results are then reported in section 5.4. Finally, a discussion of the findings of Study 3 and the implications for the future research are provided (section 5.5).

5.1.   Study aims and hypotheses

When Study 3 was first conceived, it was decided that the focus should first be placed on examining the psychological variables because these specific internal protective factors were not previously studied in the BMT environment involving conscripted recruits. In addition, the SAF has not intervene in this area because the exact psychological variables found in Study 2 that were related to psychological resilience were not previously known prior to the study. While the external protective factors (i.e., support from peers, trainers and family) also have influence over the recruits' psychological resilience, they were known factors and the SAF has been actively intervening in these areas. For example, with regards to building peer support, the SAF commanders at all levels know the importance of building cohesion in their units and were trained during various leadership courses to know how to intervene. For trainer support, the SAF has always emphasised the importance of leadership and Care for Soldiers is one of the eight core values of the SAF. The SAF also encourages the recruits' parents to support their sons by allowing the parents to take part in activities on BMT enlistment day. These include touring the training facilities, sampling the food that their sons will eat in the cookhouse, and interacting with the recruits' trainers. Also, the SAF corresponds with the parents directly to encourage them to write to the recruits and invites

them to attend the recruits' BMT graduation. Hence, it was envisaged that Study 3 would not yield new insight by examining the external protective factors. Likewise, it was decided that the skill-based protective factors could be addressed in subsequent study[8] so that Study 3 could focus on gaining a better understanding of the psychological variables. By focusing on what had not been examined before (i.e., internal psychological variables), it was envisaged that this research would add more knowledge in the field of psychological resilience research. While the findings from Study 2 showed that psychological resilience could be studied at the team or unit level, involving the peers and trainers, it was decided that the current research should first gain a better understanding of the construct at the individual level before proceeding further.

As the list of psychological variables was extensive, it was thought that Study 3 might run the risk of using an excessively long questionnaire similar to the GAT which included 95 items. Hence, it was decided that Study 3 should only examine the ones that more recruits cited and also reported by the trainers. Passion, competitiveness, altruism and desire to improve were excluded because they were not reported by the trainers and first three were cited by only one recruit each. Eventually, six out of 10 psychological variables were chosen, and they included: (1) pride; (2) hope; (3) perseverance; (4) purpose; (5) optimism; and (6) acceptance.

As mentioned in Chapters 1 and 3, studying psychological resilience on its own without assessing its criterion validity adds limited value to the research. It is analogous to measuring personality without relating it to behaviours or evaluating cognitive ability without using the scores to predict performance. Hence, Study 3 also examined these psychological variables in relation to BMT performance.

Study 3 aimed to measure the six psychological variables and examine their relations with psychological resilience and performance in BMT. For this study, the intent was to examine these psychological variables both separately and collectively. On one hand, examining them separately would allow the study to ascertain if these six factors individually were salient as reported by the recruits. On the other hand, studying them collectively would reveal how much of the variance in psychological resilience and

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[8] The skill-based protective factors were subsequently considered in Study 5.

performance in BMT they could explain together. Two hypotheses were generated based on the research aims:

H[1] – Pride, hope, perseverance, purpose, optimism and acceptance are positively related to psychological resilience and performance in BMT.

H[2] – All the psychological variables that have positive relations with psychological resilience and performance will collectively explain substantial[9] amount of the variance in psychological resilience and performance in BMT.

5.2. Introducing the six psychological variables included in Study 3

5.2.1. Pride

Tracy and Robins (2007) posited that pride is a critical emotion that plays a significant role in many domains of psychological functioning. On one hand, it has been established that pride reinforces adaptive behaviours such as achievement (Weiner, 1985), and on the other hand, the loss of pride can lead to aggression and other antisocial behaviours as individual's ego is being threatened (Bushman & Baumeister, 1998). Pride is linked to self-esteem (Brown & Marshall, 2001) with the latter influencing a wide range of interpersonal processes. In more recent studies, pride has been identified as a distinct, cross-culturally recognised characteristic that can be identified by both children and adults (Tracy & Robins, 2006). Tracy and Robins (2007) claimed that pride may serve important adaptive functions and further argued that the experience of pride may reinforce the behaviours that boost self-esteem.

5.2.2. Hope

Snyder et al. (1991) defined hope as a positive motivational state that includes three components; goals, agency (goal directed energy) and pathways (planning to meet goals). Agency refers to the will to accomplish an intended outcome, and pathways involve the identification of goal and multiple means of achieving this goal (Snyder,

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[9] There is a huge range of applications for regression analysis in science, medicine, engineering, economics, finance etc. Consequently, the amount of variance explained is considered substantial depending on the context where it is interpreted and what variables were being examined. For example, in clinical studies, an R^2 value of .5 might not be enough to explain the variation to be addressed but it could be considered sufficiently high in other fields. In Study 1 (Systematic review of psychological resilience measurement in the military environment), it was found that military researchers such as Arthur et al. (2015) reported R^2 value ranging from .14 to .31 and claimed that the scale they used successfully predicted performance. Hence, this research adopted the middle ground and chose .25 (i.e., 25%) to be considered as substantial.

2000). Individuals with high level of hope can foresee obstacles along the way and actively identify various pathways for them to achieve those goals (Snyder, 2000). In a study involving Chinese factory workers, Luthans, Avolio, Walumbwa and Li (2005) found that level of hope has a positive relation to supervisory-rated performance and merit salary increases.

5.2.3. Perseverance

Peterson and Seligman (2004) defined persistence or perseverance as voluntary continuation of a goal-directed action despite facing obstacles or discouragement. They added that individuals who persevere usually expect to be rewarded for their persistence. Furthermore, according to Janoff-Bulman and Brickman (1982), individuals who display more perseverance than those who do not, often expect to succeed. Likewise, Carver, Blaney, and Scheier (1979) found that expectation of positive outcome enhances perseverance while expectation of negative outcome decreases it. Self-efficacy (Locke, 1997) and self-esteem are also linked to perseverance (Shrauger & Sorman, 1977). More recently, Duckworth et al. (2007) introduced the construct of grit, defining it as a trait-level perseverance and passion for long-term goals. In a study involving officer cadets at West Point U.S. Military Academy, the authors found that those higher in grit were less likely to drop out compared to their peers with lower level of grit.

5.2.4. Purpose

Antonovsky (1987) developed the sense of coherence concept which consists of three components: (1) comprehensibility; (2) manageability; and (3) meaningfulness or purpose. In the context of stress and adversity, comprehensibility is about whether these stress and adversity make sense in terms of them being clear and coherent. Manageability is about whether adequate resources are available to meet the demands imposed by these stress and adversity. Meaningfulness or purpose is about whether there is meaning to these stress and adversity. If meaning is found in these situations, they will be thought of as interesting, challenging, and worthy of an investment of energy and dedication. Meaningfulness or purpose is thought to be most important because without motivation, the ability to cope becomes temporal (Antonovsky, 1990).

5.2.5. Optimism

Drawing from attribution theory, Seligman (1998) described optimists as those who make internal, stable, and global attributions regarding positive events. In a study

involving insurance sales agents, he found that optimism had a significantly positive relation with performance. Luthans (2002) suggested that optimism is associated with a positive outlook or attribution of events. He added that optimism involves positive emotions and motivation, and has the element of being realistic. Hence, realistic optimism involves an assessment of what one can and cannot achieve in a given situation. In their study involving Chinese factory workers, Luthans et al. (2005) found that the level of optimism has a positive relation with the workers' rated performance.

5.2.6. Acceptance

Acceptance is about the willingness to experience feelings and thoughts without avoiding or controlling them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Instead of trying to avoid or control these feelings and thoughts, by accepting them, individuals can more effectively channel their energies to the achievement of their goals (Hayes et al., 1996). In doing so, individuals focus their scarce attention to make behavioural choices based on what will help them to succeed instead of what feelings or thoughts they may have. In a study involving customer service centre workers in the United Kingdom, Bond and Bunce (2003) found that acceptance predicted mental health and the workers' performance as measured by the number of errors made during work.

5.3. Method

5.3.1. Measure

It was decided that Study 3 should use established scales to measure the six psychological variables as their psychometric properties would have been assessed to be sound. As there were many existing scales available to measure each of the six psychological variables, various factors were taken into consideration to decide on which exact scales to use. For example, to measure pride, three options were considered: (1) the pride subscale from Dispositional Positive Emotion Scale (DPES; Shiota, Keltner & John, 2006); (2) the Achievement Pride Scales (Buechner, Pekrun & Lichtenfeld, 2016); and (3) the authentic pride subscale from Authentic and Hubristic Pride Scales (Tracy & Robins, 2007). Eventually, option three was chosen as the theory associated with the scales was the most established to date. For optimism, there were much more options and they included: (1) Life Orientation Test-Revised (LOT-R; Scheier et al., 1994); (2) Positive and Negative Affect Schedule (PANAS; Watson et al., 1988); (3) Positivity Scale (PS; Seligman, 1990); (4) Optimism/Pessimism Scale (O & P; Dember, Martin, Hummer,

Howe & Melton, 1989); and (5) Attributional Style Questionnaire (ASQ; Peterson, Semmel, Baeyer, Abramson, Metalsky & Seligman, 1982). The LOT-R was chosen over the rest because it was the most widely used self-report measure of optimism. Lastly, for acceptance, existing scales include: (1) Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) and AAQ-II (Bond et al., 2011); (2) Work-related Acceptance and Action Questionnaire (WAAQ; Bond, Lloyd & Guenole, 2013); (3) Perceived Acceptance Scale (PAS; Brock, Sarason, Sanghvi & Gurung, 1998); and (4) Philadelphia Mindfulness Scale (PHLMS; Cardaciotto, Herbert, Forman, Moitra & Farrow, 2008). The PHLMS was eventually chosen as it contains a subscale specifically measuring acceptance while both the AAQ and AAQ-II measure ACT's model of mental health and behavioral effectiveness, WAAQ measures psychological flexibility and PAS assesses acceptance within specific categories of relationships.

However, as context has been established to be central in the study of psychological resilience, it was necessary to modify the items in the scales such that they took into consideration the BMT context. These scales were used:

Pride. The Authentic and Hubristic Pride Scales developed by Tracy and Robins (2007) consists of adjectives and phrases reflecting the two facets of pride. Each scale consists of seven items. Respondents indicate the extent to which each item represents them, on a 5-point scale. Tracy and Robins (2007) reported that both scales are reliability as the internal consistency was .89 for the Authentic Pride Scale and .85 for the Hubristic Pride Scale. Only the Authentic Pride Scale was used for Study 3 as it measures the positive aspects of pride which this study aimed to specifically examine. To give the items the right context, they were modified by developing proper statements that invoked the recruits' thoughts about BMT. For example, the single word "confident" in the scale was revised into a proper statement "In general, I feel confident during BMT." (see Appendix J for the modified scale).

Hope. The Adult Hope Scale developed by Snyder et al., (1991) was used to measure hope. It is a 12-item scale that is divided into two sub-scales measuring agency (goal-directed energy) and pathways (planning to accomplish goals), plus 4 fillers. Each item is answered using an 8-point Likert-type scale ranging from definitely false to definitely True. To keep the measure succinct, the fillers were excluded. To give the scale the BMT context, items such as "Even when others get discouraged, I know I can find a way to solve the problem." were modified to "During BMT, when others get discouraged

when confronted with a problem, I know I can find a way to solve it." In addition, to keep the whole measure of the study consistent, the scale was reduced from eight points to five points: (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; and (5) strongly agree (see Appendix K for the modified scale).

Perseverance. For perseverance, the 12-item self-report measure of grit (Grit-O) developed by Duckworth and Quinn (2009) was used. It contains two factors; consistency of interest and perseverance of effort. Only items measuring perseverance of effort were used. Again, to give the scale the right context, items such as "Setbacks don't discourage me." were modified to "In general, the setbacks I experienced in BMT don't discourage me." Also, this measure adopted a 5-point scale (see Appendix L for the modified scale).

Purpose. For sense of purpose, relevant items from the Orientation to Life Scale (SOC-13) developed by Antonovsky (1987) were used. The original instrument consisted of 29 items with a 7-point response scale, and there is now a 13-item version. The instrument measures three aspects of sense of coherence (SOC): (1) comprehensibility; (2) manageability; and (3) meaningfulness. Only the four items from the meaningfulness factor were used. Again, these items were modified to give them the proper BMT context. For example, "How often do you have the feeling that there is little meaning in the things you do in your daily life?" were modified to "How often do you have the feeling that there is little meaning in the things you do in BMT?" Also, the 7-point response scale was reduced to five points (see Appendix M for the modified scale).

Optimism. The LOT-R was used to measure optimism (Scheier et al., 1994). It is used to assess dispositional optimism, defined as generalised optimistic outcome expectancies (Scheier & Carver, 1985), and is a well-known and validated instrument. This version consists of 10 items; three worded optimistically, three worded pessimistically and four fillers. Respondents are asked to indicate the extent of their agreement with the items on a 5-point scale. The four fillers were similarly excluded. Items such as "Overall, I expect more good things to happen to me than bad." were changed to "Overall, I expect more good things to happen to me than bad ones during BMT." The LOT-R's 5-point scale was retained (see Appendix N for the modified scale).

Acceptance. The PHLMS developed by Cardaciotto et al. (2008) was used to measure acceptance. This 20-item instrument, answered on a 5-point scale, has an acceptance subscale that consisted of 10 items. This instrument is preferred over the WAAQ as it contains a subscale measuring acceptance while the WAAQ measures

psychological flexibility. Again, items such as "There are things I try not to think about." were changed to "There are things in BMT I try not to think about." The PHLMS's 5-point scale was retained (see Appendix O for the modified scale).

Resilience and performance in BMT. Psychological resilience and performance in BMT were measured with self-report and peer appraisal. For self-report, the items were "How would you rate your level of psychological resilience in BMT?" and "How would you rate your BMT performance in general?" while for peer appraisal, they were "How would you rate Recruit A's psychological resilience in general during BMT?" and "How would you rate Recruit A's BMT performance in general?" These were answered on a 5-point scale: (1) not resilient at all; (2) somewhat not resilient; (3) average level of resilience; (4) somewhat resilient; and (5) very resilient for measuring psychological resilience, and (1) poor; (2) somewhat poor; (3) average; (4) somewhat good; and (5) good for measuring BMT performance.

While this single-item approach represents an efficient first pass assessment of psychological resilience in BMT, it was possible that the two single items could not take into consideration the full complexity of the construct; low content validity. In addition, single item has fewer points of discrimination (i.e., a single Likert question has five points to discriminate while a 3-item 5-point scale has 15 points of discrimination) and lacks a measure of internal-consistency. However, some studies have shown that there is no disadvantage in using single item and the approach is valid. For example, Cunny and Perri (1991) found that a single item of the Medical Outcome Study Survey (MOSS) can serve as a substitute for the full 20-item measure [i.e., the item "In general, would you say your health is excellent, very good, good, fair, or poor?" correlated very highly ($r = .86$) with the overall score of the measure]. Likewise, Bergkvist and Rossiter (2007) found no difference in predictive ability between single item measures and multiple item measures when they asked their research participants to evaluate four advertisements and rate how much they liked the advertisement, attitude toward the brand, purchase intention, and brand beliefs. In fact, some researchers have gone so far as to suggest that single-item measure is more robust than multiple-item measure. For example, Drolet and Morrison (2001) conducted a study varying the number of items and found that as the number of synonymous items grew, respondents were more likely to engage in random response behaviour. The authors suggested that not only do multiple-item measure takes more time, the approach may actually increase response error.

For the current study, the two single items were developed as criteria (i.e., whether psychological resilience in BMT was demonstrated or not) and not as a full measure of the construct as a psychological variable. In addition, a working definition of psychological resilience in BMT (i.e., not dropping out of training and successfully completing BMT) was provided to the recruits at the start of Study 3 to ensure alignment in the understanding of the construct.

In addition, performance was measured with objective data collected after the recruits graduated from BMT; qualification for leadership training after BMT. After BMT, the best performing recruits would be posted to Officer Cadet School (OCS) to be trained as officers and the good performers would be sent to Specialist Cadet School (SCS) to be trained as specialists, the equivalent of non-commissioned officers (NCOs). Those recruits who did not perform as well would be posted to other units or training institutions for trade courses. Qualification for leadership training was thought to be a robust measure of BMT performance as the decisions took into account the recruits' various test results assessing physical fitness, military knowledge and marksmanship. and trainers' appraisal. Qualification for leadership training was broken into three categories to reflect the differences in BMT performance: (1) qualification for training to be officer (tier 1); (2) qualification for training to be specialist (tier 2); and (3) not qualified for leadership training (tier 3).

The questionnaire was piloted approximately one month before the actual study. As the six scales were heavily modified, this provided the opportunity to verify their psychometric properties such as internal consistency, factor structure and factor loadings of each item. In addition, as most of the items were reworded, it was important to solicit feedback about whether the items were straightforward and easy to understand. The pilot involved two companies of recruits[10] who were undergoing BMT. While no recruit mentioned that they had difficulty understanding the questions, several of them did seek clarification on the meaning of psychological resilience. Following this feedback, the definition of psychological resilience was provided during the actual study.

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[10] As the intent was to just pilot the questionnaire, the researcher did not request for the actual headcount.

5.3.2. Participants

The research participants of the actual study were recruited from the BMTC. As mentioned in Chapter 1 section 1.3, the sole purpose of the centre is to conduct BMT and generate soldiers to be deployed to other units or more advance training institutions. It is made up of numerous schools, and each school consists of various companies. Enlistment exercises occur throughout each year, and the schools take turn to receive the recruits and conduct BMT. While each batch of BMT intake can include up to 500 recruits (i.e., considered as one company), the exact number varies dependent on numerous factors such as the country's birthday rate in that particular year the recruits were born, whether deferment was granted to some recruits and recruits failing to turn up on enlistment day for various reason. As the intent was to involve all the recruits in the study but there was no way to know the exact number of each intake, the initial planned sample size was 500. For this study, data were collected on two separate occasions from this batch of recruits; Week 2 and Week 7 of BMT. 413 and 447 recruits were present for the study on Week 2 and Week 7 respectively. There was a difference in the number of recruits who turned up on each occasion because some recruits might have reported sick on those days, were assigned to perform various duties or involved in other administrative functions (e.g., being interviewed by the trainers). It was also possible that those recruits who turned up on Week 2 did not turn up on Week 7 and vice versa. Eventually, only data from a smaller sample size of 378 recruits were used for Study 3. This was partly because for ethical reasons, the recruits were given option not to take part in the research if they did not consent to the use of their data (see sub-section 5.3.3 for the procedure of Study 3). In addition, there was a need to examine each recruit's data on both occasions (see subsection 5.3.4 for the data analysis plan). Hence, if the recruits were not present during both occasions, their data were excluded from the study. The recruits had either completed A-levels or polytechnic education. They were all male with an age range from 18 to 22 years and the mean age was 19.95 years ($SD = 1.02$).
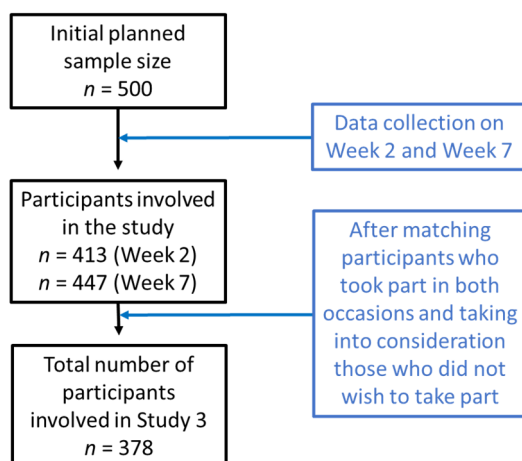
Figure 5.1: Flow chart of participants recruitment for Study 3

5.3.3. Procedure

The data were collected at two time-points, Week 2 and Week 7 of BMT, so that the test-retest reliability and agreement of all the scales can be examined. For both time-points, three to five days before the study, the recruits were provided with information sheets (see Appendix P) containing the details of the study. As there was no direct access to the recruits, these information sheets were disseminated through the trainers.

On both occasions, the study was conducted in an auditorium in BMTC. Coordination was made with the school's commanding officer to assemble the recruits for the study. After the recruits were invited into the auditorium and sat down, the purpose of the study was explained to them. The recruits were then asked if they had any concern or issue with taking part in the research, and whether anyone was feeling unwell. They were given the option to withdraw and go back to their training if they wished. They could also simply not answer any question.

Thereafter, the recruits were given the consent forms (see Appendix Q), No. 2B lead pencils, erasers, question sheets and machine-scoring answer sheets. Instructions were then provided on how to complete the questionnaire (e.g., how and where to shade on the machine-scoring answer sheets and not to write their names on the question and answer sheets). The definition of psychological resilience was also provided so that there is alignment in the understanding of the construct. Each recruit was given two question sheets; Questionnaire 1 contained 40 items measuring pride, hope, perseverance, purpose, optimism and acceptance, and Questionnaire 2 contained two self-report items and two

items for each peer the recruits had to rate[11]. The exact number of items was contingent on how many peers they had to rate.

After the recruits had completed the questionnaires, they then individually handed in the answer sheets with the answer side faced down, returned the rest of the items, and were given permission to leave the auditorium. All the answer sheets were then machine-scored and collated into a single SPSS dataset.

5.3.4. Data Analysis

In analysing the data for this study, it was important to first verify the reliability of the measures used as some items from the original measure were either excluded or drastically modified to reflect the BMT context as discussed in sub-section 5.3.1. Furthermore, to keep the respond scale consistent for the questionnaire as a whole, the original response scale of some of the measures was changed.

Internal consistency. The six scales' reliability was examined with respect to their internal consistency. According to Tang, Cui and Babenko (2014), the internal consistency of a test shows whether the items in the test that are designed to measure the same construct will produce consistent scores. For example, if the seven items in the Authentic Pride Scale are all designed to measure the same construct of pride, the participants should answer these seven items in the same way. This will keep the response pattern consistent, thereby showing that the Authentic Pride Scale has internal consistency. Some researchers like Cronbach (1951) and Cortina (1993) described internal consistency as a measure that is based on the degree of bivariate correlations between the different items in a given test. As the correlations between items in a test often differ in strength, internal consistency measures the average inter-item correlation in order to establish the degree of correlation between different items on a test. The internal consistency reliability coefficient ranges between 0 and 1, and the closer the coefficient is to 1, the greater the internal consistency of the items in the measure. According to George and Mallery (2003), internal consistency of > .9 is considered excellent, > .8 is good, > .7 is acceptable, > .6 is questionable, > .5 is poor, and < .5 is unacceptable.

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[11] Each company is made up of numerous platoons and each platoon in turn comprises several sections. The recruits only had to rate the peers in their section as interaction between the recruits is most intimate at the section level. Each section can consist of up to 15 recruits.

Test-retest reliability and agreement. The six scales were also examined for their test-retest reliability and agreement. One test-retest approach to assess the reliability of a measure is to examine the magnitude of relationship between scores obtained at two time-points. Hence, if the measure consistently produces the similar results at the two time-points, the relation between the two scores would be high. This approach is often achieved by calculating the correlation coefficient which measures the strength of relation. While a high positive correlation between two sets of scores is a necessary condition in assessing reliability, it is not a sufficient one (Berchtold, 2016). On one hand, test-retest reliability is the capacity of a measure to produce the same ordering between respondents when measured in two time-points. On the other hand, test-retest agreement is the capacity of a measure taken at two time-points on the same respondents under the same conditions to replicate exactly the same scores. Hence, in addition to preserving the relative order of the respondents in the measure taken at two separate time-points, test-retest agreement also requires the same exact score that each respondent obtains during the two time-points. According to Bland and Altman (1986), it is possible to have high reliability with high degree of correlation coefficient but have a poor level of agreement. As such, this study assessed both the six measures' test-retest reliability and agreement.

The Pearson product-moment correlation coefficient was used to assess test-retest reliability. It was interpreted using the commonly used guideline provide by Evans (1996); less than .20 is very weak, .20 to.39 is weak, .40 to.59 is moderate, .60 to .79 is strong and above .79 is very strong. To assess test-retest agreement, this study used the common approach of examining the intra-class correlation coefficient (ICC). However, there is no standard values for acceptable agreement using ICC. While researchers such as Fleiss (1981) and Cicchetti and Sparrow (1981) stated that an ICC value of less than .40 is poor, .40 to .59 is fair, .60 to .74 is good, and more than .74 is excellent, there are other more stringent cut-offs suggested by other authors. For example, Koo and Li (2016) more recently suggest the ICC value less than 0.5 indicates poor agreement, value between 0.5 and 0.75 indicates moderate agreement, value between 0.76 and 0.9 indicate good agreement, and value greater than 0.90 indicates excellent agreement. This research as a whole adopted the more stringent requirements.

Correlation. To test H_1 in examining the relations of the six psychological variables individually with psychological resilience and performance, correlation analyses were performed for self-report and peer appraisal data. Correlation analysis can

show: (1) whether there is any relation between two or more variables; (2) what is the direction of relation; and (3) the magnitude of the relation (Cohen, 1988). It was necessary to examine the correlations of the six psychological variables individually with psychological resilience and performance because the six psychological variables were identified collectively with different participants (e.g., one recruit only mentioned the hope variable while another highlighted perseverance, purpose and optimism). None of the recruit in Study 2 reported all six of them together in their accounts of what helped them to adapt positively during BMT. Hence it was important to first examine if these six factors separately on their own were representative.

Multinomial logistic regression. To test H_1, a series of multinomial logistic regressions were also performed. These analyses were used because the data for qualification for leadership training are categorical and have three categories: (1) qualified for training to be officer; (2) qualified for training to be specialist; and (3) not qualified for leadership training. Again, these were performed separately for the six psychological variables for the same reason highlighted in the previous sub-section.

Multiple regression. To test H_2, how much variance in psychological resilience and performance could be accounted for collectively by the psychological variables that have significant relations with these two outcomes, standard multiple regression was performed. The standard multiple linear regression was chosen over the hierarchical alternative because there is no logical or theoretical ground yet to decide the order of entering the factors (Dewberry, 2004).

The sequence of analysis is depicted in Figure 5.1.
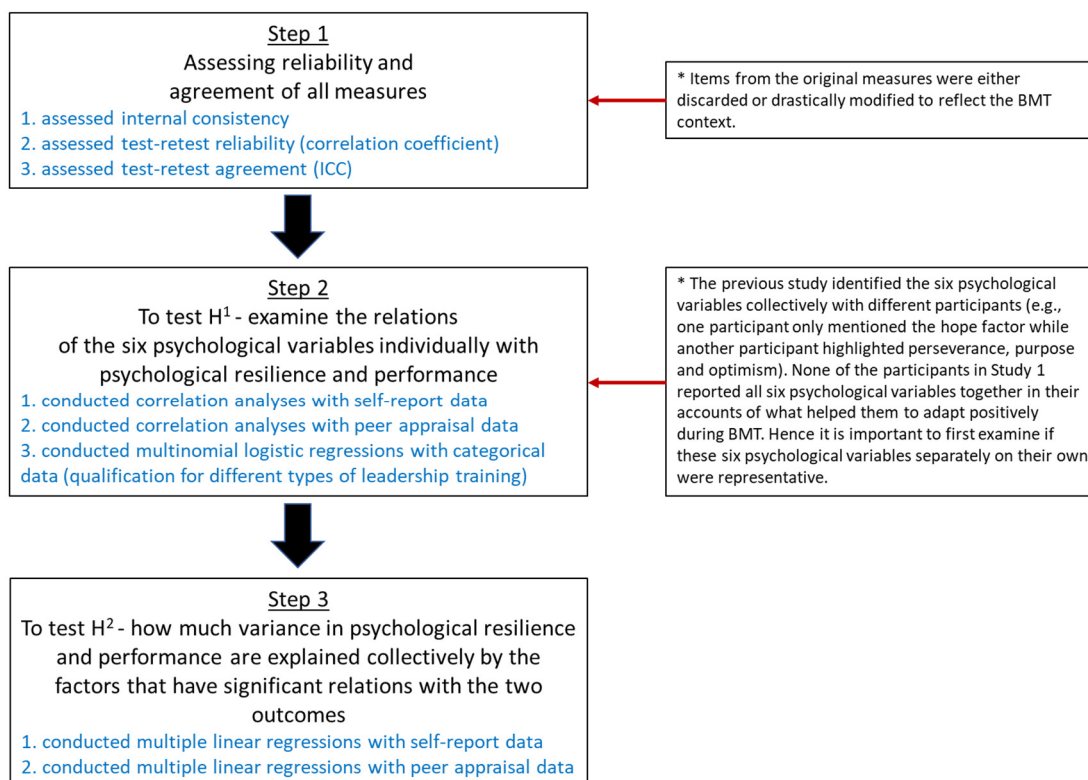
Figure 5.2: Sequence of analysis

5.4.   Results

5.4.1.   Reliability and agreement

As data were collected at two time-points, it was possible to examine the internal consistency of the six measures twice. The internal consistency for each of the adapted measure at Week 2 and Week 7 were as follows: (1) pride (7 items; α = .93 and .95); (2) hope (8 items; α = .92 and .93); (3) perseverance (5 items; α = .74 and .80); (4) purpose (4 items; α = .83 and .84); (5) optimism (6 items; α = .72 and .80); and (6) acceptance (10 items; α = .87 and .89). Appendix R shows the detail item-level analyses of the six measures. The detail item-level analyses were performed just using data collected on Week 7 because these are the data that were eventually used for the main analyses of this study.

The test-retest reliability as reflected by the Pearson product-moment correlation coefficients were: (1) pride, $r(377)$ = .80, $p <$ .01; (2) hope, $r(377)$ = .81, $p <$ .01; (3) perseverance, $r(377)$ = .76, $p <$ .01; (4) purpose, $r(377)$ = .76, $p <$ .01; (5) optimism, $r(377)$ = .72, $p <$ .01; and acceptance, $r(377)$ = .69, $p <$ .01 (.69). Summary of the findings are included in Table 5.1.

Table 5.1

Test-retest reliability of the six measures

Factor	r	df	p
Pride	.80**	377	.01
Hope	.81**	377	.01
Perseverance	.76**	377	.01
Purpose	.76**	377	.01
Optimism	.72**	377	.01
Acceptance	.69**	377	.01

Note: ** $p < 0.01$.

The test-retest agreement as reflected by the ICC showed that:

(1) for pride, the average measure ICC was .88 with a 95% confidence interval from .85 to .91 [$F(378,378) = 9.04$, $p < .001$];

(2) for hope, the average measure ICC was .89 with a 95% confidence interval from .85 to .91 [$F(378,378) = 9.49$, $p < .001$];

(3) for perseverance, the average measure ICC was .86 with a 95% confidence interval from .83 to .87 [$F(378,378) = 7.19$, $p < .001$];

(4) for purpose, the average measure ICC was .86 with a 95% confidence interval from .83 to .86 [$F(378,378) = 7.17$, $p < .001$];

(5) for optimism, the average measure ICC was .83 with a 95% confidence interval from .79 to .86 [$F(378,378) = 5.97$, $p < .001$]; and

(6) for acceptance, the average measure ICC was .81 with a 95% confidence interval from .77 to .85 [$F(378,378) = 5.36$, $p < .001$].

Summary of the findings are also included in Table 5.2.

Table 5.2

Test-retest agreement of the six measures

Factor (average measures)	Intraclass correlation	95% confidence interval		F Test with true value			
		Lower Bound	Upper Bound	Value	df1	df2	p

Pride	.88***	.85	.91	9.04	378	378	.001
Hope	.89***	.85	.91	9.49	378	378	.001
Perseverance	.86***	.83	.87	7.19	378	378	.001
Purpose	.86***	.83	.86	7.17	378	378	.001
Optimism	.83***	.79	.86	5.97	378	378	.001
Acceptance	.81***	.77	.85	5.36	378	378	.001

Note: *** $p < 0.001$.

5.4.2. Correlations – psychological resilience and performance (self-report)

Correlation analyses were performed to test H_1 that Pride, hope, perseverance, purpose, optimism and acceptance are positively related to psychological resilience and performance during BMT. The correlations between the six psychological variables and psychological resilience in BMT as measured by self-report were as follows:

(1)   there was a statistically significant, moderate positive correlation between pride and psychological resilience, $r = .58$, $p < .01$;

(2)   there was a statistically significant, strong positive correlation between hope and psychological resilience, $r = .63$, $p < .01$;

(3)   there was a statistically significant, strong positive correlation between perseverance and psychological resilience, $r = .64$, $p < .01$;

(4)   there was a statistically significant, moderate positive correlation between purpose and psychological resilience, $r = .54$, $p < .01$;

(5)   there was a statistically significant, moderate positive correlation between optimism and psychological resilience, $r = .47$, $p < .01$; and

(6)   there was a statistically non-significant, very weak negative correlation between acceptance and psychological resilience, $r = -.06$, $p < .01$.

The correlations are also provided in Table 5.3.

Table 5.3

Correlations between the six psychological variables and psychological reseilience in BMT as measured by self-report

	M	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Psychological resilience	4.25	0.75	-						
2. Pride	3.99	0.76	.58**	-					
3. Hope	3.94	0.68	.63**	.85**	-				
4. Perseverance	4.02	0.64	.64**	.80**	.85**	-			
5. Purpose	3.69	0.84	.54**	.81**	.80**	.76**	-		
6. Optimism	3.29	0.72	.47**	.64**	.64**	.59**	.67**	-	
7. Acceptance	2.72	0.72	-.06	-.16**	-.15**	-.10*	-.09	.06	-

Note: Pearson's correlation coefficient. ** $p < 0.01$, * $p < 0.05$

The correlations between the six psychological variables and performance in BMT as measured by self-report are as follows:

(1)   there was a statistically significant, strong positive correlation between pride and performance, $r = .67$, $p < .01$;

(2)   there was a statistically significant, strong positive correlation between hope and performance, $r = .68$, $p < .01$;

(3)   there was a statistically significant, strong positive correlation between perseverance and performance, $r = .66$, $p < .01$;

(4)   there was a statistically significant, moderate positive correlation between purpose and performance, $r = .58$, $p < .01$;

(5)   there was a statistically significant, moderate positive correlation between optimism and performance, $r = .57$ $p < .01$; and

(6)   there was a statistically non-significant, very weak negative correlation between acceptance and performance, $r = -.03$, $p < .01$.

The correlations are also provided in Table 5.4.

Table 5.4

Correlations between the six psychological variables and performance in BMT as measured by self-report

	M	SD	1	2	3	4	5	6	7
1. Performance	4.03	0.80	-						
2. Pride	3.99	0.76	.67**	-					
3. Hope	3.94	0.68	.68**	.85**	-				
4. Perseverance	4.02	0.64	.66**	.80**	.85**	-			
5. Purpose	3.69	0.84	.58**	.81**	.80**	.76**	-		
6. Optimism	3.29	0.72	.57**	.64**	.64**	.59**	.67**	-	
7. Acceptance	2.72	0.72	-.03	-.16**	-.15**	-.10*	-.09	.06	-

Note: Pearson's correlation coefficient. ** $p < 0.01$, * $p < 0.05$

5.4.3. Correlations – psychological resilience and performance (peer appraisal)

The correlations between the six psychological variables and psychological resilience in BMT as measured by peer appraisal were as follows:

(1)　　there was a statistically significant, weak positive correlation between pride and psychological resilience, $r = .32, p < .01$;

(2)　　there was a statistically significant, weak positive correlation between hope and psychological resilience, $r = .33, p < .01$;

(3)　　there was a statistically significant, weak positive correlation between perseverance and psychological resilience, $r = .32, p < .01$;

(4)　　there was a statistically significant, weak positive correlation between purpose and psychological resilience, $r = .30, p < .01$;

(5)　　there was a statistically significant, weak positive correlation between optimism and psychological resilience, $r = .25, p < .01$; and

(6)　　there was a statistically non-significant, very weak negative correlation between acceptance and psychological resilience, $r = .09, p < .01$.

The correlations are also provided in Table 5.5.

Table 5.5

Correlations between the six psychological variables and psychological reseilience in BMT as measured by peer appraisal

	M	SD	1	2	3	4	5	6	7
1. Psychological resilience	4.24	0.57	-						
2. Pride	3.99	0.76	.32**	-					
3. Hope	3.94	0.68	.33**	.85**	-				
4. Perseverance	4.02	0.64	.32**	.80**	.85**	-			
5. Purpose	3.69	0.84	.30**	.81**	.80**	.76**	-		
6. Optimism	3.29	0.72	.25**	.64**	.64**	.59**	.67**	-	
7. Acceptance	2.72	0.72	.09	-.16**	-.15**	-.10*	-.09	.06	-

Note: Pearson's correlation coefficient. ** $p < 0.01$, * $p < 0.05$

The correlations between the six psychological variables and performance as measured by peer appraisal were as follows:

(1)   there was a statistically significant, weak positive correlation between pride and performance, $r = .35$, $p < .01$;

(2)   there was a statistically significant, weak positive correlation between hope and performance, $r = .35$ $p < .01$;

(3)   there was a statistically significant, weak positive correlation between perseverance and performance, $r = .33$, $p < .01$;

(4)   there was a statistically significant, weak positive correlation between purpose and performance, $r = .31$, $p < .01$;

(5)   there was a statistically significant, weak positive correlation between optimism and performance, $r = .28$ $p < .01$; and

(6)   there was a statistically non-significant, very weak negative correlation between acceptance and performance, $r = .06$, $p < .01$.

The correlations are also provided in Table 5.6.

Table 5.6

Correlations between the six psychological variables and performance in BMT as measured by peer appraisal

	M	SD	1	2	3	4	5	6	7
1. Performance	4.25	0.54	-						
2. Pride	3.99	0.76	.35**	-					
3. Hope	3.94	0.68	.35**	.85**	-				
4. Perseverance	4.02	0.64	.33**	.80**	.85**	-			
5. Purpose	3.69	0.84	.31**	.81**	.80**	.76**	-		
6. Optimism	3.29	0.72	.28**	.64**	.64**	.59**	.67**	-	
7. Acceptance	2.72	0.72	.06	-.16**	-.15**	-.10*	-.09	.06	-

Note: Pearson's correlation coefficient. ** $p < 0.01$, * $p < 0.05$

5.4.4. Multinomial logistic regression – performance in BMT as measured with qualification for leadership training

A series of multinomial logistic regressions were performed to examine the relations between the six psychological variables and the outcome of qualification for leadership training after BMT. The reference category for the outcome variable was 'not qualified for leadership training' and each of the other two categories was compared with this reference group. As the six measures contain different number of items and hence could have different maximum scores, the mean scores were used instead so that the interpretations of the findings could be kept consistent.

The second column in Table 5.7 compares the outcome of "qualified for specialist training" with the reference category. The results showed that for every one point increased in the mean score of:

(1)   pride, chances of qualification for specialist training increased by a factor of 1.75 ($B = .56$, OR = 1.75, $p < 0.001$);

(2)   hope, chances of qualification for specialist training increased by a factor of 2.32 ($B = .84$, OR = 2.32, $p < 0.001$);

(3)   perseverance, chances of qualification for specialist training increased by a factor of 2.16 ($B = .77$, OR = 2.16, $p < 0.001$);

(4)   purpose, chances of qualification for specialist training increased by a factor of 1.84 ($B = .61$, OR = 1.84, $p < 0.001$); and

(5)   optimism, chances of qualification for specialist training increased by a factor of 1.57 ($B = .45$, OR = 1.57, $p < 0.001$).

The third column compares the outcome of "qualified for officer training" with the reference category. The results showed that for every one point increased in the mean score of:

(1)   pride, chances of qualification for specialist training increased by a factor of 1.67 ($B = .51$, OR = 1.67, $p < 0.05$); and

(2)   hope, chances of qualification for specialist training increased by a factor of 1.93 ($B = .66$, OR = 1.93, $p < 0.05$).

Table 5.7

Results of the multinomial logistic regressions performed with the six psychological variables on qualification for leadership training

	Qualified for specialist training (*n* = 88)			Qualified for officer training (*n* = 41)		
	B	*OR (95% CI)*	*SE*	*B*	*OR (95% CI)*	*SE*
Pride	.56	1.75 (1.21, 2.54)***	.19	.51	1.67 (1.01, 2.76)*	.26
Hope	.84	2.32 (1.52, 3.54)***	.22	.66	1.93 (1.11, 3.34)*	.28
Perseverance	.77	2.16 (1.40, 3.31)***	.22	.44	1.55 (0.89, 2.69)	.28
Purpose	.61	1.84 (1.31, 2.58)***	.17	.25	1.28 (0.85, 1.94)	.21
Optimism	.45	1.57 (1.10, 2.24)***	.18	.42	1.52 (0.94, 2.45)	.25
Acceptance	.19	1.21 (0.86, 1.69)	.17	.38	1.46 (0.93, 2.29)	.22

Note: Reference group: not qualified for leadership training (*n* = 250). *B* = unstandardized B estimates, *OR* = Odds Ratio. *SE* = Standard Error. *CI* = Confidence Interval. * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001.

5.4.5. Multiple regression – psychological resilience and performance in BMT (self-report)

Multiple regression was performed to test H_2 that all the psychological variables that had positive relations with psychological resilience and performance in BMT would collectively explain substantial amount of the variance in the two outcomes. When all the five psychological variables that have significant relations with psychological resilience as measured by self-report (i.e., pride, hope, perseverance, purpose and optimism) were entered into the regression together, the results showed that the model explained 44.2% of the variance and that the model was a significant predictor, $F(5, 373) = 59.14$, $p < .001$. While hope [$\beta = .25$, $t(373) = 2.80$, $p < .01$] and perseverance [$\beta = .37$, $t(373) = 4.80$, $p < .001$] contributed significantly to the model, pride [$\beta = .03$, $t(373) = .38$, $p < .71$], purpose [$\beta = -.03$, $t(372) = -0.42$, $p < .68$] and optimism [$\beta = .09$, $t(373) = 1.66$, $p < .10$] did not (see Table 5.8).

Table 5.8

Multiple regression (self-report) with psychological variables related to psychological resilience in BMT

Factor	R^2	β	B	SE	CI 95% (B)
Model	.44***				
Pride		.03	.03	.08	-.13 / .19
Hope		.25**	.28	.10	.08 / .47
Perseverance		.37***	.43	.09	.26 / .61
Purpose		-.03	-.03	.07	-.16 / .10
Optimism		.09	.09	.06	-.02 / .20

Note: ** $p < 0.01$, *** $p < 0.001$.

For performance in BMT, the results showed that the model explained 52% of the variance and that the model was a significant predictor, $F(5, 373) = 81.54$, $p < .001$. While pride [$\beta = .25$, $t(377) = 3.20$, $p < .01$], hope [$\beta = .23$, $t(373) = 2.70$, $p < .01$] perseverance [$\beta = .24$, $t(373) = 3.40$, $p < .001$] and optimism [$\beta = .19$, $t(373) = 3.89$, $p < .001$] contributed significantly to the model, purpose [$\beta = -.11$, $t(373) = -1.65$, $p < .10$] did not (see Table 5.9).

Table 5.9

Multiple regression analysis (self-report) with psychological variables related to performance in BMT

Factor	R^2	β	B	SE	CI 95% (B)
Model	.52***				
Pride		.27**	.26	.08	.10 / .42
Hope		.23**	.27	.10	.07 / .46
Perseverance		.24***	.30	.09	.13 / .48
Purpose		-.11	-.11	.07	-.24 / .02

Optimism	.19***	.22	.06	.11 / .33

Note: ** $p < 0.01$, *** $p < 0.001$.

5.4.6. Multiple regression – psychological resilience and performance in BMT (peer appraisal)

When all the five psychological variables that have significant relations with psychological resilience in BMT as measured by peer appraisal (i.e., pride, hope, perseverance, purpose and optimism) were entered into the regression together, the results showed that the model explained 11.9% of the variance and that the model was a significant predictor, $F(5, 373) = 10.09$, $p < .001$. However, none of the predictor contributed significantly to the model: (1) pride [$\beta = .11$, $t(373) = 1.05$, $p < .30$]; (2) hope [$\beta = .11$, $t(373) = .35$, $p < .01$]; (3) perseverance [$\beta = .10$, $t(373) = 1.03$, $p < .30$]; (4) purpose [$\beta = .03$, $t(373) = .76$, $p < .001$]; and (5) optimism [$\beta = .03$, $t(373) = .48$, $p < .63$] (see Table 5.10).

Table 5.10

Multiple regression (peer appraisal) with psychological variables related to psychological resilience in BMT

Factor	R^2	β	B	SE	CI 95% (B)
Model	.12***				
Pride		.11	.08	.08	-.07 / .24
Hope		.11	.09	.10	-.10 / .28
Perseverance		.11	.09	.09	-.08 / .26
Purpose		.03	.02	.06	-.11 / .14
Optimism		.03	.03	.05	-.08 / .13

Note: *** $p < 0.001$.

For performance in BMT, the results showed that the model explained 13.5% of the variance and that the model was a significant predictor, $F(5, 373) = 11.67$, $p < .001$. However, none of the predictor contributed significantly to the model: (1) pride [$\beta = .12$, $t(373) = 1.15$, $p < .25$]; (2) hope [$\beta = .14$, $t(373) = 1.20$, $p < .23$]; (3) perseverance [$\beta =$

.08, $t(373) = .83$, $p < .41$]; (4) purpose [$\beta = .00$, $t(373) = .05$, $p < .96$]; and (5) optimism [$\beta = .07$, $t(373) = .99$, $p < .32$] (see Table 5.11).

Table 5.11

Multiple regression analysis (peer appraisal) with psychological variables related to performance in BMT

Factor	R^2	β	B	SE	CI 95% (B)
Model	.14***				
Pride		.12	.09	.07	-.06 / .23
Hope		.14	.11	.09	-.07 / .28
Perseverance		.08	.07	.08	-.09 / .23
Purpose		.00	.00	.06	-.11 / .12
Optimism		.05	.07	.05	-.05 / .15

Note: *** $p < 0.001$.

5.5. Discussion

5.5.1. Reliability of the measures

Using George and Mallery's (2003) guideline to interpret the internal consistency, it was found that the reliability of the measures for pride (7 items; $\alpha = .93$ and .95) and hope (8 items; $\alpha = .92$ and .93) were excellent, the measures of purpose (4 items; $\alpha = .83$ and .84) and acceptance (10 items; $\alpha = .87$ and .89) were good, and the measures of perseverance (5 items; $\alpha = .74$ and .80) and optimism (6 items; $\alpha = .72$ and .80) were acceptable.

Using guideline provided by Evans (1996), the test-retest reliability assessment found that the measures of pride [$r(377) = .80$, $p < .001$] and hope [$r(377) = .81$, $p < .001$] were very strong, and the measures of perseverance [$r(377) = .76$, $p < .001$], purpose [$r(377) = .76$, $p < .001$], optimism [$r(377) = .72$, $p < .001$] and acceptance [$r(377) = .69$, $p < .001$] were strong.

Lastly, using guideline provided by Koo and Li (2016), it was found that the test-retest agreement measures of:

(1)   pride {average measure ICC was .88 with a 95% confidence interval from .85 to .91 [$F(378,378) = 9.04$, $p < .001$]};

(2)   hope {average measure ICC was .89 with a 95% confidence interval from .85 to .91 [$F(378,378) = 9.49$, $p < .001$]};

(3)   perseverance {average measure ICC was .86 with a 95% confidence interval from .83 to .87 [$F(378,378) = 7.19$, $p < .001$]};

(4)   purpose {average measure ICC was .86 with a 95% confidence interval from .83 to .86 [$F(378,378) = 7.17$, $p < .001$]};

(5)   optimism {average measure ICC was .83 with a 95% confidence interval from .79 to .86 [$F(378,378) = 5.97$, $p < .001$]}; and

(6)   acceptance {average measure ICC was .81 with a 95% confidence interval from .77 to .85 [$F(378,378) = 5.36$, $p < .001$]} had excellent agreement.

Hence, the first conclusion that could be drawn from Study 3 was that, even with the removal of items from the original scales and modifications made to all the items, the six measures remained reliable in measuring what they were developed to measure. As such, future studies could continue to use these modified items.

5.5.2. Hypothesis 1 – pride, hope, perseverance, purpose, optimism and acceptance are positively related to psychological resilience and performance in BMT

Partial support was found for Hypothesis 1 regarding the psychological variables having significant positive relations with psychological resilience. With the exception of acceptance, Study 3 found moderate to strong significant positive relations between pride ($r = .58$, $p < .01$), hope ($r = .63$, $p < .01$), perseverance ($r = .64$, $p < .01$), purpose ($r = .54$, $p < .01$) and optimism ($r = .47$, $p < .01$) and psychological resilience in BMT as measured with self-report. For psychological resilience in BMT as measured with peer appraisal, while the correlations were weaker, they were nonetheless significant; pride ($r = .32$, $p < .01$), hope ($r = .33$, $p < .01$), perseverance ($r = .32$, $p < .01$), purpose ($r = .30$, $p < .01$) and optimism ($r = .25$, $p < .01$).

Partial support was also found for Hypothesis 1 regarding the psychological variables having significant positive relations with performance. Again, with the

exception of acceptance, Study 3 found moderate to strong significant positive relations between pride ($r = .67$, $p < .01$), hope ($r = .68$, $p < .01$), perseverance ($r = .66$, $p < .01$), purpose ($r = .58$, $p < .01$) and optimism ($r = .57$, $p < .01$) with performance as measured with self-report. Similarly, for performance as measured with peer appraisal, while the correlations were weaker, they were also significant; pride ($r = .35$, $p < .01$), hope ($r = .35$, $p < .01$), perseverance ($r = .33$, $p < .01$), purpose ($r = .31$, $p < .01$) and optimism ($r = .28$, $p < .01$).

The results from the multinomial logistic regressions also partially supported Hypothesis 1 as the odds of qualification for specialist training improved with increases in scores of pride ($B = .56$, OR = 1.75, $p < 0.001$), hope ($B = .84$, OR = 2.32, $p < 0.001$), perseverance ($B = .77$, OR = 2.16, $p < 0.001$), purpose ($B = .61$, OR = 1.84, $p < 0.001$) and optimism ($B = .45$, OR = 1.57, $p < 0.001$). For qualified for officer training, odds were improved as scores increased in pride ($B = .51$, OR = 1.67, $p < 0.05$) and hope ($B = .66$, OR = 1.93, $p < 0.05$). As mentioned, qualification for leadership training data were objective and the outcomes were thought to be a robust measure of BMT performance as they took into account the recruits' various test results assessing physical fitness, military knowledge, marksmanship and trainers' appraisal. Furthermore, the data were collected on a separate occasion after the recruits graduated from BMT. Hence, this also mitigated the effects of possible common method bias if it was present with self-report and peer appraisal data.

Taken together, the results of both the subjective and objective data analyses lent partial supported to Hypothesis 1. Hence, the second conclusion that could be drawn from Study 3 was that pride, hope, perseverance, purpose and optimism were salient psychological variables that had influence over the recruits' psychological resilience and performance in BMT.

5.5.3. Hypothesis 2 – all the psychological variables that have positive relations with psychological resilience and performance will collectively explain substantial amount of the variance in psychological resilience and performance during BMT

The multiple regression found that collectively, the five psychological variables that had significant positive relations with psychological resilience and performance in BMT could account for up to 44.2% and 52% of the variance in both outcomes as measured with self-report. While for peer appraisal, the variance explained in

psychological resilience and performance were lower at 11.9% and 13.5% respectively, the regression equations were nonetheless significant. Hence, the third conclusion of Study 3 was that collectively, the five psychological variables could potentially predict psychological resilience and performance in BMT. Hence, the results supported Hypothesis 2.

While the five psychological variables collectively explained substantial amount of variance in both psychological resilience and performance in BMT as measured with self-report, some of them did not significantly improved the variance accounted for when they were entered into the regression equations. For peer appraisal, while the models for predicting psychological resilience and performance in BMT were significant, none of the predictors contributed significantly to the models. These suggested that some of the psychological variables may be measuring the same aspects of psychological resilience and performance in BMT and signalled the present of multicollinearity.

Study 2 was exploratory in nature and its aim was to examine the recruits' direct account of their BMT experience to identify the internal protective factors that helped them to adapt positively during BMT. Hence, the contribution of Study 3 was in validating the relations between some of these psychological variables and psychological resilience and performance in BMT. Furthermore, in successfully establishing the linkage between pride, hope, perseverance, purpose and optimism with the objective outcome of qualification for leadership training, this study also has practical contribution. The SAF could potentially measure these psychological variables and use the scores to supplement current assessment protocol in deciding which recruits to send for leadership training.

5.5.4. High mean scores for psychological resilience and performance in BMT

Study 3 noted that the mean scores for psychological resilience and performance were high (i.e., greater than 4.0 out of a highest possible 5.0). This suggested that both the participants and their peers thought positively of themselves and their section mates. This could be attributed to two phenomena; healthy worker effect (HWE) and self-enhancement. HWE was initially observed in studies of occupational diseases where workers often exhibited lower overall death rates compared to the general population, because the disabled and ill were naturally excluded from employment in the first place (Last, 1995). As mention in Chapter 1 section 1.3, exemption from NS is granted to those who are physically and mentally unable to perform military duties. Hence, the high mean

scores could be attributed to the profile of recruits; more resilient psychologically and generally better performers compared to the general population. According to Sedikides and Strube (1995), self-enhancement is a type of motivation that helps individuals maintain their self-esteem and make them feel good about themselves. It involves a preference for positive rather than negative view of the self. This phenomenon is especially salient in situations of threat, setback or risk to one's self-esteem. Given that the research participants, being recruits, held the lowest rank in the military and had to confront various adversities during BMT, self-enhancement could be a strategy that the recruits adopted to help them feel good about themselves and to maintain their self-esteem.

5.5.5. Variance accounted for substantial higher for self-report compared to peer appraisal

Study 3 also noted that for self-report, the variance accounted for in both psychological resilience and performance in BMT were substantially higher compared to peer appraisal. There are a number of possible reasons. Firstly, this could be attributed to common method variance where relationships between variables measured by self-reports are inflated (Campbell & Fiske, 1959). Assuming that, based on theory, two constructs are expected to correlate highly. If the methods of measuring these two constructs are also common, it is possible that these methods may have exerted a systematic effect on the observed correlation between the measures. Hence, common method bias may pose as an alternate explanation for the correlation observed between the constructs (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). This is a potential problem in behavioural research and the impact of this bias was discussed more than 50 years ago (Campbell & Fiske, 1959). Hence, to mitigate against the possible negative impact of this phenomenon, Study 3 included another form of method (i.e., using objective data collected from another time timepoint). In addition, it could be that psychological resilience and performance in BMT were difficult to observe by third parties since intention to quit may not result in actual quitting. For example, Recruit A might assess himself to be low on psychological resilience and performance, but he did not quit eventually from a particular activity because his trainer managed to encourage him to carry on. However, this was not known to Recruit A's peers and hence they rated him to be psychologically resilient and performing better than Recruit A's own assessment. Hence, the peers' appraisal of Recruit A's psychological resilience and

performance correlates poorer with Recruit A's actual psychological resilience and performance.

5.5.6. Limitations

While Study 3 did not find any relation between acceptance and psychological resilience and performance in BMT, it may be premature to conclude that this psychological variable has no bearing on these outcomes in reality. The first limitation of the current study was that it was possible that the study did not measure acceptance appropriately. The PHLMS might not be the appropriate scale to be adopted for the current study for a number of reasons. Firstly, the scale was developed with a mix of students, general psychiatric clinical patients, patients with eating disorders and student seeking counselling support (Cardaciotto et al, 2008). Hence there was a possibility that the scale might not be applicable for measuring the acceptance level of soldiers as the profile of the populations and context were different. Furthermore, unlike the other five scales used, all 10 items in the PHLMS are negatively worded. While the responses of these 10 items were subsequently reverse coded in the analyses, this negatively worded format might have given rise to differences in the participants' response patterns. Lastly, on closer inspection of the items, it appeared that some of them might be vague or even potentially problematic. For example, while the item "I try to stay busy to keep thoughts or feelings from coming to mind" measures denial which is generally considered a negative form of coping, it might not be undesirable for the recruits to think in such a manner when engaging in certain BMT activity. To illustrate, for exercises such as trench digging which is typically mundane and can last for days, it may not be a bad thing for the recruits to just keep digging or think about other more pleasant things to motivate themselves so that they can be distracted from the boredom and gruelling experience.

As mentioned, some of the psychological variables might be measuring the same aspects of psychological resilience and performance in BMT and signalled the possible presence of multicollinearity. The second limitation was that the study did not probe further to examine if this was indeed the case as the main aim of the overall research at this stage was to examine the psychological variables individually first. This issue was addressed in the next study.

The use of a 5-point scale to measure psychological resilience in BMT as a criterion could be a limitation as it appeared that most recruits' responses were either

three, four or five, thus limiting the ability of the measure to be responsive. However, there is no consensus in the literature about how many answer category is superior. Proponents of 5-point scale argued that: (1) it improves respondents' comprehension and better enables them to express their views (Marton-Williams, 1986); (2) it can improve response rate, response quality and reduce respondents' frustration level with too many options (Babakus & Mangold, 1992); and (3) it is then possible to compare reliability coefficients with other research using 5-point Likert scales (Saleh & Ryan, 1991). Those who favoured seven points suggested that: (1) reliability is optimized with seven response categories (Ghiselli, 1955); and 7-point scales have stronger correlations with t-test results (Lewis, 1993). Other researchers such as Cox (1980) found seven points to be ideal but acknowledged that as few as five or as many as nine work equally well. In studying the differences between four, five, six and 11point scales using the Rosenberg Self-Esteem Scale, Leung (2011) found that there is no major difference in the means, standard deviations, item–item correlations, item–total correlations, Cronbach's alpha or factor loadings. Hence, to be consistent, Study 3 adopted a 5-point scale as most, four out of six, of the existing scales used for this study have five response categories (i.e., Authentic Pride Scale, Grit-O, LOT-R and PHLMS). Future study could examine whether adopting a scale with different number of response category would make any difference to the results obtained in Study 3.

5.5.7. Implication for future studies

As pride, hope, perseverance, purpose and optimism individually had significant positive relations with psychological resilience and performance in BMT and collectively, they could account for substantial amount of variance in the two outcomes, there was scope to examine if they were separate secondary factors that contributed to a higher-order factor of psychological resilience in BMT. Hence, it was recommended that the next study examined psychological resilience from this angle. This was also in alignment with the recommendation of Study 2 to follow the approach taken by other researchers (e.g., Connor & Davidson, 2003; Friborg et al., 2003) to measure internal protective factors or psychological variables as lower-order factors of psychological resilience. As these five psychological variables were identified in Study 2, and Study 3 found that they were positively related to psychological resilience in BMT, they were relevant to the context of the current research unlike other factors used in various existing scales reviewed in Study 2.

As peer appraisal might not be a good measure of the recruits' psychological resilience and performance in BMT, the next study should address this issue. Also, to ensure that studying and measuring psychological resilience had practical value, the next study should continue to relate the construct to performance outcomes.

Chapter 6:   Examining psychological resilience in BMT as a higher-order construct that includes pride, perseverance, purpose and optimism (Study 4)

In Study 3, the findings showed that the five psychological variables (i.e., pride, hope, perseverance, purpose and optimism) individually had significant positive relations with psychological resilience and performance in BMT. Furthermore, they collectively accounted for substantial amount of variance in the two outcomes as measured with self-report. Hence, it was possible that psychological resilience in BMT was a higher-order construct that was made up of several psychological variables that included the five examined in Study 3. As such, follow-on study should test this assumption.

Chapter 6 begins by highlighting the aims of Study 4 and the associated hypotheses (section 6.1). This is followed by an account of the preparation stage of the study including checking for multicollinearity and addressing the feedback received from the recruits during Study 3 about the length of the questionnaire (section 6.2). The methods section (section 6.3) describes the final measures used, participant characteristics, procedure of Study 4 and the data analysis plan. The results are then reported in section 6.4. Finally, a discussion of the findings of Study 4 and the implications for the future research are provided (section 6.5).

6.1.   Study aims and hypotheses

Study 4 aimed to examine psychological resilience in BMT as a higher-order construct that comprised several secondary psychological variables. Four of these were included based on the findings of Study 2, Study 3, and analyses conducted in preparation for the current study (see section 6.2). Hence, the first hypothesis was:

H_1 – Psychological resilience in BMT is a higher-order construct that comprises secondary psychological variables including pride, perseverance, purpose and optimism (see Figure 6.1 for the hypothesised model)
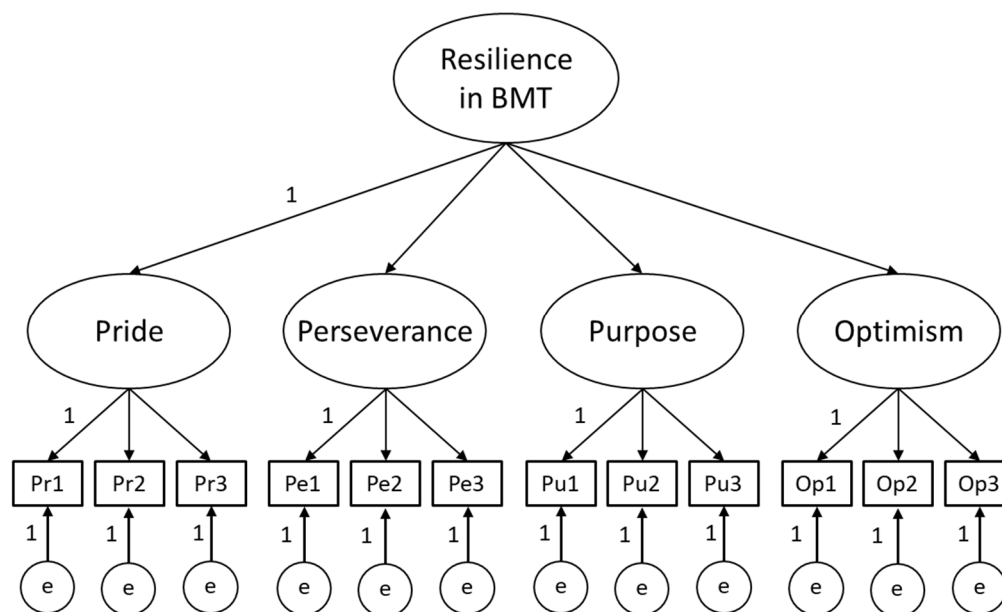
Note: Pr = pride, Pe = perseverance, Pu = purpose, and Op = optimism

Figure 6.1: Hypothesised model of psychological resilience in BMT

As with Study 3, Study 4 examined psychological resilience in relation to BMT performance so that studying and measuring the construct continued to have practical value. The second hypothesis was:

H$_2$ – The recruit's level of psychological resilience in BMT is positively related to performance in BMT

Studying and measuring psychological resilience had value only if the construct had a greater relationship with performance in BMT than the four individual psychological variables that comprised it. In considering pride, perseverance, purpose and optimism as salient facets of psychological resilience instead of focusing on just one individual facet in particular, it was expected that their collective effects would be more impactful than any one of them individually. For example, Recruit A who is optimistic, finds purpose in BMT, perseveres despite hardship and takes pride in his achievements is psychologically more resilient than Recruit B who is just generally optimistic. Hence, the third hypothesis was:

H$_3$ – The recruit's level of psychological resilience in BMT has a relatively stronger positive relation to performance in BMT than each of the individual psychological variable

6.2.   Preparation for Study 4

Acceptance was excluded from the Study 4 as the previous study did not find any relation between it and psychological resilience and performance in BMT as measured by either the self-report, peer appraisal or qualification for leadership training. While the five psychological variables collectively accounted for substantial amount of variance in psychological resilience and performance in BMT, some of them did not significantly improved the variance accounted for when they were entered into the regression equations. For psychological resilience in BMT, pride ($\beta = .03$, $t(373) = .38$, $p < .71$), purpose ($\beta = -.03$, $t(373) = -0.42$, $p < .68$) and optimism ($\beta = .09$, $t(373) = 1.66$, $p < .10$) did not and for performance, purpose ($\beta = -.11$, $t(373) = -1.65$, $p < .10$) did not. These suggested that some of the psychological variables may be measuring the same aspects of psychological resilience and performance in BMT and signalled possible presence of multicollinearity which would likely prevent any of the individual psychological variable from being significant (Dewberry, 2004).

Also, during Study 3, the recruits had to answer up to 76 questions (i.e., seven items for pride, eight items for hope, five items for perseverance, four items for purpose, six items for optimism, 10 items for acceptance, two self-report items and up to 30 items for peer appraisal depending on how many peers they had to rate). They provided feedback that the questionnaire was too long, and their trainers also highlighted that the study took a substantial amount of time out of the BMT curriculum. Hence, before commencing Study 4, it was necessary to address these issues by conducting further analyses with the data collected in Study 3.

6.2.1. Excluding hope from Study 4 – checks on tolerance and Variance Inflation Factor (VIF)

In multiple regression, the tolerance level and Variance Inflation Factor (VIF) are used to gauge if multicollinearity is present. Low level of tolerance and high level of VIF are known to adversely affect the results of analysis (O'Brien, 2007). When the tolerance and VIF reach the different thresholds set by different researchers, they form the basis for the researchers to consider reducing the collinearity by eliminating factors from their analysis (O'Brien, 2007). There are various recommendations for acceptable levels of tolerance and VIF. For tolerance, the most commonly used value of .10 is recommended as the minimum level of tolerance (Tabachnick & Fidell, 2007). However, other researchers have also recommended minimum value of .20 (Menard, 1995) and even as

high as .25 (Huber, Ragin & Stephens, 1993). For VIF, a value of 10 is recommended as the maximum level (Hair, Anderson, Tatham, & Black, 1995). Similarly, there are other more cautious researchers who recommend a maximum VIF value of five (Rogerson, 2001) and even four (Pan & Jackson, 2008). This research adopted the middle ground and chose the value of .20 for tolerance and five for VIF. Table 6.1 shows the tolerance and VIF values of the five psychological variables.

Table 6.1

Multicollinearity tests using tolerance and VIF statistics

Factor	Tolerance	VIF
Pride	.21	4.66
Hope	**.18**	**5.44**
Perseverance	.25	4.03
Purpose	.27	3.70
Optimism	.52	1.94

Note: Tolerance value less than .20 and VIF value of greater than 5 are highlighted in bold.

The tolerance values ranged from .18 to .52 and hope did not meet the minimum level of tolerance of .20. The VIF figures ranged from 1.94 to 5.44 and using the threshold of five, hope surpassed it. Hence, the option was opened for this psychological variable to be excluded from Study 4. To err on the safe side, before this option was exercised, additional regression analyses were performed to examine if the variance accounted for in psychological resilience and performance would be substantially reduced with the exclusion of hope.

6.2.2. Excluding hope from Study 4 – checks on whether variance accounted for in psychological resilience and performance would be substantially affected

In Study 3, when all five psychological variables were entered into the regression analysis together, the results showed that the model explained 44.2% of the variance and that the model was a significant predictor of psychological resilience as measured by self-report, $F(1, 377) = 59.14$, $p < .001$. For performance, the results showed that the model explained 52% of the variance and that the model was a significant predictor of performance as measured by self-report, $F(1, 377) = 81.54$, $p < .001$.

After removing hope from the regression analysis, the results showed that the model now explained 43% of the variance in psychological resilience and that the model was still a significant predictor of resilience, $F(1, 377) = 70.65$, $p < .001$ (see Table 6.2).

Table 6.2

Summary of multiple regression (self-report) with psychological variables related to psychological resilience (after removing hope)

Factor	R^2	β	B	SE	CI 95% (B)
Model	.43***				
Pride		.13	.12	.08	-.03 / .27
Perseverance		.48***	.55	.08	.40 / .71
Purpose		-.00	-.00	.07	-.13 / .13
Optimism		.11*	.11	.06	-.00 / .22

Note: * $p < 0.05$, *** $p < 0.001$.

Likewise, for performance, the results showed that the model now explained 51.3% of the variance and that the model was still also a significant predictor of performance, $F(1, 377) = 98.44$, $p < .001$ (see Table 6.3).

Table 6.3

Summary of multiple regression analysis (self-report) with psychological variables related to performance (after removing hope)

Factor	R^2	β	B	SE	CI 95% (B)
Model	.51***				
Pride		.33***	.35	.08	.20 / .50
Perseverance		.34***	.42	.08	.26 / .58
Purpose		-.08	-.08	.07	-.21 / .05
Optimism		.21***	.23	.06	.12 / .34

Note: *** $p < 0.001$.

As the reductions in variance explained in psychological resilience and performance were negligible, the decision was made to exclude hope from Study 4.

6.2.3. Reducing number of items – choosing three items with the highest loadings for each factor

In order to address the feedback from the recruits about survey fatigue and to avoid taking them off training for too long, it was necessary to reduce the number of items for each measure so that the questionnaire can be kept succinct. Furthermore, it was in the interest of the research to keep the measure short so that response biases caused by boredom or fatigue could be minimised (Schmitt & Stults, 1985). According to Raubenheimer (2004), the minimal number of items needed in a measure that contains more than one factor is three, as this will allow all of the subscales to be successfully identified. Hence, it was decided that each psychological variable would be measured with three items. These three items were chosen based on their loadings on the psychological variables.

At this preparation stage of the study, the psychological variables were treated as distinct from one another, and as the intent was to solely choose which items to retain for each measure, a series of Exploratory Factor Analysis (EFA) were performed to inspect their factor loading values on the respective psychological variables. To address the issue of factor structure, Confirmatory Factor Analysis (CFA) was performed in the actual study. Maximum likelihood extraction was chosen for the EFA as it was the best choice since it allows statistical significance testing of factor loadings (Fabrigar, Wegener, MacCallum & Strahan, 1999). For rotation, both oblique and orthogonal options were explored.

While the aim was to choose the three highest loading items for each factor, it was also important to examine the reliability of the factor and factor loading values. According to Stevens (2002), the larger the sample size, the smaller the loadings are required for a factor to be considered significant. Using an alpha level of .01 (two-tailed), a rotated factor loading for a sample size of at least 300, as was the case with the previous study, would need to be minimally .32 to be considered statistically meaningful (Tabachnick & Fidell, 2007). The factor loading values of each item of the respective measures are shown in Tables 6.4, 6.5, 6.6 and 6.7.

Table 6.4

Factor loading values for items measuring pride

Item	Factor loading
In general, I feel a sense of accomplishment during BMT.	**.91**
In general, I feel like I have achieved something during BMT.	**.91**
In general, I feel confident during BMT.	.84
In general, I feel a sense of fulfilment during BMT.	**.91**
In general, I feel productive during BMT.	.81
In general, I feel like I have a sense of self-worth during BMT.	.85
In general, I feel I have been successful during BMT.	.80
Eigenvalues	5.47
% of variance	78.18

Note: Three highest loading items in bold.

Table 6.5

Factor loading values for items measuring perseverance

Item	Factor loading
During BMT, I have overcome setbacks to conquer an important challenge.	**.78**
During BMT, setbacks don't discourage me.	.60
During BMT, I finish whatever I begin.	**.63**
During BMT, I have achieved a goal that took a lot of effort.	.61
I am diligent during BMT.	**.68**
Eigenvalues	3.46
% of variance	49.49

Note: Three highest loading items in bold.

Table 6.6

Factor loading values for items measuring purpose

Item	Factor loading
During BMT, I have a feeling that I really don't care about what is going on around me.	.49
I have clear goals and purpose for BMT.	**.84**
Doing the things I do in BMT gives me a sense of satisfaction.	**.89**
I feel that there is meaning in the things I do in BMT.	**.84**
Eigenvalues	2.78
% of variance	69.42

Note: Three highest loading items in bold.

Table 6.7

Factor loading values for items measuring optimism

Item	Factor loading
In uncertain times during BMT, I usually expect the best.	**.64**
During BMT if something can go wrong for me, it will.	.07
I'm always optimistic about what happens to me in BMT.	**.74**
During BMT, I hardly ever expect things to go my way.	.22
During BMT, I rarely count on good things happening to me.	.01
Overall, I expect more good things to happen to me than bad ones during BMT.	**.54**
Eigenvalues	3.01
% of variance	50.16

Note: Three highest loading items in bold.

6.2.4. Reducing the number of items – checks on whether variance accounted for in psychological resilience and performance would be affected

Next, it was essential to ensure that the removal of the items did not substantially reduce the variance accounted for in psychological resilience and performance in BMT. Earlier, it was established that the removal of hope did not adversely affect the variance accounted for in both psychological resilience and performance. Having chosen the three

items with the highest loadings for all four psychological variables, multiple linear regressions were performed again. For psychological resilience, the results showed that the model now explained 42.2% of the variance and that the model was still a significant predictor, $F(1, 377) = 66.29$, $p < .001$.

Table 6.8

Summary of multiple regression (self-report) with psychological variables related to psychological resilience (after removing items)

Factor	R^2	β	B	SE	$CI\ 95\%\ (B)$
Model	.42***				
Pride		.18**	.17	.07	.04 / .31
Perseverance		.43***	.46	.07	.32 / .59
Purpose		-.01	-.01	.06	-.12 / .14
Optimism		.09	.07	.05	-.03 / .17

Note: ** $p < 0.01$, *** $p < 0.001$.

For performance, the results showed that the model now explained 49.1% of the variance and that the model was also still a significant predictor, $F(1, 377) = 90.21$, $p < .001$.

Table 6.9

Summary of multiple regression (self-report) with psychological variables related to performance (after removing items)

Factor	R^2	β	B	SE	$CI\ 95\%\ (B)$
Model	.49***				
Pride		.23***	.24	.07	.11 / .37
Perseverance		.33***	.37	.07	.23 / .51
Purpose		-.02	-.06	.06	-.15 / .11
Optimism		.25***	.05	.05	.12 / .33

Note: *** $p < 0.001$.

Again, as the reduction in the number of items to three for each psychological variable did not result in substantial decrease in the variance accounted for in both psychological resilience and performance, this decision was maintained.

6.3. Methods

6.3.1. Measures

The same four measures were used for Study 4 [i.e., the Authentic Pride Scale (Tracy & Robins, 2007), the Grit-O (Duckworth & Quinn, 2009), Orientation to Life Scale (Antonovsky, 1987) and LOT-R (Scheier et al., 1994)]. However, the number of items had been reduced to three for each psychological variable (see Appendix S for the 12 items). To examine psychological resilience in BMT as a higher-order construct, Study 4 also examined these 12 items as one measure. Two additional measures and age from the biodata were used to assess the convergent validity and divergent validity of the new measure. Convergent validity is concerned with "*demonstrating that two independent methods for inferring an attribute lead to similar ends*" (Nunnally & Bernstein, 1994, p. 92). Convergent validity can be assessed by examining the extent to which two or more independent measures are correlated. The assumption is that a measure is accurately measuring a construct if it correlates highly with another measure that has been established to measure the same or similar construct. Divergent validity is about the extent to which a measure is measuring something different from another instrument. Again, this can be examined though correlation between two or more measures, and divergent validity can be established if they are not correlated to an extremely high degree (Whitley, 1996). To assess convergent validity, Study 4 used the CD-RISC 10 (see Appendix T) to measure psychological resilience (Campbell-Sills & Stein, 2007) and 10 items from the Big-Five factor markers (Goldberg, 2001) to measure conscientiousness (see Appendix U). For divergent validity, age was used.

6.3.2. Participants

The research participants were similarly recruited from BMTC. However, Study 4 involved a different batch of recruits who were enlisted at a later time point from those who took part in the previous study. Again, the initial planned sample size was 500. 442 recruits turned upon the day of the study. However, only data from 437 recruits were used for Study 4. This was because for ethical reasons, the recruits were given option not to take part in the research if they did not consent to the use of their data (see sub-section

6.3.3 for the procedure of Study 4). All the recruits had either completed A-levels or polytechnic education. They were all male with an age range from 18 to 22 years and the mean age was 20.12 years (SD = 0.88).

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┌─────────────────┐
│ Initial planned │
│  sample size    │          ┌──────────────────┐
│   n = 500       │◄─────────│ Data collection  │
└────────┬────────┘          └──────────────────┘
         │
         ▼
┌─────────────────┐
│ Participants    │          ┌──────────────────┐
│ present         │          │ After taking into│
│ on the day of   │◄─────────│ consideration    │
│ study           │          │ those            │
│   n = 442       │          │ who did not wish │
└────────┬────────┘          │ to take part     │
         │                   └──────────────────┘
         ▼
┌─────────────────┐
│ Total number of │
│ participants    │
│ involved in     │
│ Study 4         │
│   n = 437       │
└─────────────────┘
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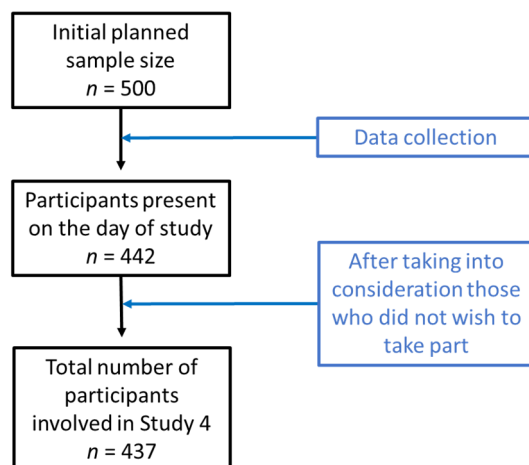
Figure 6.2: Flow chart of participants recruitment for Study 4

6.3.3. Procedure

Five days before the study, the recruits were provided with information sheets (see Appendix V) containing the details of the study. As there was no direct access to the recruits, these information sheets were again disseminated through the trainers.

The study was conducted in an auditorium in BMTC. Coordination was made with the school's commanding officer to assemble the recruits for the study. The purpose of the study was also explained to the recruits after they were invited into the auditorium and sat down. Similar to Study 3, the recruits were asked if they had any concern or issue with taking part in the research, and whether anyone was feeling unwell. They were also given the option to withdraw and go back to their training if they wished.

An attendance check was conducted based on the nominal roll submitted by the BMTC. Thereafter, the recruits were given the consent forms (see Appendix W), No. 2B lead pencils, erasers, question sheets and machine-scoring answer sheets as per Study 3. Instructions were then provided on how to complete the questionnaire. The definition of psychological resilience was also provided so that there is alignment in the understanding of the construct. Each recruit was given 2 question sheets; Questionnaire 1 contained 32 items measuring pride, perseverance, purpose, optimism, psychological resilience and conscientiousness, and Questionnaire 2 contained two self-report items. All questions were answered on a 5-point Likert-type scale.

After the recruits completed the questionnaires, they then individually handed in the answer sheets, returned the rest of the items and were given permission to leave the auditorium. All the answer sheets were then machine-scored and collated into a single SPSS dataset.

6.3.4. Data analysis

The internal consistency of the customised measure, Psychological Resilience in BMT (PsyResQ-BMT), and the other four measures of the secondary factors were examined for reliability. For Study 4, test-retest reliability and agreement could not be checked using data collected for the present study as access to the recruits was only granted once by commander, BMTC. Hence, to be able to at least provide an indication of the test-retest reliability and agreement of the PsyResQ-BMT, data collected in the previous study were used instead. This procedure could provide new insight as the test-retest reliability and agreement assessments in the previous study were examined with all items (i.e., seven items to measure pride, five items to measure perseverance, four items to measure purpose and six items to measure optimism) instead of three each in Study 4.

CFA was performed to test H_1 that psychological resilience in BMT is a higher-order construct that comprised the secondary psychological variables of pride, perseverance, purpose and optimism. The fit of the model was examined using the criteria proposed by Hu and Bentler (1999). The authors suggested that for continuous data, the standard root mean square residual (SRMR) must be less than .08, CFI needs to be greater than .95, TLI has to be greater than .95, and RMSEA should be close to or less than .06. The authors added that the SRMR was the most sensitive to mis-specified factor covariances while the rest of the fit indexes were most sensitive to mis-specified factor loadings. Based on these assertions, they proposed a 2-index strategy using SRMR coupled with another index to assess model fit. To verify that the model was sound, and that the findings were representative of the population and BMT context as a whole, another CFA was conducted with data collected from Study 3 involving an earlier batch of recruits. To test the PsyResQ-BMT's convergent and discriminate validity, the correlations with CD-RISC, measure of conscientiousness and age were inspected.

To test H_2 in examining the relation between psychological resilience in BMT and performance, correlation analyses were performed with self-report data. Peer appraisal data were not used for Study 4 as it was ascertained that they were used as part of the

decision for qualification for leadership training. Multinomial logistic regression was performed for the qualification for leadership training data.

To test H_3 that psychological resilience in BMT had a relatively stronger relation with performance than each of the psychological variable, Study 4 used hierarchical multiple regressions to perform what was termed as usefulness analysis (Darlington, 1990). The idea is that a new measure of a construct is only useful if it can show incremental validity over and beyond established measures of that same construct. Usefulness analysis can be performed to provide evidence to demonstrate this. To illustrate, the approach taken by Luthans et al. (2007) to develop the PCQ is used. Luthans and colleagues examined the variance explained in performance and satisfaction by comparing the composite PsyCap [i.e., consisting of four components: (1) hope; (2) resilience; (3) optimism; and (4) self-efficacy] with each component independently. In four separate analyses, hope, resilience, optimism and self-efficacy were first entered into the regression to predict performance and satisfaction. Thereafter, the overall PsyCap was entered into the regression to determine whether more variance in performance and satisfaction was accounted for. The results were then compared with a reverse procedure (i.e., overall PsyCap was entered first into the regression followed by each individual component). The authors found that when the overall PsyCap were entered after each component, more variance in performance and satisfaction was accounted for. For the reverse procedure, variance in performance and satisfaction accounted for remained the same. This approach of comparing the composite measure to each individual scale was also adopted by Judge et al. (2003) to assess CSE. For Study 4, the value of the composite PsyResQ-BMT was compared with each of the individual scale that were used to measure pride, perseverance, purpose and optimism. Each individual psychological variable was first entered into the regression to predict performance. Then, psychological resilience in BMT was entered into the regression to examine whether more variance in performance could be accounted for. The results were then compared with the reverse procedure where psychological resilience in BMT was entered first into the regression followed by each individual psychological variable. The sequence of analysis is depicted in Figure 6.2.

Step 1
Preparation for Study 4
1. Acceptance excluded as Study 3 did not find any relation between it and psychological resilience and performance
2. Hope excluded on the basis that:
- it did not meet the minimum level of tolerance and the VIF figures surpassed the threshold
- excluding hope factor did not substantially affect the variance accounted for in psychological resilience and performance
3. reduced total number of items to three for each psychological variable:
- kept three items with the highest loadings
- ensured that reducing items did not substantially affect the variance accounted for in psychological resilience and performance

* While the five psychological variables collectively accounted for substantial amount of variance in psychological resilience and performance in BMT, some of them did not significantly improved the variance accounted for when they were entered into the regression equations. Hence, multicollinearity was suspected.

* Participants provided feedback that the questionnaire is too long, and their trainers also highlighted that the study took a substantial amount of time out of the BMT curriculum.

Step 2
Assessing reliability and agreement of the R-BMT and all four measures
1. assessed internal consistency
2. assessed test-retest reliability (correlation coefficient)
3. assessed test-retest agreement (ICC)

* Number of items were reduced to three for all four psychological variables, hence the psychometric property may be affected.
* There was a need to assess the R-BMT's psychometric property.

Step 3
To test H_1 - resilience in BMT is a higher-order construct that comprises the secondary factors of pride, perseverance, purpose and optimism
1. conducted CFA
2. assessed convergent and divergent validity

Step 4
To test H_2 – recruit's level of resilience in BMT has a positive relation to performance
1. conducted correlation analyses with self-report data
2. conducted multinomial logistic regressions with categorical data (qualification for different types of leadership training)

Step 5
To test H_3 – recruit's level of psychological resilience in BMT has a relatively stronger relation to performance than each of the individual secondary factor
1. conducted usefulness analysis with self-report data

Figure 6.3: Sequence of analysis

6.4. Results

6.4.1. Reliability and agreement

The internal consistency of the PsyResQ-BMT and four separate measures were: (1) PsyResQ-BMT (12 items; $\alpha = .91$); (2) pride (3 items; $\alpha = .94$); (3) perseverance (3 items; $\alpha = .83$); (4) purpose (3 items; $\alpha = .89$); and (5) optimism (3 items; $\alpha = .83$). Appendix X shows the detail item-level analyses of the five measures.

The test-retest reliability as reflected by the Pearson product-moment correlation coefficients using data from the previous study were: (1) PsyResQ-BMT, $r(377) = .86$, $p < .01$; (2) pride, $r(377) = .74$, $p < .01$; (3) perseverance, $r(377) = .70$, $p < .01$; (4) purpose,

$r(377) = .77$, $p < .01$; and (5) optimism, $r(377) = .74$, $p < .01$. The findings are also included in Table 6.10.

Table 6.10

Test-retest reliability of the PsyResQ-BMT and measures of the four psychological variables

Measure	r	df	p
PsyResQ-BMT	.86**	377	.01
Pride	.74**	377	.01
Perseverance	.70**	377	.01
Purpose	.77**	377	.01
Optimism	.74**	377	.01

Note: ** $p < 0.01$.

The test-retest agreement as reflected by the ICC using data collected from the previous study showed that:

(1)   for PsyResQ-BMT, the average measure ICC was .92 with a 95% confidence interval from .90 to .94 ($F(378,378) = 13.15$, $p < .001$);

(2)   for pride, the average measure ICC was .85 with a 95% confidence interval from .81 to .88 ($F(378,378) = 6.70$, $p < .001$);

(3)   for perseverance, the average measure ICC was .82 with a 95% confidence interval from .78 to .86 ($F(378,378) = 5.63$, $p < .001$);

(4)   for purpose, the average measure ICC was .87 with a 95% confidence interval from .83 to .89 ($F(378,378) = 7.74$, $p < .001$); and

(5)   for optimism, the average measure ICC was .85 with a 95% confidence interval from .82 to .88 ($F(378,378) = 6.76$, $p < .001$).

The findings are also included in Table 6.11.

Table 6.11

Test-retest agreement of the PsyResQ-BMT and measures of the four secondary factors

	95% confidence interval		F Test with true value

Factor (average measures)	Intraclass correlation	Lower Bound	Upper Bound	Value	*df*1	*df*2	*p*
PsyResQ-BMT	.92***	.90	.94	13.15	378	378	.001
Pride	.85***	.81	.88	6.70	378	378	.001
Perseverance	.82***	.78	.86	5.63	378	378	.001
Purpose	.87***	.83	.89	7.74	378	378	.001
Optimism	.85***	.82	.88	6.76	378	378	.001

Note: *** $p < 0.001$.

6.4.2. Confirmatory factor analyses

In testing H_1 that psychological resilience in BMT was a higher-order construct that comprised the secondary psychological variables of pride, perseverance, purpose and optimism, the CFA results showed the following estimates of model fit: χ^2 (50) = 104.60, $p < .001$, SRMR = .017, CFI = .981, TLI = .975, and RMSEA = .050. The model appeared to have good fit with all four indices meeting the cut-off criteria. To verify that the model is sound and that the findings could indeed be generalised to the population of interest and BMT context, another CFA was performed using the data collected for Study 3. The results again showed that the model fitted the data as the fit indices were good; χ^2 (50) = 165.27, $p < .001$, SRMR = .027, CFI = .974, TLI = .966, and RMSEA = .066. The factor structure and item loading values are presented in Table 6.12 and 6.13 respectively for data collected during Study 4 and Study 3.

Table 6.12

Factor structure and item loadings of the PsyResQ-BMT with data collected for Study 4

Item	Factor 1 (Pride)	Factor 1 (Perseverance)	Factor 1 (Purpose)	Factor 4 (Optimism)
In general, I feel a sense of accomplishment during BMT.	.88			
In general, I feel like I have achieved something during BMT.	.89			
In general, I feel a sense of fulfilment during BMT.	.84			
During BMT, I have overcome setbacks to conquer an important challenge.		.68		
During BMT, I finish whatever I begin.		.67		
I am diligent during BMT.		.79		
I have clear goals and purpose for BMT.			.72	
Doing the things I do in BMT gives me a sense of satisfaction.			.83	
I feel that there is meaning in the things I do in BMT.			.81	
In uncertain times during BMT, I usually expect the best.				.71
I'm always optimistic about what happens to me in BMT.				.83
Overall, I expect more good things to happen to me than bad ones during BMT.				.49

Table 6.13

Factor structure and item loadings of the PsyResQ-BMT with data collected for Study 3

Item	Factor 1 (Pride)	Factor 1 (Perseverance)	Factor 1 (Purpose)	Factor 4 (Optimism)
In general, I feel a sense of accomplishment during BMT.	.96			
In general, I feel like I have achieved something during BMT.	.95			
In general, I feel a sense of fulfilment during BMT.	.87			
During BMT, I have overcome setbacks to conquer an important challenge.		.81		
During BMT, I finish whatever I begin.		.68		
I am diligent during BMT.		.81		
I have clear goals and purpose for BMT.			.87	
Doing the things I do in BMT gives me a sense of satisfaction.			.87	
I feel that there is meaning in the things I do in BMT.			.82	
In uncertain times during BMT, I usually expect the best.				.76
I'm always optimistic about what happens to me in BMT.				.87
Overall, I expect more good things to happen to me than bad ones during BMT.				.74

6.4.3. Convergent and discriminant validity

In addition to assessing the factor structure of the PsyResQ-BMT and the items' factor loading values, its discriminant and convergent were also examined. The PsyResQ-BMT was not related to age but had strong positive relations with the CD-RISC 10 ($r = .70, p < .001$) and conscientiousness (Big-Five factor markers) ($r = .66, p < .001$). The correlation matrix is presented in Table 6.14.

Table 6.14

Correlation matrix

Measure	PsyResQ-BMT	Age	CD-RISC	Con
PsyResQ-BMT	-			
Age	.08	-		
CD-RISC 10	.70***	-.25	-	
Conscientiousness (Big-Five factor markers – Con)	.66***	.03	.67***	-

Note: Pearson's correlation coefficient. *** $p < 0.001$.

6.4.4. Correlations – performance as measured with self-report

Correlation analyses were performed to test H_2 that the recruit's level of psychological resilience in BMT had a positive relation to performance in BMT. The correlations between the four secondary factors[12] and performance were also inspected individually for reference. The correlations to performance as measured by self-report were as follows:

(1)   there was a statistically significant, strong positive correlation between psychological resilience in BMT and performance, $r = .63, p < .01$;

(2)   there was a statistically significant, moderate positive correlation between pride and performance, $r = .56, p < .01$;

(3) there was a statistically significant, strong positive correlation between perseverance and performance, $r = .60, p < .01$;

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[12] The psychological variables were also referred to as factors after the CFA.

(4) there was a statistically significant, moderate positive correlation between purpose and performance, $r = .57$, $p < .01$; and

(5) there was a statistically significant, moderate positive correlation between optimism and performance, $r = .45$, $p < .01$.

The correlations are also provided in Table 6.15.

Table 6.15

Correlations between psychological reseiliencein BMT, the four factors and performance as measured by self-report

	M	SD	1	2	3	4	5	6
1. Performance	4.05	0.72	-					
2. Psychological resilience in BMT	3.97	0.56	.63**	-				
3. Pride	4.20	0.62	.56**	.86**	-			
4. Perseverance	4.13	0.57	.60**	.84**	.66**	-		
5. Purpose	3.87	0.72	.57**	.90**	.73**	.73**	-	
6. Optimism	3.69	0.72	.45**	.80**	.55**	.53**	.61**	-

Note: Pearson's correlation coefficient. ** $p < 0.01$

6.4.5. Multinomial logistic regression – performance as measured with qualification for leadership training

To test H_2, multinomial logistic regression was performed to examine the relation between psychological resilience in BMT and performance as measured with the outcome of qualification for leadership training after BMT. For reference, additional multinomial logistic regressions were also performed for the four factors separately to examine their individual contribution. The reference category for the outcome variable was 'not qualified for leadership training' and each of the other two categories was compared with this reference group. As the PsyResQ-BMT contained 12 items while the other measures contained three items each, the total scores differed between the PsyResQ-BMT and the four measures. Hence, the mean scores were used instead so that the interpretations of the findings could be kept consistent.

The second column in Table 6.16 compares the outcome of "qualified for specialist training" with the reference category. The results showed that for every one point increased in the mean score of:

(1)   PsyResQ-BMT, chances of qualification for specialist training increased by a factor of 2.11 ($B = .75$, OR = 2.11, $p < 0.001$);

(2)   pride, chances of qualification for specialist training increased by a factor of 1.62 ($B = .48$, OR = 1.62, $p < 0.001$);

(3)   perseverance, chances of qualification for specialist training increased by a factor of 1.97 ($B = .68$, OR = 1.97, $p < 0.001$);

(4)   purpose, chances of qualification for specialist training increased by a factor of 1.81 ($B = .59$, OR = 1.81, $p < 0.001$); and

(5)   optimism, chances of qualification for specialist training increased by a factor of 1.52 ($B = .42$, OR = 1.52, $p < 0.001$).

The third column compares the outcome of "qualified for officer training" with the reference category. The results showed that for every one point increased in the mean score of:

(1)   PsyResQ-BMT, chances of qualification for officer training increased by a factor of 4.46 ($B = 1.50$, OR = 4.46, $p < 0.001$);

(2)   pride, chances of qualification for officer training increased by a factor of 2.05 ($B = .72$, OR = 2.05, $p < 0.001$);

(3)   perseverance, chances of qualification for officer training increased by a factor of 5.11 (B = 1.63, OR = 5.11, $p < 0.001$);

(4)   purpose, chances of qualification for officer training increased by a factor of 3.46 (B = .61, OR = 1.24, $p < 0.001$); and

(5)   optimism, chances of qualification for officer training increased by a factor of 2.40 (B = .88, OR = 2.40, $p < 0.001$).

Table 6.16

Results of the multinomial logistic regressions performed with the PsyResQ-BMT and separately for the four internal factors on qualification for leadership training

	Qualified for specialist training (n = 135)			Qualified for officer training (n = 36)		
	B	*OR (95% CI)*	*SE*	*B*	*OR (95% CI)*	*SE*
PsyResQ-BMT	.75	2.11 (1.42, 3.14)***	.20	1.50	4.46 (2.19, 9.08)*	.36
Pride	.48	1.62 (1.14, 2.30)**	.18	.72	2.05 (1.11, 3.77)*	.31
Perseverance	.68	1.97 (1.33, 2.91)***	.20	1.63	5.11 (2.46, 10.62)***	.37
Purpose	.59	1.81 (1.32, 2.47)***	.16	.61	3.46 (1.93, 6.20)***	.30
Optimism	.42	1.52 (1.12, 2.06)**	.16	.88	2.40 (1.40, 4.11)***	.27

Note: Reference group: not qualified for leadership training (n = 266). *B* = unstandardized B estimates, *OR* = Odds Ratio. *SE* = Standard Error. *CI* = Confidence Interval. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

6.4.6.   Usefulness analysis with hierarchical multiple regressions

To test H_3 that psychological resilience in BMT had a relatively stronger relation with performance than each of the psychological variable, a series of hierarchical multiple regressions were performed for the usefulness analysis. The psychological variables were each entered into the equations first followed by psychological resilience in BMT. The results showed that psychological resilience in BMT significantly increased the variance accounted for in performance in all cases:

(1)   with pride, psychological resilience in BMT increased the variance accounted for in performance by 9% when it was entered into the equation $F(2,433) = 145.82, p < .001$;

(2)   with perseverance, psychological resilience in BMT increased the variance accounted for in performance by 8% when it was entered into the equation $F(2,433) = 154.62, p < .001$;

(3)   with purpose, psychological resilience in BMT increased the variance accounted for in performance by 8% when it was entered into the equation $F(2,433) = 145.57, p < .001$; and

(4)   with optimism, psychological resilience in BMT increased the variance accounted for in performance by 20% when it was entered into the equation $F(2,433) = 150.82, p < .001$.

When the order was reversed, it was found that all the four psychological variables did not substantially increase the variance accounted for in performance (see Table 6.17).

Table 6.17

Usefulness analysis of psychological resilience in BMT compared with individual psychological variable

	Variance accounted for	Increase in variance accounted for
1. Pride	.31***	
2. Pride and psychological resilience in BMT	.40***	9%
1. Perseverance	.36***	
2. Perseverance and psychological resilience in BMT	.42***	8%
1. Purpose	.32***	
2. Purpose and psychological resilience in BMT	.40***	8%

1. Optimism	.21***	
2. Optimism and psychological resilience in BMT	.41***	20%
1. Psychological resilience in BMT	.40***	
2. Psychological resilience in BMT and pride	.40***	0%
1. Psychological resilience in BMT	.40***	
2. Psychological resilience in BMT and perseverance	.41***	1%
1. Psychological resilience in BMT	.40***	
2. Psychological resilience in BMT and purpose	.40***	0%
1. Psychological resilience in BMT	.40***	
2. Psychological resilience in BMT and optimism	.41***	1%

6.5. Discussion

6.5.1. Reliability of the measures

Using George and Mallery's (2003) guideline to interpret the internal consistency, it was found that the reliability of the PsyResQ-BMT (12 items; $\alpha = .91$) was excellent. Using guideline provided by Evans (1996), the test-retest reliability assessment found that the PsyResQ-BMT [$r(377) = .86$, $p < .01$] was very strong. Lastly, using guideline provided by Koo and Li (2016), it was found that the test-retest agreement measures of the PsyResQ-BMT {the average measure ICC was .92 with a 95% confidence interval from .90 to .94 [$F(378,378) = 13.15$, $p < .001$]} had excellent agreement. Hence, the first conclusion that could be drawn from Study 4 was that, the PsyResQ-BMT using just 12 items to measure pride, perseverance, purpose and optimism was a reliable measure. Furthermore, Study 4 contributed to the overall research by reducing the number of items needed to measure psychological resilience in BMT from 22 to just 12, hence resulting in a more efficient measure.

6.5.2. Hypothesis 1 – psychological resilience in BMT is a higher-order construct that comprises pride, perseverance, purpose and optimism

As mentioned, Study 4 aimed to examine psychological resilience, specifically in the BMT context, as a higher-order construct that comprised pride, perseverance, purpose and optimism. The results of two separate CFAs performed using data collected at different time-points from different samples showed that the PsyResQ-BMT model fitted the data well. The PsyResQ-BMT also correlated strongly with the CD-RISC 10 ($r = .70$, $p < .001$) which is a widely used measure of psychological resilience as an outcome. This suggested that the PsyResQ-BMT is indeed measuring psychological resilience or at least certain aspects of the construct. Hence, there was evidence to support Hypothesis 1. As the previous study had found that 44.2% of the variance in psychological resilience in BMT could be explained by the four psychological variables, it is plausible that psychological resilience in BMT comprises more than just pride, perseverance, purpose and optimism examined in the current research, and can include other aspects of individual differences. The second conclusion that could be drawn from Study 4 was that in the BMT context involving conscripted recruits, psychological resilience in BMT is a higher-order construct that comprises of pride, perseverance, purpose, optimism and plausibly more.

6.5.3. Hypothesis 2 – the recruit's level of psychological resilience in BMT is positively related to performance in BMT

Study 4 found a strong significant positive relation between psychological resilience in BMT and performance as measured with self-report ($r = .63$, $p < .01$). In addition, its constituent parts were also positively related to performance; pride ($r = .56$, $p < .01$), perseverance ($r = .60$, $p < .01$), purpose ($r = .57$, $p < .01$) and optimism ($r = .45$, $p < .01$). Hence, Hypothesis 2 regarding psychological resilience in BMT having significant positive relations with performance was supported. The results from the multinomial logistic regression also supported Hypothesis 2 as the odds of qualification for specialist training improved with increase in score of PsyResQ-BMT ($B = .75$, OR = 2.11, $p < 0.001$) and odds of qualification for officer training also improved with increase in score of PsyResQ-BMT ($B = 1.50$, OR = 4.46, $p < 0.001$). Furthermore, increases in the scores of all its constituent parts separately also significantly improved the odds of qualification for both specialist and officer training. As such, the third conclusion that

could be drawn from Study 4 was that psychological resilience in BMT was positively related to the recruits' performance in terms of qualification for leadership training.

6.5.4. Hypothesis 3 – the recruit's level of psychological resilience in BMT has a relatively stronger positive relation to performance than each of the individual psychological variable

The results from the usefulness analysis performed using hierarchical regressions showed that psychological resilience in BMT had a relatively stronger relation with performance than each of the psychological variable. Hence, Hypothesis 3 was supported. In addition, psychological resilience in BMT alone could account for up to 40% of the variance in performance. As psychological resilience in BMT could explain variance in performance beyond what the four individual psychological variables could, incremental validity was hence demonstrated. The fourth conclusion that could be drawn from Study 4 was that it was useful to study and measure psychological resilience in BMT as a whole.

6.5.5. Progress of the overall research effort at this point

Study 2 had ascertained what constituted as adversities in BMT and identified various internal and external protective factors or psychological variables that helped the recruits to adapt positively during BMT. Consequently, in the context of the current research, psychological resilience could be conceptualised as an internal capacity. In operationalising psychological resilience in this perspective, it is an internal capacity that is made up of multiple internal protective factors or psychological variables, and in this particular study, they included pride, perseverance, purpose and optimism. Psychological resilience could also be conceptualised as a process as there were interactions between the recruits, the adversities and protective factors in their environment. In operationalising psychological resilience in this viewpoint, there are processes that involved how the recruits appraise the adversities, what internal protective factors shield them from the negative impact of exposure to the adversities, and what external protective factors are available to facilitate them in adapting positively. Hence, the first research question of the overall research related to how psychological resilience could be conceptualised and operationalised was addressed.

The second research question was about how to measure psychological resilience in the context of the current research, and this was addressed by Study 2, Study 3 and Study 4. Study 2 had identified various internal psychological variables that helped the

recruits to adapt positively during BMT and Study 3 found that they were positively related to psychological resilience and performance in BMT. Furthermore, Study 4 managed to establish the construct as a higher-order factor that comprised these psychological variables which included pride, perseverance, purpose and optimism. While Study 4 did not claim to have developed a definitive measure of psychological resilience in BMT, it did contribute to the overall research in customising a resilience measure in the context of BMT involving conscripted recruits; by assessing the psychological variables that are related to the construct. This approach of measuring psychological resilience was also in line with how other researchers developed their respective scales to measure the construct in different settings. For example, CD-RISC 25 that was developed in a clinical setting included: (1) personal competence, high standards, and tenacity; (2) trust in one's instinct, tolerance of negative effects, and strengthening effects of stress; (3) positive acceptance of change and secure relationships; (4) control; and (5) spiritual influences as secondary factors while the RSA used for testing adults in general included personal competence, social competence and personal structure. As mentioned, it is plausible that psychological resilience in BMT comprises more than just the four psychological variables examined in the current research. As such, this research positioned the PsyResQ-BMT as a measure that is modular in nature. On one hand, it is possible to improve the variance explained in psychological resilience in BMT by including more secondary psychological variables into the measure when specifically examining the BMT context. On the other hand, it may also be possible to add, exclude, or mix and match different secondary psychological variables into the measure when examining another military context (e.g., more advance training phases involving the same participants, leadership training where the profile of the participants is different, and during operations when the adversities differ).

The third research question related to whether psychological resilience in BMT could predict the recruits' performance was addressed by Study 4. Using correlation analyses, Study 4 found a strong significant positive relation between psychological resilience in BMT and performance as measured with self-report. In addition, the results from the multinomial logistic regressions also showed that the odds of qualification for specialist and officer training improved with increases in scores of PsyResQ-BMT.

6.5.6. Limitation

Two limitations were identified for Study 4. The first limitation was that the PsyResQ-BMT was not checked for test-retest reliability using data collected specifically for the Study 4. This was because access to the recruits was granted only once, unlike in Study 3 when data were collected at Week 2 and Week 7 of BMT. The second limitation was related to checking the PsyResQ-BMT's discriminant validity. As Study 4 aimed to keep the questionnaire as short as possible so that the study did not take up too much of the recruits' training time, the focus was placed on establishing the PsyResQ-BMT's convergent validity instead of divergent validity. Hence, only the biodata age was used. The education biodata was not appropriate because all the recruits either had A-levels or polytechnic education. While there was no correlation between PsyResQ-BMT and age, the finding was not conclusive as the age range was just limited to between 18 to 22 years. For future study where there is less time constraint, other measures such as the other four personality factors or IQ can be used.

6.5.7. Implication for future studies

As the first three research questions had been addressed by this point in the research, it was timely to focus on the final research question related to whether psychological resilience in BMT could be enhanced through a targeted training intervention. As Study 4 had established psychological resilience in BMT as a higher-order construct that comprised pride, perseverance, purpose and optimism, it also meant that it was possible to target these four psychological variables for intervention. Hence, it was recommended that the next study examined ways to develop the recruits' sense of pride, motivate them to persevere during tough times, help them to find purpose in BMT and meaningfulness of the activities, and encourage them to think optimistically to enhance their level of psychological resilience in BMT. Furthermore, the next study should continue to assess the reliability of the PsyResQ-BMT and higher-order nature of psychological resilience in BMT.

Chapter 7:   Determining how psychological resilience in BMT can be enhanced with targeted training intervention (Study 5)

Having addressed three out of four key research questions of this thesis, Study 5 was conducted to focus on the final research question (i.e., whether psychological resilience in BMT could be enhanced through a targeted intervention). Chapter 7 begins by highlighting the aims of Study 5 and the associated hypothesis (section 7.1). Next, section 7.2 provides an account of the preparation stage of the study including the intervention strategy, content of the new training intervention and how it was developed. The methods section (section 7.3) reiterates the detail of the measure used, and describes the participant characteristics, the procedure and the data analysis plan of the study. The results are then reported in section 7.4. Finally, a discussion of the findings of Study 5 is provided (section 7.5).

7.1.   Research aims and hypothesis

Having developed the PsyResQ-BMT, it was possible to measure the recruits' level of psychological resilience in BMT. Furthermore, it could be used to predict the recruits' performance. However, up until this point, studying and assessing psychological resilience in BMT in this research had only provided insights mostly related to possible screening and selection efforts. As such, Study 5 aimed to examine how psychological resilience in BMT could be enhanced through a targeted training intervention. If psychological resilience in BMT can be enhanced, then there may be scope to improve the well-being of the recruits as this will help them to cope better during BMT. As the recruits adapt more positively, they are more likely to stay in training and perform better during BMT. Hence, it will also contribute to improving the organisation by having better soldiers. The following hypothesis was developed based on the aim of Study 5:

H_1 – psychological resilience in BMT can be enhanced through a targeted training intervention

Study 5 also aimed to examine the psychometric properties of the PsyResQ-BMT and the higher-order nature of psychological resilience in BMT so that the construct could be measured reliably.

7.2. Preparation for Study 5 – design, content and delivery of the training intervention

In consultation with DPD and BMTC, it was decided that two periods (i.e., 100 minutes) could be allocated for the new training intervention. The training intervention would also have to be conducted at the company level as all training programmes in BMT were planned at this level. As such, the mode of delivery was restricted to mainly workshop format with individual-level exercise, as one company could have up to 250 recruits.

The training intervention was developed mainly based on theories and research related to the four constructs of pride, perseverance, purpose and optimism. For example, setting goals can provide individuals with a sense of purpose (Locke & Latham, 2009) and increase their level of perseverance and pride (Williams & DeSteno, 2008), and positive thinking can improve optimism (Scheier & Carver, 1993). In reviewing existing psychological resilience interventions, the literature review (Chapter 2, section 2.10) found that the programmes that worked provided information about what could helped to improve psychological resilience (Cohn & Pakenham, 2008), adopted principles related to CBT and included changing individual's thinking pattern (Williams et al., 2004), and imparted practical skills such as grounding exercise (Adler et al., 2015). Hence, the training intervention was developed using a three-prong strategy: (1) highlighting that it was possible to enhance one's psychological resilience and providing the recruits with information on what could and how to build psychological resilience; (2) imparting skills that promotes psychological resilience; and (3) sharing of personal experience from the perspective of a senior officer. The mode of delivery of the training intervention involved a mix of lecture and individual-level exercise. Figure 7.1 outlines the strategy and how the skills are mapped on to the four psychological variables.
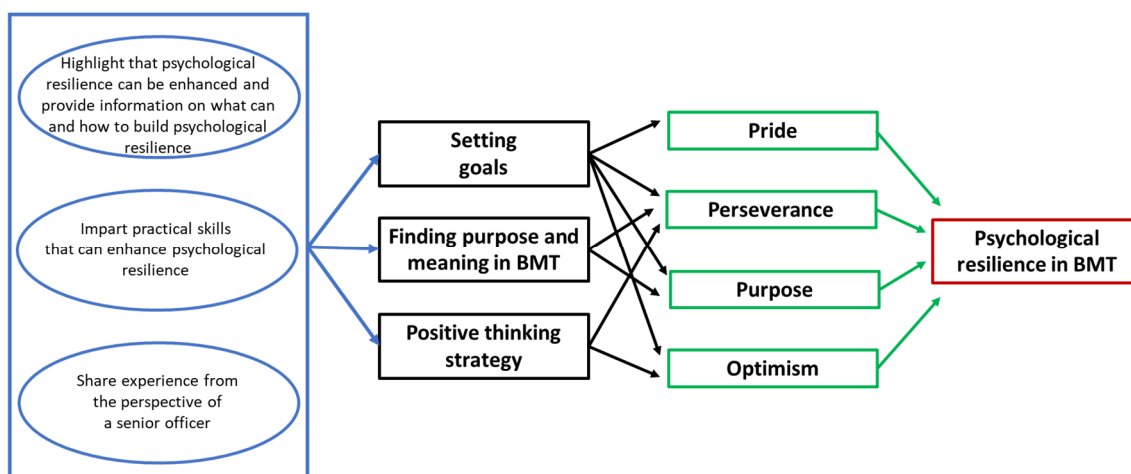
Figure 7.1: Intervention strategy

Taking into consideration the three-prong strategy, the training intervention was designed to include three parts as follows:

7.2.1. Part 1 – Introduction

The first stage would be delivered in lecture format, and PowerPoint slides and video clips. As it was important to establish credibility in order to gain the attention and trust of the recruits (Clark-Hitt et al., 2012), the researcher would need to introduce himself both as a researcher and senior officer of the SAF. The importance of psychological readiness and resilience in influencing performance (Driskell, Copper & Moran, 1994) would be highlighted to impress upon the recruits the need to focus their attention and efforts not just on physical training and preparation during BMT. To reinforce the message, quotes and video clips containing interviews with famous athletes such as Michael Phelps and Singapore's first Olympic gold medallist, Joseph Schooling, would be used. Next, the recruits would be told that it was possible to enhance one's psychological resilience. To illustrate this point, a video clip interview with Sir Mo Farah would be shown. The video clip showed how Sir Mo Farah fell at the 10th lap during the 2016 Rio Olympics 10,000 metres race but eventually won the gold medal, and in the interview, he attributed this to his focus on his purpose for the race; to bring back the gold medal for his daughter. The researcher would then share the key findings of Studies 2, 3 and 4: (1) the internal and external protective factors that recruits from a previous batch of BMT shared; (2) psychological resilience in BMT comprised but not limited to purpose, perseverance, pride and optimism; and (3) psychological resilience in BMT was related to performance. Finally, the recruits would be told that Stage 2 would focus on

how they could target the four internal psychological variables to enhance their psychological resilience during BMT.

7.2.2. Part 2 – Imparting practical skills and sharing personal experience

The second stage would be delivered in lecture format, and it required the recruits to participate in self-reflection, individual-level exercises and sharing ideas with their buddies.

Finding purpose in BMT and NS. As NS is compulsory and the recruits were not able to avoid fulfilling this duty, the researcher would need to encourage them to focus on what they could control instead. Since there was no way out of NS, it made sense for the recruits to make the best out of these two years rather than to go through motion and waste their time. Next, the recruits would be told that it was important to find purpose in every endeavour, and BMT and NS were no exemptions. Otherwise, they would find the nine weeks of BMT and two years of NS meaningless, and time would pass very slowly for them. Thereafter, the researcher would share his personal experience about why having purpose was important and the point would be expanded with various examples including his own BMT encounters and operational deployment. For example, the researcher would share that similar to all the recruits present in the auditorium, he was initially enlisted into the Army as a conscript, and only signed on as a regular much later during NS. During his BMT, he was not particularly motivated to serve as his instructors only emphasised the need to protect the country. The researcher found this idea distal as Singapore had not experienced war since WWII. However, he did find other purpose in serving NS as he saw the duty as a way of fulfilling his obligation as a Singaporean since the country had provided him a safe and peaceful environment to grow up and have an education which his parents did not have. This purpose kept him going as he dutifully participated in each activity and performed every function in BMT. In addition, he found new purposes during BMT; to better himself each day and outdo others in order to qualify for command school. This was triggered by an unpleasant BMT experience when the researcher was punished for reason not made known to him. Since then, his purpose in BMT was to strive to qualify for command school so that when he came into a position of authority, he would not do likewise. The researcher would then encourage the recruits to make the best out of their time in NS, and to create personal purposes for themselves. The recruits would be assured that the purpose did not necessarily need to be as grand as

protecting the country or loved ones. The researcher would then share about what other recruits mentioned during Study 1; purpose could be as simple as seeing NS as an opportunity to expand their circle of friends, to become fitter or to learn new skills. The recruits would then be given five minutes to think about their possible personal purposes for BMT and NS. Next, the recruits would be encouraged to share their initial thoughts with their buddies[13]. Finally, the researcher would urge the recruits to think about this again in the evening during their personal reflection and journaling exercise. This segment of the training intervention was envisaged to contribute to building purpose and perseverance.

Positive thinking strategy. This segment of Stage 2 was largely influenced by the work of Ellis (1991) on the ABC[14] model of rational-emotive therapy (RET) and of CBT. The recruits would be told that it was possible to condition the mind to think positively, and thereby helping them to achieve a more desirable outcome in their endeavours. Next, the researcher would explain how the ABC model worked. To ensure that all recruits could understand, the example of sitting for an examination would be used. To illustrate, the Activating Event would be an upcoming important examination, belief would be "I'm going to fail." or "I don't have enough time to prepare." or "This is unbearable.", and consequence would be anxiety, inability to sleep or remained focus, resulting in poor performance during the examination. Instead, with the same activating event, the recruits could think "I should plan in advance such that I give myself adequate time to prepare for the examination." or "I've sat for many examinations before and did well, this one is no exception." so that they would not panic and lose control. Next, the researcher would focus the recruits' attention back to BMT. The recruits would be encouraged to think positively about BMT in general (e.g., instead of saying to themselves "I don't like to do this.", they could think that "The faster I get this done, the sooner I can do the things that I like." or "It is an opportunity for me to learn new things.". To make this segment more relevant and practical, the example of the 24km route march would be used. Instead of dwelling on "I don't think I can complete the 24km route march.", the recruits could say to themselves "Others have done it before, surely I can too.", "I get to rest after every 4km.", "My buddy and section mates will push me on." or "My parents and girlfriend will feel proud if I can complete the route march.". The recruits would then be asked

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[13] The recruits would be seated next to their assigned BMT buddies.
[14] ABC stands for Activating Events, Beliefs and Consequences.

whether they have experienced any negative consequence over the last few weeks of BMT, what beliefs they held that could possibly have led to this, and could they have thought positively instead to derive at a more desirable consequence. They would then be given five minutes to ponder over this. Next, the recruits would be encouraged to share their thoughts with their buddies. This segment of the training intervention was envisaged to contribute to improving optimism and perseverance.

Goal-setting. The final segment of Stage 2 was guided by the SMART[15] framework (Doran, 1981), and the differentiation between performance, outcome and process goals (Hardy & Jones, 1994). The recruits would first be told that having goals would give them a sense of purpose, help them to persevere, and when they attained the goals they set, they would feel a sense of pride and optimism. Next, the researcher would share that there were three different types of goals; performance, outcome and process goals. Outcome goals focus on the outcomes of a particular event and are based on comparison (e.g., coming in first in class), performance goals are about achieving self-reference standard (e.g., to score 75 points in science examination), and process goals specify certain behaviours during performance. To ensure that the recruits understand the differences, examples related to BMT would be used. For example, qualification for command school could be an outcome goal, performance goal could be running 2.4km below 10 minutes, while process goal could be about clearing the first obstacle of the Standard Obstacle Course (SOC). To facilitate better odds of attaining the goals they set, the recruits would be told that it was important to set SMART goals; specific, measurable, achievable, relevant and time-bound. To illustrate, the researcher would use the 2.4km run as an example. The goal was specific because it was precisely about a particular activity (2.4km run) and clear standard was set (i.e., below 10 minutes). It was measurable because it was possible to ascertain if the goal was met (i.e., running above or below 10 minutes). The goal must also be achievable. If the recruit was running 14 minutes during Week 1, clearly the goal would not be achievable in Week 2. However, if the goal was to run 10 minutes by the last week of BMT, then it was more achievable. To ensure that the goal was relevant, it must be related to BMT (e.g., shooting, running, swimming etc.). Lastly, the recruits must put a time frame to the goal instead of keeping it open (e.g., running 10 minutes in 2.4km run by the last week of BMT instead of just running 10

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[15] SMART stands for Specific, Measurable, Achievable, Relevant and Time-bound.

minutes in 2.4km run). The recruits would then be given five minutes to think about their preliminary goals for BMT. Next, the recruits would be encouraged to share their initial thoughts with their buddies. The researcher would also urge the recruits to think about this again in the evening during their personal reflection and journaling exercise. Finally, the recruits were asked to discuss these goals with their platoon commander during the formal interview sessions. This segment of the training intervention was envisaged to contribute to improving pride, perseverance, purpose and optimism.

7.2.3. Part 3 – Conclusion

At the concluding part of the training, the researcher would reiterate the importance of psychological readiness and resilience in influencing performance. Hence, it was necessary for the recruits to focus their attention and efforts on both physical and psychological preparation during BMT. The researcher would add that it was possible for the recruits to enhance their psychological resilience in BMT and they could start by focusing on their sense of purpose, perseverance, pride and optimism. The recruits would be reminded to think about their purposes and goals for both BMT and NS during their reflection and journaling exercises. In addition, the recruits should set goals that were SMART and discussed them with their platoon commanders during the formal interview session. Finally, before bidding the recruits farewell and wishing them all the best, the researcher would urge them to find various opportunities to practise the positive thinking skill.

7.3. Methods

7.3.1. Design

Study 5 is a cluster or group randomised trial (GRT), a form of randomised controlled trial (RCT). An RCT is a type of scientific experiment that aims to reduce certain sources of bias when testing the efficacy of a new intervention (Chalmers et al., 1981). Participants are randomly assigned to two or more groups, treated differently, and then compared with respect to a measured outcome. The treatment group undergoes the planned intervention while the control group does not. The groups are followed under conditions of the experiment to examine how efficacious the intervention was. In a well-executed RCT, there is usually good opportunity for randomisation to distribute all potential sources of bias evenly such that any difference in the outcome is attributed to the intervention (Murray, 1988). GRT was chosen for Study 5 as it was not possible to

randomly assign recruits individually to different groups as they had to undergo all training in BMT together as a company. Hence, in adopting a GRT, Study 5 had less opportunity, compared to RCT, for randomisation to distribute all potential sources of bias evenly (Murray, 1988). However, the GRT of Study 5 shared some feature and benefits of an RCT (i.e., demographics including but not limited to age, gender, race, education and social economic status were randomised by default as the participants for Study 5 were all male recruits who were part of a larger intake of conscripts who had just completed A-levels, and were randomly assigned to different companies at the beginning of BMT). In addition, efforts were made at the design stage of Study 5 to control for as many confounding effects as possible. Possible confounding variables were identified and controlled for in order to isolate the pre and post changes to the training intervention. Firstly, to control for trainer and mode of delivery effects, the researcher personally conducted the training for the treatment and control groups, and the mode of delivery was kept consistent (i.e., workshop format with individual-level exercises). Secondly, both trainings were conducted in the same location (i.e., BMTC auditorium) to control for environmental factors such as lighting, temperature, noise and the recruits' general level of comfort. Thirdly, to control for the recruits' level of attention, they were given at least seven hours of sleep the night before and both trainings were conducted immediately after lunch. Finally, the PsyResQ-BMT was administered immediately before and after the trainings so that the was no opportunity for the recruits to interact among themselves or with their trainers.

7.3.2. Ethical considerations

As mentioned in both Chapter 1 (Introduction) and Chapter 4 (Study 2), the researcher held a senior rank in the SAF (i.e., Lieutenant Colonel). It was envisaged that his position would have an impact on the nature of the researcher–researched relationship. For Study 2, having exercised reflexivity, the researcher envisaged that in the military environment where there is a high power distance culture, the recruits might feel intimidated or stressed out during the one-to-one interviews if they knew his position and rank in the organisation. In addition, the recruits might feel compelled to participate in the research even when they were given the option not to. Hence, to avoid causing undue stress to the recruits, the researcher decided not to disclose this information. However, for Study 5, the researcher decided that it was necessary to disclose his rank in order to establish source credibility (Clark-Hitt et al., 2012) as he had to conduct a training session.

Again, the researcher exercised reflexivity about the impact of his position and deduced that, unlike Study 2 where the interaction with the recruits were one-to-one, conducting a workshop with up to 250 recruits was unlikely to cause them to be intimidated out stressed out. In addition, to mitigate against the risk of the recruits feeling compelled to take part in the research and fill in the questionnaire, the researcher asked the recruits to just leave the finished or unfinished questionnaire on the table at the end of the session instead of physically handing them in. The recruits' identity and responses were also kept anonymous as they were not required to provide their names or any form of identification.

7.3.3. Measures

The PsyResQ-BMT developed in Study 4 was used to measure psychological resilience in BMT for Study 5. The PsyResQ-BMT consists of 12 items in total, with three items measuring each of the four psychological variables that made up psychological resilience in BMT (i.e., pride, perseverance, purpose and optimism). Items were scored on a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The results of two separate CFAs performed using data collected at different time-points from different samples during Study 4 showed that the PsyResQ-BMT model fitted the data well. Also, the measure can be considered reliable as the PsyResQ-BMT's internal consistency (12 items; $\alpha = .91$), test-retest reliability ($r(377) = .86$, $p < .001$) and agreement {the average measure ICC was .92 with a 95% confidence interval from .90 to .94 [$F(378,378) = 13.15$, $p < .001$]} were also excellent. The PsyResQ-BMT correlated strongly with the CD-RISC 10 which is a widely used measure of psychological resilience as an outcome.

In Study 4, it was also found that the PsyResQ-BMT is positively related to performance as measured by self-report ($r = .63$, $p < .01$). It could also explain a substantial amount of variance in performance, $R^2 = .40$, $F(1, 433) = 291.45$, $p < .001$. Furthermore, multinomial logistic regression analyses also showed that the PsyResQ-BMT could predict qualification for leadership training as the odds improved on prospects to be trained as specialist or officers with simultaneous increases in the PsyResQ-BMT scores.

7.3.4. Participants

This final study involved yet another batch of recruits from BMTC; enlisted after the recruits who took part in the previous two studies. An initial sample size of 500 was

similarly planned for. For Study 5, a total of 481 recruits turned up. The data of 480 recruits were eventually used as one of them did not fill in the answer sheet. The research participants all had completed A-levels. They were all male with an age range from 18 to 22 years and the mean age was 20 years (SD =1.165).

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┌─────────────────────┐
│   Initial planned   │
│    sample size      │
│      n = 500        │
└─────────────────────┘
          │         ┌─────────────────────┐
          │◄────────│  Data collection    │
          │         └─────────────────────┘
          ▼
┌─────────────────────┐
│ Participants present │
│  on the day of study │
│      n = 481        │     ┌─────────────────────┐
│                     │◄────│   After taking into  │
│                     │     │ consideration those  │
│                     │     │  who did not wish to │
│                     │     │      take part       │
          ▼               └─────────────────────┘
┌─────────────────────┐
│  Total number of    │
│    participants     │
│ involved in Study 5 │
│      n = 480        │
└─────────────────────┘
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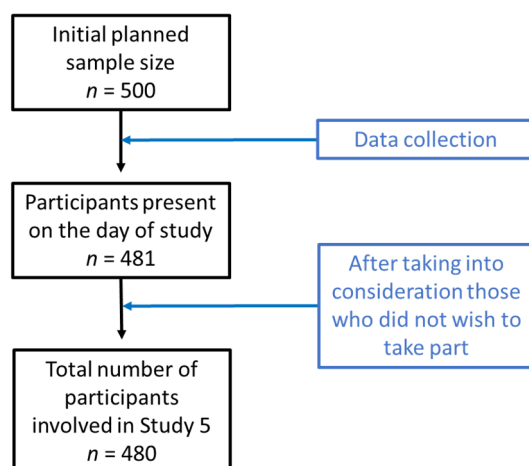
Figure 7.2: Flow chart of participants recruitment for Study 5

7.3.5. Procedure

Two companies of recruits were randomly assigned to either the control or treatment group. This was achieved by having two separate portable storage devices with one containing the slides for an existing BMT programme (i.e., combat breathing and visualisation) and the other containing the new training intervention. The two sets of slides were sealed separately in two unlabelled envelopes. On the day of the training, the researcher then randomly chose one of the envelopes, and delivered the content of the slides stored in the storage device to the first company of recruits. The other set of slides were then used for the second company of recruits.

The study again took place in one of the auditoriums in BMTC. Coordination was made with the school's commanding officer to assemble the two companies of recruits in the auditorium on two separate occasions. Attendance checks were then conducted based on the nominal rolls submitted by BMTC. The study design necessitated that participants could only be informed about their participation in the study after they have undergone the training intervention. This was because the study involved delivering a training intervention with pre and post measurements, and Hawthorne effects needed to be mitigated particularly given the compliant military environment. For the first measurement that took place before the intervention, the recruits were asked to just

complete the questionnaire. The definition of psychological resilience was also provided. The full detail of the study was not disclosed to them at that point in time. Instead, assurance was given to them that more detail would be provided at the end of the training session as to why they had to fill in the questionnaire. After the completion of the questionnaire, the recruits were instructed to retain the completed question and answer sheet. Thereafter, the training intervention began. After the session, the second measurement was taken.

The recruits were then given the information sheet (see Appendix Y), fully debriefed, and the rationale of initially withholding information about the study was explained to them. Thereafter, their consent was sought for the use of both the pre- and post-intervention data (see appendix Z). For those who did not wish to take part in the study, they had the option of making an indication on the question and answer sheet, and they were not expected to provide any explanation. To prevent the recruits from feeling pressurised to take part in the study, they were asked to simply leave the completed question and answer sheet on the desk instead of physically handing them in. This way, there was no way to identify any of them. All the answer sheets were then machine-scored and collated into a single SPSS dataset.

7.3.6. Data analysis

The internal consistency the PsyResQ-BMT and the four measures of the secondary factors were examined for reliability. The test-retest reliability and agreement could not be checked using data collected for this study as access to the recruits was only granted once by commander, BMTC. The fit of the PsyResQ-BMT model was again assessed using CFA.

To test the hypothesis that psychological resilience in BMT can be enhanced through the targeted training intervention, a mixed measures factorial ANOVA was performed to determine if there was an interaction between time of measurement and whether or not the recruits attended the new training intervention. The same ANOVA was also performed individually for the four psychological variables to examine if the new training intervention had any effect on them.

The sequence of analysis is depicted in Figure 7.2.

Step 1
Preparation for Study 5
1. developed training intervention to enhance psychological resilience by specifically targeting pride, perseverance, purpose and optimism
2. included goal-setting, finding purpose and meaning in BMT and positive thinking strategy in the training intervention

* As pride, perseverance, purpose and optimism had been established as secondary factors that made up psychological resilience in BMT, the training intervention aimed to specifically target these four factors.

* The training intervention involved a mix of lecture and individual exercise, employing a three-prong strategy; (1) providing the recruits with information on what could and how to build psychological resilience; (2) sharing of personal experience from the perspective of a senior officer; and (3) imparting skills that promotes psychological resilience.

Step 2
Assessed reliability of
the R-BMT and all four measures
1. assessed internal consistency

* Test-retest reliability and agreement could not be assessed as access to the recruits was only granted once by Comd, BMTC.

Step 3
Confirmed psychological resilience in BMT was a higher-order construct that comprised the secondary factors of pride, perseverance, purpose and optimism
1. conducted CFA

Step 4
Tested the hypothesis – resilience in psychological in BMT could be developed through targeted training intervention
1. conducted mixed measures factorial ANOVA

Figure 7.3: Sequence of analysis

7.4. Results

7.4.1. Reliability

The internal consistency of the PsyResQ-BMT and four separate measures were: (1) PsyResQ-BMT (12 items; α = .94); (2) pride (3 items; α = .90); (3) perseverance (3 items; α = .74); (4) purpose (3 items; α = .86); and (5) optimism (3 items; α = .89).

7.4.2. Confirmatory factor analysis

In examining psychological resilience in BMT as a higher-order construct that comprised the secondary psychological variables of pride, perseverance, purpose and optimism, the third CFA results showed the following estimates of model fit: χ^2 (50) = 186.28, $p < .001$, SRMR = .045, CFI = .966, TLI = .955, and RMSEA = .075. While the RMSEA was higher than the recommended cut-off of close or equal to .06, the model appeared to have good fit with the remaining three indices meeting the cut-off criteria hence meeting the condition of the 2-index strategy proposed by Hu and Bentler (1999). The factor structure and item loadings are presented in Table 7.1.

Table 7.1

Factor structure and item loadings of the PsyResQ-BMT with data collected for Study 5

Item	Factor 1 (Pride)	Factor 1 (Perseverance)	Factor 1 (Purpose)	Factor 4 (Optimism)
In general, I feel a sense of accomplishment during BMT.	.85			
In general, I feel like I have achieved something during BMT.	.86			
In general, I feel a sense of fulfilment during BMT.	.88			
During BMT, I have overcome setbacks to conquer an important challenge.		.74		
During BMT, I finish whatever I begin.		.77		
I am diligent during BMT.		.62		
I have clear goals and purpose for BMT.			.78	
Doing the things I do in BMT gives me a sense of satisfaction.			.86	
I feel that there is meaning in the things I do in BMT.			.81	
In uncertain times during BMT, I usually expect the best.				.84
I'm always optimistic about what happens to me in BMT.				.87
Overall, I expect more good things to happen to me than bad ones during BMT.				.83

7.4.3. Mixed measures factorial ANOVA

A 2 x 2 mixed measures factorial ANOVA was carried out using time of measurement, before and after the training intervention, and whether or not the recruits took part in the new training intervention as the independent variables, and PsyResQ-BMT scores as the dependent variable. There were no outliers, as assessed by examination of studentized residuals for values greater than ±3. Analysis of the studentised residuals showed that there was normality as assessed by the Shapiro-Wilk test of normality ($p > .05$) and visual inspection of Normal Q-Q Plots. Mauchly's test of sphericity was not run because there were only two levels of within-subjects factor. Means and standard deviations are shown in Table 7.2, and a line graph of the results is shown in Figure 7.3. A significant interaction was found between the independent variables, $F(1, 478) = 9.14$, $p = .003$, $\eta^2 = .02$. An examination of Figure 7.3 indicates that PsyResQ-BMT scores of both the trained and non-trained groups were quite close before the training intervention. However, after the training intervention, PsyResQ-BMT scores were considerably higher for recruits who attended the new training intervention. Because the interaction term was found to be significant, main effects were not considered. Instead, simple main effects were used for follow-up testing of the interaction effect. It was found that PsyResQ-BMT scores were not significantly different in the control group ($M = 50.23$, $SD = 9.63$) compared to the intervention group ($M = 51.86$, $SD = 9.91$) at the beginning of the training intervention, $F(1, 241) = 2.75$, $p = .098$, $\eta^2 = .01$, a difference of 1.63, 95% CI (-.28 to 3.31). PsyResQ-BMT scores were however significantly different in the control group ($M = 50.74$, $SD = 11.50$) compared to the intervention group ($M = 54.10$, $SD = 11.07$) at the end of the training intervention, $F(1, 241) = 7.72$, $p = .006$, $\eta^2 = .03$, a difference of 3.36, 95% CI (.84 to 4.90).

Table 7.2

Means and standard deviations of PsyResQ-BMT scores by whether or not recruits attended the new training intervention and time of measurement

	PsyResQ-BMT Scores		
Time of measurement	Attended new training intervention	Mean	Standard Deviation	Sample size

Before intervention	No	50.23	9.63	238
	Yes	51.86	9.91	242
After intervention	No	50.74	11.50	238
	Yes	54.10	11.07	242
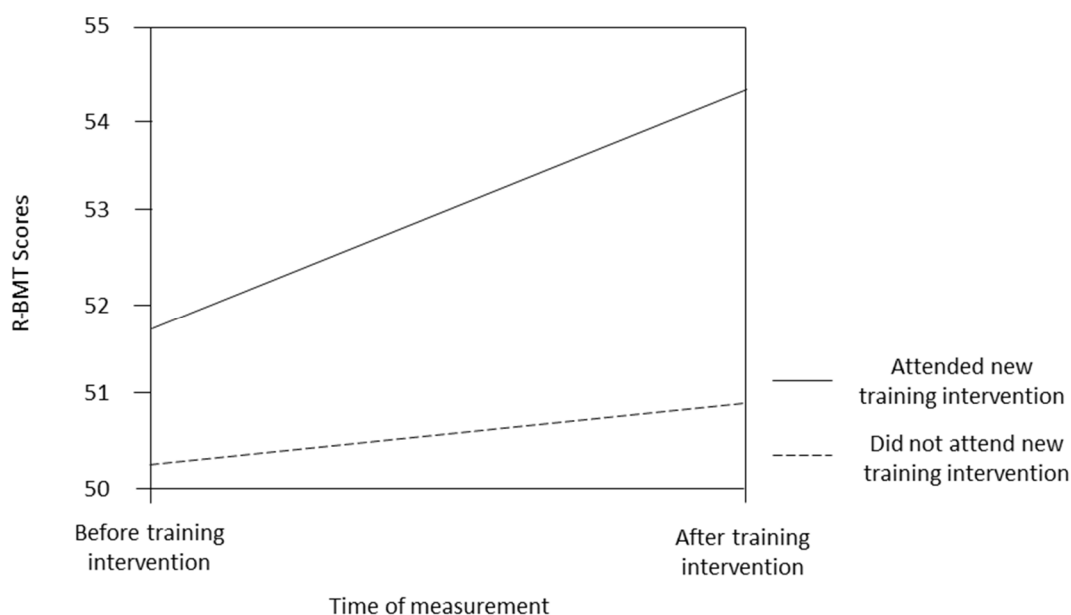
Figure 7.4: Line graph of PsyResQ-BMT scores by time of measurement and whether recruits attended the new training intervention or not

The same ANOVA was carried out individually for each psychological variable as the dependent variable. Means and standard deviations for pride, perseverance, purpose and optimism are shown in Tables 7.3, 7.4, 7.5 and 7.6 respectively. The line graphs of the results are shown in Figures 7.4, 7.5, 7.6 and 7.7.

Pride. A significant interaction was found between the independent variables, $F(1, 478) = 4.75$, $p = .03$, $\eta^2 = .01$. An examination of Figure 7.4 indicates that pride scores of both the trained and non-trained groups were quite close before the training intervention. However, after the training intervention, pride scores improved relatively more for recruits who attended the new training intervention.

Table 7.3

Means and standard deviations of pride scores by whether or not recruits attended the new training intervention and time of measurement

		Pride Scores		
Time of measurement	Attended new training intervention	Mean	Standard Deviation	Sample size
Before intervention	No	10.29	2.55	238
	Yes	10.40	2.53	242
After intervention	No	10.43	2.74	238
	Yes	10.82	2.55	242

Figure 7.5: Line graph of pride scores by time of measurement and whether recruits attended the new training intervention or not

Perseverance. A significant interaction was found between the independent variables, $F(1, 478) = 11.56$, $p = .001$, $\eta^2 = .02$. An examination of Figure 7.5 indicates that perseverance scores of both the trained and non-trained groups were fairly close

before the training intervention. However, after the training intervention, perseverance scores improved for recruits who attended the new training intervention and decreased slightly for the other group.

Table 7.4

Means and standard deviations of perseverance scores by whether or not recruits attended the new training intervention and time of measurement

Time of measurement	Attended new training intervention	Mean	Standard Deviation	Sample size
		Perseverance Scores		
Before intervention	No	10.47	2.01	238
	Yes	10.71	1.88	242
After intervention	No	10.40	2.28	238
	Yes	11.12	2.22	242
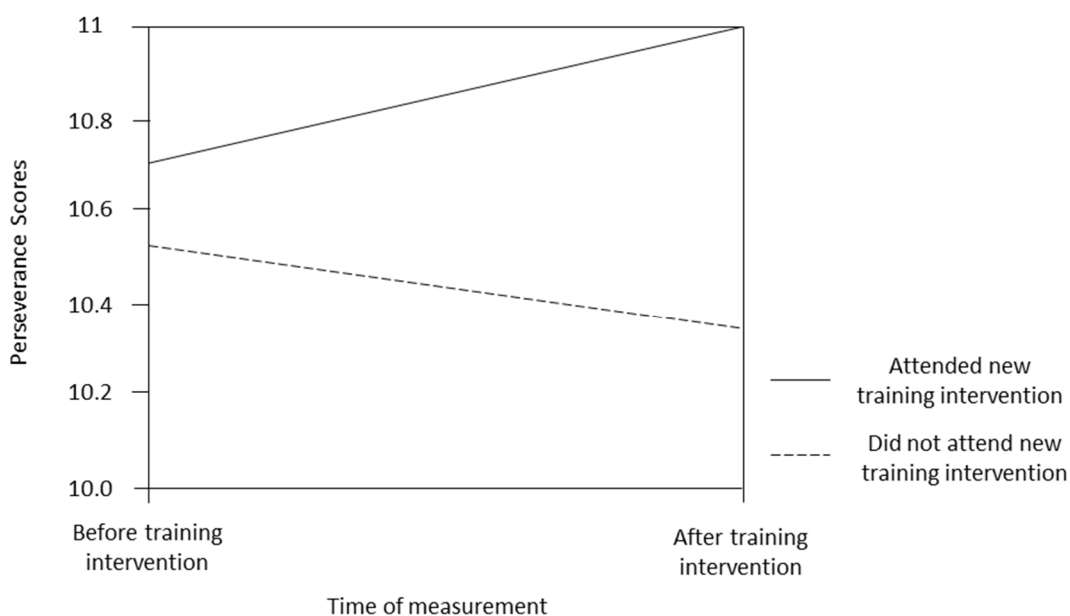
Figure 7.6: Line graph of perseverance scores by time of measurement and whether recruits attended the new training intervention or not

Purpose. No significant interaction was found between the independent variables, $F(1, 478) = 3.56$, $p = .06$, $\eta^2 = .01$. An examination of Figure 7.6 indicates that purpose scores of both the trained and non-trained groups were fairly close before the training intervention. After the training intervention, the gap widened a little with the purpose scores of the treatment group improved slightly more than the control group.

Table 7.5

Means and standard deviations of purpose scores by whether or not recruits attended the new training intervention and time of measurement

Time of measurement	Attended new training intervention	Mean	Standard Deviation	Sample size
		Purpose Scores		
Before intervention	No	9.66	2.73	238
	Yes	10.02	2.77	242
After intervention	No	9.82	3.03	238
	Yes	10.50	2.91	242
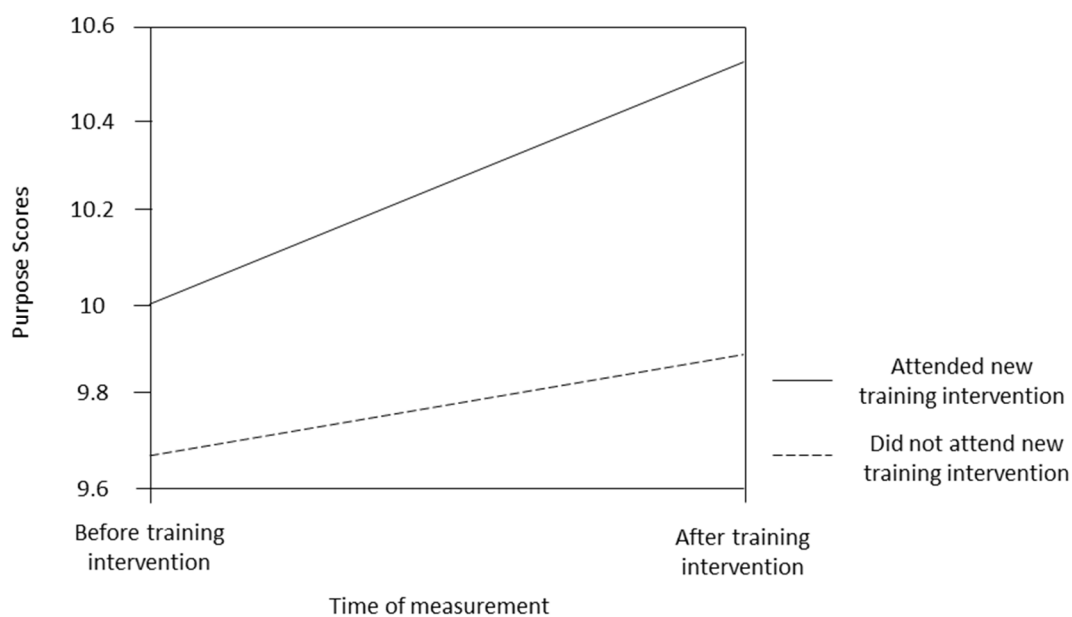
Figure 7.7: Line graph of purpose scores by time of measurement and whether recruits attended the new training intervention or not
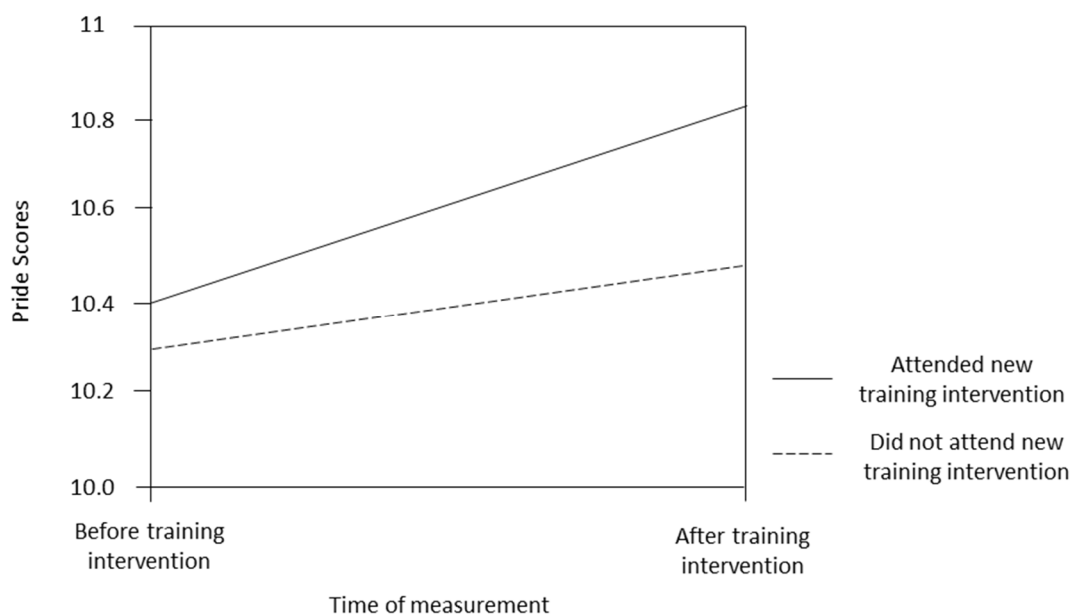
     Optimism. A significant interaction was found between the independent variables, $F(1, 478) = 6.53$, $p = .01$, $\eta^2 = .01$. An examination of Figure 7.7 indicates that optimism scores of both the trained and non-trained groups were fairly close before the training intervention. However, after the training intervention, optimism scores improved relatively more for recruits who attended the new training intervention.

Table 7.6

Means and standard deviations of optimism scores by whether or not recruits attended the new training intervention and time of measurement

		Optimism Scores		
Time of measurement	Attended new training intervention	Mean	Standard Deviation	Sample size
Before intervention	No	9.34	2.82	238
	Yes	9.63	2.92	242
After intervention	No	9.46	3.04	238
	Yes	10.20	3.01	242
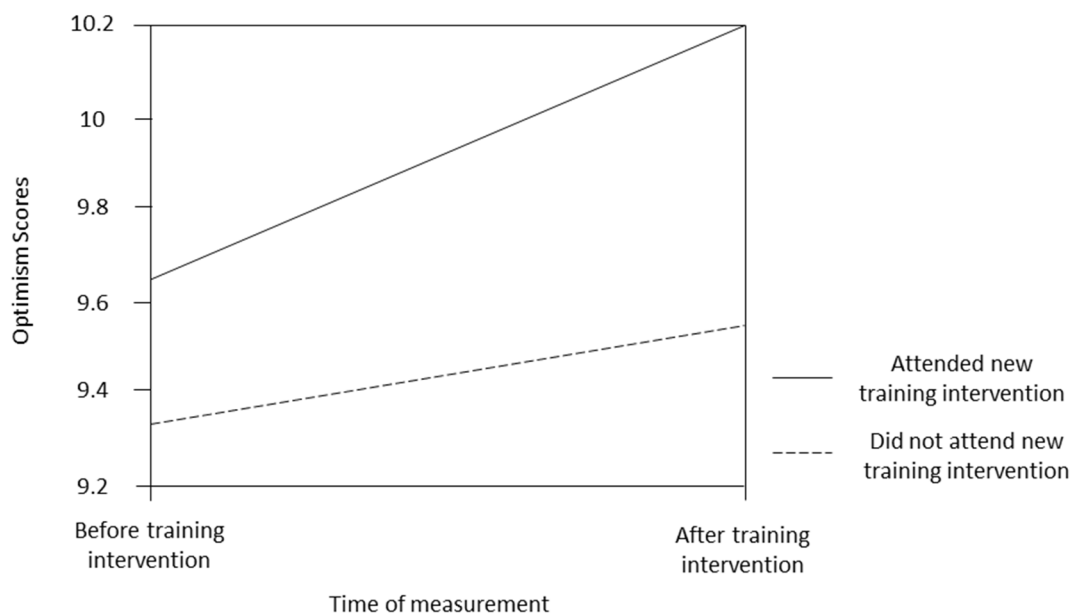
Figure 7.8: Line graph of optimism scores by time of measurement and whether recruits attended the new training intervention or not

7.5.   Discussion

7.5.1. Reliability of the PsyResQ-BMT and higher-order nature of psychological resilience in BMT

Using George and Mallery's (2003) guideline to interpret the internal consistency, it was found that the reliability of the PsyResQ-BMT (12 items; $\alpha = .94$) was excellent. While the PsyResQ-BMT was not assessed for test-retest reliability and agreement in Study 5 because access to the recruits was only granted once, it was established in the previous study that the test-retest reliability ($r(377) = .86$, $p < .001$) and agreement {the average measure ICC was .92 with a 95% confidence interval from .90 to .94 [$F(378,378) = 13.15$, $p < .001$]} were excellent. Hence, the first conclusion that could be drawn from Study 5 was that the PsyResQ-BMT was a reliable measure of psychological resilience in BMT.

For Study 5, the results of the third CFA showed that the model again fitted the data well: $\chi2 (50) = 186.28$, $p < .001$, SRMR $= .045$, CFI $= .966$, TLI $= .955$, and RMSEA $= .075$. While the RMSEA index was higher than .06, the other fit indices all met the cut-off criteria. According to Hu and Bentler's (1997) two-index presentation strategy of including SRMR and either TLI, CFI, or RMSEA in the interpretation, the PsyResQ-BMT model could still be considered a well-fitting model. In total, three separate CFA

were performed for the entire research using data collected on different occasions involving various batches of recruits. The findings showed that the PsyResQ-BMT model fitted the data well (see Table 7.4). Hence, the second conclusion that could be drawn from Study 5 was that psychological resilience in BMT was a higher-order construct that comprised pride, perseverance, purpose and optimism.

Table 7.7

PsyResQ-BMT model fit indices

Data used	χ^2	*df*	SRMR	CFI	TLI	RMSEA
From Study 3	165.27***	50	.027	.974	.975	.066
From Study 4	104.60***	50	.017	.981	.975	.050
From Study 5	186.28***	50	.045	.966	.955	.075

Note: ***, $p < 0.001$.

7.5.2. Psychological resilience in BMT can be enhanced

As mentioned, the Study 5 aimed to examine if psychological resilience in BMT could be enhanced through a targeted training intervention. The 2 x 2 mixed measures factorial ANOVA found a significant interaction between time of measurement and whether or not the recruits took part in the new training intervention, $F(1, 478) = 9.14$, $p = .003$, $\eta^2 = .02$. An examination of the line graph also showed that the PsyResQ-BMT scores of both the trained and non-trained groups were quite close before the training intervention but after the training intervention, PsyResQ-BMT scores were considerably higher for recruits who attended the new training intervention. Furthermore, it was found that PsyResQ-BMT scores were not significantly different in the control group compared to the intervention group at the beginning of the training intervention, $F(1, 241) = 2.75$, $p = .098$, $\eta^2 = .01$, a difference of 1.63, 95% CI (-.28 to 3.31). However, the scores were significantly different at the end of the training intervention, $F(1, 241) = 7.72$, $p = .006$, $\eta^2 = .03$, a difference of 3.36, 95% CI (.84 to 4.90).

With the exception of purpose, similar results were found when using the scores of the constituent parts of psychological resilience for BMT; there were significant interactions between time of measurement and whether or not the recruits took part in the new training intervention when using the scores of pride, perseverance and optimism individually as the dependent variables. While there was no significant interaction between time of measurement and whether or not the recruits took part in the new training

intervention when using the score of purpose, the improvement for the treatment group was slightly higher (i.e., improvement of 0.48 for the treatment group compared to just 0.16 for the control group). This suggested that the content of the training intervention did not adequately address purpose compared to the other three variables or that purpose is simply a psychological variable that is less susceptible to change in a short period of time. However, the findings were reassuring as if scores on all the psychological variables had increased, it might just suggest that the new training was a feel-good intervention. As the scores on the psychological variables did not all improve suggested that the training intervention had influenced the recruits' thinking in certain aspects of psychological resilience that were enhanced.

The third conclusion that could be drawn was that psychological resilience in BMT could possibly be enhanced with a targeted training intervention such as the one conducted in Study 5 as there was preliminary evidence to suggest that the intervention was useful in improving some aspects of the recruits' psychological resilience. However, more study is needed to replicate the effects observed in Study 5. Furthermore, as three out of the four psychological variables improved significantly overtime following the new training intervention, it affirmed the approach in specifically targeting the constituent parts to improve the overall psychological resilience in BMT.

7.5.3. Limitations

Five limitations were identified for Study 5. Firstly, Study 5 was a GRT. Although GRT can be considered a form of RCT, it has less opportunity for randomisation to distribute all potential sources of bias evenly. While randomisation took place at the beginning of BMT (i.e., the recruits were randomly assigned to various companies and hence demographics including but not limited to age, gender, race, education and social economic status were randomised by default) and efforts were made to control for as many confounding effects (e.g., trainer and mode of delivery, environment, recruits' level of attention etc.) as possible, the changes in the recruits' level of psychological resilience could well be attributed to other factors that Study 5 did not managed to identify. Secondly, it appeared that Study 5 did not achieve perfect randomisation as the mean PsyResQ-BMT score for the control group was 50.23 and that of the treatment group was 51.86. However, in examining the simple main effects, it was found that PsyResQ-BMT scores of the control and treatment groups were not statistically significantly before the training intervention [i.e., $F(1, 241) = 2.75$, $p = .098$, $\eta^2 = .01$, a difference of 1.63, 95%

CI (-.28 to 3.31)]. Thirdly, Study 5 did not examine the intraclass correlation coefficients (ICC) to determine the required sample size and number of groups for the study. As such, if the ICC had been large, the statistical power[16] would be reduced, resulting in Study 5 requiring a larger sample size or more groups. Fourthly, while the findings suggested that psychological resilience in BMT could be enhanced, the longer-term effects of the training intervention were not examined (i.e., would the improvement be sustained for weeks or months following the intervention?). Finally, as access to the recruits was only granted once, it was not possible to collect more data at a later time-point to relate the improvement in psychological resilience in BMT to some performance outcome.

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[16] Within-group correlation can affect the power of a trial because a greater homogeneity of members in the groups can increase the standard error of the estimate of the intervention resulting in a loss of power to detect a difference between the treatment and control groups (Donner, 1982).

Chapter 8:   Discussion and conclusion

A key premise underlying this research is that psychological resilience is context-dependent (e.g., Luthar et al., 2000; Davydov et al., 2010; Rutter, 2013). Hence, this research aimed to measure psychological resilience, establish its criterion validity and ascertain if it could be enhanced with a targeted intervention by studying the construct specifically in a military basic training environment involving conscripted recruits where little research has been carried out.

The final chapter of this thesis puts the overall findings of this research in context vis-à-vis its aims. Section 8.1 highlights the key findings of this research as a whole. Next, the theoretical and research implications of this research are discussed in section 8.2. The limitations of this research and possible future research directions, and implications for organisation practices are then presented in sections 8.3 and 8.4 respectively. Finally, a reflection of the contributions of this research is provided in the concluding section (section 8.5).

8.1.   Key findings of this research as a whole

To recapitulate, this research set out to answer the following key research questions:

1.   How can psychological resilience be conceptualised and operationalised in the BMT environment involving conscripted recruits;

2.   Is psychological resilience related to performance during BMT;

3.   How can psychological resilience be measured in the BMT environment involving conscripted recruits; and

4.   How can psychological resilience in BMT be enhanced through a targeted training intervention?

8.1.1.   Clarifying the research context – adversities in BMT, and internal and external protective factors available to the recruits

Context is a key consideration in resilience research because the nature and intensity of adversity differ between different settings, and individuals' appraisal of how stressful an adversity is will vary depending on individual differences. Psychological

resilience is also context-dependent in terms of what internal and external protective factors are available to the individuals. Hence, in responding to calls for better clarity in general about the context in which resilience research are carry out so that the findings can be interpreted with that particular context in mind (Southwick et al., 2014), this research examined in detail the specific adversities present in the BMT environment and what protective factors were available. This research (Study 2) found that BMT was physically demanding, mentally stressful and emotionally challenging as the adversities in the environment were episodic and chronic. These compelled the recruits to quickly adjust and adapt to an unusual and unfamiliar environment where they were subjected to authority, uncertainty, rough treatment and sometime physically challenging environments. This research (Study 2) also found three sets of protective factors; 10 psychological variables (e.g., optimism), five skills (e.g., goal setting) and three external support (e.g., peer support). This contextual understanding allowed the research to better appreciate what challenges the recruits faced and what might have helped them to cope and adapt positively.

8.1.2. Conceptualising and operationalising the construct of psychological resilience in BMT

As highlighted in the literature review (Chapter 2, section 2.5), one of the controversies in psychological resilience research is the disagreement about the conceptualisation and operationalisation of the construct. Some researchers argued that it is an internal capacity (e.g., Garmezy, 1991), some study it from a process prospective (e.g., Luthar et al., 2000) while others see it as merely an outcome (e.g., Rutter, 2006). Based on the findings on what internal protective factors helped the recruits to cope and adapt positively during BMT (Study 2), psychological resilience in BMT can be conceptualised as an internal capacity and in operationalising the construct, it is made up of multiple internal psychological variables or protective factors such as authentic pride, perseverance, purpose and optimism. Psychological resilience in BMT can also be conceptualised as a process and in operationalising the construct, there are various processes including but not limited to: (1) the recruits' appraisal of the adversities; (2) the recruits harnessing their internal protective factors to cope and adapt; and (3) external protective factors facilitating the recruits to achieve positive adaptation. This conceptualisation and operationalisation of the construct then paved the way for the research to progress; measure psychological resilience and intervene.

8.1.3. Developing a customised measure of psychological resilience in BMT involving conscripted recruits

The systematic review (see Chapter 3, sub-section 3.5.2) concluded that existing scales were not suitable for this research as they were either developed to: (1) measure psychological resilience merely as an outcome (e.g., CD-RISC 10) which would provide limited insight in explaining how various outcomes were derived and what factors were involved; (2) assess only one dimension of psychological resilience (e.g., psychological flexibility as measured by the AAQ-2) which over-simplified the construct; or (3) examine the construct as a trait (e.g., DRS-15) which contradicted this research's objective to enhance psychological resilience. Hence, this research (Studies 3 and 4) proceeded to develop a customised measure of psychological resilience that was specifically suited to the context of this research. As the systematic review (Chapter 3) found that most scales measured various internal and external protective factors as lower-order factors of psychological resilience (e.g., optimism, social competence and family cohesion), this research adopted a similar approach.

The customised measure, PsyResQ-BMT, assessed psychological resilience in BMT as a higher-order construct that comprised the salient internal protective factors; pride, perseverance, purpose and optimism. It has excellent internal consistency, test-retest reliability and agreement, and correlated strongly with the widely used CD-RISC 10 and performance outcomes. While this research did not claim to have developed a definitive measure of psychological resilience, it did produce a customised measure that could be used specifically for BMT involving conscripted recruits. This research also positioned the PsyResQ-BMT as a measure that is modular in nature. On one hand, it is possible to improve the variance explained in psychological resilience in BMT by including more secondary psychological variables into the measure when specifically examining the BMT context. On the other hand, it may also be possible to add, exclude, or mix and match different secondary psychological variables into the measure when examining another military context (e.g., more advance training phases involving the same participants, leadership training where the profile of the participants is different, and during operations when the adversities differ).

8.1.4. Establishing the criterion validity of psychological resilience in BMT – relating the construct to performance in BMT and qualification for leadership training

As mentioned, studying psychological resilience on its own without examining its criterion validity adds limited value to the research. It is akin to assessing personality without relating it to behaviours or measuring cognitive ability without using the scores to predict certain task performance. The systematic review (Chapter 3, sub-section 3.4.3) found a wide range of tangible military outcomes that were related to psychological resilience. These included better post-deployment adjustment (Cunningham et al., 2014) and general mental health (Eisen et al., 2014), leadership styles (Johnsen et al., 2009), military performance such as successful completion of ski marches (Johnsen et al., 2013), and higher level of unit cohesion (Brown et al., 2016). This research (Studies 3 and 4) found that psychological resilience in BMT, measured with the PsyResQ-BMT, had a significant positive relation with the recruits' performance as measured by self-report and qualification for leadership training.

8.1.5. Developing a targeted training intervention to enhance recruits' psychological resilience in BMT

In the most recent systematic review conducted by Chmitorzae et al. (2018), the authors found as many as 43 programmes that aimed to developed individual psychological resilience. As psychological resilience is context-dependent, the literature review (Chapter 2, section 2.10) then focused on examining programmes developed with the military population in mind. It was found that among numerous programmes, three had evidences to show that they worked. This suggested that psychological resilience can be enhanced with the right kind of intervention. The BOOT STRAP (Williams et al., 2004) helped more recruits to complete their basic training while the CBTI (Cohn & Pakenham, 2008) and RT (Adler et al., 2015) lowered the recruits' levels of psychological distress and anxiety. These programmes provided information about what could helped to improve psychological resilience (Cohn & Pakenham, 2008), adopted principles related to CBT and involved changing individual's thinking pattern (Williams et al., 2004), and imparted practical skills such as grounding exercise (Adler et al., 2015). As such, this research adopted a similar approach to design the training intervention. As it was established that psychological resilience in BMT is a higher-order construct that comprises at least pride, perseverance, purpose and optimism, the training intervention

was designed to specifically target these four aspects. Specifically, the recruits were thought how to set SMART goals, find purpose and meaning in NS and BMT, and develop strategy to facilitate positive thinking. Based on the results of the GRT, this research (Study 5) found preliminary evidence to suggest that some aspects of psychological resilience in BMT could be enhanced through a targeted training intervention by focusing on its constituent parts.

8.2.   Theoretical and research implications of this research

Based on findings of this research, this section discusses the theoretical and research implications. Specifically, it considers existing psychological resilience theory concerning the roles and nature of protective factors, highlights the importance of having a positive self-concept, and addresses issues related to the conceptualisation, operationalisation and measurement of the construct.

8.2.1.   Psychological resilience theory – the role of protective factor

This research has shown that protective factors (i.e., internal psychological variables, skills and external sources of support) had positive impacts on how the recruits coped with adversities in BMT and adapted during training; helped the recruits to be psychologically resilient. This is in alignment with the theories proposed by resilience researchers such as Werner and Smith (1982; individual, family and community factors), Garmezy (1991; individual, familial and support factors) and Luthar et al. (2000; protective-stabilising, protective-enhancing and protective but reactive factors). While these resilience researchers labelled the protective factors they found differently, it is clear that these protector factors served the important role of facilitating individuals to cope and adapt to adversities [e.g., Werner (1989) argued that protective factors can increase an individual's capacity to cope effectively with adversity and Garmezy (1991) added that there is an interactive relationship between the protective factors and adversities]. Protective factor can also allow individuals to engage with adversity such that their competence is enhanced with increasing risk (Luthar et al., 2000). Furthermore, Kumpfer (1999) suggested that protective factor has a cumulative effect in that the more protective factors an individual has, the more likely he or she can cope better and arrive at a more positive outcome following exposure to adversity.

As such, the theoretical implication of this thesis is that studying psychologically resilience from the protective factor perspective remains relevant since the day Garmezy

urged resilience researchers to shift the focus away from risk factors to study the protective factors that facilitate positive adaptation (Garmezy, 1971); to examine the likelihood of resilient functioning by identifying the availability or absence of certain protective factor. While it may appear simplistic, theoretical frameworks that adopt this approach can also help to elucidate the complexity of psychological resilience. It must however be cautioned that resilience researchers should not see the presence or absence of certain protective factor in a particular context as guaranteeing resilience functioning or otherwise. Rather, protective factors serve the role of facilitating but not guaranteeing psychological resilience while their absence merely puts an individual at a higher risk of suboptimal coping but not rendering them completely helpless.

8.2.2. What protective factors are salient and why?

Resilience researchers such as Rutter studied young people who thrived while living in poverty and with parental mental illness found protective factors including an easy temperament, good self-esteem and a supportive environment to be important (Rutter, 1985). Other resilience researchers have identified various other protective factors including self-reliance (Wagnild & Young, 1993), spirituality (Dunn, 1994), commitment (Connor & Davidson, 2003) and family coherence (Friborg et al., 2003). Over the years, a long list of generic protective factors has also been proposed by numerous resilience researchers (e.g., Dahlberg, 1998; Hawkins, Catalano & Miller, 1992; O'Connell, Boat, & Warner, 2009). However, Luthar and Zelazo (2003) questioned the generalisability of these protective factors and suggested that these factors operate differently given the specific context and population under study. Likewise, Rutter (2013) had doubts about the utility of such a list as he stated that it is important to understand individuals' needs in relation to specific situations instead of assuming that all protective factors have the same influence on all the individual under all circumstances.

As psychological resilience is context-dependent, this thesis has argued that the protective factors found to be salient in another environment may not be generalised to the current conscripted military context. Indeed, this research has found three sets of protective factors (i.e., 10 internal psychological variables, five skills and three external sources of support) that are relevant in the BMT environment involving conscripted recruits. In the same vein, these findings should also not be generalised to other environment or population. As such, an important research implication of this thesis is

that it is important for resilience researcher to both identify the protective factors present in a particular context and comprehensively study the environment to understand the adversities and the population of interest. This will pave the way to better appreciate why certain protective factors may be important in that particular context. For example, this research found that support from peers and encouragement from trainers were important protective factors as majority of the recruits reported that they helped them to cope better during BMT, and these were also observed by both the platoon and section commander groups. This finding is intuitive as military psychology research have long established that cohesion is a major predictor of combat motivation and performance (Kellett, 1982).

8.2.3. Having a positive self-concept is important in promoting psychological resilience and performance in BMT

While the individual internal psychological variables found in this research can be considered as separate internal protective factors, taken as a whole, they represent the recruits' self-concept or CSE. This research found that pride, perseverance, purpose and optimism were related to psychological resilience and performance in BMT as measured by self-report and peer appraisal. In addition, higher scores on the four psychological variables also significantly increased the probability of recruits being qualified for leadership training. This research also found that psychological resilience in BMT, comprising of pride, perseverance, purpose and optimism, was positively related the recruits' performance in BMT as assessed by their chances of qualification for leadership training.

The theoretical implication is that having a positive self-concept (i.e., taking pride in accomplishing tasks, able to persevere when the going gets tough, being purposeful in daily endeavours and having a sense of optimism) is important as it helped the recruits to be psychological resilient and perform in BMT. This is in alignment with what Kammeyer-Mueller and Judge (2009) found; individuals with positive self-concept or CSE reported fewer stressors and less strain, and exhibited more problem-solving coping behaviours, less avoidance coping behaviours and emotion-focused coping behaviours compared to individuals with negative self-concept or CSE. Similarly, van Doorn and Hülsheger (2015) found that employees with positive self-concept or CSE experienced less psychological distress at work (i.e., more resilient psychologically) and argued that

positive self-concept or CSE functioned as a personal resource and acted as a buffer between job demands and psychological distress.

8.2.4. The approach in conceptualising and measuring psychological resilience as an internal capacity remains valid and valuable

As mentioned throughout this thesis, the conceptualisation and definition of psychological resilience remain controversial today; is psychological resilience an internal capacity, process or outcome? By extension, those who adopts the perspective that the construct is a process or outcome would presumably disagree with measuring it as an internal capacity. Indeed, resilience researchers such as Pangallo (2014) argued that operationalising psychological resilience as an individual characteristic implies that it is a global construct that an individual either has or does not have, and the limitation of such an approach is that person variance is explained at the expense of both situational variance and the interplay between person and situation. While the author did not explicitly criticise the internal capacity approach in measuring psychological resilience, it is alluded to that such an approach is inadequate.

This thesis takes an inclusive and conciliatory approach to adopt the perspective that psychological resilience can be conceptualised as an internal capacity, process and outcome (see Chapter 2, section 2.11). This research also found that psychological resilience in BMT, measured as an internal capacity alone, was related to important outcomes including performance and qualification for leadership training. While this thesis agrees that given the complex nature of psychological resilience, examining it as an internal capacity alone will not fully explain the construct, this approach is not inadequate and person variance is not explained at the expense of either the situational variance or the interplay between person and situation. On the contrary, this thesis has placed importance in understanding the adversity or situation by studying it in detail (Study 2) and emphasised the interaction between person and situation as a process. Hence, the theoretical implication is that the approach in conceptualising and measuring psychological resilience as an internal capacity, while imperfect, remains valid and useful.

8.2.5. Psychological resilience in BMT is a higher-order construct consisting of several secondary factors including but not limited to those found in this research

This research found that psychological resilience in BMT is a higher-order construct that comprises the secondary factors of pride, perseverance, purpose and optimism. Evidence for this higher-order nature of psychological resilience in BMT was found using three sets of data collected from separate groups of recruits at different time points. This higher-order nature of the construct is consistent with what other resilience researchers such as Wagnild and Young (1993) and Friborg et al. (2003) found about psychological resilience in general. What differ are the exact secondary factors and the number, which could be attributed to the context-dependent nature of psychological resilience (i.e., different adversities and individuals require different type and number of protective factors for effective coping and adaptation). However, this research (Study 3) found that the four secondary factors could explain 44.2% of the variance in psychological resilience in BMT. This suggested that there is room to improve the variance accounted for by possibly increasing the number of secondary factors in the PsyResQ-BMT.

Study 2 originally found that the recruits reported 10 internal psychological variables and they included: (1) pride; (2) hope; (3) perseverance; (4) purpose; (5) optimism; (6) acceptance; (7) desire to improve; (8) passion; (9) being competitive; and (10) altruism. However, it was decided that Study 3 should only examine the ones that were cited more often by the recruits and reported by the trainers. Consequently, passion, competitiveness, altruism and desire to improve were excluded because they were not reported by the trainers and the first three were cited by only one recruit each. It could well be the case that psychological resilience in BMT, as higher-order construct, consists of the 10 secondary factors or internal psychological variables and more, but were not examined in all the studies of this research. In any case, the theoretical implication is that psychological resilience in BMT is a higher-order construct or internal capacity, as conceptualised by this research, that comprises several secondary factors or protective factor, as operationalised by this research, including but not limited to just those examined in this research.

8.2.6. Psychological resilience is a state-like internal capacity that can be enhanced

As discussed in the literature review (Chapter 2), researchers such as Luthans et al. (2007) have argued that psychological resilience, which makes up PsyCap, is a state-like attribute. They added that being a state-like attribute, it is not as stable and is therefore more susceptible to change and development compared to trait. Other researchers have however theorised and defined psychological resilience and related construct as a trait (e.g., Kobasa, 1979; Oshioa et al., 2018) and adopted the perspective that it is stable. While the debate over the influences of nature versus nurture continues, new research findings suggest that certain traits such as personality can be changed with motivation, effort, environmental factors and deliberate interventions (Hudson & Fraley 2015). The current research (Study 5) has found that the recruits' psychological resilience in BMT could be enhanced though a targeted intervention for the treatment group while it remained fairly stable for the control group. Hence, a theoretical implication of this thesis is that psychological resilience in BMT is more state-like than being a trait. The malleability of psychological resilience and various other psychological attributes can be understood on a trait-state continuum (Luthans & Youssef-Morgan, 2017). On one end of the continuum, traits are relatively fixed and not changeable (e.g., CSVs and personality). On the other end of the continuum, states such as moods and emotions are transient and unstable. Luthans and Youssef-Morgan (2017) argued that state-like attributes, positioned somewhere in the middle of the continuum, while relatively more stable than state and less stable than trait, are malleable and still open to being developed.

8.2.7. Conceptualise and operationalise psychological resilience in BMT as a process consisting several internal and external protective factors

As mentioned in sub-section 8.1.2, psychological resilience in BMT can be conceptualised as a process. In addition, Study 2 found that what helped the recruits to adapt positively during BMT included three sets of protective factors; 10 internal psychological variables, five internal skills or behaviours and three external sources of support. Hence, in operationalising psychological resilience in BMT as a process, the findings on the internal and external protective factors suggested two possible processes: (1) how the recruits harness their internal protective factors to cope and adapt; and (2) how the external protective factors facilitated the recruits to achieve positive adaptation.

While it is not within the scope of the current research to examine psychological resilience in BMT as a process, it nonetheless has theoretical implication in that it is possible to examine the construct from this perspective. This is also in line with recommendations proposed by resilience researchers such as Pangallo (2014); to examine the interplay between different resilience factors and to understand the amount of external support available and the nature of support (i.e., emotional, instrumental or informational). Hence, the theoretical implication is that psychological resilience in BMT can be conceptualised as a process and in order to operationalise it, it is necessary to better understand both the protective factors that are internal and external to the recruits.

8.2.8. Measuring psychological resilience in BMT – what aspects of the construct or protective factors to include

While this research did not find an existing measure suitable for this research to adopt, valuable insights were gleaned on how the various measures examined in the systematic review (Chapter 3) were developed and what aspects of psychological resilience or protective factors were included. For example, Connor and Davidson (2003) highlighted that the content of the CD-RISC 25 was drawn from a number of sources: (1) Kobasa's work on hardiness; (2) Rutter's work on goal-setting, self-esteem, adaptability and strengthening effect of stress; (3) Lyons' work on patience and the ability to endure stress; and (4) Shackleton's experiences of faith and good luck. However, this approach gave the impression that the decision on what aspects of psychological resilience to measure was arbitrary and did not consider the context-dependant nature of the construct. Likewise, for the DRS-15 (Bartone, 1995) that was widely used by the US military in the 1990s, the protective factors included were originally derived from studies involving Illinois Bell executives and Chicago City bus drivers. While the current research does not question the content validity of these measures, it was felt that the decisions on what aspects of psychological resilience to measure could be based more directly on the environment in which these measures were meant to be used.

The protective factors included in the current research were based on the recruits' direct accounts of what helped them to adapt positively during BMT. By employing an inductive qualitative approach, this research also has ecological validity (Bryman, 2008) as the data collected were based on the recruits' own experiences and not influenced by the researcher's assumption or bias. This approach provided more certainty that the

aspects of psychological resilience or protective factors that were included were relevant and not arbitrarily decided. Consequently, Study 2 was able to uncover various internal psychological variables for consideration, and Studies 3 and 4 could establish the criterion validity of psychological resilience in BMT. Equally important, it was eventually possible to develop a customised measure of psychological resilience in BMT by considering the construct as a higher-order factor consisting of several lower-order psychological variables. As such, one research implication of this thesis is that instead of solely relying on existing literature to inform on what aspects of psychological resilience or protective factors may possibly be relevant in a particular research context, an inductive approach could be more informative; directly examine the experiences of the protagonists, in this case the recruits, in the context of interest.

8.3. General limitations of this research and possible future research direction

As the specific limitations of Studies 1 to 5 were discussed in the respective study chapters, this sub-section will summarise the general limitations of this research.

The strength of this research is also its first main limitation. One key insight gained from the literature review is that context is an important consideration in resilience research. Hence, this research adopted a context-dependent approach at the onset. Consequently, the various findings of this research could be replicated across the different studies (e.g., the higher-order nature of psychological resilience was replicated in Studies 3, 4 and 5 using data collected at different time-points involving different batches of recruits, and higher scores on PsyResQ-BMT increased the likelihood of qualification for leadership training in both Studies 3 and 4). However, the context had been specified so precisely that the findings of this research may not be representative in other settings (i.e., representative of BMT only and not other phases of training or operation, recruits and not higher rank servicemen, and conscripts and not career soldiers). Hence, this reinforces Fletcher and Sarkar's (2013) assertion that the findings derived from a research involving a specific population to address a particular research aim may not be directly applicable to another context. While this research submits that it has advanced the understanding of psychological resilience in the context of basic military training involving conscripted recruits, other resilience researchers should pay due care in interpreting the findings of this research or try to replicate the findings in other context.

It was evident from the onset of this research (Study 2) that psychological resilience in BMT can be studied as a process: (1) how and what influences the recruits' appraisal of the adversities; (2) how the recruits harness their internal protective factors to cope and adapt; and (3) how the external protective factors facilitate the recruits to achieve positive adaptation. Hence, this research adopted the perspective that psychological resilience in BMT can be conceptualised both as an internal capacity and process. However, in ensuring that the scope of this PhD endeavour is manageable, subsequent studies were designed to primarily examined the construct as an internal capacity. While this research found that the approach in conceptualising and measuring psychological resilience as an internal capacity is valid and valuable, given the complex nature of psychological resilience, examining it as an internal capacity alone will not fully explain the construct. This is the second limitation of the research. However, by focusing on gaining a better understanding of psychological resilience as an internal capacity, this research paves the way to examine it as a process in future research.

While this research has successfully developed a customised measure of psychological resilience in BMT, PsyResQ-BMT, and established that it was positively related to performance in BMT, it did not go further to answer an important question: how psychologically resilient must the recruits be in order to cope and adapt well during BMT? This is hence the third limitation of this research. It may be useful to ask: (1) can certain score on the PsyResQ-BMT flag out recruits who are likely to drop out of BMT and therefore should be accorded more attention; and (2) should a recruit attain a certain score on the PsyResQ-BMT for him to be considered for leadership training so as to maximise the chances of success. It will also be insightful to examine the means and ranges of score on the PsyResQ-BMT for the three groups of recruits; those who qualifies for officer training, those who qualifies for specialist training and those who did not qualify for leadership training. This will help inform whether it is useful to classify ranges of score (e.g., very resilient for scores above 50 out of 60, somewhat resilient for scores between 36 to 50, average level of resilience for scores between 25 to 35, somewhat not resilient for scores between 10 to 24, and not resilient at all for scores below 10).

In addition to the suggestions for improvement made above, future research can also replicate the design of this research to examine psychological resilience in other phases of military training or operation. For example, if the interest lies in understanding

psychological resilience in leadership training such as in OCS, it is possible to begin with an inductive qualitative study to directly explore the officer cadets' training experience. It is envisaged that the adversities reported by the officer cadets will be different compared to those mentioned by the recruits as the training context is different. In BMT, the focus is on learning individual-level soldiering fundamentals such as firing a weapon or to walk a certain distance during route march. However, in OCS, it is about preparing future leaders to command soldiers and manage resources. Hence, the intensity and nature of the adversities can be different. For example, physical stress for the recruits can come from participating in an individual-level fitness test while for the officer cadets, it can be mental stress that is related to making sure 30 other officer cadets follow your command because you have been appointed as the exercise platoon commander. Consequently, positive adaptation in training may be facilitated by different sets of internal and external protective factors.

In the discussion section of Chapter 6 (section 6.5.5), it was suggested that the PsyResQ-BMT can be modular in nature (i.e., it may be possible to add, exclude, or mix and match different psychological variables into the measure when examining different military context). Hence, in measuring psychological resilience in OCS, different variables may be included depending on what are uncovered in the qualitative study. It may well include pride, perseverance, purpose and optimism or a different combination of these variables plus more. Similarly, future research can also examine if psychological resilience in OCS is a higher order internal capacity that consists of a set of lower-order psychological variable whether they are similar to those found in the current research or not. The intervention approach can also mirror that of this research (i.e., enhancing psychological resilience in OCS by targeting its constituent parts). Finally, it will also serve a practical purpose to examine the criterion validity of psychological resilience in OCS in relation to some other form of performance outcome (e.g., performance during a particular training exercise or overall performance in OCS).

8.4. Implications for organisation practice

There are several implications for organisation practice. This section discusses two; supplementing existing selection and development protocol, and intervention approach.

8.4.1. Supplementing existing selection and development protocol

This research has developed the PsyResQ-BMT to measure psychological resilience specifically in BMT involving conscripted recruits. It was also established that score on the PsyResQ-BMT was associated with the likelihood of qualification for leadership training. Hence, the practical and policy implications are that the PsyResQ-BMT could be trialled for used in supplementing existing protocol for leadership selection and development. The suggestion is not to replace existing selection protocol or to add the PsyResQ-BMT score as another criterion for entry into leadership schools. Rather, it is suggested that the PsyResQ-BMT score be used as a supplementary tool. After a potential candidate has been selected for leadership training, the selection board can check his PsyResQ-BMT score to examine if the score falls below a certain range. The selection board can then interview the candidate to understand if there is any issue of concern and can identify him for development if necessary. After all, the SAF is a military organisation that embraces Leadership by Example as one of its eight core values and a national institution where approximately half of Singapore's population performs their NS at some point. Hence, we see SAF leaders as ambassadors who should be proud to be soldiers, persevere in the face of adversity, find NS purposeful, and are optimistic and positive.

8.4.2. Intervention approach

This research (Study 5) found preliminary evidence to suggest that some aspects of psychological resilience in BMT could be enhanced through a targeted intervention by addressing the constituent parts and in the case of this research, it was pride, perseverance, purpose and optimism. More specifically, the strategy was to provide information on what could and how to build psychological resilience, change the thinking pattern and impart skills that promotes psychological resilience. Hence, at the organisational level, the practical and policy implications is to incorporate resilience training. However, more research is required to replicate the findings of Study 5 and benefits of the training intervention. For example, as the current research focused only on the recruit population attending BMT, it would be insightful to design similar studies for other phases of training involving different populations (e.g., more advance training phases such as leadership training involving specialist and officer cadets). In addition, increase in psychological resilience score on its own has no utility if this increase does not lead to a corresponding improvement in some tangible outcomes (e.g., mental well-being, general military performance such as grades in training courses and specific military performance such as

shooting accuracy and physical fitness). Therefore, it is necessary for future research to relate psychological resilience to some tangible outcomes and examine if improvement in psychological resilience also leads to better performance in those outcomes. If more evidence is found, resilience intervention approach can mirror that of this research (Study 5) by targeting the salient psychological variables or protective factors through teaching skills such as goal-setting and positive self-talk. This will promote positive self-concept and enhance psychological resilience which will in turn potentially lower the training attrition rate and produce better performing soldiers. As discussed in sub-section 8.2.5, psychological resilience in BMT is a higher-order internal capacity that comprises several internal protective factors including but not limited to just the four examined in this research. Hence, when future studies find more salient internal psychological variables, the training intervention can additionally address them to improve the overall psychological resilience in BMT.

This research also found that external protective factors such as help from peers, encouragement from trainers and support from family and loved ones helped the recruits to adapt positively during BMT. While this research did not examine the amount of support available nor the nature of support, there are practical and policy implications to extend the intervention efforts to include these external factors. The SAF can continue to emphasise the importance of unit cohesion and design activities to promote this so that solders are more closely knitted and will support one another in times of need. The SAF can also target its organisational culture by reiterating the need to Care for Soldiers, one of its core values, by creating more awareness in potential leaders during the leadership training that soldiers' well-being is their responsibility. Lastly, more can be done to better engage the soldiers' family and loved one. Initiatives such as parent visiting day during BMT, home visitation programmes and many more should be continued.

8.5. Concluding note

This research submits that it has met the aim of advancing the understanding of psychological resilience. This research contributed to the field in establishing that psychological resilience in BMT can be conceptualised as an internal capacity and process; psychological resilience can be conceptualised as an internal capacity as all the recruits reported various internal psychological variables that helped them to adapt positively or be resilient in the face of adversities, and psychological resilience can also

be conceptualised as a process as there were interactions involving the recruits with the adversities and protective factors in their environment. In operationalising psychological resilience as an internal capacity, it is made up of multiple internal psychological variables or protective factors such as pride, perseverance, purpose and optimism. In operationalising psychological resilience as a process, it involves how the recruits appraised the adversities, and what and how internal and external protective factors facilitated them to adapt positively during BMT.

This research also added new knowledge by providing evidences to show that psychological resilience in BMT is a higher-order construct that comprises secondary psychological variables including pride, perseverance, purpose and optimism. Consequently, this research could develop a customised measure of the conscripted recruits' psychological resilience in BMT by examining its constituent parts. Equally important, this research established the criterion validity of psychological resilience by relating it to BMT performance; qualification for leadership training. It is also assuring to ascertain that psychological resilience in BMT could be enhanced through a targeted intervention by specifically addressing its constituent parts to build a positive self-concept.

While BMT is tough, it is heartening to learn that most recruits are able to adapt positively during the training despite exposure to a variety of adversities. As the saying goes, what gets measured gets done. Now that it is possible to quantitatively assess psychological resilience in BMT and prove that something can be done to improve it, the researcher is hopeful that more can and will be done to improve the well-being of tens of thousands of Singaporean sons each year as they enlist for NS. The ability to improve psychological resilience will also help the SAF to fulfil its mission "*to enhance Singapore's peace and security through deterrence and diplomacy, and should these fail, to secure a swift and decisive victory over the aggressor*" ("Mission" n.d.).

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Appendices

Appendix A: Interview schedule – for pilot study

Research Questions:

1. What do the participants consider as challenges or adversities in the BMT environment?

2. What factors, both internal and external, helped the participants to adapt positively to these challenges or adversities?

Duration: 45 minutes

Venue: Home

Participants: Convenient sample of SAF officers

Duration	Activity	Questions	Remarks
	Preparation before interview	N.A.	1. Table and chairs 2. Refreshment 3. Turn off mobile phone
5 mins	Introduction	1. Self-introduction and explain why the researcher is conducting the research. 2. Provided the participant with details about the study from the information sheet. 3. Assure the participant that the interview is confidential, and no information provided by the participant will be shared with anybody. 4. Highlight that the session will be voice-recorded or video-recorded for the purpose of testing which approach is more appropriate.	

		5. Emphasize that there is no right or wrong answer, just the participant's opinion.	
		6. Checked that the participant is comfortable, understand everything, and has no issue with taking part in the pilot study.	
		7. Hand out the consent form for the participant to sign.	
5 mins	Participant introduction	"*Let us start by talking about yourself (brief summary of participant's life to date).*" Prompts: 1. education background 2. concurrent curriculum activities in school (e.g., clubs, sports society, student counsel etc) 3. hobbies (e.g., individual/team sports) 4. family background 5. activities outside of school	
10 mins	Examine general BMT experience	"*Let us now talk about your BMT experience.*" Prompts: 1. What were your expectations of BMT before coming here? 2. Did you do any preparation before BMT and how? 3. How has your BMT experience being so far?	
10 mins	Examine most challenging aspects of BMT	"*With regard to the toughest aspects of BMT, try to recall a specific incident, activity or experience (prompt and allow time for recollection).*"	

10 mins	Examine what factor helped the participant to adapt positively during the incident	"*With reference to the same incident, activity or experience, what helped you to adapt positively or what do you think got in the way of you adapting well?*"	
5 mins	Conclusion	1. Debrief the participant and provide debriefing sheet 2. Reassure confidentiality 3. Ask for feedback	
Total time: 45 mins			

Appendix B: *Discussion schedule – for focus group discussion with trainers*

Research Questions:

1. What do the recruits consider as challenges or adversities in the BMT environment?

2. What factors, both internal and external, helped the recruits to adapt positively to these challenges or adversities?

Duration: 60 minutes

Venue: BMTC recreation room

Participants: Trainers

Duration	Activity	Questions	Remarks
	Preparation before interview	N.A.	1. Table and chairs 2. Refreshment 3. Turn off mobile phone
10 mins	Introduction	1. Self-introduction and explain why the researcher is conducting the research. 2. Provided the recruit with details about the study from the information sheet. 3. Assure the recruit that the interview is confidential, and no information provided by the recruits will be shared with the trainer. 4. Highlight that the session will be voice-recorded for the purpose of subsequent transcription.	

		5. Emphasize that there is no right or wrong answer, just the recruit's opinion.	
		6. Checked that the recruit is comfortable, understand everything, and has no issue with taking part in the study.	
		7. Hand out the consent form for the recruit to sign.	
10 mins	Trainer's introduction	"*Let us start by talking about yourself (brief summary of participant's life to date).*"	
		Prompts:	
		1. education background	
		2. concurrent curriculum activities in school (e.g., clubs, sports society, student counsel etc)	
		3. hobbies (e.g., individual/team sports)	
		4. family background	
		5. activities outside of school	
10 mins	Examine general BMT experience	"*Let us now talk about your BMT experience.*"	
		Prompts:	
		1. What were your expectations of BMT before coming here?	
		2. Did you do any preparation before BMT and how?	
		3. How has your BMT experience being so far?	
		a. Is it different from what you have earlier expected / what others told you? How so?	
		b. How is it easier or tougher than you have thought?	

		c. What were the most rewarding or positive aspects of BMT?	
		d. What were the toughest aspects of BMT (physically, mentally, emotionally)?	
5 mins	Examine most challenging aspects of BMT	"*With regard to the toughest aspects of BMT, try to recall a specific incident, activity or experience (prompt and allow time for recollection).*" Prompt: 1. What exactly happened? Which BMT activity? When? 2. Describe the environment. a. Was there anybody else involved? b. What was your role? What did you do? What did you not do? c. What was going through your mind? How did you feel at that point? d. What was the consequence? e. What would/could have make things better/worse? f. Did the experience/consequence change over time? g. What did you learn? What would you have done instead?	
5 min	Define psychological resilience	Highlight Oxford dictionary's definition of physical resilience: 1. The ability of a substance or object to spring back into shape	Provide picture of a spring:

		2. notion of elasticity	
10 mins	Examine what factor helped the recruit to adapt positively during the incident	"*With reference to the same incident, activity or experience, what helped you to adapt positively or what do you think got in the way of you adapting well?*" Prompt on dimensions: 1. Physical 2. Mental 3. Emotional 4. Value, attitude, belief 5. Skills, training, previous experience	
10 mins	Conclusion	1. Debrief the recruit and provide debriefing sheet 2. Reassure confidentiality 3. Provided information on who the recruits can turn to if needed 4. Briefly explained plan for analysing the data 5. Ask for feedback	
Total time: 60 mins			

Appendix C: *Information sheet (Study 2)*

Dear Recruit,

Understanding Psychological Resilience in the Singapore Conscripted Armed Force Environment (Basic Military Training Phase) – Information Sheet

Principal Researcher & Affiliation: Ta Chuia Jeremiah KOH, Birkbeck

Researcher's Contact detail: +44 (0)7398 833 925 (UK)

+65 9760 9372 (Singapore)

tkoh01@mail.bbk.ac.uk

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1. What is the purpose of the study?

The purpose of this study is to understand how recruits react to the transition into the Singapore conscripted armed force environment, in particular the BMT phase when the recruits are introduced to the military environment.

The key objectives are to examine what the recruits consider as challenges or adversities in BMT, how they adapt and what kind of things ease the transition experience.

The eventual findings will help us to appreciate what the recruits are going through as they transform from civilians to soldiers, and allows us to better train and care for them.

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2. Who is conducting this research?

I am currently a full-time PhD student with Birkbeck, University of London. My study is fully sponsored by the MINDEF. I am conducting this research as part of this PhD requirement. I am supervised by Dr Almuth McDowall.

As the MINDEF only requires me to share my findings with them, only me and my supervisors will use and see the data.

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3. Why have I been Selected to Take Part?

You have been selected to take part in this study because you are currently undergoing or have just completed BMT. As such, the memory of your experience of BMT is still fresh and you will be able to provide vivid information that is valuable to the study.

About 30 recruits like yourself have been selected for this research.

4. What will I have to Do?

This is a qualitative study that uses the method of one-to-one interview.

Sometimes, we do not know in detail what are the various challenges or adversities faced by recruits like yourself and how they handle them. To find out, we need to interview recruits who are undergoing BMT. By analysing the information provided by the recruits, we will be able to obtain useful information from them.

The interview will take approximately 30 minutes and you will be asked questions based on your personal experience of BMT.

5. Will my participation involve any physical discomfort?

The interview will take place in the company line's interview room. It will be quiet, conducive and away from disturbance. Hence, your participation will not involve any physical discomfort. However, if you feel unwell at any point during the interview, you can alert me immediately and ask for the process to be stopped.

You can withdraw from the study at any time during the interview and you will not be expected to provide a reason. Likewise, you can also choose not to answer any question that makes you feel uncomfortable.

Please feel free to ask me any question during the interview and seek clarification as and when you deem necessary.

6. Will my participation involve any psychological discomfort or embarrassment?

Your participation is not expected to involve any psychological discomfort or embarrassment. However, you can refuse to answer any questions which you feel uncomfortable with, or you can stop the interview anytime.

In the unlikely event that you feel stressed or uncomfortable, please alert me and we can stop the interview. Also, as part of my employment with the MINDEF, I have been trained to recognise signs and symptoms of stress. If I pick up any of this sign or symptom or when you highlight to me that you do not feel well, I will stop the interview. If it is necessary, I will refer you to your para-counsellor or counsellor from the SAF Counselling Centre.

After the interview, if you feel that you need assistance or to talk to someone, please feel free to contact me or approach your buddy or immediate superior. You can also talk to your para-counsellor or call the SAF Counselling Centre at 1800 278 0022.

7. How will confidentiality be assured?

We will follow ethical practice in line with the military's guidance and my university's policy; all information about you will be handled in confidence.

The recorded conversation will be transcribed by me. Only me and my supervisor will have access to the audio recordings.

Information that can potentially identify you (e.g., the mentioning of another person, a particular place or activity) will be coded and anonymised.

As you may be asked to provide simple facts about yourself, we will log these information separately from the transcript so that your personal details remain protected.

8. Who will have access to the information that I have provided?

As the MINDEF only requires me to share my findings with them, only me and my supervisors will use and see the data.

9. How will information that I have provided be stored / used in the future?

The information that we have collected in paper copies will be stored under lock and key, while the electronic data can only be accessed with a secure password.

The data we collect will be used only for the purpose of this particular research. If data were to be used for future studies, further Research Ethics Committee approval will be sought. The transcripts will be kept for five years.

10. Has this research received appropriate ethical clearance?

Yes.

11. Will I receive any financial reward / travel expenses for taking part?

No, you will not receive any financial reward / travel expenses for taking part.

12. How can I withdraw from the study?

You can withdraw from the study at any time during the interview and you will not be expected to provide a reason.

After the conversation is transcribed, you will also have the opportunity to read them and retract your data if you wish, up until the point where we commence full analysis.

We will gladly discuss any concerns that you may have.

13. If I require further information, who should I contact and how?

You can call, text or email me. You can also talk to your immediate superior.

Appendix D: *Consent form (Study 2)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Force Environment (Basic Military Training Phase) – Participant Consent Form

Please read the following before participating in this study:

• I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

• I understand I have the right to withdraw from the study at any time and to decline to answer any particular questions.

• I agree to provide information to the researcher(s) on the understanding that my name will not be used without my permission. (The information will be used only for this research and publications arising from this research project.)

• I agree to the interview being taped.

• I understand that I have the right to ask for the audio tape to be turned off at any time during the interview.

• I agree to participate in this study under the conditions set out in the Information Sheet.

Signed by:

The researcher: ……………………………   Date: ………………

The interviewee: …………………………..   Date: ………………

Appendix E: *Debriefing sheet (Study 2)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Force Environment (Basic Military Training Phase) – Information Sheet

Principal Researcher & Affiliation: Ta Chuia Jeremiah KOH, Birkbeck

Researcher's Contact detail: +44 (0)7398 833 925 (UK)

+65 9760 9372 (Singapore)

tkoh01@mail.bbk.ac.uk

Thank you once again for participating in this study that will help us to better understand the construct of psychological resilience in the Singapore conscripted armed forces BMT environment.

I am conducting this study as part of my PhD research at Birkbeck, University of London, in the department of Organizational Psychology. I am supervised by Dr Almuth McDowall (a.mcdowall@bbk.ac.uk).

As highlighted in the participant information sheet that you have earlier received, the key objectives are to examine what the recruits consider as challenges or adversities in BMT, how they adapt and what kind of things ease the transition experience.

The research findings will help us to better appreciate what the current generation of recruits are going through as they transform from civilians to soldiers. It is hoped that the research will contribute in helping us to better train and care for recruits as they journey through this undoubtedly tough transition.

As you have experienced, the one-to-one interview drew out the recruit's thinking and emotion as they vividly recalled their fresh memories of the activities they went through days, hours or moments just before the interviews.

The next steps are to analyse what is common about the recruits' experience and group the findings into a framework.

Again, we thank you for your participation in this study. If you know of other recruits who will be participating in this study, we request that you not discuss it with them until after they have had the opportunity to participate. We greatly appreciate your cooperation.

Do be reassured that all information about you will be handled in confidence. Only the researchers will have access to the data. If we intend to use the data for future studies, further Research Ethics Committee approval will be sought.

If you have any questions regarding this study, please feel free to contact me, my supervisor or your immediate superior.

Appendix F: *Interview schedule – for one-to-one interview with recruits*

Research Questions:

1. What do the recruits consider as challenges or adversities in the BMT environment?

2. What factors, both internal and external, helped the recruits to adapt positively to these challenges or adversities?

Duration: 30 minutes

Venue: Unit interview room

Participants: Recruits

Duration	Activity	Questions	Remarks
	Preparation before interview	N.A.	1. Table and chairs 2. Refreshment 3. Turn off mobile phone
5 mins	Introduction	1. Self-introduction and explain why the researcher is conducting the research. 2. Provided the recruit with details about the study from the information sheet. 3. Assure the recruit that the interview is confidential, and no information provided by the recruits will be shared with the trainer. 4. Highlight that the session will be voice-recorded for the purpose of subsequent transcription.	

		5. Emphasize that there is no right or wrong answer, just the recruit's opinion. 6. Checked that the recruit is comfortable, understand everything, and has no issue with taking part in the study. 7. Hand out the consent form for the recruit to sign.	
3 mins	Recruit's introduction	"*Let us start by talking about yourself (brief summary of participant's life to date).*" Prompts: 1. education background 2. concurrent curriculum activities in school (e.g., clubs, sports society, student counsel etc) 3. hobbies (e.g., individual/team sports) 4. family background 5. activities outside of school	
5 mins	Examine general BMT experience	"*Let us now talk about your BMT experience.*" Prompts: 1. What were your expectations of BMT before coming here? 2. Did you do any preparation before BMT and how? 3. How has your BMT experience being so far? a. Is it different from what you have earlier expected / what others told you? How so?	

		b. How is it easier or tougher than you have thought?	
		c. What were the most rewarding or positive aspects of BMT?	
		d. What were the toughest aspects of BMT (physically, mentally, emotionally)?	
5 mins	Examine most challenging aspects of BMT	*"With regard to the toughest aspects of BMT, try to recall a specific incident, activity or experience (prompt and allow time for recollection)."*	
		Prompt:	
		1. What exactly happened? Which BMT activity? When?	
		2. Describe the environment.	
		a. Was there anybody else involved?	
		b. What was your role? What did you do? What did you not do?	
		c. What was going through your mind? How did you feel at that point?	
		d. What was the consequence?	
		e. What would/could have make things better/worse?	
		f. Did the experience/consequence change over time?	
		g. What did you learn? What would you have done instead?	

2 min	Define psychological resilience	Highlight Oxford dictionary's definition of physical resilience: 1. The ability of a substance or object to spring back into shape 2. notion of elasticity	Provide picture of a spring:
5 mins	Examine what factor helped the recruit to adapt positively during the incident	"*With reference to the same incident, activity or experience, what helped you to adapt positively or what do you think got in the way of you adapting well?*" Prompt on dimensions: 1. Physical 2. Mental 3. Emotional 4. Value, attitude, belief 5. Skills, training, previous experience	
5 mins	Conclusion	1. Debrief the recruit and provide debriefing sheet 2. Reassure confidentiality 3. Provided information on who the recruits can turn to if needed 4. Briefly explained plan for analysing the data 5. Ask for feedback	
Total time: 30 mins			

Appendix G: *Adversities reported by the recruits and their prevalence*

Recruit	Adversities					
Recruit A	Field camp					
Recruit B	Field camp					
Recruit C		Being away from home	Punishment	Getting people to cooperate		
Recruit D	Field camp	Being away from home			Route march	
Recruit E	Field camp					Change in environment
Recruit F					Route march	

Recruit	Field camp	Punishment	Route march	Change in environment	Injury	Unreasonable standards	Trainers	Physical training
Recruit G			Route march	Change in environment				
Recruit H		Punishment			Injury	Unreasonable standards	Trainers	
Recruit I	Field camp							Physical training
Recruit J	Field camp			Change in environment				
Recruit K	Field camp			Change in environment				
Recruit L	Field camp			Change in environment			Trainers	Physical training
Recruit M	Field camp			Change in environment				
Recruit N			Route march	Change in environment				
Recruit O		Punishment	Route march					
Recruit P	Field camp			Change in environment				

	15	3	5	1	6	8	2	1	2	5	1
Recruit Q	Field camp	Being away from home								Physical training	
Recruit R	Field camp										
Recruit S	Field camp									Physical training	
Recruit T			Punishment							Physical training	
Recruit U	Field camp		Punishment		Route march						
Recruit V	Field camp						Injury				Confinement

Appendix H: *What the trainers reported were adversities in BMT*

<u>Field camp</u>

Adversities	Reason cited	Detail provided
Field camp	First time out field	1. Trained in field condition for 5 consecutive days
		2. Deprived of creature comfort like shower and bed
		3. Field condition
		- harsh weather (e.g., hot in the day and raining)
		- no shelter
		- not so safe environment (e.g., wild boar, snake and scorpion)
		- insect buzzing sound
		- no toilet therefore has to dig hole
	Overconfident thinking that it was going to be easy	1. Field training is different from physical training in barrack (i.e., recruits thinking that it will be easy just because they achieved gold standard in physical fitness test)
		2. It is not a one-shot activity
	Digging shell scrape	1. When rained, recruits have to prevent flooding by using their helmets to scoop out the water
		2. Have to shift location when they encounter rocks or roots
		3. Toughest activity in field camp
	Additional challenge when appointed as IC	1. Given artificial authority over the peers
		2. Hard to exercise command and control when the recruits were tired

		3. In addition to motivating themselves, the IC have to motivate others
	Unlike in the barrack, the recruits have to carry their weapons, and wear helmets and load-bearing vests all the time	1. Additional weight
		2. Abrasion
	Disconnected from outside world	Unlike in the barrack, they cannot bring their mobile phones out
	Maintaining field discipline	Cannot see in the dark as the recruits were not allowed to use torch light at night

Change in environment

Adversities	Reason cited	Detail provided
Change in environment	Submission to authority	1. The recruits will be resistant initially but will eventually have to surrender their pride and ego
		2. Not used to taking orders from others
		3. Trainers treated them different compared to their parents
		4. The recruits cannot argue with the trainers
	Transiting from civilians to soldiers	1. Being observed and controlled all the time
		2. Detachment from privileges that the recruits used to have as civilians (e.g., no freedom and little personal time)
		3. Regimentation and discipline (e.g., having to ask permission all the time)
		4. Rushing all the time

	Getting along with others in a high stress environment	Especially difficult for the shy and socially awkward recruits
	Undergoing training	1. Physically tough training
		2. Most recruits did not train themselves before enlistment
		3. Initial shock when the recruits realised they could not keep up

Route march

Adversities	Reason cited	Detail provided
Route march	Longer distance marches	1. All recruits will start strong, but the marches will challenge their resilience
		2. Physically taxing
		3. The recruits will start to have leg cramps and limping toward the end
	Not long lasting for some marches but physically intense nonetheless	Shoulder and neck hurts
	The final march (i.e., 24km)	The recruits will face the dilemma of giving up and not attending the graduation parade or to persevere
	Mundane	1. It is just about walking
		2. Doing the same thing over and over again

	There is little the recruits can do to distract themselves from the pain	
	Uneven ground	
	Especially tough for the smaller size recruits	Carrying the same weight with different load-bearing capability

Physical training

Adversities	Reason cited	Detail provided
Physical training	Regular and tough	1. Physically tough training
		2. Most recruits did not train themselves before enlistment
		3. Initial shock when the recruits realised they could not keep up
		4. The recruits will be completely drenched in sweat after each training

Getting other recruits to cooperate

Adversities	Reason cited	Detail provided
Getting other recruits to cooperate	Additional responsibilities when appointed as IC	1. Given artificial authority over the peers
		2. Hard to exercise command and control when the recruits were tired
		3. In addition to motivating themselves, the IC have to motivate others

<u>Confinement</u>

Adversities	Reason cited	Detail provided
Confinement	Confinement up to three weeks	1. Cut off from the outside world 2. Sense of isolation

Appendix I: *The protective factors that the trainers thought helped the recruits to adapt positively during BMT*

Internal (psychological variable)

Internal (psychological variable)	Trainers' remarks
Pride	"*And not being able to complete the whole thing. It is a feeling that I I've let them down. I think this feeling of disappointment is very, it can be a really great source of motivation for them, especially when they are going through tough times.*" "*Because when, whenever, they, they failed in something, in an exercise. They they'll feel that, you know, not only have I let myself down, I've let my buddy down, I've let my commanders down, you know. Then maybe my loved ones at home down.*"

Internal (psychological variable)	Trainers' remarks
Hope	"*I think if you were to ask right. If there's a day that the recruits will be most effective, most motivated, most efficient right, it'll be on Friday. Because that's what they are looking for towards the whole week.*"

Internal (psychological variable)	Trainers' remarks
Perseverance	"*I said, "So how? Tired? You want to fall out or not?" They'll say, "No sir, don't want to fall out, soldier strong sir.".*" "*I know some of the dragon boating recruits, that all the physical activities, they always push because then their training in dragon boating as tough.*" "*Cause they had a choice of whether they wanted to continue or quit. They themselves pushed themselves, to carry on the training.*"

Internal (psychological variable)	Trainers' remarks
Purpose	"*What helps them a bit to say not give up, or adapt positively, is we give them a why, or something to work with.*" "*Find that the better ones are those who can, understand the bigger picture. They are not so blur, in the sense that they, they can see why we are doing these. And in the picture, where this piece fits in.*" "*If they understand why, why we instruct them. Usually for my recruits, I would, I would try to rationalise with them whenever they asked me why I give this instruction. Then I, I just very plainly, very truthfully tell them everything.*" "*Think also when they don't see a purpose in completing it. Like they just look at it, like, ok if I do it, what's the point. I still go through everything, I still go through BMT, my life goes on. They just, they don't see a purpose.*"

Internal (psychological variable)	Trainers' remarks
Optimism	"*I think if you were to ask right. If there's a day that the recruits will be most effective, most motivated, most efficient right, it'll be on Friday. Because that's what they are looking for towards the whole week.*" "*There's always someone in a worse situation than you.*"

Internal (psychological variable)	Trainers' remarks
Acceptance	"*The recruits will be resistant initially but will eventually have to surrender their pride and ego.*" "*Trying to come to terms that they're serving NS.*"

Internal (skills)

Internal (skills)	Trainers' remarks
Setting goal	"*I think it's more of goal setting. Some of these recruits want to achieve something out of BMT, go to command school. Some of them will just be like I just want to get through this course doing the bear minimum. But some of them want to excel at what they are doing. So, if they have that goal in mind, usually they will perform better.*" "*So they have the mentality to push on through the hardships because they want to achieve the goal.*" "*But some of them want to excel at what they are doing. So, if they have that goal in mind, usually they will perform better.*"

Internal (skills)	Trainers' remarks
Positive appraisal / reframing of situation	"*There's always someone in a worse situation than you.*"

Internal (skills)	Trainers' remarks
Not giving excuse	"*If you see your friends can do it. Competitiveness. No excuse for you not to be able to do it.*"

External factor

Factor	Trainers' remarks
Family / loved ones	"*Maybe their loved ones, people close to them have you know like actually, they, that, they expect them to be, you know, strong, to learn to pull through these training. And not being able to complete the whole thing. It is a feeling that I I've let them down. I think this feeling of disappointment is very, it can be a really great source of motivation for them, especially when they are going through tough times.*" "*If your parents support you when you go through the Army, through NS, it helps a lot.*"

Factor	Trainers' remarks
Section / platoon mates	*"So they'll always turned to their friends first. Whether it's, like, things like after they get, after, after, they, after the activity, they tired, they feel like giving up, they'll talk to their friends first. In the middle of say route march or field camp, basically what you call, they feel down, they feel like they could, that they could fall out any moment, it's their friends who pushed them on first… But for the first, but first line of, of defence or anything, it's that the buddy will notice first, the section mates will notice first, and they will push this guy on."* *"Because when, whenever, they, they failed in something, in an exercise. They they'll feel that, you know, not only have I let myself down, I've let my buddy down, I've let my commanders down, you know. Then maybe my loved ones at home down."* *"Everyone goes through the same thing, so they can motivate each other."*

Factor	Trainers' remarks
Trainers	*"Then the commanders will notice and they will push them on."* *"The section commander level. Whom are with the recruits almost 24 hours. Take them for training, knowing them, their behaviour, their fitness, what are their strengths and weaknesses. These section commanders are there to give their encouragement. Not only encouragement, but also telling them what's happening in this particular exercise, this particular activity. So they are mentally prepared. So even they want to give up, they have their buddies of course. And of course, additional helps is from the section commanders' encouragement. A good pair of shoulder or encouragement."* *"Because when, whenever, they, they failed in something, in an exercise. They they'll feel that, you know, not only have I let myself down, I've let my buddy down, I've let my commanders down, you know. Then maybe my loved ones at home down."* *"So, it's like when you give him a smile, "Good job." Then they like feel better, when they do something. 'Cause, they kind of like trying their best."* *"It's this sense of, commander's acknowledgement that they done, they did something right."*

"They will stop questioning my command. I'll give them command, they'll stop questioning, they just do first, after that then they ask me why we do this."

Appendix J: *Authentic Pride Scale*

Factor	Scale	Existing Item	Modified Item
Pride	Authentic Pride Scale	Accomplished	In general, I feel a sense of accomplishment during BMT.
		Like I am achieving	In general, I feel like I have achieved something during BMT.
		Confident	In general, I feel confident during BMT.
		Fulfilled	In general, I feel a sense of fulfilment during BMT.
		Productive	In general, I feel productive during BMT.
		Like I have self-worth	In general, I feel like I have a sense of self-worth during BMT.
		Successful	In general, I feel I have been successful during BMT.

Appendix K: *Adult Hope Scale*

Factor	Scale	Existing Item	Modified Item
Hope	Adult Hope Scale	I energetically pursue my goals.	During BMT, I energetically pursue my goals. (Agency 1)
		My past experiences have prepared me well for my future.	My BMT experiences so far have prepared me well for future training. (Agency 2)
		I've been pretty successful in life.	I've been pretty successful during BMT. (Agency 3)
		I meet the goals that I set for myself.	In BMT, I meet the goals that I set for myself. (Agency 4)
		I can think of many ways to get out of a jam.	During BMT, I can think of many ways to overcome obstacles along the way. (Pathway 1)
		There are lots of ways around any problem.	There are lots of ways around the problems I encounter during BMT. (Pathway 2)
		I can think of many ways to get the things in life that are important to me.	I can think of many ways to achieve the things I want in BMT. (Pathway 3)
		Even when others get discouraged, I know I can find a way to solve the problem.	During BMT, even when others get discouraged, I know I can find a way to solve the problem. (Pathway 4)

Appendix L: *Grit-O*

Factor	Scale	Existing Item	Modified Item
Perseverance	Grit–S	I have overcome setbacks to conquer an important challenge.	During BMT, I have overcome setbacks to conquer an important challenge.
		Setbacks don't discourage me.	During BMT, setbacks don't discourage me.
		I finish whatever I begin.	During BMT, I finish whatever I begin.
		I have achieved a goal that took years of work.	During BMT, I have achieved a goal that took a lot of effort.
		I am diligent.	I am diligent during BMT.

Appendix M: *Orientation to Life Scale (SOC-13)*

Factor	Scale	Existing Item	Modified Item
Purpose	Orientation to Life Scale (SOC-13)	Do you have the feeling that you really don't care about what is going on around you?	During BMT, I have a feeling that I really don't care about what is going on around me. (R)
		Until now your life has had: no clear goals – very clear goals and purpose	I have clear goals and purpose for BMT.
		Doing the things you do every day is: a source of deep pleasure and satisfaction – a source of pain and boredom	Doing the things I do in BMT gives me a sense of satisfaction.
		How often do you have the feeling that there is little meaning in the things you do in your daily life?	I feel that there is meaning in the things I do in BMT.

Appendix N: *Life Orientation Test-Revised (LOT-R)*

Factor	Scale	Existing Item	Modified Item
Optimism	Life Orientation Test-Revised (LOT-R)	In uncertain times, I usually expect the best.	In uncertain times during BMT, I usually expect the best.
		If something can go wrong for me, it will. (R)	During BMT if something can go wrong for me, it will. (R)
		I'm always optimistic about my future.	I'm always optimistic about what happens to me in BMT.
		I hardly ever expect things to go my way. (R)	During BMT, I hardly ever expect things to go my way. (R)
		I rarely count on good things happening to me. (R)	During BMT, I rarely count on good things happening to me. (R)
		Overall, I expect more good things to happen to me than bad.	Overall, I expect more good things to happen to me than bad ones during BMT.

Appendix O: *Philadelphia Mindfulness Scale (PHLMS)*

Factor	Scale	Existing Item	Modified Item
Acceptance	Philadelphia Mindfulness Scale (PHLMS)	If there is something I don't want to think about, I'll try many things to get it out of my mind.	If there is something I don't want to think about in BMT, I'll try many things to get it out of my mind. (R)
		There are things I try not to think about.	There are things in BMT I try not to think about. (R)
		I try to stay busy to keep thoughts or feelings from coming to mind.	I try to stay busy to keep unpleasant thoughts or feelings about BMT from coming to mind. (R)
		I tell myself that I shouldn't have certain thoughts.	During BMT, I tell myself that I shouldn't have certain thoughts. (R)
		There are aspects of myself I don't want to think about.	With regard to BMT, there are aspects of myself I don't want to think about. (R)
		I wish I could control my emotions more easily	I wish I could control my emotions more easily during BMT. (R)
		I try to distract myself when I feel unpleasant emotions	I try to distract myself when I feel unpleasant emotions during BMT. (R)
		I tell myself that I shouldn't feel sad.	I tell myself that I shouldn't feel sad during BMT. (R)
		When I have a bad memory, I try to distract myself to make it go away.	When I have a bad memory during BMT, I try to distract myself to make it go away. (R)
		I try to put my problems out of mind.	I try to put my BMT problems out of mind. (R)

Appendix P: *Information sheet (Study 3)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Forces Environment (Basic Military Training Phase) – Information Sheet

Principal Researcher & Affiliation: Ta Chuia Jeremiah KOH, Birkbeck

Researcher's Contact detail: +44 (0)7398 833 925 (UK)

                                      +65 9760 9372 (Singapore)

                                      jeremiahktc@hotmail.com

1. <u>What is the purpose of the research?</u> This study represents Phase 2 of the overall research endeavour. Phase 1 involved a qualitative study aimed at examining what were the challenges or adversities present in the BMT environment and what helped the recruits to adapt positively. The study managed to identify numerous factors. This is a follow-up study to better understand these factors. The findings will inform us on how we can enhance existing BMT training such that the recruits become more resilient, and can navigate through BMT more smoothly and in the process have a better NS experience.
2. <u>Who is conducting this research?</u> I am currently a full-time research student with Birkbeck, University of London. My study is fully sponsored by the MINDEF. I am conducting this research as part of this PhD requirement. I am supervised by Dr Almuth McDowall. I will be soliciting the help of some of my colleagues to collect data. These will be the people whom you will meet in a few days' time.
3. <u>Why have I been Selected to Take Part?</u>

You have been selected to take part in this study because you are currently undergoing BMT. As such, the memory of your experience of BMT is still fresh and you will be able to provide information that is valuable to the research.

4. What will I have to Do?

We will only need you to complete a pen and paper questionnaire which will take less than half an hour. The questionnaire will contain various statements that you can respond on a 5-point scale. There is no right or wrong answer, and all that you will need to do is to give us your opinion.

5. Will my participation involve any physical discomfort?

The session will take place in the BMTC main auditorium. It will be quiet, conducive and away from disturbance. Hence your participation will not involve any physical discomfort. However, if you feel unwell at any point, you can alert the research assistant immediately and he or she will attend to you.

6. Will my participation involve any psychological discomfort or embarrassment?

Your participation is not expected to involve any psychological discomfort or embarrassment. In the unlikely event that you feel uncomfortable or unwell, please feel free to alert the research assistant.

7. How will confidentiality be assured?

We will follow ethical practice in line with the military's guidance and my university's policy; all information about you will be handled in confidence and anonymised by the researcher.

You will not be required to provide your name on the answer sheet, and the data that we collect will eventually be analysed at the group level, and not at the individual level.

8. Who will have access to the information that I have provided?

Only me, my supervisor and the research assistant will have access to the information that you have provided.

While the MINDEF will require me to share the findings with them, these will be shared only at the group level. Hence your identity and responses will be kept anonymous.

9. <u>How will information that I have provided be stored / used in the future?</u>

The information that we have collected in paper copies will be stored in the strong room in the Defence Psychology Department. They will be destroyed once the data are transferred into electronic form. The electronic data will be stored in the MINDEF's intranet portal.

The data we collect will be used only for the purpose of this particular study. If data were to be used for future studies, further Research Ethics Committee approval will be sought.

10. <u>Has this research received appropriate ethical clearance?</u>

Yes.

11. <u>Will I receive any financial reward / travel expenses for taking part?</u>

No, you will not receive any financial reward / travel expenses for taking part.

12. <u>How can I withdraw from the research?</u>

You can withdraw from the research at any time during the session and you will not be expected to provide a reason.

13. <u>If I require further information, who should I contact and how?</u>

You can call, text or email me. You can also talk to your immediate superior.

Appendix Q: *Consent form (Study 3)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Forces Environment (Basic Military Training Phase) – Participant Consent Form

Please read the following before participating in this research:

• I have read the information sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

• I understand I have the right to withdraw from the study at any time and to decline to answer any particular questions.

• I agree to provide information to the researcher(s) on the understanding that my name will not be used without my permission. The information will be used only for this research and publications arising from this research project.

• I agree to participate in this study under the conditions set out in the Information Sheet.

Signed by:

The researcher: ……………………………   Date: ………………

The interviewee: …………………………..   Date: ………………

Appendix R: *Detail item-level analyses of the six measures*

Detail item-level analysis for the measure of pride

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
In general, I feel a sense of accomplishment during BMT.	4.15	0.83	23.79	21.37	.86	.94
In general, I feel like I have achieved something during BMT.	4.15	0.82	23.80	21.42	.86	.94
In general, I feel confident during BMT.	4.01	0.83	23.93	21.52	.83	.94
In general, I feel a sense of fulfilment during BMT.	3.99	0.86	23.95	20.88	.89	.94
In general, I feel productive during BMT.	3.76	1.02	24.18	20.28	.79	.95
In general, I feel like I have a sense of self-worth during BMT.	3.92	0.88	24.02	20.95	.85	.94
In general, I feel I have been successful during BMT.	3.96	0.82	23.98	21.84	.79	.95

Reliability Coefficients = .95

Detail item-level analysis for the measure of hope

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
During BMT, I energetically pursue my goals.	3.85	.89	27.65	22.19	.76	.92
My BMT experiences so far have prepared me well for future training.	4.07	.76	27.44	23.36	.74	.92
I've been pretty successful during BMT.	3.91	.80	27.59	22.79	.78	.92
In BMT, I meet the goals that I set for myself.	3.86	.85	27.64	23.09	.68	.92
During BMT, I can think of many ways to overcome obstacles on the way.	4.03	.78	27.47	22.85	.80	.92
There are lots of ways around the problems I encounter during BMT.	3.91	.89	27.60	22.53	.71	.92
I can think of many ways to achieve the things I want in BMT.	3.88	.87	27.62	22.03	.82	.91
During BMT, even when others get discouraged, I know I can find a way to solve the problem.	4.01	.79	27.49	22.99	.76	.92

Reliability Coefficients = .93

Detail item-level analysis for the measure of perseverance

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
During BMT, I have overcome setbacks to conquer an important challenge.	4.11	.73	22.82	12.05	.67	.75
During BMT, setbacks don't discourage me.	4.08	.754	22.85	12.21	.61	.76
During BMT, I finish whatever I begin.	3.25	.92	23.68	13.94	.18	.84
During BMT, I have achieved a goal that took a lot of effort.	3.58	.98	23.36	11.63	.51	.78
I am diligent during BMT.	3.87	.89	23.06	11.44	.63	.75

Reliability Coefficients = .80

Detail item-level analysis for the measure of purpose

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
During BMT, I have a feeling that I really don't care about what is going on around me.	3.59	1.09	11.18	7.31	.47	.89
I have clear goals and purpose for BMT.	3.71	0.98	11.05	6.52	.76	.77
Doing the things I do in BMT gives me a sense of satisfaction.	3.74	0.99	11.02	6.45	.77	.76
I feel that there is meaning in the things I do in BMT.	3.72	1.01	11.04	6.43	.75	.77

Reliability Coefficients = .84

Detail item-level analysis for the measure of optimism

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
In uncertain times during BMT, I usually expect the best.	3.36	1.08	16.35	13.00	.58	.76
During BMT if something can go wrong for me, it will.	3.14	1.01	16.57	14.22	.46	.79
I'm always optimistic about what happens to me in BMT.	3.66	1.01	16.05	13.33	.60	.76
During BMT, I hardly ever expect things to go my way.	2.92	0.10	16.79	13.72	.55	.77
During BMT, I rarely count on good things happening to me.	3.04	1.00	16.67	13.99	.50	.78
Overall, I expect more good things to happen to me than bad ones during BMT.	3.59	1.03	16.12	12.95	.64	.75

Reliability Coefficients = .80

Detail item-level analysis for the measure of acceptance

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
If there is something I don't want to think about in BMT, I'll try many things to get it out of my mind.	2.47	.98	24.69	43.63	.56	.88
There are things in BMT I try not to think about.	2.66	1.02	24.51	43.07	.58	.88
I try to stay busy to keep unpleasant thoughts or feelings about BMT from coming to mind.	2.62	1.05	24.55	41.37	.70	.87
During BMT, I tell myself that I shouldn't have certain thoughts.	2.57	0.99	24.60	43.40	.57	.88
With regard to BMT, there are aspects of myself I don't want to think about.	3.12	1.07	24.05	42.49	.58	.88
I wish I could control my emotions more easily during BMT.	3.14	1.00	24.03	44.63	.46	.89
I try to distract myself when I feel unpleasant emotions during BMT.	2.61	0.98	24.56	41.50	.75	.87
I tell myself that I shouldn't feel sad during BMT.	2.48	1.04	24.69	43.49	.53	.88
When I have a bad memory during BMT, I try to distract myself to make it go away.	2.78	1.06	24.3905	40.556	.76	.87
I try to put my BMT problems out of mind.	2.70	1.04	16.12	12.95	.64	.75

Reliability Coefficients = .80

Appendix S: *Final 12 items*

Item
In general, I feel a sense of accomplishment during BMT.
In general, I feel like I have achieved something during BMT.
In general, I feel a sense of fulfilment during BMT.
During BMT, I have overcome setbacks to conquer an important challenge.
During BMT, I finish whatever I begin.
I am diligent during BMT.
I have clear goals and purpose for BMT.
Doing the things I do in BMT gives me a sense of satisfaction.
I feel that there is meaning in the things I do in BMT.
In uncertain times during BMT, I usually expect the best.
I'm always optimistic about what happens to me in BMT.
Overall, I expect more good things to happen to me than bad ones during BMT.

Appendix T: *Conner-Davidson Resilience Scale (CD-RISC)*

Item
I am able to adapt to change.
I can deal with whatever that comes my way.
I often see the humorous side of things.
I believe that stress will strengthen my coping ability.
I tend to bounce back after illness or hardship.
I can achieve my goals.
When under pressure, I can focus and think clearly.
I am not easily discouraged by failure.
I think of myself as a strong person.
I can handle unpleasant feelings.

Appendix U: *Conscientiousness (Big-Five factor markers)*

Item
I am always prepared.
I pay attention to details.
I get chores done right away.
I like order.
I follow a schedule.
I am precise in my work.
I leave my belongings around.
I make a mess of things.
I often forget to put things back in their proper place.
I avoid my duties.

Appendix V: *Information sheet (Study 4)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Forces Environment (Basic Military Training Phase) – Information Sheet

Principal Researcher & Affiliation: Ta Chuia Jeremiah KOH, Birkbeck

Researcher's Contact detail: +44 (0)7398 833 925 (UK)

+65 9760 9372 (Singapore)

jeremiahktc@hotmail.com

1. <u>What is the purpose of the research?</u> This study examines resilience in the BMT environment. It aims to identify factors that are related to resilience, and how they are associated with performance during BMT. The findings will inform us on how we can enhance existing BMT training such that the recruits become more resilient, and can navigate through BMT more smoothly and in the process have a better NS experience.
2. <u>Who is conducting this research?</u> I am currently a full-time research student with Birkbeck, University of London. My study is fully sponsored by the MINDEF. I am conducting this research as part of the PhD requirement. I am supervised by Dr Almuth McDowall. I will be soliciting the help of some of my colleagues to collect data. These will be the people whom you will meet in a few days' time.
3. <u>Why have I been Selected to Take Part?</u> You have been selected to take part in this study because you are currently undergoing BMT. As such, the memory of your experience of BMT is still fresh and you will be able to provide information that is valuable to the study.
4. <u>What will I have to Do?</u>

We will only need you to complete a pen and paper questionnaire which will take about 15 minutes. The questionnaire will contain various statements that you can respond on a 5-point scale. There is no right or wrong answer, and all that you will need to do is to give us your opinion.

5. Will my participation involve any physical discomfort?

The session will take place in the BMTC main auditorium. It will be quiet, conducive and away from disturbance. Hence your participation will not involve any physical discomfort. However, if you feel unwell at any point, you can alert the research assistant immediately and he or she will attend to you.

6. Will my participation involve any psychological discomfort or embarrassment?

Your participation is not expected to involve any psychological discomfort or embarrassment. In the unlikely event that you feel uncomfortable or unwell, please feel free to alert the research assistant.

7. How will confidentiality be assured?

We will follow ethical practice in line with the military's guidance and my university's policy; all information about you will be handled in confidence and anonymised by the researcher.

You will not be required to provide your name on the answer sheet, and the data that we collect will eventually be analysed at the group level, and not at the individual level.

8. Who will have access to the information that I have provided?

Only me, my supervisor and the research assistant will have access to the information that you have provided.

While the MINDEF will require me to share the findings with them, these will be shared only at the group level. Hence your identity and responses will be kept anonymous.

9. How will information that I have provided be stored / used in the future?

The information that we have collected in paper copies will be stored in the strong room in the Defence Psychology Department. They will be destroyed once the data are transferred into electronic form. The electronic data will be stored in the MINDEF's intranet portal.

The data we collect will be used only for the purpose of this particular study. If data were to be used for future studies, further Research Ethics Committee approval will be sought.

10. Has this research received appropriate ethical clearance?

Yes.

11. Will I receive any financial reward / travel expenses for taking part?

No, you will not receive any financial reward / travel expenses for taking part.

12. How can I withdraw from the research?

You can withdraw from the study at any time during the session and you will not be expected to provide a reason.

13. If I require further information, who should I contact and how?

You can call, text or email me. You can also talk to your immediate superior.

Appendix W: *Consent form (Study 4)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Forces Environment (Basic Military Training Phase) – Participant Consent Form

Please read the following before participating in this research:

• I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

• I understand I have the right to withdraw from the study at any time and to decline to answer any particular questions.

• I agree to provide information to the researcher(s) on the understanding that my name will not be used without my permission. The information will be used only for this research and publications arising from this research project.

• I agree to participate in this study under the conditions set out in the Information Sheet.

Signed by:

The researcher: ……………………………   Date: ………………

The interviewee: …………………………..   Date: ………………

Appendix X: *Detail item-level analyses of the PsyResQ-BMT*

Detail item-level analysis for the PsyResQ-BMT

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
In general, I feel a sense of accomplishment during BMT.	4.15	0.83	41.89	66.22	.77	.94
In general, I feel like I have achieved something during BMT.	4.15	0.82	41.89	66.31	.78	.94
In general, I feel a sense of fulfilment during BMT.	3.99	0.86	42.05	65.10	.82	.94
During BMT, I have overcome setbacks to conquer an important challenge.	4.11	0.73	41.93	68.06	.72	.94
During BMT, I finish whatever I begin.	3.87	0.89	42.17	66.65	.68	.94
I am diligent during BMT.	3.98	0.83	42.06	66.91	.72	.94
I have clear goals and purpose for BMT.	3.71	0.98	42.33	63.40	.83	.94
Doing the things I do in BMT gives me a sense of satisfaction.	3.74	0.99	42.30	63.34	.82	.94
I feel that there is meaning in the things I do in BMT.	3.72	1.00	43.83	36.92	.74	.90

	Mean	SD				
In uncertain times during BMT, I usually expect the best.	3.36	1.08	44.16	37.58	.57	.91
I'm always optimistic about what happens to me in BMT.	3.66	1.01	43.80	37.53	.68	.90
Overall, I expect more good things to happen to me than bad ones during BMT.	3.59	1.03	43.95	39.69	.40	.92

Reliability Coefficients = .91

Detail item-level analysis for the measure of pride

Item	*Mean*	*SD*	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
In general, I feel a sense of accomplishment during BMT.	4.15	0.83	8.14	2.55	.91	.90
In general, I feel like I have achieved something during BMT.	4.15	0.82	8.14	2.60	.90	.90
In general, I feel a sense of fulfilment during BMT.	3.99	0.86	8.30	2.59	.84	.96

Reliability Coefficients = .94

Detail item-level analysis for the measure of perseverance

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
During BMT, I have overcome setbacks to conquer an important challenge.	4.11	0.73	7.85	2.32	.73	.73
During BMT, I finish whatever I begin.	3.87	0.89	8.09	2.03	.66	.80
I am diligent during BMT.	3.98	0.83	7.98	2.14	.69	.76

Reliability Coefficients = .83

Detail item-level analysis for the measure of purpose

	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
I have clear goals and purpose for BMT.	3.71	0.98	7.46	3.50	.78	.86

Doing the things I do in BMT gives me a sense of satisfaction.	3.74	0.99	7.44	3.37	.82	.83
I feel that there is meaning in the things I do in BMT.	3.72	1.01	7.45	3.40	.78	.86

Reliability Coefficients = .89

Detail item-level analysis for the measure of optimism

Item	Mean	SD	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
In uncertain times during BMT, I usually expect the best.	3.36	1.08	7.26	3.36	.69	.77
I'm always optimistic about what happens to me in BMT.	3.66	1.01	6.96	3.54	.72	.74
Overall, I expect more good things to happen to me than bad ones in BMT.	3.59	1.03	7.02	3.64	.66	.80

Reliability Coefficients = .83

Appendix Y: *Information sheet (Study 5)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Forces Environment (Basic Military Training Phase) – Information Sheet

Principal Researcher & Affiliation: Ta Chuia Jeremiah KOH, Birkbeck

Researcher's Contact detail: +44 (0)7398 833 925 (UK)

                                      +65 9760 9372 (Singapore)

                                      jeremiahktc@hotmail.com

1. <u>What is the purpose of the research?</u> This study examines resilience in the BMT environment. It aims to identify factors that are related to resilience, and how they are associated with performance during BMT. The findings will inform us on how we can enhance existing BMT training such that the recruits become more resilient, and can navigate through BMT more smoothly and in the process have a better NS experience.
2. <u>Who is conducting this research?</u> I am currently a full-time research student with Birkbeck, University of London. My study is fully sponsored by the MINDEF. I am conducting this study as part of the PhD requirement. I am supervised by Dr Almuth McDowall.
3. <u>Why have I been Selected to Take Part?</u> You have been selected to take part in this research because you are currently undergoing BMT. As such, the memory of your experience of BMT is still fresh and you will be able to provide information that is valuable to the research.
4. <u>What will I have to Do?</u> You will be required to take part in a training session which you just did. We will also need you to complete a pen and paper questionnaire twice which will take about 15 minutes each time. The questionnaire will contain various statements that you can

respond on a 5-point scale. There is no right or wrong answer, and all that you will need to do is to give us your opinion.

5. <u>Will my participation involve any physical discomfort?</u>

The session will take place in the BMTC main auditorium. It will be quiet, conducive and away from disturbance. Hence your participation will not involve any physical discomfort. However, if you feel unwell at any point, you can alert the research assistant immediately and he or she will attend to you.

6. <u>Will my participation involve any psychological discomfort or embarrassment?</u>

Your participation is not expected to involve any psychological discomfort or embarrassment. In the unlikely event that you feel uncomfortable or unwell, please feel free to alert the research assistant.

7. <u>How will confidentiality be assured?</u>

We will follow ethical practice in line with the military's guidance and my university's policy; all information about you will be handled in confidence and anonymised by the researcher.

You will not be required to provide your name on the answer sheet, and the data that we collect will eventually be analysed at the group level, and not at the individual level.

8. <u>Who will have access to the information that I have provided?</u>

Only me and my supervisor will have access to the information that you have provided.

While the MINDEF will require me to share the findings with them, these will be shared only at the group level. Hence your identity and responses will be kept anonymous.

9. <u>How will information that I have provided be stored / used in the future?</u>

The information that we have collected in paper copies will be stored in the strong room in the Defence Psychology Department. They will be destroyed once the data are transferred into electronic form. The electronic data will be stored in the MINDEF's intranet portal.

The data we collect will be used only for the purpose of this particular study. If data were to be used for future studies, further Research Ethics Committee approval will be sought.

10. <u>Has this research received appropriate ethical clearance?</u>

Yes.

11. <u>Will I receive any financial reward / travel expenses for taking part?</u>

No, you will not receive any financial reward / travel expenses for taking part.

12. <u>How can I withdraw from the research?</u>

You can withdraw from the research at any time during the session and you will not be expected to provide a reason.

13. <u>If I require further information, who should I contact and how?</u>

You can call, text or email me. You can also talk to your immediate superior.

Appendix Z: *Consent form (Study 5)*

Dear Participant,

Understanding Psychological Resilience in the Singapore Conscripted Armed Forces Environment (Basic Military Training Phase) – Participant Consent Form

Please read the following before participating in this research:

• I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

• I understand I have the right to withdraw from the study at any time and to decline to answer any particular questions.

• I agree to provide information to the researcher(s) on the understanding that my name will not be used without my permission. The information will be used only for this research and publications arising from this research project.

• I agree to participate in this study under the conditions set out in the Information Sheet.

Signed by:

The researcher: ……………………………   Date: ………………

The interviewee: ……………………………..   Date: ………………