Identifying and understanding factors associated with failure to complete infantry training among British Army recruits

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ABSTRACT

BACKGROUND: Over 30% of the British Army's Infantry Recruits who underwent training between 1999 and 2003 failed to complete their training. Previous studies have focused predominantly on identifying the cumulative reasons for failure. There is a dearth of research investigating the effect of failure on the individual recruit and what influences their ability to pass training.

AIM: The overall aims of this study were: to achieve an understanding of the role that antecedent personal, social and demographic factors play in a British Army recruit's ability to complete basic training; to investigate the possibility of identifying predictive factors that would identify infantry recruits who were at risk of being unable to cope with the transition to life in the British Army; and to explore the reasons given by those recruits who failed to complete basic training to develop a more comprehensive understanding of why recruits fail.

METHODS: All new army recruits joining the first and second battalion between September 2002 and March 2003 were invited to take part in the study. A biographical questionnaire based on a modified version of the US Army's 115 item biographical questionnaire form was self-completed prior to infantry training by all those agreeing to take part in the study. Study participants were monitored weekly throughout their training and the training outcome (pass/fail) was recorded. The data was randomly split into a development dataset (two thirds) and a test dataset (one third). Independent variables were grouped into five categories (Demographic & Physical Measurement, Education, Outdoor Education, Non-Physical Activity and Conduct and Behaviour*)* and tested univariably and multivariably to examine their association with training outcome in the development dataset using

logistic regression. The multivariable model was then used to construct a score and its sensitivity and specificity was tested using the test dataset.

All those within the study who failed to complete Infantry recruit training were invited to take part in a qualitative semi-structured exit interview. These interviews were analysed using framework analysis methodology. Findings from both the quantitative and qualitative analysis were integrated to determine whether prediction of failure was practicable and to develop an increased understanding of the impact that antecedent factors and training experiences contributed to training failure.

RESULTS: Of the study cohort of 999 recruits 36.2% (n=362) failed. Within the failure group 74.4% (n=269) gave reasons to suggest that this was attributable to difficulties in adapting to life in the British Army Infantry. Factors associated with higher odds of failure were: absence of female siblings (p=0.005), aggressive coping strategies (p=0.013), use of ecstasy (p=0.02), evenings per week spent at the family home (p=0.032), truancy (p=0.039), an increased number of schools attended (p=0.046) and classroom behaviour (p=0.052). The area under the curve on the test dataset was 0.58 (0.501-0.65 95% CI).

Analysis of the qualitative data suggested that there was a marked difference between the socio-personal identity of recruits who failed training and the organisational identity of the British Army Infantry. Cognitive dissonance and varying extremes of stress were reported by those recruits that failed during the transition to military life.

CONCLUSION: A screening tool constructed from items of the biographical questionnaire was unable to predict failure in training with sufficient accuracy to recommend its routine use for new recruits to British Army Infantry training. This study has identified that there is a lack of fit between military identity and the socio-personal identity of the infantry recruit which results in dissonance

and stress during the transition into the military. It is recommended that future studies should focus on how to reduce the psychological impact of the transition into infantry training.

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

This study developed from ideas generated when I was working at the Defence Psychiatric Services Military Training and Rehabilitation Unit (Neal et al., 2003). A new project was instigated to develop an alternative method of care delivery to meet the specific requirements of service personnel with mental health problems. Its primary aim was to promote full recovery and reduce the number of personnel being returned to their units with *occupational restrictions*[1] following admission to the Defence Services Psychiatric Facility.

This Military Training and Rehabilitation Unit project began in January of 2001 and received patients for rehabilitation from the defence psychiatric services inpatient unit. A database was kept on all service personnel who passed through the unit; this was primarily to assess the extent to which the unit was meeting its aim. Through retrospective analysis of the data collected it emerged that although the unit took referrals from all three services (Royal Navy, Army and the Royal Air Force), 34% of all those admitted were army infantry soldiers. A further investigation into all admissions into the Defence Services Psychiatric facility showed that 26% from all three services were infantry soldiers. The Armed Forces current strength is approximately 210,000 with the infantry career employment group being approximately 28,600. Infantry personnel contribute to 14% of the UK armed forces population but accounted for over a quarter of all referrals from the total population to inpatient psychiatric care. This relatively high proportion of mental health

[1] All military personnel have a medical grading that determines their combat occupational status i.e. a soldier who is deemed fully fit can be sent to any combat zone in the world, a soldier who is not fully fit but still able to do some of their core duties might be sent to a combat zone but would have to remain in the main base. The occupational restrictions are a way for the Army to protect a soldier who might not be fully fit due to physical or psychological reasons.

referrals in one employment group of the armed forces raises questions as to why this single group is over represented.

Psychiatric pathology within the armed forces is very different to that seen in the NHS. Referrals comprise few, if any, incidents of 'serious' mental illness (i.e. diagnoses of psychotic illness). Individuals are typically referred with relatively mild mental health problems related to social issues. It is the low tolerance by military commanders of behaviour related to mental health problems in a safety critical environment which leads to referral to mental health services. It is difficult to account for higher referral rates from the infantry but this has been linked to it having one of the lowest educational entry requirements in the UK Armed Forces. The British Army has over 100 trades to which recruits may apply. To assist educational streaming for fitness to undergo training, recruits sit a test called the British Army Recruit Battery (BARB) and are issued with a score called a General Trainability Index (GTI) (Hampson, 1997). This score determines what job a recruit can do within the Army. The lowest GTI score is 26 and this is for infantry soldiers[2]. It is very common in my day to day work as a military mental health practitioner to have recruits and trained soldiers referred to me as 'unhappy soldiers'. The most common reason for their unhappiness is finding themselves in a different trade to that which they applied for at the recruiting office. This is usually the case with unhappy infantrymen who tend to report that they went to the Army

[2] **Infantrymen** are soldiers who are specifically trained for the role of fighting on foot to engage the enemy face to face and have historically borne the brunt of the casualties of combat in wars. As the oldest branch of the Combat Arms they are the backbone of armies. Infantry units have more physically demanding training than other branches of armies, and place a greater emphasis on discipline, fitness, physical strength and aggression. Wikipedia 2009. Infantry. *In:* Wikipedia (ed.).

careers office to join a certain trade within the Army, but ended up in the infantry with promises that they could transfer to another trade later in their career. It is possible that at the time of recruitment they did not have the educational requirements or achieve a high enough GTI score to undergo the training of their choice. In addition to this, the infantry constantly struggles to meet recruitment targets, and recruits are potentially being directed to the infantry whatever their preferences to ensure front line units are kept operational. The impact of this at an individual level is that many who did not set out to be an infantryman find themselves undergoing some of the most arduous training in the world[3].

In addition to this it is also important to reflect on the nature of the infantryman's role. A seminal publication used by the Joint Services Defence Staff College to study war is 'On War' by Carl Von Clausewitz (Clausewitz, 1832). Although an historical document it is still deemed relevant today in defining the act of war (Herberg-Rothe, 2009, Jackman, 2008, Villacres and Bassford, 1995). The definition of war itself can be simply viewed as an act of violence intended to compel an adversary to fulfil the will of of a nation state (Clausewitz, 1832) . The instrument that delivers violence at the personal level is the infantryman. It is argued that the 'nature of war' is enduring and never changes and will always consist of violence and death (Herberg-Rothe, 2009, Jackman, 2008, Villacres and Bassford, 1995, Clausewitz, 1832). The nature of war is in no way changed or modified with the progress of civilisation it is the 'character of war' (Clausewitz, 1832) that changes and modernises with time. The progression from the long bow to the musket can be used as an

[3] Combat Infantryman's Course:Infantrymen complete a 26-week course designed to teach all the skills required to operate as an infanteer on operations anywhere in the world Mod 2009. Infantry Soldier. *In:* Mod (ed.) *http://www.armyjobs.mod.uk/Jobs/Pages/JobDetail.aspx?armyjobid=INF101%2F501%2F601&category=*. Ministry of Defence.

example; while they were both designed to kill (nature of war) the musket was more effective (character of war) and modernised the warfare of its day. However, even with the modernisation of the character of war the role of the modern infantryman can differ little from that of his medieval counterpart. As recently as the Iraq conflict the British Infantryman has had to result to using the bayonet to deliver death to his enemy with the individual infantryman experiencing the overwhelming assault on his senses that this inevitably brings (Holmes, 2007). To be able to achieve this and control fear there has to be strong cohesion within the group as it cannot afford to have 'dissenters', 'weak-links' or 'non-copers' at such a time. Within the military the importance of the group rather than the individual is paramount and this leaves little place for individualism. This makes it very complex for the military to meet the individualistic expectations of modern recruits.

In order to better understand the psychological stress and strain that the infantryman is placed under, the Infantry Training Centre at Catterick Garrison was visited as it is the entry point for all infantrymen joining the British Army. This visit revealed that of the total infantry recruits (n=3700) for the training year 1999-2000, there was an attrition rate of 16% during the first 12 weeks of basic training alone, rising to over 30% by the end of the 26 week course (I.T.C, 2001). In effect, 593 recruits did not complete the first 12 weeks of training for the following reasons (routinely recorded in military records):

175 (5%) Discharged as of right, that is they took their own discharge.

257 (7%) Services no longer required, (equal to dismissal).

68 (2%) Other & Absent without leave.

93 (2%) were 'back squaded', i.e. made to repeat the initial training due to physical injury or failing to achieve the standard required. This visit and the subsequent meetings with the Commanding Officer of the Infantry Training

Centre revealed that there was a significant problem with recruit wastage and failure in basic infantry training.

Recruit selection to military service will never be an exact science, and inevitably there will always be those individuals that will have been incorrectly selected for service. However, poor selection methods that lead to the enlistment of unsuitable recruits has both a financial impact and a human toll (Borman et al., 2004b). Within key British Army career employment groups such as the Infantry, Royal Artillery, Royal Armoured Corps and the Royal Engineers, attrition within the first 12 weeks of training remains consistently above 30% a year (A.R.T.D., 2010). Within that percentage of failure nearly three quarters is attributed to psychological, personnel and disciplinary reasons rather than physical factors. Army Recruitment and Training Division (2010) financial assumptions calculate that individual uniform issue at the beginning of training costs £1299 and each recruit incurs a costs of approximately £64.74 per day (this includes pay, field rations, cost of ammunition and travel expenses, but does not include food and accommodation). To calculate an approximate cost of wastage the following formula was used: cost of wastage = number of failed recruits x 1299 (uniform issue) + ((64.74 x number of days completed) x number of recruits. If applied to the current figures for wastage within the county regiments of the infantry career employment group (n=936), a conservative cost of wastage (this assumes all left at 28 days[4] (cost of wastage = 1299 x 936 + ((64.74 x 28) x 936)) would be £2,912569 (A.R.T.D., 2010). Such a consistent level of recruit wastage indicates that recruit selection criteria should be examined with a view to exploring alternative methods of ascertaining recruit suitability.

[4] Once recruits have enlisted they have to complete a minimum of 28 days before they are allowed to self discharge. The majority of self discharge will occur in this period, however others may leave later in training

These figures identify three significant problems with the current selection methods used by the British Army: 1. The financial cost of wastage is indefensible in the current financial climate where all public departments including the Ministry of Defence having to make significant cuts to their annual budgets. 2. The British Army is currently engaged in a sustained conflict in Afghanistan and is reliant on manpower replenishment in its infantry units. This significant wastage during recruit training has the potential to leave frontline units undermanned. 3. There is no clear understanding of the impact or human toll that this amount of wastage is having on the individual recruit that fails. Army Recruitment and Training Division figures show that average training wastage across the British Army (excluding infantry formations) Is 14.2% (A.R.T.D., 2010) indicating that the Infantry is experiencing a disproportionate amount of training wastage, of which nearly three quarters is attributed to psychological, personnel and disciplinary reasons.

A key aspect of the military mental health nurses role is to identify social situations within the military environment that cause disproportionate amounts of manpower loss to the Army due to psychological difficulties. Due to discharge methods and the trainees status as recruits, this excessive loss of manpower had not been identified as a significant occupational mental health problem. What was of most interest initially was just how little was known about the reasons for the methods of discharge such as ‘discharge as of right’, ‘service no longer required’ and those that go absent without leave. The three reasons for discharge each raise particular points of interest.

Firstly, individuals who choose to leave employment in the army, which requires an enormous amount of commitment and effort to join are arguably experiencing significant discomfort in their new role. It is of interest to explore

what is causing their difficulties, how the role differs from expectations, and what psychological and social factors are associated with the group of recruits who take their own discharge.

Secondly, for those recruits lost through Service No Longer Required (SNLR), Absent Without Leave and others, it is an understanding of why the recruit fails to adapt to the army's expectations that is of interest. SNLR was the highest cause of infantry recruit attrition at the Infantry Training Centre during the 12 week period examined and presently there is very little information available to explain what it was that was causing the recruits to be dismissed.

Thirdly, if the precise nature of difficulties can be identified then it is possible that interventions to enhance an individual's coping strategies may enable more recruits to succeed in basic training. If prediction of this vulnerable group of recruits were possible then strategies, including mental health interventions, could be targeted to attempt to reduce the attrition.

It is clear from both the Infantry Training Centre data as well as more recent data from the Army Recruitment and Training Division that wastage within the Infantry Training Centre remains unacceptably high and worryingly consistent year on year. As this thesis will show, recent studies have focused on the recruit as the protagonist in failure and that there has been very little reflection on the organisation's role in the recruit failure process. In contrast, this study assumes that infantry recruit failure is potentially more complex than individual inadequacy and approaches the problem from a holistic perspective, examining the role that both the recruit and the organisation play in the failure pathway.

The study aims to identify and explore the factors associated with recruit failure in the infantry in order to consider ways in which the consistently high, and extremely costly levels of failure might be redressed. It begins by identifying biographical factors associated with failure and then through the use of semi-structured interviews and leaver's reports develops a greater understanding of the process of failure from both the recruits and the training staff's perspective. To achieve this a mixed method approach is adopted using a biographical questionnaire (with a cohort of 1000 consecutive recruits) followed by semi-structured interviews with those who failed in infantry training and analysis of Commanding Officer's discharge reports.

Organisational identity theory will be used as a theoretical framework to examine the current difficulties that the Army is experiencing with infantry recruit attrition. Initially this thesis will examine Organisational Identity Theory and its origins in Social Identity Theory and then critically examine its relevance as a framework for understanding organisational difficulties within a military population The literature review concludes with a critique of recent studies undertaken to predict and understand recruit attrition in a military population.

The methodology is split into four sections; initially it will outline the study design, including methodological considerations and then describes the study setting in detail. The study is split into three phase, each of which will be described in turn. Finally it will discuss the ethical issues faced whilst conducting research on a military population.

The result section is split into two chapters, initially the findings of the biographical questionnaire are reported and secondly the findings of the exit interviews and training reports. Finally these results are synthesised in the

discussion chapter which looks at the gap between societal identity and military organisational identity and the effect of the training institution on the infantry recruit. In summary the thesis will discuss what future research should be undertaken and what changes could be made to reduce recruit attrition.

CHAPTER 1: SOCIAL, ORGANISATIONAL AND MILITARY IDENTITY

1.1: Social identity

1.1.1: Categorisation

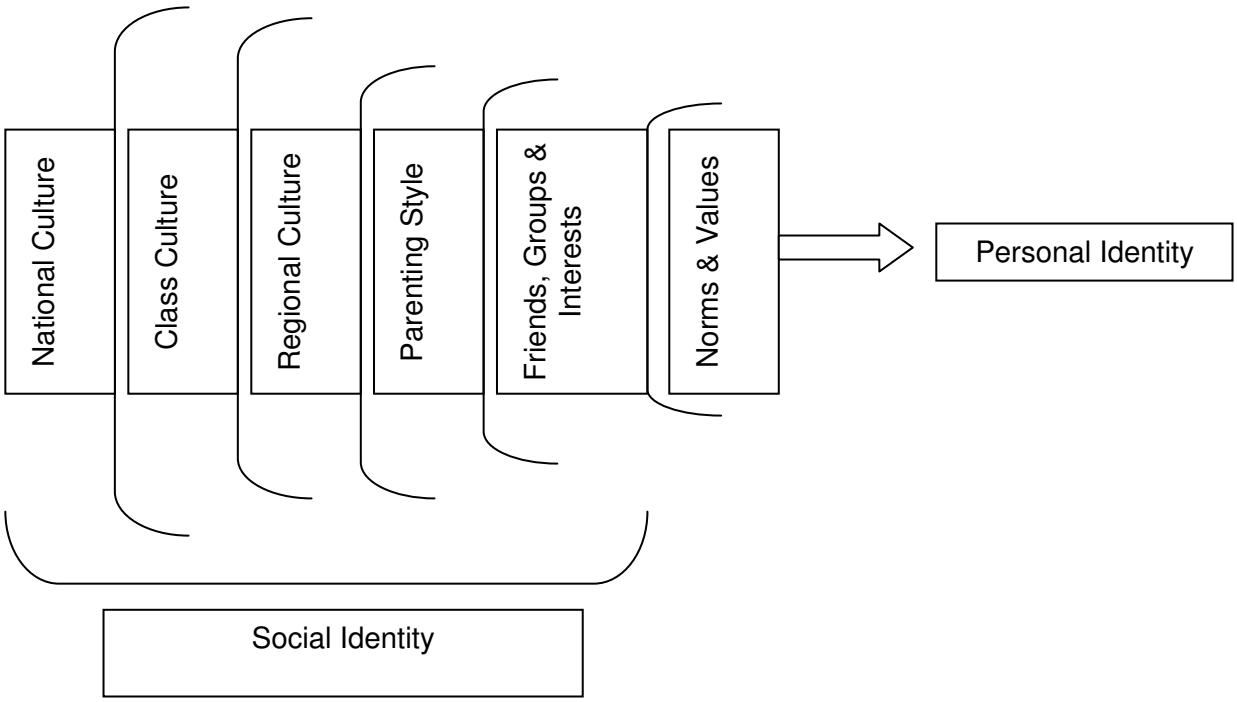
Rosch (1978) argues that people categorise themselves at a number of different levels of abstraction and Hogg and McGarty (1990) identify the three most important levels as: The superordinate level of humanity (defining ones *human* identity), the intermediate level of in-group-out-group, (defining ones *social* identity) and the subordinate level of self (defining ones *personal* identity). This study focused on the relationship between the military organisation and the individual's previous civilian identity and the impact it had on training success. Therefore this thesis is primarily concerned with the intermediate level, social identity, and the factors which influence a specific component of it, military organisational identity.

Turner (1984) argues that social Identity arises out of a process of categorisation which cognitively segments the social environment so that the individual can define himself and others, and understand the relationship between the two. Social identity is therefore relational and comparative in the sense that the individual defines themselves in relation to individuals in other categories or groups (Tajfel and Turner (1985).

Abrams and Hogg (1990) and Jenkins (1996) argue that this process of categorisation involves reference to being a member of, or belonging to certain social groups. The groups range from broad entities (nationality) through organisations (the military) to more exclusive groups (an individual's family). Further categorisation in terms of idiosyncratic or personal attributes such as bodily attributes, abilities, psychological traits and interests, then

yields a personal identity (Bong and Clark, 1999). Figure 1 summarises some of the key categories that could contribute to an individual's identity whilst also bringing out the relationship between personal and social identity.

Figure 1: Influences on individual social identity



1.1.2: Partial identification and temporal variation

Some authors have argued (Adler and Adler, 1987, Schneider et al., 1971) that the extent to which a given individual is a member of a group, or identifies with a group, is a matter of degree (Adler and Adler, 1987). An example of this is given by Ashforth and Mael (1989) who refer to a study undertaken by Jackall (1978) on bank workers. Jackall (1978) observed that bank workers in menial jobs often distanced themselves from the bank-organisational component of their social identity in that although they were clearly members of the group 'bank workers' they claimed that the job was temporary whilst

they saved money to start their own business. This finding indicates that individuals who are unhappy with their imposed identity (bank worker) will psychologically distance themselves from it and reject it as a category within their social identity.

Furthermore, not only is membership of a category at any given point in time influenced by a range of factors, but Jenkins (1996) has pointed out that social categorisation, and therefore social identity formation, is constantly evolving through time. Individuals can join or leave individual groups and sub-categories within a group of which they consistently remain a member. Membership can change depending, for example, on economic or personal circumstances, for example social mobility from working class to middle class through education and good employment (Jenkins, 1996).

The findings that social identity is the result of (1) the application of multiple categories, (2) influenced by multiple factors and, (3) subject to change over time (e.g. when an individual joins a new organisation), raises the possibility of conflict and inconsistency within the individual. This can be understood as a conflict between the components of an individual's social identity, but Ashforth and Mael (1989) prefer the view that an individual can have several simultaneous identities and that the identities themselves can conflict. Ashforth and Mael (1989) go on to suggest that the resolution of these conflicts and inconsistencies (as might arise when an individual joins a new organisation such as the military) is achieved by individuals structuring their identities hierarchically in terms of importance.

1.2: Organisational identity

1.2.1: The nature of organisations

Organisations are social entities with distinctive and enduring characteristics (Albert et al. (1985). Membership of particular organisations, modulated by the extent to which the organisation's 'cognitive structures' (Mael and Ashforth, 1995) are embraced, constitutes a specific part of an individual's social identity known as their organisational identity.

In order to understand the development and maintenance of social identity Mael and Tetrick's (1992) theoretical paper identifies that organisational identity theory has elements of its theoretical foundations in "identification with a psychological group theory". Foote (1951) states that psychological identification is the individuals' perception of their cognitive oneness with the group, not their behaviour as a result of those cognitions. Whereas organisational identification is the process by which the goals of the organisation and those of the individual become increasingly integrated (Hall et al., 1970), psychological identification is the emotional attachment with the organisation (the emotion the individual experiences as part of belonging to the organisation).

1.2.2: Organisational attractiveness

For organisations to survive they must attract new members and therefore it is important to understand what makes organisational membership attractive and what binds the individual psychologically to it. Oakes and Turner (1986) suggest that distinctiveness and prestige are two factors which increase the likelihood of an individual to identify with an organisation. Distinctiveness of an organisation's values and practices in relation to comparable organisations

differentiates the organisation from others and provides a unique identity. The distinctiveness however does not have to be a positive one to forge a strong identity. Ashforth and Mael (1989) use racism as an example. By giving the persecuted group the psychological ability not to bend to others beliefs that being black is negative, but rather that being black sets them aside from the rest, it is possible through that distinctiveness to develop a positive identity of themselves and the group. It is about the group's ability to be at ease and feel good about their identity in the face of those who view their group as negative. Ashforth and Mael (1989) believe that the stronger the threat or persecution of the group, the greater the defensiveness becomes. They believe that such machinations partly explain an individual's fierce identification with countercultures or disaffected groups.

Secondly, the 'prestige of the organisation' is also a factor in identification (Chatman et al., 1986, March and Simon, 1958). Ashforth and Mael (1989) argue that perceived organisational prestige is related to organisational identification and Mael and Tetrick (1992) suggest that individuals often cognitively identify themselves with a winner or successful person which in turn often accounts for the 'band wagon effect' often witnessed in organisations. This is where popular support for an individual or idea suddenly gains momentum and escalates, thus creating distinctiveness in line with prestige within the group. Schelling (1957) observed that the desire for positive identification effectively creates champions within an organisation. Therefore successful individuals within an organisation benefit the whole organisation by making the identity of the group more attractive due to prestige, a phenomenon often seen with successful sports teams.

Distinctiveness and prestige is not just restricted to the organisational level. Within an organisation there will also be sub-groups with their own perceived distinctive and prestigious identities. Using football as an example, a footballer on being asked what he did for a living would reply 'footballer', assuming the collective identity of the profession and the prestige which that holds. However, every footballer belongs to a team (sub-group) that sits within the global identity of professional football, and each team will have its own organisational identity that sets it apart from other teams within professional football. Ashforth and Mael (1989) suggest that inter-group conflict between these sub-groups occur due to the fact that groups exist within an organisation. This inter-group conflict can be extremely important when the organisation wants to influence performance and the internalisation of goals, values and commitment.

1.2.3: Identification and internalisation

Individuals who are attracted to an organisation will seek to learn more about its goals and values; organisational attractiveness is the initial process in an individual's identification with an organisation. Dutton et al (1994) developed an untested model to attempt to explain how prestige, distinctiveness and imagery can affect an individual's strength of identification with an organisation and the internalisation of its beliefs and values. The model led to thirteen propositions of the way in which organisational identification affected its member's patterns of social interaction. The authors focused on two organisational images, one based on what a member of the organisation believes is distinctive, central and enduring about their organisation and the member's beliefs about what outsiders think about their organisation. They conclude that when an individual identifies strongly with an organisation, the

attributes that they use to define the organisation are also used to define themselves.

Dutton et al (1994) developed these conclusions from a series of interviews with New York Port Authority Employees and 3M sales personnel. 3M personnel described how they felt proud to belong to an organisation that is seen by outsiders as having socially valued characteristics. In contrast employees from the New York Port Authority described the opposite feelings and emotions. The New York Port Authority, in response to homeless people congregating and sleeping on New York Port Authority property, instigated a 'clean up' program designed to remove all homeless people from the New York Port Authority area. The organisation came under media criticism for this and was depicted as ineffective and inhumane. This unfavourable image affected employees, leaving them feeling demeaned and hurt by the criticism. As a result of the unfavourable press there was an increase in staff absence due to strain and stress. Dutton et al (1994) concluded that those New York Port Authority personnel that had identified with the organisation and internalised the organisation's values and beliefs were affected emotionally by the negative press as they believed it to be a criticism of themselves. This personalisation of the organisational image was also identified by Porter et al (1974) and Mowday et al (1982) in similar studies. Tajfel and Turner (1985) and Ashforth and Mael (1989) propose that identification with the organisation is at its strongest when these psychological attachments are formed and the members categorise themselves into a social group that is the organisation.

The amount that the individual internalises the organisation's identity remains open to debate. Dutton et al's (1994) model assumed that the greater the attractiveness of the organisation's identity the stronger the individual would

identify with it and internalise its goals and values. However, this assumption is not fully supported by Tüzün and Cağlar's (2009) study of 545 public and private bank workers in Turkey. They used three scales in their methodology, a six item organisational identification scale (Mael and Ashforth, 1992), an adapted 23 item attractiveness of perceived organisational identity questionnaire (Dukerich et al., 2002) and an 12 item organisational trust scale (Cummings and Bromiley, 1996). Their results showed that attractiveness of perceived organisational identity had no influence on organisational identification; however attractiveness of organisational identification was positively influenced by the level of trust that the individual had with the organisation and organisational trust clearly acted as a mediator between attractiveness of organisational identification and organisation identification. This would suggest that Dutton et al's (1994) model requires adaptation, as being attracted to an organisation does not necessarily mean that the individual will embrace the organisational identity, there must be an element of trust before organisational identification occurs. This supports Puusa and Tolvanen's (2006) theoretical paper which suggests that trust is the link between member identification and strong organisational identity and that the key to greater organisational commitment is trust. Therefore, it can be assumed that before psychological attachments can be formed with an organisation the individual must find the organisation's identity attractive and trust the organisation.

1.2.4: Belonging and commitment

It has been suggested joining a new organisation involves a series of conscious and unconscious decision making. To add categories to an individual's social identity an individual initially seeks an organisation that they

find attractive. Once settled on an organisation they begin to explore its goals and values which is the initial process of identification. The organisational identity begins to be incorporated into the individual's social identity, where the individual will categorise the importance of the organisation within their own social identity hierarchy. The level of commitment to the new organisational identity is determined by the level of internalisation of the organisation's goals and values, as this ultimately determines the position of the organisation within the individual's social identity hierarchy. What is not clear is what initially drives the individual to seek membership of new organisations in the first instance.

Social identity theory is based on the concept of in-group behaviour (Tajfel and Turner, 1979) and the processes that an individual uses to categorise themselves and others within society. The fact that individuals do categorise themselves suggests that humans have a desire to belong to social groups and that social inclusion is paramount within society. Social inclusion is associated with employment, prosperity and status and the consequences of social exclusion are enormous (Repper and Perkins, 2003). Reberio and Allen (1998) examine the use of voluntarism as a therapeutic intervention for sufferers of Schizophrenia to enable them to reintegrate into society. They conducted a single case design study to explore and describe the personal experiences of an individual with schizophrenia who resides in the community; it looked at how the individual used voluntarism to construct an acceptable social identity so that he would be accepted within society. This study identified the need of an individual to belong to a social group and to fit into society.

To achieve social acceptance and belonging an individual has to conform to the expectations of the society or organisation and abide by their norms[5] and values[6]. Hart's (1961) concept of law argues the importance of norms and values within society. He views the behaviours or etiquette associated with functioning in a society or culture as the primary rules of obligation. These are modes of behaviour that are controlled by the society through social pressure. A society without law would evolve its primary rules of obligation and look to induce conformity through the use of social pressure. Within a society that lives by its primary rules of obligation there is no written law and, as with etiquette, there is no procedure for settling doubt and there is no control on the free use of violence, theft and deception. Therefore Hart (1961) identifies that the primary rules of obligation need supplementing with secondary rules, which are permanent law.

To belong within society and fit in the individual must abide by permanent law and respect the primary rules of obligation. If they do not they will no longer belong in society, e.g. those that break the law are removed from society and held in a prison. Therefore it must be a pre-requisite that to belong in society you must believe to some extent in the goodness of the norms and values of that society, and internalise part or all of them as your own. Social and organisational identity theory would dictate that the more an individual identifies with norms and values, the greater the internalisation of those societies' or organisations' beliefs into their own. This internalisation will lead to a greater sense of belonging and commitment to the society, demonstrated

[5] Culture contains a number of rules; these are the 'norms' that underpin culture. Haralambos and Holborn outline these 'norms' as a guide to actions which define acceptable and appropriate behaviour in particular situations

[6] Values are the individual's beliefs of what is important or worthwhile and what is good and desirable. Haralambos, M. & Holborn, M. 1991. *Sociology Themes and Perspectives,* London, Collins Educational.

by acceptable inclusive behaviour and abiding by the norms and values of that society.

Internalisation of goals and values may generate a stronger committed bond between an organisation and an individual; however there are strong arguments to suggest that commitment and identification are mutually exclusive. Early work on organisational commitment such as Mowday et al's (1979) Organisational Commitment Questionnaire found that identification and commitment were one and the same thing, while Wiener (1982) and Riechers (1985) characterise commitment as a belief in, and acceptance of the organisations goals and values, which again asserts that commitment is synonymous with identification.

Ashforth and Mael (1989) identify that Riechers' (1985) theory of organisational commitment includes internalisation, behavioural intention and affect but not identification. Ashforth and Mael (1989) argue that although identification is organisation specific, internalisation and commitment are not. They believe that commitment questionnaires such as the Occupational Commitment Questionnaire generalise goals and values rather than specify which values are specific to the organisation. Therefore an individual would score a high commitment score if membership of that organisation suited their own career goals. Wiener (1982) further supports this theory by defining commitment as 'the totality of internalised normative pressures to act in a way which meets organisational goals and interests'. He suggests that individuals exhibit behaviours solely because they believe that it is the right and moral thing to do. If an individual truly identified with an organisation, they would experience some level of emotional loss on leaving (Levinson, 1970). Ashforth and Mael (1989) therefore argue that to understand the true impact

that organisational identity has on organisational commitment, the confusion between identification with the organisation and commitment to it must be resolved. Organisational commitment can only be achieved when the individual begins to internalise the values and beliefs of the organisation into their own. This argument is not dissimilar to the theoretical debate between identification and internalisation. In relation to organisational commitment, internalisation can be viewed as the bridge that the individual uses to move from identification with the organisation to greater commitment to the organisation, the key being the formation of a psychological attachment. If they left the organisation the individual would experience an emotional loss.

1.3: Military identity

1.3.1: The military organisation

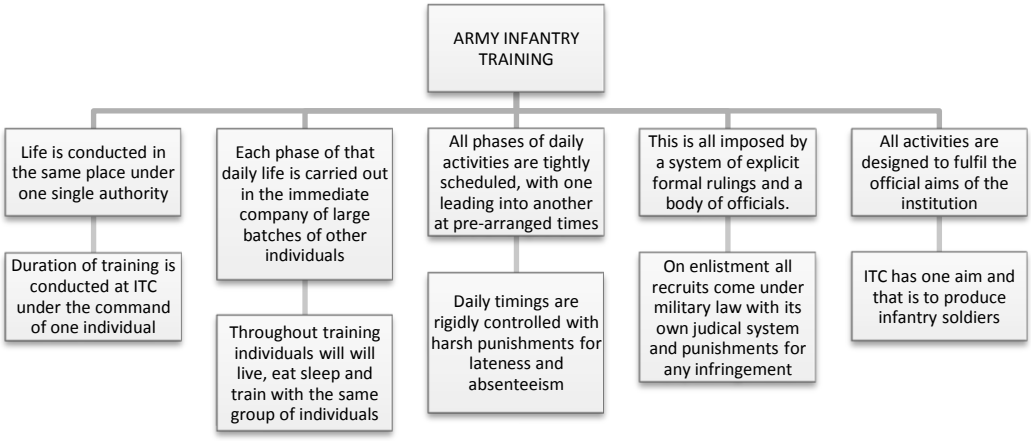
Although the military organisation has distinct characteristics it is not dissimilar from any other organisation within an individual's social identity. It consists of a cognitive structure (Mael and Ashforth, 1995) which the individual negotiates to form constituent parts of their social identity. However, the unique characteristics found in the military organisation can make membership increasingly difficult. Goffman (1961), in his essays on asylums, identifies the military as a total institution within his list of five groupings of total institutions in society. He explains the pre-requisites of defining a total institution by focusing on key aspects of daily living. Individuals within society will usually sleep, play and work in different places, with different co-participants, under different authorities and without an overall rational plan (Goffman, 1961). He describes the central feature of the total institution lying in the breakdown of the barriers that separate these three spheres of life. This is demonstrated in Figure 2 which examines each aspect of a military recruit's basic training experience in relation to Goffman's model of the total institution (Goffman, 1961). It can be seen that the model of the total institution offers a fitting framework for examining the military organisation, especially the recruit experience. However, the theory is not without its critics and the use of the total institution model as a theoretical framework is applied with caution.

Key criticisms of Goffman's essay on total institutions refer to his methodology: Goffman studied one psychiatric hospital in depth and then generalised from this single (and quite specific) case study to various non-psychiatric institutions. Various commentators question the validity of claims that similar processes necessarily occur in other psychiatric institutions, so the

parallels drawn with non-psychiatric institutions are even more nebulous. (Scott, 2010, Perry, 1974, Weinstein, 1994, Levinson and Gallagher, 1964).

More specifically, Perry (1974) argues that Goffman's designation of particular organisations as total is to absolute and does not reflect the varying degrees of totality within an institutions.

Figure 2: Comparison of Goffmans five principles of a total institution and military basic training



Other authors join Perry (1974) in asserting that the extent to which an institution is 'total' is a matter of degree and what Goffman portrays is the extreme of the total institution (Scott, 2010, Perry, 1974, Weinstein, 1994). Of key interest to this study is the effect that the degree to which an institution might be viewed as 'total' has on the individual. Weinstein (1994) examines Goffman's theory of asylums from the perspective of the social situation of mental patients and concludes that Goffman's portrayal of the total institution and the extent of self-mortification[7] that it has on the inpatient are exaggerated and overdrawn. Similarly, Scott (2010) argues that this pessimistic view of the

[7] Self-mortification is defined as a loss of self concept and self esteem when an individual is admitted to a total institution Homer, J. 1981. Total Institutions and the Self-Mortifying Process. *Canadian Journal of Criminology,* 23**,** 331-342.

totality of the psychiatric institution is a result of Goffmans flawed methodology, that is he only viewed the institution from the inmates perspective and did not reflect on the necessity for them to be there or the perspective of the staff who have to maintain order within a challenging community. What is most prominent about Goffman's critics is that much of the criticism is based on his total institution models poor fit to the psychiatric hospital setting. What is generally accepted is that the characteristics of his total institution would undoubtedly have an undesirable effect on those in the 'inmate' role. Therefore if Goffman's model of the total institution is viewed as a theoretical framework it is useful in assessing the extent to which an institution is total and can be used by organisations such as the military to reflect on the impact that their organisation might be having on its personnel.

Implicit in much of the literature on total institutions has been the belief that 'inmates'[8] improve as a result of being in the particular institution, with improvement being measured in terms of the extent to which they conform to certain standards of behaviour defined by the institution (Karmel, 1969). Goffman (1961) describes the impact of total institutions have on individuals as a process of mortification and Karmel (1969) argues that Goffman's work implies that self-mortification occurs regardless of how therapeutic or non-therapeutic the organisation is. Scott (2010) challenges Goffman's argument that the 'inmate' is a passive observer with no autonomy to determine their own fate, and Homer (1981) argues that Goffman's assertion that the induction processes are a conscious act to debase, depredate and humiliate the 'inmate' are again pessimistic, condemnatory and one sided.

[8] The term inmate is used collectively by many authors referring to Goffman's work and the term defines those individuals that reside within an institution.

There is a consensus of agreement amongst most authors that new 'inmates' experience what Goffman describes as a 'shock period' (Scott, 2010, Homer, 1981, Karmel, 1969) as they adapt to an institutional life. Although Homer argues that Goffman's portrayal of this shock period and self-mortification is oversimplified and one dimensional and Jenkins (2008) claims that the total institution is a dynamic entity and the newcomer undergoes a complex process of reshaping and redefining of their individual identity

This study argues that Goffman's model of a total institution is still relevant today if used by organisations as a reflective tool to examine the extent of totality within their organisations. This is of particular interest to military organisations as the nature of an organisation can adversely affect its organisational attractiveness and seriously affect its ability to attract and retain new recruits (Dutton et al., 1994).

Ashforth and Mael (1989) identify from Fisher's (1986) and Goffman's (1961) work on total and quasi-total institutions, the potential difficulties and psychological conflict organisational newcomers might experience when adapting to a new organisation such as the military. Unlike a job in civilian society (such as a supermarket) the military adopt induction behaviours to encourage the newcomer to feel as if they belong and separate them from their previous life. On arrival at basic training in the military symbols of the recruits previous identity are removed, their hair is cut, their clothes removed and codes of dress and behaviour are imposed. These are all methods of encouraging the individual to adapt to their new environment and encourage the internalisation of the organisation's goals and values. The process provides the individual with an identity consistent with the organisation's expectations. However during this transitional period the individual's beliefs

and attitudes are challenged which causes a varying degree of cognitive discomfort as the individual prioritises the military identity within the hierarchy of their social identity.

1.3.2: Impact of Military Identity

Society influences an individual's social identity through both subtle and overt means. Key milestones in an individual's development will impact on their social identity; for example starting school, changing to senior school or leaving home. The impact on the individual's social identity can be both positive and negative, but overall the societal influence aims to help the individual to function within their chosen society. Studies undertaken in Israel identify the impact that compulsory military service can have on the development of an individual's social and individual identity. Bleich and Levy et al's (1986) theoretical paper argues that a crisis in identity occurs when young Israelis are conscripted into the army. Israeli conscripts are generally late adolescents who are at the height of 'exploration' and 'crystallisation' of their identities in all its bio-psychosocial aspects. During this period the individual is making sense of the socialisation they have undergone as a child, and coming to terms with their 'status and role' as well as making sense of the cultural norms and values that shape their world. Levy et al (1987) expand on Bleich and Levy's (1986) theory and describe this process as the natural formation of 'youth identity' with its own interests, cultural norms, values, and how this contrasts with 'military identity' which is a 'rational, formal, grown-up ideology.

Military identity within Israeli society however is an imposed social identity as the conscript has no choice but to serve in the military. Bleich and Levy

(1986) describes how Israeli society views national service as an expected moral undertaking, which is the sacrifice of personal freedom to serve the country. The adolescent Israeli does not choose the category for their social identity as it is forced upon them through social pressure and expectation. What Bleich and Levy (1986) identify in the recruits that they studied was a degree of cognitive conflict between identities as the conscripts struggled to incorporate the military identity into their social identity.

1.3.3: Cognitive dissonance, military service and identity conflict

The cognitive conflict identified by Bleich and Levy et al (1986) in Israeli conscripts is recognised in Festinger's (1962) cognitive dissonance theory. Festinger (1962) proposed that an individual prefers and seeks consistency, and will change attitudes and behaviours to reach a consistent state. Dissonance refers to the personal tension or stress experienced when an individual's actions contradict or are inconsistent with his or her values or beliefs (Gruber 2003). Festinger's (1962) dissonance theory assumes four concepts: People like to be consistent in their thoughts, beliefs, attitudes, values and actions; dissonance is the result of psychological inconsistency not logical inconsistency, and therefore makes the discomfort more significant as the individual acknowledges that the life change that they have made is logically correct, but is causing them psychological discomfort. Dissonance drives people to action with the expectation of obvious change and dissonance stimulates people to attain consistency and reduce inconsistency.

More recent studies by Hampson (1997) and Hale (2008) have observed behaviour consistent with Festinger's (1962) theory in recruits joining the British military, which supports Bleich and Levy et al's (1986) earlier findings.

Hampson (1997) conducted a study that explored the possibilities of predicting the voluntary withdrawal from training of British Army recruits. He used a focus group approach to collect data on why recruits withdrew from training and interviewed both recruits and training staff. Training staff identified what they referred to as 'culture-shock' in recruits. Recruits were unable to manage the expectations of their new surroundings and withdrew from training. Hale's (2008) qualitative study consisted of 29 semi-structured interviews with recruits from the Royal Marines, Army and the Royal Air Force and focused on the role that masculinity and symbolic resource theory had in relation to the transition to military life. Hale (2008) identified that recruits make a transition from belonging only to a civilian culture to also being a member of a military one. She identified that when recruits enlist they experience a 'rupture' as everything that was certain and familiar for the individual became uncertain and unfamiliar and the rupture (the name given to the period of transition to military life) played a pivotal role in how the individual constructed their military identity.

These studies support Festinger's (1962) theory as periods of dissonance are being observed in military recruits on enlistment. Recruits taken out of their known social identity (physical surroundings, support networks, interests, groups and friends) will experience a varying degree of psychological discomfort. They will seek consistency in their thoughts as they struggle to resolve conflict between identities. This conflict will result in a specific behavioural outcome; the recruit will adapt to their new surroundings or will leave and return to the social identity that they were comfortable with. With army recruits that action can be either positive or negative. The individual that adapts to the new surroundings, norms and values of the Army will achieve an outcome that is positive for all involved. However, the individual who has

difficulty adapting will experience discomfort and distress and will take action to restore psychological consistency in their life. If they are unable to adapt to the imposed values and norms and their new surroundings, they will seek to reduce their cognitive dissonance by leaving the Army. This is a positive outcome for the individual as consistency is restored but a negative outcome for the Army which loses a recruit.

1.3.4: Military newcomers

It has been argued that to achieve organisational commitment the organisation must be viewed by the individual as attractive and trustworthy before identification and internalisation can take place. It has also been argued that a degree of conflict occurs between the individual's established social identity and the new organisational identity. Ashforth and Mael (1989) argue that organisational newcomers are particularly vulnerable as they are unsure of their role and status within the new organisation and will build a self definition of the organisation based on their initial experience. If a newcomer is left in doubt as to what the role expectations and behavioural norms of the organisation are there is the potential for the individual to begin to change their perception of the organisation and no longer find membership attractive. The organisation must have an induction process that reinforces the goals and values that sit at the heart of their organisational identity and be able engage the newcomer in the process of internalising that identity.

The military use inter-group rivalry in basic training to reinforce core military values and standards in recruits. With the British military there is no ambiguity as to what those values and standards are as they are published in a booklet

given to recruits[9]. The military use sub-group distinctiveness to promote sub-unit pride, cohesion and identity. All soldiers belong to the collective identity that is the Army, but within the organisational identity of the Army are individual regiments or sub-groups. Inter-regiment rivalry promotes the development of sub-group identity which in turn provides leaders with a tool for motivation and greater performance. Organisational and sub-group identity can be influenced by leadership as good leadership can influence a member's acceptance and reinforcement of the organisational identity.

Leaders within the British Army will actively promote the view amongst soldiers that they are the most highly trained and professional Army in the world. They support this claim with references to units such as the Parachute Regiment and the Special Air Service (SAS), collectively referred to as an elite unit and a special force respectively. At regimental level commanding officers will assure their soldiers that within the best army in the world they are the best regiment. They will reinforce this identity within the members with the use of the regimental colours (the regiment's flags), on which are the dates of the regiment's victories in battle. In addition to this their uniforms will have items or badges that remind the individual of victories in battle. For instance, the fusiliers hackle (plume attached to the head-dress) is a battle trophy won by the Northumberland Fusiliers at the battle of St Lucia in 1778. Regiments use these insignia along with distinctive head dress and other parts of the uniform to promote a clear, prestigious and distinctive identity. Ashforth and Mael (1996) identify that organisations that lack a strong organisational identity at senior management level are essentially rudderless, and have a

[9] Values and Standards of the British Army: Dannatt, R. 2008. *Values and Standards of the British Army* [Online]. London: http://www.army.mod.uk/documents/general/v_s_of_the_british_army.pdf. [Accessed].

tendency to drift without a sense of direction or mission. This directly impacts on the performance and behaviour of the sub-groups within that organisation and affects the extent to which the individual internalises the organisation's values and goals.

However, Ashforth and Mael (1996) suggest that there is a balance to be struck in relation to how an organisation manages its identity. Organisational identities are always under pressure to evolve with time and society. Asforth and Mael (1996) argue that this pressure to constantly evolve can cause internal conflict within an organisation. Organisations are built on values and goals that form their identity, and to change those values and goals would be the potential cause of conflict. However, they also argue that if an organisation fails to evolve with time it runs the risk of becoming out of touch with society, the identity of its current members remains strong but the organisation becomes unattractive to potential recruits. As an organisation becomes more isolated from society its leaders come under increasing pressure to make the system work, usually resulting in rigidity of thinking and reliance on past practices to solve the problem; the greater the threat to the identity the more rigid it becomes in an attempt to defend itself. Organisations are dependent upon newcomers for their survival and therefore must constantly be insightful as to the attractiveness of the image that they project, with special reference to whether it is attractive to those individuals it wishes to recruit.

1.3.5: Acceptance in the military organisation

In this chapter I have argued that acceptance and belonging within society is an achieved status, so it equates that acceptance within an organisation is no different and also has to be achieved. Ashforth and Mael (1989) describe the process a newcomer goes through and as discussed earlier in this chapter Rebeirio and Allen's (1998) study shows how an individual with mental illness can use voluntarism as a method to achieve societal acceptance. Rebeirio and Allen's (1998) study participant focuses on the importance of being seen to 'fit into society' and achieving social acceptance. Shabtay's (1995a) work on the experiences of Ethiopian Jewish soldiers in the Israeli army also discussed the notion that identity is achieved through acceptance by society. Shabtay (1995a) examines the experiences and expectations of Ethiopian immigrants who enlisted into the Israeli defence forces. He suggests that Israeli identity is an achieved status, "one that is acquired through active struggle to establish positive self esteem and acceptance within society and motivated by a strong desire to belong". Shabtay (1995a) goes on to introduce Israeli government policy on the use of military service to create social mobility and the absorption of immigrant communities into Israeli society. Israel holds all service in the defence forces in high esteem, and for an immigrant to enlist on entering the country is seen as a positive step towards social inclusion and social acceptance. Within a unique society such as the military it can be argued that not only is it important for an individual to feel that he belongs, it is imperative that the individual is seen to belong and be accepted or else they would find themselves socially excluded from military society, suffering the consequences and stigma which that entails.

Jenkins (1996) examines the part stigma plays in social and individual identity with particular attention to Goffman's perspective (1961). Goffman (1961)

suggested that identity can be spoiled or stigmatised due to a range of social or physical situations. Jenkins (1996) within the context of social identity describes stigma as an emphasis of the demands that others make on us, which he believes is on the basis of an individual's public image. Jenkins (1996) suggests that individuals can in essence live a life as a consequence of social pressure rather than a life they would choose. This imposed 'social career' (Jenkins, 1996) is not just a result of naming or categorising but also a consequence of how society responds to us and treats us. This is very much a one dimensional perspective of social stigmatisation and focuses only on the negative aspects of stigma. Jenkins (1996) expands this theory by suggesting that the process of labelling and social pressure that is applied by society can have positive as well as negative consequences, as an individual can internalise valued identities, with stigma and social pressure being used to shape valued (considerate and law abiding) members of society (the primary and secondary rules of obligation that form and dictate a societies cultural norms and values (Hart, 1961) . The process of stigmatisation functions within military society to promote conformity, group cohesion and battle effectiveness. There is a strong organisational identity that forms clear in-groups and potentially out-groups, the emphasis being placed on the individual being part of the in-group. Membership of that in-group will be a direct result of the individual accepting the consequences of the social pressure applied to conform to military life. The individual's acceptance of this 'social career' will have a direct influence on how the society within which they live will respond to them and treat them. As a Military Mental Health Nurse working within conflict areas such as Bosnia, Kosovo Iraq and Afghanistan, I have regularly discussed with infantry soldiers what it was that maintained their resolve to fight in a situation that on many occasions only offered injury or death. Their responses reflected emotions and beliefs based around honour,

integrity and the seeking of their colleagues' approval. They wanted to be perceived as one of the group and for their peers to recognise that when the time came they were able to stand and fight alongside their fellow soldiers. The individual that runs or refuses to fight would be stigmatised by being branded weak or cowardly. The social stigma applied to running from a fight would be so socially crippling within the close confines of military society that the stigma has the effect of providing an incentive for men to remain together and fight.

However, Jenkins (1996) argues that just because a society applies a label it does not necessarily mean that the individual takes on that label as an identity. The military has to be mindful that if the stigma of failure to meet expectation is not successful in producing a positive outcome for the individual, then the negative outcome for that individual would be catastrophic as it would probably lead to social exclusion within the military society. Repper and Perkins (1998) focus on the impact that mental health problems have on an individual's ability to function and be part of communities and society in general. In the cases that they study they focus on the social exclusion that individuals suffer as a consequence of their mental health problems. But the consequences perceived are not dissimilar to those that an individual within military society would experience should they be excluded from military society. The difference being that the consequence for the military individuals could be mental health problems as a result of social exclusion. Much of the literature regarding social exclusion focuses on social exclusion being a symptom of mental health problems; within the military environment failure to identify oneself with the organisation and be part of the in-group can lead to social exclusion and mental health problems then become a symptom of that.

1.3.6: Newcomer vulnerability in military service

Ashforth and Mael (1989) identify that organisational newcomers have a period of adjustment that makes them vulnerable to rejecting the organisation. They believe that this is most prominent in professions such as the military or the fire service, where individuals have romanticised views of the profession which they have established from written fiction and televised drama. Training data from the British Army's Infantry training Centre has shown that the highest rate of attrition occurs in the first 12 weeks of training (I.T.C, 2001) and the literature has identified that recruits pass through a period where they have to adjust to the physical reality of military life (Mael and Ashforth, 1995, Hale, 2008), adapting their social identity to achieve acceptance and belonging. There have been a limited amount of studies that look at recruit failure, and the majority of those have focused on predicting recruit attrition prior to enlistment (Long, 1990, Mael and Ashforth, 1995, Hampson, 1997, Larson et al., 2002, Niebuhr et al., 2008).

Long's (1990) research examined the predictive validity of the Royal Navy officers selection process. A retrospective study was undertaken to examine the accuracy of Holland's Vocational Preference Inventory (Holland, 1985) at predicting voluntary withdrawal from training. Prior to the study the inventory was being used as part of a selection interview, with the Vocational Preference Inventory score being used to determine organisational fit. The study did not examine the sensitivity or specificity of the findings or provide positive and negative predictive values. The results were reported as 'hit' and 'miss' criterion with regards successful predicition of voluntary withdrawl. Longs (1990) results showed that in 25% of recruits the Vocational Preference Inventory incorrectly identified recruits that subsequently passed training. As the inventory at the time of the study was being used to select recruits out of

training, Long concluded that it was not an accurate enough predictor to exclude potential recruits.

Mael and Ashforth's (1995) study was predominately a factor analysis study (n=1082) to identify the dimensions of organisational identity within the US military. It is the only one of the five prediction papers that focuses on identification with the military and the the conflict between social identity and military organisational identity. The focus of the study was on the relationship between a recruits antecedant biographical factors and identification with the US Army. The impact of organisational identification in relation to recruit attrition was measured as a practical concern. Their results identified four biographical factors which were associated with increased organisational identification: pre-enlistment participation in rugged outdoor activity, solid citizen (evidence of good and dependable school and employment behaviour prior to enlistment), participation in group orientated team sports and intellectual and achievement orientated pursuits (non-physical extracarricular intellectual pastimes). The authors acknowlege that the relationship between organisational identification and attrition was not the focus of the study; however they examined the utility of measuring poor identification with attrition. They split the sample and computed cross-validation co-efficients for the attrition at 10 and 21 months. The association between poor identification and attrition was significant; however the attrition sample suffered extensive shrinkage (10 months n=98 and 21 months n=176). The authors acknowlege the poor power of these findings as they were based on only 50% of the attrition sample (10 months n=49 and 21 months n=88). The study identified a positive relationship between good organisational identification and reduced attrition, however it did not establish the effectiveness of biographical data

alone in predicting attrition. However, the potential role of biographical data for development of recruit selection methods has been highlighted.

Hampson (1997), who cites previous evaluations of British Army recruit selection tools by Jacobs (1997a) Jacobs (1997b) and Holroyd et al (1995), focuses more on exploring possible methods of better prediction of voluntary withrawal amongst Army recruits. He used a combination of interviews with training staff, group discussions with recruits, and analysis of selection and training data (n=5000) to evaluate the effectiveness of current methods of selection and identify potentially more effective methods of training outcome prediction. The study identifies three main reasons for attrition: external reasons (family), unmet expectations of Army life, and the dislike of various aspects of training. Recruits were more inclined to cite multiple reasons for leaving rather than a single one which suggested that failure was due to several influencing factors. Hampson (1997) concluded that as the nature of voluntary withdrawal is multi-faceated the likelihood of a single predictor of withdrawal is remote. However, he does acknowlege that the improved use of biographical data in a weighted biodata proforma could add to the prediction of training risk.

Larson et al (2002) used a medical and psychosocial history questionnaire to measure prediciton of attrition in United States Navy recruits. They concluded that this approach was considerably more powerful than educational credentials or mental ability score; however this approach still produced a high number of false positives at the cut points identified. At the initial cut point 26% would have been incorrectly referred for remedial training and at the second cut point that increased to 34%. In the British Army, where resources

are becoming increasingly reduced, this level of false positives would have resulted in considerable extra costs in unnecessary extra training.

Niebuhr et al (2008) used a fitness performance test (The Assessment of Recruit Motivation and Strength) to identify individual US recruits fitness and motivation to complete basic combat training. Their findings indicate that low fitness and motivation scores were associated with training failure; however the predictive tools ability to measure the likelihood of attrition diminished over longer periods (>180 days). They argue that the relevance of the performance test diminishes because poor physical fitness and motivation would manifiest in the first nine weeks of basic training. However, the study does have some difficulty in differentiating between those training discharges due to army physical fitness test failure and those failures related to conduct. More interestingly, the largest cause of discharge was failure to meet medical standards, most commonly asthma, personality disorder and mood disorders while passing or failing the fitness performance test was not associated with discharge for these reasons. The authors acknowledge the limitations of the study as regards the lack of specificity in Army discharge codes, and without any measurement of the tests predictive ability it is difficult to assess its value as a tool to predict recruit attrition.

Sirett's (1999) study focused on the reason for British Army recruits discharging and found that over 50% of all discharges could be attributed to the recruit having some level of psychological difficulty in adapting to Army life. Loss of freedom, homesickness and the demands of training were cited as the most common reason for voluntary withdrawal from training. These findings are similar to those of Hampson (1997) who also identified multiple cumulative factors associated with training failure in Britsh Army recruits. Hampson and

Sirret's studies both focus on the cumulative factors associated with training failure but not the impact which those factors have on the individual.

1.4: Summary

This thesis seeks to understand why such a significant number of British Army infantry recruits are fail to complete recruit training and choose to leave. It is acknowledged that the literature surrounding organisational identity is theory laden with more theoretical debate than empirical testing (Rock and Pratt, 2002). However, its importance should not be dismissed because of a lack of empirical evidence. The debate surrounding organisational identification and commitment is an important one as it strives to make sense of the relationship between the individual and the organisation. The debate has not been used to prove or dismiss a theoretical assumption but more to stimulate thinking and create a framework to examine organisational and individual behaviour and attempt to understand and observe the relationship between them.

Existing literature suggests that individuals have a desire to belong to a group and this desire for group membership sits at the heart of Tajfel and Turner's (1979) social identity theory which in turn provides the foundation for organisational identity theory (Mael and Ashforth, 1995). Social identity theory, and by default organisational identity theory, focuses on in-group membership and contributes to our understanding of how an individual defines themselves and behaves as a result of that group or organisational membership. Individuals seek to belong to an organisational structure, be it society or an interest group, and they adapt their own values and beliefs to enable them to belong and be accepted by the organisation or group that they desire membership of (Shabtay, 1995a, Rebeiro and Allen, 1998, Shabtay, 1995b).

Organisational identification is intrinsically linked to organisational commitment; however they are independent, and an individual can identify with an organisation without committing themselves to it. Organisations can not assume that an individual is committing and internalising their values and beliefs just because they identify with it. The individual could as easily be using the organisation to achieve their own values and goals without committing. The British Army can not assume commitment because the individual joins. The Army must earn the recruits commitment through the projection of an attractive, achievable organisational identity and developing trust between it and the individual. By promoting an attractive organisational identity and developing trust the individual will potentially be more inclined to alter the way that they think about the organisation and internalise aspects of its goals and values. This in turn has the potential benefit of the individual changing their behaviour toward the organisation and becoming more committed.

Considering the potential benefits of understanding organisational identity is important because organisational identity holds the key to developing a mental bridge (Puusa and Tolvanen, 2006) between the individual and the organisation. Not only must organisations be clear as to what is the essence of their organisational identity, they must also have the ability to acknowledge when there is a potential problem with it. This study is concerned with the question of why so many British Army infantry recruits fail in basic training; this is a question that the literature has only partially answered. A strong organisational identity can be beneficial; however it can also create problems within an organisation, most notably that it closes the organisation off to newcomers and is resistant to change and improvement. The British Army infantry is experiencing a consistent training failure rate in excess of 30%

during its basic training phase. Studies have identified that this transitional period into military service causes a 'culture shock' or 'rupture' (Mael and Ashforth, 1995, Hampson, 1997, Hale, 2008, Bleich and Levy, 1986) as recruits move from the known to the unknown. Social identity theorists argue that during the period when a new identity is added to the individual's established social identity, cognitive conflict will occur as the individual structures their identities hierarchically in terms of importance. In the military context little is known as regards the psychological impact that this conflict has and why such a large number of recruits fail to place military identity in a prominent position within their social identity hierarchy. Previous studies have identified that life experience is associated with recruit training attrition (Mael and Ashforth, 1995), and that an individual's social history in the form of biographical data has some potential in identifying those recruits that might experience difficulty in making the transition to military service (Mael and Ashforth, 1995, Hampson, 1997, Long, 1990).

The literature review has identified a consensus of opinion as to why organisational newcomers may have a period of difficulty in adjusting to life within an organisation such as the military. What is not clear is whether those that have the potential for failure can be predicted and what ultimately makes the individual decide to leave. Biographical questionnaires have been identified as having the potential to accurately predict training attrition in military recruits, but to date no study has used a biographical questionnaire to test this hypothesis on British Army recruits. In addition, previous studies into recruit attrition have identified the cumulative factors that are given as reasons for failure but have not explained the impact that those factors have on an individual. What is of interest is how the individual's identification with the organisation changes from enthusiastic recruit to failed recruit. Understanding

this phenomenon could potentially inform the organisation of the impact that its organisational identity has on the individual during the transition into service, ultimately providing the organisation with the insight to evolve, and reduce training attrition.

CHAPTER 2: METHODOLOGY

2.1: Aims of the study

The literature review was essential in informing the methodology for this research, ensuring that it was mindful of the research that had already been done and that the methodological approach met the aims of the study. On completion of the literature review it was evident that a single methodological approach was not going to be able to meet the aims of the study and that mixed methods would be required. Cox et al (2007) identified the requirement for mixed method explanatory models when considering how to understand and challenge problems such as work-related stress at an organisational level. This study aimed to explain the impact that enlistment into a military organisation (the British Army infantry) had on the individual recruit that failed, and to see whether prediction of that failure was possible from antecedent social and demographic information. To effectively answer these questions a mixed method approach was required.

The aims of this study were to:

(1) identify antecedent personal, social and demographic factors associated with training failure in British Army infantry recruit's;

(2) investigate the possibility of prospectively identifying those at risk of failing to complete basic training; and

(3) explore the reasons given by those recruits who fail to complete basic training in order to understand the journey to failure with a particular emphasis on the cumulative factors attributed to failure and the impact that they have on the individual.

2.2: Methodological consideration

Combining positivist/empiricist and constructivist/phenomenological methodologies into a single mixed paradigm approach remains a contentious subject for debate. Tashakkori and Teddie (1998) describe how 'Paradigm Wars' regarding validity of the differing methodologies have raged for the last three decades. What is clear though is that by the early 1990s the academic conflict between the two methodological approaches appeared to have run its course, with mixed methods being increasingly accepted. Authors called the followers of this new paradigm 'pragmatists' (Tashakkori and Teddlie, 1998). It has to be acknowledged that as recently as spring 2007, rather than 'pragmatism' being a paradigm in its own right it is an ideological position available within any paradigm (Giddings and Grant, 2007). However, what is clear is that most areas of research in the social and behavioural sciences have regularly used multiple methods as a matter of course (Brewer and Hunter, 1989). However, paradigm 'purists' have subsequently suggested that a mixed methodological approach to research is problematic due to the underlying incompatibility of the paradigms that underlie these two approaches (Tashakkori and Teddlie, 1998). Positivism bases knowledge solely on observed fact and rejects speculation about ultimate origins (Lincoln and Guba, 1985). Most importantly positivists believe that there is a single reality and that inquiry is value free (Lincoln and Guba, 1985). Post-positivism emerged in the 1950s with influential works by Hanson (1958) and Popper (1959). Reichardt and Rallis (1994) formulated three post-positivist tenets that are now widely shared by both qualitative and quantitative researchers:

Value-ladeness (*sic*) of inquiry: research is influenced by the values of the investigator

Theory-ladeness (*sic*) of facts: Research is influenced by the theory, hypothesis or framework that an investigator uses.

Nature of reality: Our understanding of reality is constructed.

Lincoln and Guba (1985) believe that the marriage between the two methodologies is impossible due to naturalists believing that that there are multiple constructed realities as opposed to one single reality. Giddings and Grant (2007) bring an element of simplification to the argument. They view 'pragmatism' as an ideological position and go on to define the term 'methodology' as the researcher's thinking tool and the term 'methods' as describing, the 'doing' tool. Methodology is the researcher's guide to what methods and forms of data analysis to use, with methods being the tools that are used for collecting and analysing data. They suggest that there is a critical confusion as regards the relative status of qualitative and quantitative methods in relation to mixed method research, with intimation that within current mixed method literature qualitative research cannot stand on its own and is only exploratory or supportive of the quantitative data.

By the mid 90s Tashakkori and Teddie (1998) identify that many influential researchers had began to state that the schism between the two methodologies had been overstated by the purists. In further support of the usefulness of the mixed-method approach, Ritchie and Spencer (2002) identify that over the last two decades qualitative research is being used to explore and understand a diversity of social and public policy issues in combination with statistical inquiry. The use of qualitative methods in conjunction with statistical inquiry lies in the persistent need in the social policy fields of research to understand complex behaviours, needs, systems and cultures. With the above assertions and accepted beliefs Tashakkori and

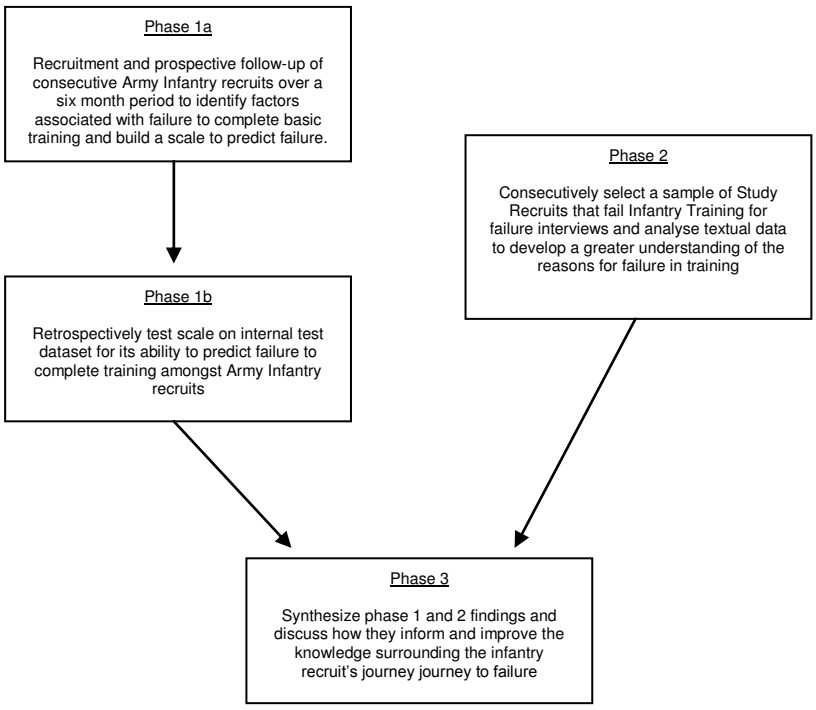
Teddie (1998) argue that many social and behavioural scientists have created a paradigm distinct from positivism, post-positivism and constructivism and labelled it pragmatism, ‘a paradigm that allows the use of mixed methods in social and behavioural research’ (Tashakkori and Teddlie, 1998).

Within this study the mixed methods used were co-dependent. The quantitative data was collected to identify aspects of pre-service existence that increase vulnerability or protect against ‘failure’, whereas the qualitative data was integral to identifying and understanding the cause of failure. As Giddings and Grant (2007) outline, it is the knowledge of a methodological approach that ensures that the correct method is selected for a study. Not only did I want to search for factors associated with failure, but I also wanted to understand the impact that they had at an individual level, the cognitive process that took place within the individual, and search for areas in which vulnerable recruits could be assisted in succeeding.

2.3: Study design

The study was conducted in three phases, a quantitative phase, a qualitative phase and finally a synthesis of both sets of results. The first phase of the study was divided into two parts (phase 1a and 1b). Phase 1a (Figure 3) was the entry point of the study for study recruits. On day one of British Army Infantry Training the new infantry recruits were given a presentation on the aims and objectives of the study and asked if they would be prepared to participate. Those that volunteered to be a study recruit were then asked to provide written consent before filling out a biographical questionnaire. Phase 1b commenced on completion of all biographical data collection and once all study recruits had a definitive training outcome. The dataset was used to identify risk factors associated with failing to complete training and to build a scale designed to predict failure. In phase 1b the scale was tested by estimating its predictive value, sensitivity and specificity.

Figure 3: Study Design



Phase 2 was the qualitative phase of the study and began when the first Phase 1 participants began to fail in training. Phase 2 ran parallel to phase 1a until all study recruits had a definitive training outcome. Recruits that failed to complete training were invited to take part in a semi-structured interview. Study recruits were selected for a phase two interview on a consecutive basis. Once all study participants had a confirmed training outcome (i.e. completed training or failed to complete training) the qualitative data was analysed.

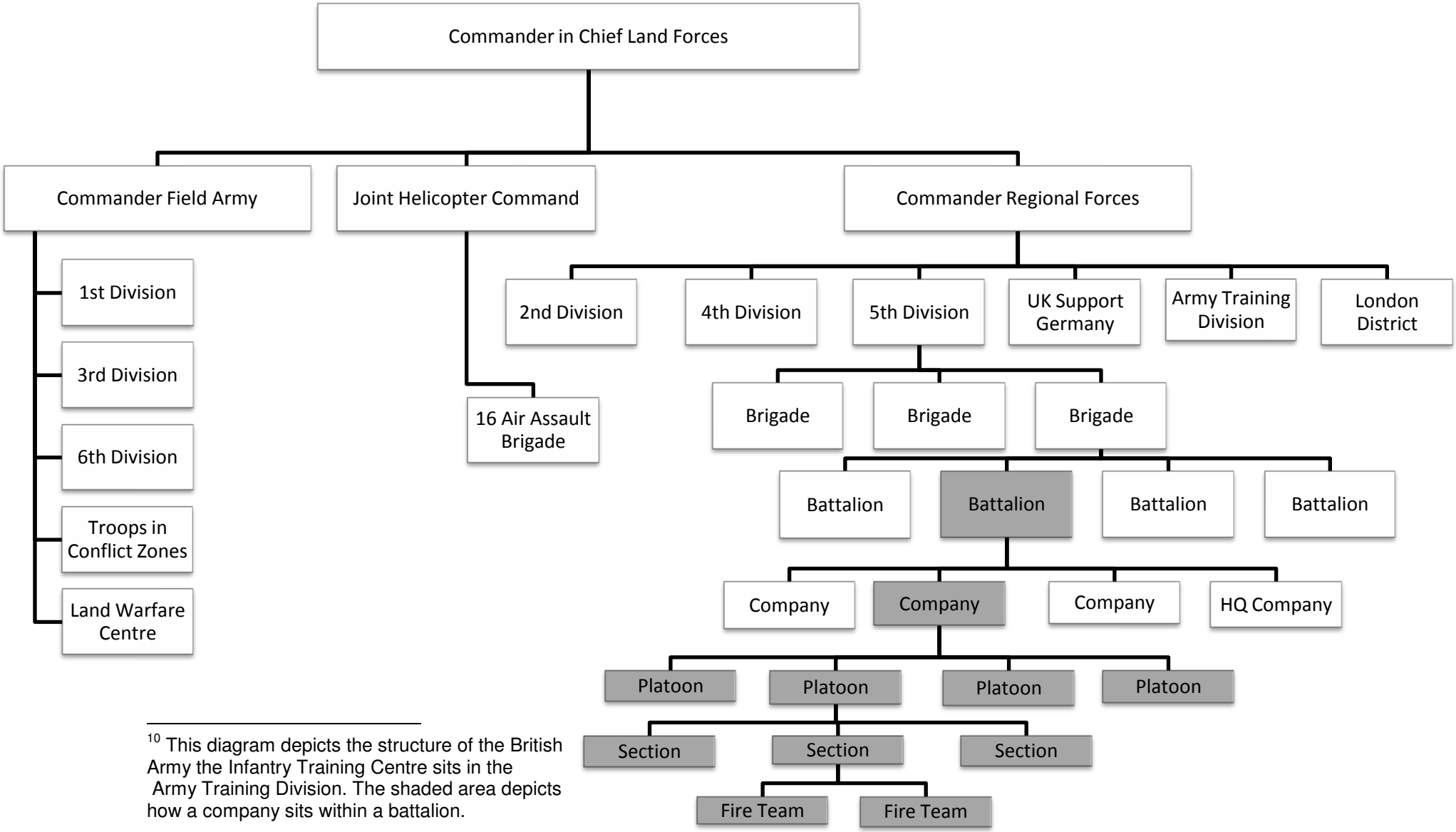
In phase 3 both sets of results were examined as a whole to see if failure to complete training could be predicted. Then the data was brought together to create a picture of an infantry recruit's journey from life prior to military service to the point of failure, with the specific aim of identifying ways of reducing training failure.

2.4: Setting

2.4.1: Military personnel structure

The study took place at the British Army's Infantry Training Centre and consisted of study participants from training companies within the 1st and 2nd training battalions. The British Army's personnel are organised into formed units as laid out in Figure 4. The shaded areas depict the level that this study is focusing on, that is Battalion and below. As can be seen in Figure 4 the Battalion is broken down into smaller personnel units, the smallest personnel structure being the Fire Team. The Fire Team can consist of between four and eight men, seven private soldiers (British Army's most junior Rank) and a Lance Corporal in charge. The Fire Team is the basic building block of any Infantry formation, and from this the Battalion formation is built, i.e. two Fire Teams make a Section (Corporal leads a section), three Sections make a Platoon (Platoon is led by a junior Lieutenant or a Sergeant), four Platoons make a Company (Company is led by a Major) and three Companies make a Battalion (approx 600 men and led by a Lieutenant Colonel), see Figure 4.

Figure 4: Structure of the British Army[10]



[10] This diagram depicts the structure of the British Army the Infantry Training Centre sits in the Army Training Division. The shaded area depicts how a company sits within a battalion.

2.4.2: Study environment

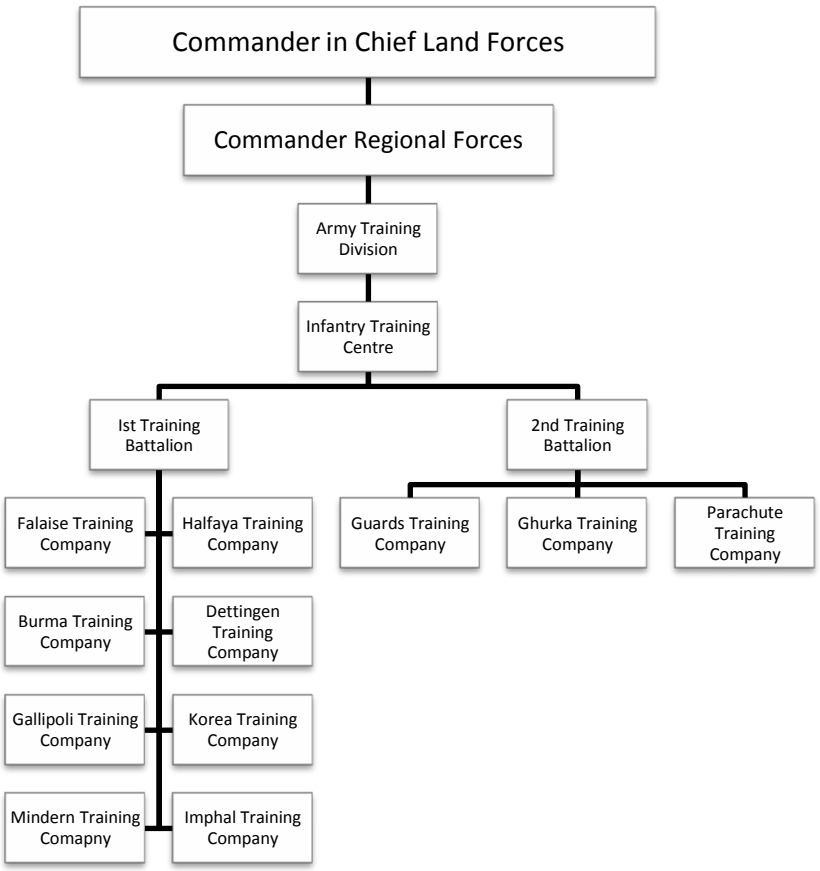
Most training centres throughout the British Army have a two step approach to initial training; basic training, usually lasting eight weeks in duration is followed by specialist training at another establishment. For example, soldiers who join as Combat Medical Technicians would commence the first eight weeks of their army training at the Army Training Centre Pirbright in Surrey. On successful completion of that first eight weeks they would graduate to the second phase of their training at Keogh Barracks, also in Surrey, where they would undertake a 36 week basic medical technician course. With this system the initial impact of training eases after the first eight weeks of basic training as the army recruit begins to focus on learning their trade in the second phase.

In contrast, the Infantry Training Centre, where this study took place, is a unique establishment in relation to all the other training units in the British Army. Infantry recruits have one continuous phase of training at Catterick for a six month duration. Rather than an initial eight week period of high training intensity followed by a more relaxed period of specialist training, infantry recruits are subjected to a gradual increase in pace and pressure over the course of their time at Catterick culminating in a pass or fail test of a military exercise using live ammunition and explosive ordinance.

The study was conducted at the Infantry Training Centre Catterick Garrison in North Yorkshire. The Infantry Training Centre itself is a large establishment spread over two sites on the edge of the Yorkshire Dales. It holds anything up to 3000 infantry recruits at any one time and with intakes of approximately 120 recruits every 2-3 weeks. The centre is divided into two Training Battalions, the 1st Battalion consisting of eight training companies based on the county

regiments of the British Army[11] and the 2nd Training Battalion consisting of three companies that train specialist infantry units, Guards Regiments, Ghurkha Regiment and the Parachute Regiment (Training Company structures are as Figure 5).

Figure 5: Infantry training centre structure[12]



The two Infantry Training Battalions each specialise in specific infantry areas. The Common Infantry Course focuses on training the recruits in the Light Infantry role, which is infantry that move around on foot without the aid of armoured vehicles, mechanised vehicles or helicopters. This course is common across both Training Battalions. The specialist training Companies

[11] Each county in the UK has its own affiliated regiment, infantry recruits that enlist in the regular infantry are assigned to their county regiment

[12] Guards Training Company of the 2nd Battalion undertakes exactly the same recruitment and training experience as the 1st Battalion, except they have an additional 2 weeks at the end of training to learn ceremonial drill.

of the 2nd Training Battalion have additional training requirements that are specific to their specialist role within the British Army, for example the Guards do everything the County Regiments of the 1st Battalion do, but in addition they have an extra two weeks of ceremonial drill training as they perform state ceremonial duties as part of their core role and provide the guard for the monarchy. The Ghurkha Training Company has additional English Language training; however most of their training is done in their native tongue. The Parachute Regiment is an elite regiment of the British Army and their training schedule is very different to that of any of the other training Companies as their main emphasis is on physical aggression, being able to move on foot with heavy personal equipment at speed and parachuting into combat. Study recruitment included all Training Companies from the 1st Battalion and the Guards Training Company from the 2nd Battalion.

2.5: Phase 1a: Biographical data collection and development of predictive scale

2.5.1: Phase 1a study sample

The target population for the main study was infantry recruits (all male) who had enlisted and undertaken secondary school education in the UK. In addition the population was further refined by focusing the study on the Training Companies with the greatest problem of attrition and self discharge from training.

The highest rate of self discharge and failure for non-physical reasons among recruits was in the Training Companies of the 1st Battalion and the Guards Training Company (2001). High training failure rates from the infantry have been anecdotally linked by training staff to having one of the lowest educational entry requirements in the UK Armed Forces. The British Army has over 100 trades to which recruits may apply. To assist educational streaming for fitness to undergo training, recruits sit a test called the British Army Recruit Battery and are issued with a score called a General Trainability Index (GTI). This score determines what job a recruit can do within the Army. A score of 60 or more gives the recruit access to apply for any trade within the Army with the skilled trades such as a mechanical engineer, combat medical technician, military police or intelligence corps requiring scores in the upper 50s. As the GTI score gets lower the options for the recruit become more manual rather than skilled and focus around the fighting element of the British Army such as artilleryman, combat engineer, pioneer, armoured corps and infantry. The lowest GTI score is 26 and this is for infantry soldiers, a score below 26 would mean that the recruit was not suitable for training and they

would not be allowed to progress their application. When considering which units at the Infantry Training Centre to include in the study, advice was sought from Defence Science and Technology Laboratory Human Sciences (the Ministry of Defence's personnel research organisation) at a meeting in June 2002. All personnel research on all of the British Armed Forces is commissioned or overseen by this establishment. Following this meeting it was decided that all Training Companies of the 1st Battalion and the Guards Training Company from the 2nd Battalion should be included in the study as they had a consistent path of training, and the most significant problem of failure through self discharge. The decision was taken to exclude the Parachute Training Company and the Ghurkha Training Company for the following reasons:

a. The Parachute Company was excluded as it is an elite formation of the British Army. It has different selection criteria from other infantry recruits; a differing training schedule; and a different qualification test to determine completion of training ('P' Company[13]). In addition to this the attrition characteristics for the Parachute Regiment differed greatly from the Training Companies of the 1st Battalion and the Guards Company. Failure within the Parachute training company was predominantly due to muscular-skeletal injury.

b. The Ghurkha training company was excluded for cultural reasons. Attrition is not an issue for this group (the Ghurkhas had a 100% pass rate in the training period 2002-03). Although the cultural differences as to why they

[13] 'P' Company is a week long series of highly physical tests including long distance pack marches, height confidence tests and 'milling' (recruits are paired up and have to fight each other in a ring for one minute as a test of aggression).

do not drop out of training may be of interest; they are outside of the focus of this study which is to understand why UK recruits fail in training.

2.5.2: Phase 1a study recruitment and consent

All infantry recruits in the 1st Training Battalion and the Guards Training Company from the 2nd Training Battalion were given the option of participating in the study. The study recruitment process began with a set presentation to all potential study recruits in the absence of training staff. This was to ensure that the study recruits were aware of the purpose of the study and what was involved in taking part. In addition this approach was also aimed at reducing the pressure on the volunteers so they did not feel coerced into participation. The initial presentation was always given by me and it covered the aims of the study, consent and assurance of confidentiality regarding data collected. In addition to this all recruits were provided with an information sheet (see Appendix 1) outlining the purpose and nature of the study. This was to allow potential participants to have the information they needed to give informed consent or decline to participate. Recruits were then given a period of time to consider participation during which the data collection team left the room. During this period those who did not want to participate were given the opportunity to leave the room. Directly prior to the study recruit filling out the biographical questionnaire, I reiterated the aims of the study and allowed participants to ask any further questions they may have had.

Volunteers were then asked to complete a written consent form that covered Phase 1 and 2 of the study. Following this they were provided with a unique identification number so that their biographical questionnaire response sheet could be linked to their training outcome without personal identification.

2.5.3: Phase 1a baseline data collection

All recruits completed the questionnaire within 48 hours of enlistment to reduce the contamination of responses through contact with service life. To achieve this, data collection was combined with their initial entry medical on their first morning at the Infantry Training Centre. A system was set up with the medical centre personnel so that the study recruits entered a seamless process that collected the required data. After consenting to take part in the study they would proceed to their entry medical with the Medical Officer. They were given a form to have their physical measurements entered onto (height and weight) so that they had it ready for completion of the biographical data questionnaire. On completion of the entry medical they came to a designated room where they were given the biographical data form marked with their unique identification number. They were given a single desk to complete the form to ensure that responses were not discussed and confidentiality was kept to a premium. The data collection team always consisted of three personnel, me and two assistants, to ensure that the study recruits always had someone on hand should they not understand any of the questions or have difficulty in completing the biographical data form. The same two assistants were used throughout the whole period of data collection and received a detailed presentation on the study design and data collection process prior to commencement of data collection.

2.5.4: Phase 1a biographical questionnaire

A structured biographical data questionnaire was administered to all recruits within 48 hours of joining Infantry Training Centre. The questionnaire consisted of a total of 95 items adapted from that used by Mael and Ashforth (1995). Permission to use the tool was granted by the American Military

Research Institute. The biographical questionnaire was selected as Mael and Ashforth (1995) and Hampson (1997) concluded in their studies that biographical data had some potential to predict training attrition. The questionnaire had been used by Mael and Ashforth (1995) to study the association between a recruits biographical history and the extent to which they identified with the US military. The identified four interpretable biographical factors that were significantly related to organisational identity with the U.S. Army. These were:

a. pre-enlistment participation in rugged outdoor activity.

b. solid citzen (evidence of good and dependable school and employment behaviour prior to enlistment),

c. participation in group orientated team sports.

d. intellectual and achievement orientated pursuits (non-physical extracurricular intellectual pastimes).

Although the Mael and Ashforth (1995) study demonstrated some ability to predict training outcome as a consequence of organisational identification, it did not examine the utility of biographical data alone to predict military recruit training attrition. The questionnaire was used to see if biographical factors could effectively predict failure amongst British Army infantry recruits.

2.5.5: Phase 1a pilot study

Prior to the biographical questionnaire being used for the main study it was anglicised (e.g. educational questions were changed to match the UK schooling system and examinations) and piloted on infantry recruits at the Infantry Training centre where the main study was conducted. The pilot study was undertaken to assess:

a. Quality issues surrounding, before, during and after administration of the bio-data tool.
b. Discrimination between populations for floor and ceiling effects.
c. Response patterns.
d. Frequency of missing values

The cohort for the pilot study was a platoon (N=30) who completed the biographical questionnaire as a group in approximately 30-40 minutes. The group size of 30 was found to be appropriate for delivering the questionnaire as it was small enough to allow interaction with the study participants and assist when they had difficulty with some questions. This was important, as throughout the data collection it was evident that the reading ability of participants varied considerably. For the main data collection there was always a minimum of three personnel in the data collection team so that one to one assistance could be given if required to complete the questionnaire. The size of the pilot group allowed for free movement of the research team amongst the sample group so that explanations to questions could be given when asked. However there were practical issues that needed to be addressed before the main data collection. The pilot group were closely packed into a small room with no desks, which led to the recruits becoming easily distracted and allowed discussion of answers. It appeared that the

participants were discussing what answers to give, thus biasing and contaminating the data. For the main study individual desks were provided for each candidate and by incorporating the data collection with the entry medical it staggered the recruits through the questionnaire answering phase, which reduced the control problems experienced in the pilot study.

The pilot study identified the importance of the timing of data collection. The pilot study participants were three weeks into their training and it was evident that some were already dissatisfied with Army Infantry training and wanted to leave. In addition to this the group was about to have their first weekend leave since joining the Army. This led to an air of high spirits and low concentration. It became evident that the data should be collected as soon after entry into training as possible, and again this problem was resolved by incorporating data collection into the entry medical process. All main study recruits completed their questionnaires within 24 hours of joining the Army.

There were also elements within the data tool itself that caused difficulties for the cohort. The main one being that the sample group used were a Scottish platoon and the educational questions reflected the English educational system. To maintain continuity of the questionnaire Scottish GCSE equivalents were written on the white board during the data collection so that any recruit schooled in the Scottish system was able to respond in a way that would accurately reflect their educational achievements. It was also found that certain wording needed simplifying as educational ability varied.

2.5.6: Phase 1a population and distribution (pilot study)

The target population was the same as the main study but included a small contingent of South African recruits. For the main study the reason and importance of using UK troops only was explained to the training staff and the study recruits were double checked at the commencement of each data collection to ensure that no non-UK personnel were invited to participate by mistake.

Pilot study data was entered into a dataset using SPSS version 11.5. Three data errors were detected by using double data entry and a decision was made to double enter the data for the main study. Descriptive analysis was used to analyse the frequencies of the data entered. Within the data there was evidence of both floor and ceiling effects. These were mainly in the areas of schools attended and extracurricular activities at school. After careful consideration it was decided to continue to include the questions identified. There were two main reasons for this: firstly the biographical data tool was loaned from the American Military Research Institute and it was felt that it should be used as completely as possible for the main study before questions were removed for an Anglicised model; and secondly the descriptive data was useful in building a background picture or profile of the modern infantry recruit and the floor to ceiling effects seen in variables such as schooling showed that none of the pilot group went to a single sex school.

2.5.7: Phase 1a missing values (pilot study)

The response patterns showed that problems with the questions and the responses given were minimal, and that these were mainly due to cultural differences caused by using an American designed tool on British Infantry

Recruits. The combination of response patterns and missing values did highlight an area of concern with eight of the variables. The higher than expected missing value score in these variables were caused by multiple answers to one question, leaving no choice but to record it as a missing value. The questions involved were re-worded and a ‘tick one box only’ caveat added to each question in bold.

The pilot questionnaire did not include questions about the participant’s ethnicity. Also, it had been anecdotally identified by the training staff that soldiers who smoked had greater difficulty completing the 24 week course due to possible health reasons. To address these issues, smoking habits and ethnicity were included in the final biographical questionnaire.

2.5.8: Phase 1a measure of potential risk factors

The biographical questionnaire was designed to collect personal information from five aspects of the Infantry Recruits life prior to joining the Army; these areas are outlined in Figure 6.

Figure 6: Areas of enquiry

AREA OF ENQUIRY		NUMBER OF ITEMS
Demographic & Physical Measurements		
	Physical Measurements	4
	Family Factors	5
	Personal Information	7
Education		
	Primary and Secondary Schooling	8
Outdoor Education		
	Team Activity	3
	Outdoor Activity	2
	Individual Physical Activity	2
Non Physical Activity		
	Individual Non Physical Activity	12
Employment and coping behaviour		
	Employment History	7
	Conduct and Behaviour	11
	Coping	8
	Group Affiliation	8
	Drug and Alcohol	18
	Total	95

2.5.8.1: Demographics

The demographic component of the biographical questionnaire was designed to paint a picture of the individual's background and home circumstances. It identified personal information and physical measurements, as well as looking at family factors. The personal information section identified the type of geographic location they grew up in, how many times they had moved house and if to new towns or cities. In addition it identified their ethnicity, as well as smoking habits, musical taste and when they left school. The family factors section focused on the size of their family, information about their parents and siblings and what employment their father and mother had whilst they were

growing up, e.g. he worked for someone, he was a manager, he was self employed, I didn't know him etc.

2.5.8.2: Education

This section of the questionnaire looked at the whole of their schooling career from primary education. It enquired about the size of schools, number of schools attended and whether they were co-educational. In addition it also looked at GCSE results, along with preferred subjects and subjects that were either dropped before examination and those failed at examination.

2.5.8.3: Outdoor education

This section was broken down into three key areas of enquiry (see Figure 6). The questionnaire (see appendix 2) focused predominately on the amount of time committed to participation in team sports and the extent of that participation (none, team member or team captain), the focus being to determine the extent to which the recruit participated in team sport activity. The questionnaire itemised each potential sport that they could have been involved in, which ultimately created problems during analysis as certain sports such as hockey had few participants. As the focus of this section was about participation in team sport activity rather than what sport they were involved in the decision was taken during the analysis phase to collapse the individual team variables into one variable that reflected their team sport participation (none, team member or team captain).

A similar process was adopted with the recording of outdoor activity. The questionnaire included many questions regarding the type of outdoor activity, but as with the team activity section its focus was on whether they took part in

outdoor activity or not. For analysis this was further broken down into two groups; rugged outdoor activity that looked at pursuits such as walking, canoeing, climbing etc. and practical activities such as car maintenance, looking after animals, electrical work etc.

Finally within this section questions were included to ascertain if and when individual physical activity milestones were achieved, such as learning to swim and learning to ride a bike.

2.5.8.4: Non physical activity

As with physical activity, the non physical activity section was mainly focused on participation as well as what activities were undertaken. It enquired about time spent playing computer games or watching television, reading, playing musical instruments, making models or playing chess as well as participation in domestic activities or babysitting.

2.5.8.5: Conduct and behaviour

This section was broken down into five parts. The initial section looked at conduct and behaviour itself with questions relating to time spent at home with the family, classroom behaviour, truancy, expulsion and trouble with the police. The coping section focused on coping strategies adopted, who they talked to about problems, amount of sleep required, sickness rate at school and what caused them the most amount of stress in their secondary school years. To ascertain how the recruit had coped with stressful situations in the past they were asked about how they 'let off steam' when they were angry and were given a choice of five answers to choose from. These ranged from

'never getting angry', through 'talking it through' to 'fighting and swearing' as a response.

The section that looked at group affiliation asked questions that would try to give insights into their group interests and levels of commitment. It inquired about the sizes of groups that they liked to associate with as well as 'quitting' behaviour. 'Quitting'[14] behaviour was recorded by asking them about activities that they had begun and then quit prior to completion. There was also a section of questions here that aimed to measure the extent to which the recruit already identified with the Army. This section in the original questionnaire was textual. The decision was taken to convert this variable so that it produced a score in relation to the level of identification with the Army. The score ranged from 0-20 with a higher score indicating greater identification. To achieve the score each response to the five items was numerically weighted from 0-4 and summed.

Finally in this section they were asked about drug and alcohol behaviour. The drug questions were aimed at recording drug taking history as well as recent drug taking behaviour. As with previous government research into drug taking behaviour (Ramsay and Spiller, 1996) the fictitious drug Semeron was included to detect over reporting of drug taking behaviour. To asses alcohol drinking behaviour and dependency, the World Health Organization Alcohol Use Disorders Identification Test tool (Babor et al., 2001) was used.

[14] The term 'quitting behaviour' was taken from the Mael and Ashforth literature and refers to individuals that do not complete tasks that they started, e.g. they commence a Duke of Edinburgh award scheme and then leave without completing it. Mael, F. A. & Ashforth, B. E. 1995. Loyal From Day One: Biodata, Organizational Identification, and Turnover Among Newcomers. *Personnel Psychology,* 48**,** 309.

2.5.9: Outcome

This study had a binary outcome measure of pass or fail at six months from the date of enlistment into the Army. A pass was classified as a successful completion of the Common Infantry Course. Any study recruit who failed to complete the course was classified as failing. This included those that transferred to other trades within the Army as they were considered to have 'failed' the Common Infantry Course. The recruits were discharged from training for a variety of reasons that were coded in one of nine ways (Figure 7).

Figure 7: Categorisation of reasons for discharge in training

Reason	
Discharge As Of Right	The recruit can leave the Army after 28 days up until the end of his Phase 2 Training
Services No Longer Required	The Army Discharges the Recruit as a result of a breach of discipline
Released from Army Service	The Army releases the Recruit from service (usually used for very unhappy recruits and those found to be incompatible with military life). A release from service by mutual consent and no blame apportioned.
Absent Without Leave (AWOL)	Recruits that leave the training camp without permission are dismissed on the grounds of being absent without leave
Medical Discharge (physical)	The recruit develops an injury or illness that is not compatible with military service and they are discharged on medical grounds.
Transfer to Other Corps/Service	Recruits who are not happy or incompatible with infantry service but wish to remain in the army may transfer to another trade within the scope of their original GTI score.
Unsuitable for Army Service	The recruit is found to be unsuitable for Army service and is released from training.
Unable to meet medical requirements of service	The recruit is unable to meet the medical standards for continuation of training i.e. reemergence of childhood asthma

2.5.10: Phase 1a data management

All data was double data entered into SPSS (v11) and the two datasets were compared to highlight data inputting errors. These errors were corrected and a main dataset for analysis was produced. Stata 9 data analysis package was used for the main analysis.

The dataset linking names to serial numbers was stored on a Ministry of Defence Computer and back up disk, which were kept in a locked office within the Royal Navy Department of Community Mental Health in Portsmouth. Both the computer and the dataset were password protected and these passwords were changed in line with Ministry of Defence security protocols. The record of names could only be accessed by me to enable identification of recruits that were discharged.

2.5.11: Phase 1a plan of statistical analysis

2.5.11.1: Population characteristics

Descriptive statistics were used to describe the study sample in terms of demographics, physical attributes and training outcomes. Descriptive statistics were expressed as proportions for categorical and ordinal variables, and means with standard deviations for continuous variables.

2.5.11.2: Creating a developmental dataset

To enable internal validation of the predictive model from the dataset it was randomly split into two datasets of unequal size (development dataset two-thirds, test dataset one third). The larger developmental dataset was used to develop a statistical model of factors predictive of failure that could be used as a scale to calculate risk of failure. This scale was then tested using the smaller

dataset, referred to here as the test dataset. Prior to the splitting of the complete dataset all study participants' outcomes were recorded as either pass or fail. A variable was created, fail=0, pass =1. This became the dependent variable for the study. The Stata 'sample' command was used to sample 668 cases to create the development dataset. The remaining 332 cases were use for the test dataset.

2.5.11.3: Calculating univariable associations between independent variables and outcomes (developmental dataset)

Independent variables were analysed in turn to test their association with whether the recruit passed or failed Basic Infantry Training. To determine the univariable association between pass and failure the *t* test was used for continuous normally distributed variables, the Mann Whitney U test for ordinal and continuous variables that were not normally distributed, and Pearson's chi-square tests were used for categorical variables.

2.5.11.4: Calculating multivariable associations between independent variables and outcomes (developmental dataset)

To adjust for confounding a multivariable logistic regression was developed using the binary outcome of pass/fail. An initial shortlist of variables was created by identifying those variables univariably associated with the study outcome with a two-tailed p value of less than or equal to 0.20. This liberal cut-off was chosen to avoid excluding potential factors that might be more strongly associated with failure once other factors were adjusted for. These variables were then used to build a multivariable logistic regression model. All shortlisted variables were entered into the model and each variable's contribution to the overall fit was estimated using likelihood ratio tests. The variable making the least contribution (as assessed by p values from the

likelihood ratio tests) was then discarded. This process was repeated until it was not possible to exclude a variable on the basis of a p value of less than 0.05. This technique was used to select the most robust set of covariates for the risk score model for use on the test dataset.

2.6: Phase 1b: Analysis plan for retrospective testing of predictive scale on test dataset

2.6.1: Phase 1b accuracy of prediction (test dataset)

The final model created from Phase 1a was then used to create a risk score for each participant in the test dataset. The risk score was created by using the intercept and regression coefficients from the final model in the development dataset. This score was interpretable as the percentage risk of failing to complete training within six months of army recruitment; for transparency a worked example is given in the results section (Table 19). The risk scores on the test dataset were divided into deciles and the actual proportion failing to complete was plotted against the mean risk score to assess the models' accuracy of prediction within each risk score deciles.

2.6.2: Phase 1b sensitivity and specificity (test dataset)

To determine the discrimination of the risk score an amalgamation of methodology was adopted from Driver et al (2007) and Nikolsky et al (2007). The observed training outcomes in the test dataset were compared with the predicted outcomes. The discrimination of the risk score was assessed by calculating the area under the receiver operating characteristic (ROC) curve, also known as the 'C statistic' (Nikolsky et al., 2007). The area under the receiver operating characteristic curve is the probability that the predicted value for the subject who developed the outcome will be greater than that for the subject who did not develop the outcome (Driver et al., 2007). Sensitivity, specificity, positive predictive and negative predictive values at the ten cut-points were calculated using the 'diagt' command in Stata.

2.7: Calculation of phase 1 sample size

In considering the sample size for this study certain key factors were taken into consideration. It has been suggested that the rule of thumb for logistic models is ten cases per independent variable (Vittinghoff and Mcculloch, 2007), with an absolute minimum of five cases per independent variable (Tabachnik and Fidell, 1989). Vittinghoff and McCulloch (2007) suggest that the rule of thumb of ten or more cases per independent variable is not a 'well defined bright line' and that when a statistically significant association is found in a regression model with five to nine cases per independent variable only a minor degree of extra caution is warranted. The anticipated failure rate was greater than 30% attrition based on previous training output records (I.T.C, 2001). The sample size was calculated on a ratio of 10 cases per independent variables with 95 variables to be measured (Tabachnik and Fidell, 1989). This produced a sample size of 950 overall, and ultimately a sample of 1000 recruits was decided upon as this ensured that all 9 Training companies had an infantry recruit intake during the study period. This also ensured that infantry recruits from all the United Kingdom's recruitment centres were included in the study, and was also mindful that it would take six months of data collection to achieve 1000 cases. The planned splitting of the dataset to allow internal validation (n=667 in development dataset, n=333 in test dataset) was also taken into consideration as the cases to independent variable would reduce to seven cases per independent variable (n=665), which still sat within Vittinghoff's and McCulloch's (2007) acceptable range of 5-9 cases per independent variable for use in logistic regression.

2.8: Phase 2: Textual data collection and plan of analysis

2.8.1: Phase 2 sample inclusions and exclusions

All recruits that participated in phase 1 of the data collection had their training progress monitored on a twice weekly basis, until they had passed the course or failed according to one of the eight reasons in Figure 7. Those who failed in training were considered potential study recruits for phase 2 of the study.

2.8.2: Phase 2 sampling

The aim of recruitment for phase two was to adequately represent those within training that failed to complete Basic Infantry Training. The sample size was determined by the factors that the sample needed to represent. It was important that the phase 2 sample was representative of social background across the United Kingdom as well as being representative of all the training companies. If a sample size quota had been set prior to phase two data collection, the number of cases that would usually be recruited for this method of study would probably have been achieved very quickly from one or two training companies. This would have presented two problems within the phase two data collection; initially the data collected would only be representative of two training companies as opposed to nine altogether and secondly, as training companies recruit from geographical areas of the United Kingdom the data would only be representative of a small proportion of the whole population recruited from. For example, I would have just been conducting interviews with recruits from Liverpool and Manchester and then the quota would have been met. On the basis that the interviews were simple, structured, and short the decision was taken to interview all who consented from all training companies until every recruit had a definitive training outcome.

2.8.3: Phase 2 sample recruitment and consent

As part of the initial recruitment and consenting process for phase 1 of the study, all study recruits were informed that as part of the study they would be asked to participate in an interview should they leave training. During the time period that the data collection ran there were no more than three training companies within the study at any one time. Twice weekly the administration clerks for each of the participating training companies were contacted and if any recruits had entered the discharge from Army process they were invited to take part in an interview at the Infantry Training Centre. On the morning of the interview the training company administration clerk would be contacted to confirm whether the recruit was going to attend or not. In addition to this the study recruit supplied written consent in advance at phase one of the study regarding participation in the interview process, with the understanding that they did not have to agree to an interview and the interview would be on a voluntary basis at the time.

2.8.4: Phase 2 textual data collection

A semi-structured interview was used to interview the recruits undergoing discharge to explore their reasons for leaving. The use of a semi structured interview was a measured decision that reflected my own understanding of certain components of the phenomena prior to the study. Morse (1992) identifies that it is acceptable to use a semi-structured questionnaire approach when the researcher is familiar with the boundaries, domain and components of a phenomena. It allows the researcher to create a semi-structured interview template with the confidence that it contained questions that were comprehensive, valid and could be answered freely. The key advantage to a semi-structured interview was that all participants were asked the same question, but most notably the freedom was there to expand and explore any

new phenomena that arose. Another key advantage identified by Morse (1992) was that semi-structured interviews are useful when there is only limited time and access to the interviewee. There was only a small window of opportunity available to me to have sole access for an interview, so it had to be brief and concise and target key areas of inquiry. Faced with the dilemma of reduced interview data, semi-structured interviews were used to compensate by having a larger sample of participants (Morse, 1992). The interviews were recorded with handwritten notes rather than recording equipment; this was a decision that was not taken lightly. There was only a small window of opportunity available to have sole access to the recruit for an interview, and many interviews would have to be conducted to ensure that a representative sample was achieved. Hoepfl (1997) believe that the choice of recording interviews with handwritten notes or electronic equipment is a matter of personal preference and Lincoln and Guber (1985) do not recommend recording equipment as they believe them to be intrusive. It was also felt that using recording equipment in this study would have made the recruits less inclined to speak openly as they were speaking intimately about their experiences and may have been reluctant to be critical of the training system and its staff if they believed the recording could be heard by someone other than me. A relaxed conversational approach was taken where notes were made during the interview and then comprehensively transcribed immediately after. I believed that this approach ensured a greater feeling of confidentiality which encouraged the recruits to speak freely. A balancing factor between both methods of data capture was that all interviews were carried out by me and I was able to decipher my detailed abbreviations and fill in gaps immediately after the interview.

2.8.5: Phase 2 area of enquiry

The semi-structured questionnaire was devised to explore a number of phenomena that were believed to be associated with failure in training. The selection of questions asked was guided by anecdotal evidence from training staff as to why recruits leave, and Hampson's (1997) study of Army recruits who left training voluntarily. The areas of potential interest identified were:

- Why the recruit was leaving, with particular focus on their reasons for leaving and their thought processes in relation to leaving.
- How the recruit would feel and behave should he not be able to leave and had to stay for a compulsory period.
- The effect that choosing to leave or being told to leave has had on the recruit during the discharge period, and how they coped with the prospect of returning home having failed in training (mood was assessed using a Subjective Units of Disturbance scale[15]).
- The impact that training failure has on their subjective mood.
- The level of communication that they had with their family and whether they found this beneficial or counterproductive (i.e. made them more homesick).
- What changes or support could be given to increase the probability of recruits staying in training.

[15] Subjective Units of Disturbance score taken from the Eye Movement Desensitization and Reprocessing Manual and is a score from 0-10. For the purpose of this study the score was reversed so that 10=normal mood and 0 = the most unhappy they had ever felt, Shapiro, F. & Forrest, M. S. 2004. *EMDR : the breakthrough therapy for overcoming anxiety, stress, and trauma,* New York, NY, BasicBooks..

2.8.6: Phase 2 data management

When consent to participate in phase 2 of the study was obtained a set of research notes were created for that study recruit. The research notes were annotated with their name, Army service number, date of birth and their unique identification number that related to the biographical questionnaire that they had filled in as part of phase 1 of the study. All interviews were recorded by hand written notes on a standardised interview template and on completion of the interview a copy of the Commanding Officer's discharge report was obtained from the training company's administrative clerk and placed in the file. These files were stored in a locked office within a separate lockable filing cabinet obtained for the purposes of this study.

2.8.7: Rationale for framework analysis (Applied Social Policy Research).

The aim of this phase of the research was to elicit the process of failing and discharge from the army in order to understand its nature. With that understanding it was hoped that potential interventions to address army recruit attrition could be devised. This exploration required a qualitative method able to elicit specific practical solutions to the problem. Applied research concentrates on finding solutions to an immediate practical problem (Ritchie and Spencer, 2002), and has a key role to play in providing insight, explanations and theories of social behaviour (Ritchie and Spencer, 2002). Framework analysis of qualitative data sits at the heart of applied policy research methodology. Framework analysis has been developed to help achieve specified aims and outputs as well as to facilitate systematic analysis of data (Ritchie and Spencer, 2002); it was chosen for its capacity to handle data from a large number of subjects in a rigorous, transparent and logical process of textual analysis.

A semi-structured interview template was developed to ensure that the perceived reasons for leaving held by training staff and those reported by Hampson (1997) were included. Interviews also had to allow the individual to express their own reasons for leaving above and beyond the *a priori* knowledge of the researcher, so they were, in essence, invited to tell their own story within a framework of questions (see appendix 3).

2.8.8: Framework Analysis

The process of framework analysis has been described by Ritchie and Spencer (2002) and its use has been reported by Pope et al (2000) and Bryman and Burgess (1994). The framework approach was developed in the UK specifically for applied or policy relevant qualitative research to meet set objectives of investigation within limited time periods (Pope et al., 2000). The process consists of five phases:

2.8.8.1: Familiarisation.

Ritchie and Spencer (2002) identify that when undertaking research where extensive material is available, judgements have to be made as to how data for analysis is to be selected and broken down into a dataset of a manageable size. This was achieved by random sampling of the interview notes of the 100 interviewees on completion of data collection. One set of interview notes was randomly picked from each training company to create a multiple of ten. The initial ten were used in the familiarisation process and further multiples of ten were added with random sampling until no new themes or relationships were emerging, i.e. data saturation was achieved[16].

[16] Files that were found to be incomplete i.e. Officer Commanding Reports (n=9) missing were removed from the selection and thereby excluded from analysis.

The initial stage of this method of analysis involves immersion in a pragmatic selection of the data by reading all of the data within the selection (Pope et al., 2000). To achieve this the initial set of 10 case notes were used in conjunction with a spreadsheet to begin to catalogue emerging themes. As each set of notes were read in turn a new line was added to the spreadsheet so that verbatim text could be recorded. This allowed text to be added to establish themes as well as adding any new emerging themes from the new case file. When all 10 case files had been used the spreadsheet was printed out, stuck together and pinned to a wall. This enabled some semblance of order to be bought to the data, as being able to see the patterns and groupings on paper assisted in establishing group headings for themes within the text. These groupings of data were then transcribed onto diagrams to begin to map emerging themes.

2.8.8.2 Identifying a thematic framework

The next stage of the process involved taking the familiarised data and identifying the key issues, concepts and themes by which the data can be referenced. This is achieved by returning to the aims and objectives of the study and reflecting on the prior issues as well as the recurring themes in the data (Pope et al., 2000). By the end of this stage the initial data had been grouped into manageable chunks and a thematic framework established. With the framework established, an index was then added to the data in preparation for passing all data through the indexing process.

2.8.8.3: Indexing

'Indexing' refers to the process whereby the thematic framework or index is systematically applied to the data; it is not a routine exercise as it involves numerous judgments as to the meaning and significance of the data (Ritchie and Spencer, 2002). It is this judgement process and interpretation that can allow bias to emerge in a study, as ultimately the researcher has been immersed in the data for a long period of time and preconceptions can inadvertently effect the interpretation of what is being read. Qualitative data interpretation is very subjective; however, by applying a thematic framework or index to all the data the judgements and assumptions of what the data means to the researcher is made transparent for all to see (Ritchie and Spencer, 2002). It is this level of transparent and potentially replicable indexing and labelling of all data that adds robustness to this method of data analysis.

It was evident from the outset of the phase 2 analysis that there was more data than required. In addition it was also evident that framework was not a linear process and that the thematic framework was constantly evolving as more data was added. During this process the case files were read in turn and an index code from the index was annotated in the margin so that verbatim text could be lifted into the charts at the next stage. As noted by Ritchie and Spencer (2002), this is not a routine exercise as judgements had to be made as to whether the emerging data fitted within the established framework, or the data was revealing a new theme within the framework. To assist in this process the original spreadsheets developed to assist with the creation of the thematic framework were built upon and the indexed data was added.

This provided an enhanced pictorial view of the patterns within the data which included direct quotes as well as interpretations of what was being observed.

2.8.8.4: Charting

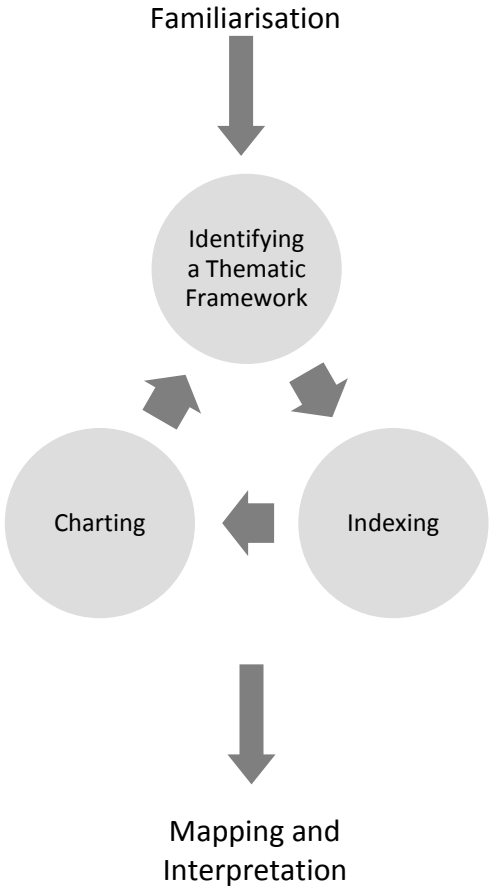
Pope et al (2000) describes the charting stage as rearranging the data into the appropriate parts of the thematic framework. Again, in reality this was not a distinct process in isolation from any other. As the data was processed the charts appeared to spontaneously grow with the data naturally gravitating into its own charting area. Clear initial chart titles were evident but what was most interesting is that very quickly both sub and supra themes emerged from the initial charts, reinforcing that one does not have to be dogmatic in applying a qualitative data analysis technique, but more importantly use the technique as a guide towards discovering the real meaning within the data. It was very evident that if I had not allowed a looping process to occur (see Figure 8) between the thematic framework phase, indexing, and charting, then fundamental sub and supra themes would have been missed. This process led to the construction of four initial charts from which three subsequent charts emerged.

2.8.8.5: Mapping and interpretation

By this stage of the process the data had been sifted and sorted into its core themes in preparation for interpretation and mapping. Guided by the six key objectives and features of qualitative analysis[17] and guided by the original research aims the charted data was used to map the range of the recruit experience, as well as finding associations and typologies within the data. This was then ultimately used to map the recruit experience for those recruits that failed in training.

[17] Key objectives and features of qualitative analysis: defining concepts, mapping range and nature of phenomena, creating typologies, finding associations, providing explanations and developing strategies. Ritchie, J. & Spencer, L. 2002. Qualitative Data Analysis for Applied Policy Research. *In:* Huberman, M. A. & Miles, M. B. (eds.) *The Qualitative Research Companion.* London: Sage Publications.

Figure 8: Framework analysis in practice



2.8.9: Validity of framework approach

Framework not only provides a systematic approach to analysing large amounts of textual data, but also tackles a more fundamental obstacle for commissioners of qualitative research. In the case of this study, it is the need of the Ministry of Defence to know how the findings of the research have been obtained (Ritchie and Spencer, 2002). If policy makers are to implement change based on qualitative research findings, they need to have confidence in the validity of the findings.

Validity in qualitative research conducted by a single field worker has always invited the question 'why should we believe it'? (Bosk, 1979). Qualitative

research is criticised for the absence of standard means for assuring validity. However, this assumption of the lack of validity is based on the requirements for validity in quantitative research (Maxwell, 2002). Maxwell (2002) argues that typologies developed for quantitative research cannot be directly applied to qualitative research without distorting the epistemological foundations of qualitative research. Maxwell (2002) proposes that qualitative research should not have to be made to fit the validity typologies of quantitative research, but that 'validity' as a concept needs to reflect an understanding of qualitative methods. When conducting qualitative research there will never be one correct objective account or 'Gods eye view' (Putnam and Conant, 1990) as observers cannot step outside of the world to provide truly independent accounts: The concept of validity that Maxwell (2002) presents does not depend on the existence of some absolute truth. If the researcher can demonstrate the integrity of the data and the accuracy of its recording, then the data itself cannot be deemed invalid. It is the inferences and interpretations that are drawn from the data that raises questions. This study adopts Maxwell's (2002) four points of validity in qualitative research: descriptive validity, interpretive validity, theoretical validity and generalizeability. Descriptive validity, the foundation upon which qualitative research is built, relates to the accuracy of the recording of data and the integrity of the researcher to be factually accurate in their account of what is observed. The strength of framework is that the observations lifted from the textual data are clearly evident at the familiarisation phase, the observations construct the thematic framework and index, and then all subsequent observations are applied to that index and framework to test the assumptions. The observations are then recorded verbatim into charts.

The interpretive validity is inherently a matter of inference from the observations recorded (Maxwell, 2002) and the charting process within framework provides a clear, transparent picture of the inferences of the researcher prior to mapping. The systematic process of theory construction in framework analysis clearly builds on evidence (within the data), and shows the development of links and relationships (within the data) that build up to theories. Thus, the integrity and validity lies in the transparency of the approach.

Maxwell (2002) acknowledges that most qualitative research is not designed to allow systematic generalisation. However, one of the benefits already identified in applied policy research and the framework analysis is that it has the capability to manage large amounts of qualitative data and therefore any findings are based on multiple case observations and not singular ones. In this study the accounts of recruits who failed in training were analysed through the framework process and cases were added until theoretical saturation was achieved (that is no new issues were emerging from additional cases. Saturation was achieved at 33 cases). The sample is representative of infantry recruits that fail in training as the observations relate directly to infantry recruits that fail, giving the results good internal generalizeability.

2.9: Ethical issues

2.9.1: Ethics

Ethical considerations for this research are in line with Ministry of Defence medical research policy which adheres to the World Medical Association's Declaration of Helsinki (1996). The study gained full ethical and scientific approval from Defence Medical Services Clinical Research Committee on 20th January 2003 and has been assigned the unique project number 082. This was achieved by submission of a research proposal to the above committee and a presentation to the Army Recruitment and Training Division Scientific Committee.

2.9.2: Consent and Coercion

Informed consent is a legal obligation in any research and no investigator may involve a human being as a research subject before obtaining informed consent. Prospective subjects must have time to decide whether to participate or not and there must be no coercion of the subject to take part (Lobiondo-Wood and Haber, 2002). Informed consent is of particular importance when dealing with service personnel, as they live and operate within a hierarchical system where coercive pressure could be applied by rank to obtain consent to participate in the research study. To reduce the risk of a feeling of coercion by the recruits steps were taken to de-militarise the information presentation. During this presentation the research team wore civilian clothing, all the training staff were asked to leave and although the research team identified that they were military, they stressed they were medical personnel and they introduced themselves by their first name and surname and did not use any form of rank.

2.9.3: Benefits of the research

It is important for any research participant to be reassured that participation in research is for the greater good and not just for the researcher's own academic advancement. It was explained to all participants that the aim of the research was to look at how to reduce the high levels of training attrition experienced within infantry training and that the information that they provided would benefit recruits in the future as the Army was constantly reviewing and developing its training methods.

2.9.4: Confidentiality

It is imperative when undertaking any research to maintain confidentiality, but when conducting biographical research on service personnel there is an extra dimension to confidentiality as the information that they are providing could prejudice their career should it become available to their chain of command. To achieve the aims of the study it was essential that the participants were totally open and had confidence that only I could link a name to a completed questionnaire. This was achieved by each study participant being assigned a unique number that the biographical questionnaire was annotated with. This number was recorded on a database on my military computer account. The case files produced for the qualitative study were again made anonymous using the participant's unique number and stored in a medical records store within my department.

CHAPTER 3: PHASE 1 RESULTS

3.1: Introduction

This chapter presents the results of the biographical questionnaire that was completed by 999 British Army Infantry recruits (during data cleansing one case was found to be a duplicate and removed from the study dataset). The results are divided into two parts: (1), the initial analysis carried out on the developmental dataset to establish a model that could be used to devise a risk score to predict 'failure'; and (2) results of the testing of that score on a test dataset. The development and test datasets were created by randomly splitting the 999 cases into two thirds one third split respectively.

3.2: Study Recruitment and Population Characteristics Prior to Enlistment

British Army infantry recruits were recruited into the study between September 2002 and March 2003. Collection of biographical data was completed by March 2003, however each study participant had to be monitored for the duration of their six month training period until they had successfully completed training or failed. The outcome data for all participants was completed by January 2004. The sample is described in Table 1.

The study population was all male[18] with a mean age of 20.0 years and an age range of 17.2 years to 27.4 years. The ethnic mix was predominately white British (95.6%, n=853) with only 25 (2.8%) recruits recording themselves as Black British. The category labelled 'other' consisted of 11 recruits who recorded their ethnicity as Indian (n=2), Pakistani (n=1), Chinese (n=1) and mixed race (n=7). The relatively large number of missing values for ethnicity

[18] All personnel within the British Infantry are male.

was caused by some study participants ticking more than one box, and therefore a decision was made to recode the variable as missing.

Within the entire population, 11.3% (n=112) did not know their father; however 84.3% (n=834) came from homes where their father was in employment, with only 4.4% (n=43) of fathers having not worked. The majority of the sample (53.1%, n=517) achieved GCSE results of grade C or below, with only 14.8% achieving grade B or above in all subjects. Most notable was that over half of all respondents (53.3%, n=533) reported being in trouble with the police prior to enlistment.

Table 1: Demographic and social characteristics of sample (n=1000)

Mean age in years (SD)	20.0 (2.3)
Missing	0
Mean height in meters (SD)	1.77 (0.08)
Missing	32
Mean weight in kilograms (SD)	70.2 (11.6)
Missing	30
Mean BMI (SD)	22.5 (3.5)
Missing	45
Ethnicity n (%)	
White	853 (95.95)
Black	25 (2.81)
Other	11 (1.24)
Missing	111
Fathers job n (%)	
Supervised	234 (23.66)
Manager	353 (35.69
Worked alone	115 (11.63)
Had partners	132 (13.35)
I don't know him	112 (11.32)
He didn't work	43 (4.35)
Missing	11
GCSE Results n (%)	
As	30 (3.08)
As & Bs	48 (4.93)
Bs	66 (6.78)
Bs & Cs	173 (17.78)
Cs & below	517 (53.13)
Didn't take exams	139 (14.29)
Missing	27
Been in trouble with the police n (%)	
Never	467 (46.7)
Warning	237 (23.7)
Once	113 (11.3)
2-3 times	123 (12.3)
4 or more times	60 (6.0)
Missing	0

3.3: Outcomes

Table 2 shows the training outcomes for all 999 study recruits, over a third of whom failed to complete infantry training (36.2%, n=362). Within the failure group 59.4% (n=215) left at their own request and 13.9% (n=50) were dismissed as Service No Longer Required or were deemed Unsuitable for Army Service. Collectively 74.4% (n=269) of training attrition was attributable to difficulties in adapting to service life, with either the individual choosing to leave or the Army discharging them from service. Of those that failed Army Infantry Training (n=362) 4.4% (n=16) went on to transfer to other branches or trades within the Army.

Table 2: Training outcomes with reason for failure

Outcome	n (%)	
Passed	637 (63.8%)	
Failed	362 (36.2%)	
Discharge as of Right		170 (47%)
Services No Longer Required (discipline)		21 (5.8%)
Services No Longer Required (drugs)		2 (0.6%)
Released from Army Service		45 (12.4%)
Absent Without Leave (AWOL)		4 (1.1%)
Medical Discharge (physical)		58 (16%)
Transfer to Other Corps/Service		16 (4.4%)
Unsuitable for Army Service		27 (7.5%)
Unable to meet medical requirements of service		19 (5.2%)
	Total	362 (100%)

3.4: Splitting Dataset

The dataset containing all the participants was split randomly into two separate datasets, so that two thirds (66.8%, n=667) of the study population were placed in the development dataset and one third (33.2%, n=332) were placed in the test dataset. As can be seen in Table 3, the study recruitment and population characteristics prior to enlistment variables were used to check that the development dataset and the test dataset had consistent characteristics prior to analysis beginning on the development dataset.

Table 3: Comparison of distribution of key factors in development (n=667) and test datasets (n=362)

	Development Data Set (n=667)	Test Data Set (n=332)
Outcome		
Passed n (%)	428 (64.1)	209 (63.0)
Failed n (%)	239 (35.8)	123 (37.1)
Mean age in years (SD)	20.0 (2.4)	20.0 (2.2)
Mean height in meters (SD)	1.8 (0.09)	1.8 (0.08)
Mean weight in kg (SD)	70.5 (11.4)	69.6 (11.9)
Mean BMI (SD)	22.5 (3.5)	22.4 (3.6)
Ethnicity n (%)		
White	568 (96.1)	284 (95.6)
Black	15 (2.5)	10 (3.4)
Other	8 (1.4)	3 (1.0)
Fathers job n (%)		
Supervised	148 (22.4)	85 (26.0)
Manager	233 (35.2)	120 (36.7)
Worked alone	84 (12.7)	31 (9.5)
Had partners	89 (13.44)	43 (13.2)
I don't know him	77 (11.6)	35 (10.7)
He didn't work	30 (4.5)	13 (4.0)
GCSE results n (%)		
As	24 (3.7)	6 (1.9)
As & Bs	33 (5.1)	15 (4.7)
Bs	43 (6.6)	23 (7.1)
Bs & Cs	116 (17.8)	57 (17.7)
Cs & below	342 (52.6)	174 (54.0)
Didn't take exams	92 (14.1)	47 (14.6)
Been in trouble with the police n (%)		
Never	312 (46.7)	155 (46.7)
Warning	146 (21.9)	90 (27.1)
Once	82 (12.3)	31 (9.3)
2-3 times	81 (12.1)	42 (12.7)
4 or more times	46 (6.9)	14 (4.2)

3.5: Phase 1a: Analysis of development dataset

3.5.1: Demographics

Body mass and physical characteristics such as height and weight were not associated with the likelihood of failure (see Table 4). However those recruits who grew up in a family unit without female siblings had an increased risk of failure compared with those with female siblings (69.2% vs 30.8%, p=*0.025)*, (see Table 5). Within the development dataset as a whole, 85.2% (n=568) of study participants classified themselves as White British (Table 6) and the proportions were similar in both pass and failure groups. Ethnicity was not associated with success or failure in training (p=*0.13)*.

Smoking was considered initially by the training personnel to be a factor that increased the likelihood of failure due to poor physical condition. However, Table 6 shows that there was no indication that smoking influenced training outcomes. Being under the age of 18 on enlistment (Table 6) was identified as a factor associated with failure (p=0.048*)* as 39.3% (n=141) of recruits within the group that failed were between the age of 16-18 years, compared with 60.7% (n=218) who passed.

Table 4: Comparison of physical measurements by outcome in development dataset

	Pass mean (sd)	Fail mean (sd)	p Value
Height in meters	1.77 (0.08)	1.77 (0.11)	0.65
Weight in kg	70.1 (9.6)	71.3 (13.8)	0.51
Body mass index	22.4 (3.05)	22.6 (4.06)	0.52

Table 5: Comparison of family factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Birth Order			0.34 *p*
Only child	22 (52.4)	20 (47.6)	
First born	153 (63.8)	87 (36.2)	
Second born or later	158 (67)	78 (33.0)	
Youngest	94 (63.5)	54 (36.5)	
Siblings			0.025 *p*
Male siblings only	78 (56.5)	60 (43.5)	
Female siblings only	128 (69.2)	57 (30.8)	
Both male and female siblings	201 (66.1)	103 (33.9)	
Only child	19 (50.0)	19 (50.0)	
Fathers view on military career			0.52 *p*
Very Much in favour	209 (65.3)	111 (34.7)	
In favour	103 (60.9)	66 (39.1)	
Neutral	49 (68.1)	23 (31.9)	
Opposed	6 (54.6)	5 (45.4)	
Very Opposed	4 (100)	0 (0.0)	
I don't know my father	51 (62.2)	31 (37.8)	
Father's Job			0.87 *p*
Supervised	97 (65.5)	51 (34.5)	
Manager	144 (61.8)	89 (38.2)	
Worked alone	53 (63.1)	31 (36.9)	
Had partners	58 (65.2)	31 (34.8)	
I don't know him	49 (63.6)	28 (36.4)	
He didn't work	22 (73.3)	8 (26.7)	
Mother's routine during school			0.46 *p*
At home full time	111 (60.7)	72 (39.3)	
Worked part-time outside the home	169 (66.0)	87 (34.0)	
Worked full time outside the home	128 (64.0)	72 (36.0)	
Did not live with mother as a child	18 (75.0)	6 (25.0)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 6: Comparison of personal information by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Geographic location during education			0.57 *p*
Rural Village or Town	114 (68.3)	53 (31.7)	
City	222 (63.4)	128 (36.6)	
Metropolitan	75 (70.0)	48 (39.0)	
Moved around	17 (68.0)	8 (32.0)	
Number of cities or towns lived in			0.78 *p*
1 to 2	335 (64.6)	184 (35.4)	
3 or more	93 (63.3)	54 (36.7)	
Ethnicity			0.13 *p*[19]
White	360 (63.4)	208 (36.6)	
Black	13 (86.7)	2 (13.3)	
Other	4 (50.0)	4 (50.0)	
Smoking			0.14 *m*
Daily	194 (61.0.)	124 (39.0)	
Occasionally	34 (69.4)	15 (30.6)	
Ex-smoker	56 (67.5)	27 (32.5)	
Never smoked	141 (66.8)	70 (33.2)	
Musical Taste			0.56 *p*
Classical or Jazz	7 (70.0)	3 (30.0)	
Rock or Pop	96 (66.2)	49 (33.8)	
Hard rock/heavy metal	49 (73.1)	18 (26.9)	
Rap music	259 (62.9)	153 (37.1)	
Folk	8 (72.7)	3 (27.3)	
Age on leaving school			0.53 *m*
13 & under	4 (44.4)	5 (55.6)	
14-17	409 (64.3)	227 (35.7)	
18 & over	10 (62.5)	6 (37.5)	
Age on enlistment			0.048 *m*
16-18	218 (60.7)	141 (39.3)	
19-21	136 (69.4)	60 (30.6)	
22 & over	71 (67.6)	34 (32.4)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

[19] Test calculated on a 2x2 contingency table (white/non-white)

3.5.2: Education

Those pupils who had a disturbed education were at a much higher risk of failure ($p<0.001$*).* Table 7 shows that those recruits who attended two or more schools were associated with an increased risk of failure in training, the risk appearing to increase linearly with a greater number of schools. Achievement of two GCSEs above grade D (71.6% vs 28.4%) or four or more GCSEs above grade D (71% vs 29%) was a protective factor and was associated with training success ($p=0.009$). Achieving no GCSEs above grade D was associated with failure (59.5% vs 40.5%)

Table 7: Comparison of education factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Size of secondary school year			0.45 *m*
Under 50	14 (46.7)	16 (53.3)	
50-99	46 (59.7)	31 (40.3)	
100-299	161 (67.9)	76 (32.1)	
300-499	73 (64.0)	41 (36.0)	
500 or more	134 (64.4)	74 (35.6)	
Number of schools attended			<0.001 *m*
1	331 (67.6)	159 (32.4)	
2	73 (58.4)	52 (41.6)	
3 or more	22 (45.8)	26 (54.2)	
Co-educational			0.58 *p*
No	21 (60.0)	14 (40.0)	
Yes	406 (64.7)	222 (35.3)	
GCSE Results			0.12 *m*
As	13 (54.2)	11 (45.8)	
As & Bs	22 (66.7)	11 (33.3)	
Bs	28 (65.1)	15 (34.9)	
Bs & Cs	83 (71.6)	33 (28.5)	
Cs & below	224 (65.5)	118 (34.5)	
Didn't take exams	50 (54.4)	42 (45.6)	
GCSE Results above grade D			0.009 *m*
None	206 (59.5)	140 (40.5)	
1	64 (67.4)	31 (32.6)	
2	48 (71.6)	19 (28.4)	
3	36 (66.7)	18 (33.3)	
4 or more	71 (71)	29 (29.0)	
Preferred academic subjects			0.92 *p*
Numeracy	199 (64.4)	110 (35.6)	
Literacy	217 (64.8)	118 (35.2)	
Skip subjects at school			0.46 *p*
No	299 (65.3)	159 (34.7)	
Yes	117 (62.2)	71 (37.8)	
Failed subjects at school			0.71 *p*
No	160 (65.3)	85 (34.7)	
Yes	256 (63.8)	145 (36.2)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

3.5.3: Outdoor Education

The categories surrounding outdoor education focused on whether the recruit participated in outdoor activity such as team sports or hiking, and if so what was their level of participation. The results indicated that there was no

evidence of difference between the pass and failure groups with regard to participation in rugged outdoor activities and sports. This suggests that participating in outdoor activity has no effect on training outcome (Table 8, Table 9 and Table 10).

Table 8: Comparison of team activity factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Hours of Sporting participation per week			0.51 *m*
5 hours or less	127 (66.2)	65 (33.8)	
6 or more	300 (63.4)	173 (36.6)	
What activity did you prefer			0.51 *p*
Team sports	340 (65.1)	182 (34.9)	
Individual Sports	80 (62.0)	49 (38.0)	
Team sport participation			0.30 *p*
Did not participate	43 (57.3)	32 (42.7)	
Did participate	245 (66.2)	125 (33.8)	
Team captain	138 (62.7)	82 (37.3)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 9: Comparison of outdoor activity factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Participation in rugged outdoor activity			0.51 *m*
Never	23 (53.5)	20 (46.5)	
Once or twice	98 (66.2)	50 (33.8)	
Few times a year	137 (63.1)	80 (36.9)	
Regularly	168 (65.4)	89 (34.6)	
Participation in practical outdoor activity			0.55 *m*
Never	86 (59.3)	59 (40.7)	
Once or twice	141 (66.5)	71 (33.5)	
Few times a year	85 (66.9)	42 (33.1)	
Regularly	114 (63.3)	66 (36.7)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 10: Comparison of individual physical activity factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Individual sport participation			
Began swimming			0.22 *m*
Age 5 years	151 (66.5)	76 (33.5)	
6-9	191 (64.8)	104 (35.2)	
10-13	58 (64.4)	32 (35.6)	
13+	14 (58.3)	10 (41.7)	
Can't swim	14 (50.0)	14 (50.0)	
Began riding a bike			0.46 *m*
Age 5 years	286 (65.0)	154 (35.0)	
6-9	130 (64.4)	72 (35.6)	
10-13	12 (57.1)	9 (42.9)	
13+	0 (0.0)	2 (100)	
Can't ride a bike	0 (0.0)	1 (100)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

3.5.4: Non-Physical Activity

Table 11 shows all those categories that were identified as individual non-physical activity. Participation in non-physical activity such as playing on computer games or watching television did not influence training outcomes.

Table 11: Comparison of Individual non-physical activity factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Participated in non-physical extracurricular activity			0.56 *p*
No	153 (35.1)	283 (64.9)	
Yes	86 (37.4)	144 (62.6)	
Played a musical instrument			0.87 *m*
No	211 (63.9)	119 (36.06)	
Took a few lessons but never learned	150 (64.1)	84 (35.9)	
Yes	65 (65.0)	35 (35.0)	
Hours spent working or playing on a computer			0.56 *m*
Less than 1	100 (66.7)	50 (33.3)	
1-2	137 (62.0)	84 (38.0)	
3-5	103 (67.3)	50 (32.7)	
5 or more	85 (60.7)	55 (39.3)	
Number of school magazine articles published			0.45 *m*
0	376 (64.6)	206 (35.4)	
1	33 (63.5)	19 (36.5)	
2-3	14 (63.6)	8 (36.4)	
4 or more	4 (40.0)	6 (60.0)	
Participated in babysitting			0.46 *m*
Never	96 (61.2)	61 (38.8)	
Once or twice	102 (63.0)	60 (37.0)	
Few times a year	127 (70.6)	53 (29.4)	
Regular	99 (61.1)	63 (38.9)	
Participated in domestic activity			0.38 *m*
Never	23 (62.2)	14 (37.8)	
Once or twice	92 (62.2)	56 (37.8)	
Few times a year	85 (62.5)	51 (37.5)	
Regular	226 (65.7)	118 (34.3)	
Library use			0.96 *m*
Once a week	44 (73.3)	16 (26.7)	
Few times a month	31 (54.4)	26 (45.6)	
Few times a year	70 (63.1)	41 (36.9)	
Almost never	281 (64.6)	154 (35.4)	
Participated in Collecting			0.63 *p*
No	379 (63.7)	216 (36.3)	
Yes	27 (67.5)	13 (32.5)	
Participated in Chess			0.54 *p*
No	357 (64.8)	194 (35.2)	
Yes	49 (61.2)	31 (38.8)	
Participated in Model making			0.84 *p*
No	337 (64.6)	185 (35.4)	
Yes	75 (63.6)	43 (36.4)	
Participated in cultural events			0.98 *p*
No	340 (64.2)	190 (35.8)	
Yes	72 (64.3)	40 (35.7)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 11: Comparison of Individual non-physical activity factors by outcome in development dataset (cont.)

	Pass n(%)	Fail n(%)	p Value
TV watched on an average weekday			0.91 *m*
Less than 1 hour	37 (8.6)	29 (12.2)	
1-2	115 (26.9)	55 (23.1)	
3-5	149 (34.8)	81 (34.0)	
More than 5	127 (29.7)	73 (30.7)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

3.5.5: Employment and coping behaviours

This area of investigation was broken down into four areas, employment history, behavioural history, coping and group affiliation and commitment. There were no differences between the pass and fail group relating to employment history, indicating that employment prior to enlistment in the infantry had no influence on training outcomes (Table 12).

Table 12: Comparison of employment history factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Age of first paid job			0.56 *m*
12 or younger	25 (71.4)	10 (28.6)	
13-14	93 (64.6)	51 (35.4)	
15-16	234 (63.9)	132 (36.1)	
17 or older	53 (61.6)	33 (38.4)	
Never had a paid job	22 (66.7)	11 (33.3)	
Did voluntary work			0.85 *p*
No	238 (63.8)	135 (36.2)	
Yes	189 (64.5)	104 (35.5)	
Number of part-time hours worked during secondary education			0.13 *m*
None	176 (62.0)	108 (38.0)	
1-5	67 (59.8)	45 (40.2)	
6 or more	184 (68.2)	86 (31.8)	
Full time employment in the school holidays			0.17 *p*
No	217 (61.8)	134 (38.2)	
Yes	211 (67.0)	104 (33.0)	
Had a paid job supervising others			0.77 *p*
No	271 (64.5)	149 (35.5)	
Yes	156 (63.4)	90 (36.6)	
Dismissed from a job			0.91 *p*
No	290 (64.0)	163 (36.0)	
Yes	138 (64.5)	76 (35.5)	
Occupation prior to enlistment			0.14 *p*
In school	30 (52.6)	27 (47.4)	
Not employed, looking for work	116 (67.1)	57 (32.9)	
Not employed, not looking for work	21 (65.6)	11 (34.4)	
Employed	229 (66.2)	117 (33.8)	
Something else	31 (54.4)	26 (45.6)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 13 shows the areas of enquiry surrounding behavioural history and indicates that those excluded from school three or more times had an increased risk associated with failing infantry training (p=*0.032).*

The study also examined the recruits' behaviour with regards to the way that they cope with stressful situations and what situations caused them anxiety during their school years (Table 14). Recruits that reacted to stress aggressively had a statistically greater chance of failure in comparison to those who adopted a more measured approach to stressful situations (56.6% vs 43.4% p=0.022). In addition, not missing any days of school due to sickness in the last year of education was a protective factor and associated with training success (73% vs 27%). Those taking more than 15 days sickness absence during their last year of school have a statistically increased risk of failure (58.3% vs 41.7% p=*0.022).*

The fourth area of enquiry within the conduct and behaviour group of questions related to group affiliation and commitment behaviour (Table 15) and showed no statistically significant differences between pass and fail, indicating that affiliation and commitment behaviour did not have an association with training outcome.

Table 13: Comparison of behavioural history factors by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Evenings per week spent at home			0.19 *m*
0-1	98 (56.7)	75 (43.3)	
2-3	192 (68.3)	89 (31.7)	
4-5	93 (65.5)	49 (34.5)	
6-7	43 (62.3)	26 (37.7)	
Volunteered to be School prefect / head of year etc.			0.79 *m*
Never	352 (64.2)	196 (35.8)	
Once	48 (64.9)	26 (35.1)	
Twice	16 (66.7)	8 (33.3)	
Three times	3 (50.0)	3 (50.0)	
Four or more times	7 (53.9)	6 (46.1)	
Spoken to by school staff for unacceptable behaviour			0.83 *p*
No	96 (63.6)	55 (36.4)	
Yes	329 (64.5)	181 (35.5)	
Hours per week spent on homework			0.29 *p*
Less than 5	323 (63.3)	187 (36.7)	
5-10	92 (64.8)	50 (35.2)	
11 or more	13 (92.9)	1 (7.1)	
Stayed up all night to complete homework			0.62 *m*
Never	236 (63.8)	134 (36.2)	
Once or twice	146 (62.7)	87 (37.3)	
Three or four times	21 (72.4)	8 (27.6)	
Five or more times	24 (70.6)	10 (29.4)	
Classroom behaviour in history course			0.06 *p*
Daydreamed	120 (63.8)	68 (36.2)	
Quietly paid attention	67 (54.9)	55 (45.1)	
Occasionally asked questions	142 (71.0)	58 (29.0)	
Often asked questions	52 (65.0)	28 (35.0)	
Challenged the opinion of the teacher	41 (61.2)	26 (38.8)	
Classroom behaviour in science course			0.68 *p*
Daydreamed	117 (62.6)	70 (37.4)	
Quietly paid attention	78 (60.9)	50 (39.1)	
Occasionally asked questions	115 (67.3)	56 (32.7)	
Often asked questions	82 (66.7)	41 (33.3)	
Challenged the opinion of the teacher	31 (59.6)	21 (40.4)	
Played truant			0.16 *m*
Never	104 (67.1)	51 (32.9)	
1-2 days	98 (62.4)	59 (37.6)	
3-5 days	65 (68.4)	30 (31.6)	
6-10 days	41 (77.4)	12 (22.6)	
More than 10 days	117 (57.4)	87 (42.6)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 13: Comparison of behavioural history factors by outcome in development dataset (cont.)

	Pass n(%)	Fail n(%)	p Value
Given detention			0.60 *m*
Never	43 (55.8)	34 (44.2)	
Once or twice	181 (65.8)	94 (34.2)	
Once a year	31 (70.5)	13 (29.5)	
Every 3 months or more	171 (63.6)	98 (36.4)	
Expelled from school			0.032 *m*
Never	211 (67.6)	101 (32.4)	
Once	107 (64.9)	58 (35.1)	
Twice	46 (64.8)	25 (35.2)	
3 times	23 (53.5)	20 (46.5)	
4 or more times	41 (55.4)	33 (44.6)	
Been in trouble with the police			0.16 *m*
Never	205 (65.7)	107 (34.3)	
Warning	83 (56.9)	63 (43.1)	
Once	55 (67.1)	27 (32.9)	
2-3 times	59 (72.8)	22 (27.2)	
4 or more times	26 (56.5)	20 (43.5)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 14: Comparison of coping behaviours by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Coping strategies			0.022 *p*
Aggressive strategies	94 (56.6)	72 (43.4)	
Non aggressive strategies	324 (66.5)	163 (33.5)	
Person talked to most about problems			0.39 *p*
Parents	163 (61.3)	103 (38.7)	
Relative	37 (61.7)	23 (38.3)	
Friend	178 (64.5)	98 (35.5)	
Teacher, counsellor, religious advisor	3 (100)	0 (0.0)	
Doesn't confide	30 (73.2)	11 (26.8)	
Religion			0.89 *p*
Did attend religious services	165 (64.5)	91 (35.5)	
Rarely or never attended	262 (63.9)	148 (36.1)	
Sleep required to feel refreshed			0.07 *m*
Less than 5 hours	5 (71.4)	2 (28.6)	
5 - 5.5	35 (68.6)	16 (31.4)	
6-6.5	117 (68.4)	54 (31.6)	
7-8	199 (62.6)	119 (37.4)	
More than 8	71 (59.7)	48 (40.3)	
Average sleep per night			0.19 *m*
Less than 5 hours	11 (55.0)	9 (45.0)	
5 - 5.5	62 (66.0)	32 (34.0)	
6-6.5	152 (67.9)	72 (32.1)	
7-8	152 (63.9)	86 (36.1)	
More than 8	49 (55.7)	39 (44.3)	
Causes of anxiety in 1st year of secondary school			0.41 *p*
Doing well in school	125 (68.7)	57 (31.3)	
Being attractive to the opposite sex	62 (62.6)	37 (37.4)	
Doing well in sports	47 (64.4)	26 (35.6)	
Doing well in acting, music, debating etc.	18 (52.9)	16 (47.1)	
I was never anxious	170 (62.3)	103 (37.7)	
Causes of anxiety during secondary school			0.44 *p*
Getting into a good university	21 (61.8)	13 (38.2)	
Being attractive to the opposite sex	84 (64.1)	47 (35.9)	
Doing well in sports	75 (67.0)	37 (33.0)	
Doing well in acting, music, debating etc.	35 (53.9)	30 (46.1)	
I was never anxious	208 (65.6)	109 (34.4)	
Sickness during last year of school			0.022 *m*
Did not miss a single day	54 (73.0)	20 (27.0)	
1-4 days	140 (65.7)	73 (34.3)	
5-10 days	77 (67.0)	38 (33.0)	
11 to 15 days	38 (62.3)	23 (37.7)	
More than 15 days	119 (58.3)	85 (41.7)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 15: Comparison of group affiliation behaviours by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Magazine articles most likely to read			0.77 *p*
Ways to relax	108 (65.9)	56 (34.1)	
Better ways to make friends with strangers	80 (63.0)	47 (37.0)	
How to get on in employment	68 (68.7)	31 (31.3)	
How to organise your life	110 (62.2)	67 (37.8)	
How to play the stock market	55 (61.1)	35 (38.9)	
When attending an event they would go			0.94 *m*
Alone	7 (100)	0 (0.0)	
With one friend	51 (52.6)	46 (47.4)	
With 2-3 friends	155 (70.8)	64 (29.2)	
With 4-6 friends	92 (60.5)	60 (39.5)	
With a group of 7 or more	118 (64.1)	66 (35.9)	
When working on a project they worked			0.19 *m*
Alone	62 (56.4)	48 (43.6)	
With one friend	119 (65.4)	63 (34.6)	
With 2-3 friends	164 (66.4)	83 (33.6)	
With 4-6 friends	81 (65.3)	43 (34.7)	
Favourite T-shirt logo			0.63 *p*
School logo	3 (42.9)	4 (57.1)	
College or pro-sports team	135 (66.2)	69 (33.8)	
A place	13 (68.4)	6 (31.6)	
A saying, phrase, quote or cartoon	77 (60.6)	50 (39.4)	
No logo	197 (64.2)	110 (35.8)	
Number of times they quitted a sports team in secondary school			*0.71* m
Never	306 (64.6)	168 (35.4)	
Once	59 (64.1)	33 (35.9)	
2 or more times	13 (54.2)	11 (45.8)	
Never in a sports team	49 (64.5)	27 (35.5)	
Number of times they quitted a camp in secondary school			
Never	283 (65.5)	149 (34.5)	0.21 *m*
Once	46 (66.7)	23 (33.3)	
2 or more times	66 (59.5)	45 (40.5)	
Never in a sports team	31 (58.5)	22 (41.5)	
Number of classes dropped in secondary school before completion			0.08 *m*
Never	289 (66.4)	146 (33.6)	
Once	73 (64.0)	41 (36.0)	
2 or more times	66 (56.9)	50 (43.1)	
Organisational affiliation with the army score[20]			0.38 *t*
Mean Score (SD)	14.02 (3.0)	13.80 (3.2)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

[20] Score range from 0-20, with higher score indicating greater affiliation to the Army

3.5.5.1: Drug and Alcohol Use

Results showed that using certain drugs was common amongst the recruits in the development dataset, with 61.6% (n=411) of them having used cannabis prior to joining the Army. The most common drug used within the development dataset was cannabis with 31.5% (210) of recruits having used it in the year prior to joining. From Table 16 it can be seen that hard drug use was relatively rare amongst recruits, and their drug-taking history (before adjustment for confounders) was not associated with training. Alcohol consumption was assessed using the World Health Organisation Alcohol Use Disorders Identification Test (Babor et al., 2001). Within the entire development dataset population 38.8% (n=259) scored between 8 and 15, which indicated hazardous drinking prior to enlistment; 6.6% (n=44) scored between 16 and 19 indicating the need for brief intervention and continued monitoring, and 5.8% (n=39) scored ≥ 20 indicating the need for diagnostic evaluation for alcohol dependence. Alcohol consumption prior to service was not associated with training outcomes.

Table 16: Comparison of Drug and alcohol use history by outcome in development dataset

	Pass n(%)	Fail n(%)	p Value
Cannabis			0.57 *m*
In the last year	130 (61.9)	80 (38.1)	
More than a year ago	132 (65.7)	69 (34.3)	
Never	163 (64.7)	89 (35.3)	
Amphetamines			0.32 *m*
In the last year	27 (60.0)	18 (40.0)	
More than a year ago	47 (60.3)	31 (39.7)	
Never	347 (65.0)	187 (35.0)	
LSD			0.91 *m*
In the last year	6 (54.6)	5 (45.4)	
More than a year ago	29 (65.9)	15 (34.1)	
Never	385 (64.3)	214 (35.7)	
Ecstasy			0.19 *m*
In the last year	42 (70.0)	18 (30.0)	
More than a year ago	53 (68.0)	25 (32.0)	
Never	330 (63.0)	194 (37.0)	
Semeron			0.20 *m*
In the last year	1 (01.0)	0 (0.0)	
More than a year ago	2 (50.0)	2 (50.0)	
Never	419 (64.3)	233 (35.7)	
Poppers			0.56 *m*
In the last year	31 (67.4)	15 (32.6)	
More than a year ago	51 (65.4)	27 (34.6)	
Never	340 (63.6)	195 (36.4)	
Tranquillisers			
In the last year	7 (77.8)	2 (22.2)	0.75 *m*
More than a year ago	13 (61.9)	8 (38.1)	
Never	402 (64.0)	226 (36.0)	
Heroin			0.85 *m*
In the last year	1 (100)	0 (0.0)	
More than a year ago	2 (50.0)	2 (50.0)	
Never	418 (64.1)	234 (35.9)	
Magic Mushrooms			0.31 *m*
In the last year	8 (72.7)	3 (27.3)	
More than a year ago	32 (69.6)	14 (30.4)	
Never	382 (63.5)	220 (36.5)	
Methadone			0.46 *m*
In the last year	1 (100)	0 (0.0)	
More than a year ago	2 (66.7)	1 (33.3)	
Never	419 (64.1)	235 (35.9)	
Crack			0.71 *m*
In the last year	1 (50.0)	1 (50.0)	
More than a year ago	8 (72.7)	3 (27.3)	
Never	412 (64.2)	230 (35.8)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

Table 16: Comparison of Drug and alcohol use history by outcome in development dataset (cont.)

	Pass n(%)	Fail n(%)	p Value
Cocaine			0.84 *m*
In the last year	34 (61.8)	21 (38.2)	
More than a year ago	34 (65.4)	18 (34.6)	
Never	356 (64.4)	197 (35.6)	
Anabolic Steroids			0.51 *m*
In the last year	4 (80.0)	1 (20.0)	
More than a year ago	5 (45.5)	6 (54.5)	
Never	414 (64.5)	228 (35.5)	
Glue or Solvents			0.89 *m*
In the last year	4 (100)	0 (0.0)	
More than a year ago	13 (59.1)	9 (40.9)	
Never	405 (64.3)	225 (35.7)	
Any other drug			0.69 *m*
In the last year	5 (71.4)	2 (28.6)	
More than a year ago	8 (66.7)	4 (33.3)	
Never	408 (64.1)	229 (35.9)	
Any Illegal Substance			0.68 *m*
In the last year	148 (62.2)	90 (37.8)	
More than a year ago	128 (66.7)	64 (33.3)	
Never	151 (64.0)	85 (36.0)	
Any Illegal Substance other than Cannabis			0.98 *m*
In the last year	70 (62.5)	42 (37.5)	
More than a year ago	84 (66.7)	42 (33.3)	
Never	272 (64.0)	153 (36.0)	
Alcohol Audit Score			0.36 *m*
0-7	176 (64.5)	97 (35.5)	
8-15	177 (68.3)	82 (31.6)	
16-19	21 (47.7)	23 (52.3)	
20+	22 (56.4)	17 (43.6)	

t = Two Sample T Test
m = Two Sample Wilcoxon (Mann Whitney) Test
p = Pearson's Chi²

3.5.6: Adjusted Model

Those variables considered to be potentially associated with pass or failure after adjustment for confounding were selected by drawing up a shortlist of variables. To avoid overlooking variables associated with recruitment pass or failure that were not predictive until after adjustment for confounders, a liberal p value cut-off was used. Variables selected for potential inclusion in the model to be used as a basis for risk score calculation were those where the p value for univariable associations were ≤ 0.2. In the adjusted model, following a process of removing variables in turn, only those variables with a p value ≤ 0.05 remained in the adjusted model. Table 17 shows the original 22 variables that made up the shortlist before the modelling process began.

Table 17: Variables shortlisted for inclusion in the multivariable logistic regression model (development dataset)

Variable	*p* Value
Weight	0.16
Siblings	0.03
Smoking	0.14
Age on enlistment	0.04
Number of schools attended	0.00
GCSE Results	0.12
GCSE Results above grade D	0.01
Number of part-time hours worked during secondary education	0.13
Full time employment in the school holidays	0.17
Occupation prior to enlistment	0.14
Evenings per week spent at home	0.19
Classroom behaviour in history course	0.06
Played truant	0.16
Been in trouble with the police	0.16
Expelled from school	0.03
Coping strategies	0.02
Sleep required to feel refreshed	0.07
Average sleep per night	0.19
Sickness during last year of school	0.02
When working on a project in secondary school they preferred to:	0.19
Number of classes dropped in secondary school before completion	0.08
Ecstasy	0.19

Following the removal of 15 variables through the modelling process the final model included seven variables (Table 18). A statistical decision had to be taken as regards the inclusion of the classroom behaviour variable as on the final round of modelling this variable returned a p value of 0.052. As this value was clearly on the threshold for inclusion the decision was taken to include it in the final model with the acknowledgement that its relevance must not be overplayed. The model suggests that there are four areas that influence training outcome: demographic factors, educational background, response to schooling and drug taking.

Table 18 shows that for recruits who grew up in a family with sisters (OR 0.54, 95% CI 0.33 to 0.88) or brothers and sisters (OR 0.54 95% CI 0.34-0.84) the odds of failure decreased by just over a half of that of the reference group. This would indicate that growing up in a family with female siblings was a protective factor and was associated with training success. Recruits that adopted non-aggressive coping strategies also reduced their odds of failure by over a half compared to those who adopted aggressive coping strategies (OR 0.6 95% CI 0.41-0.9).

In addition, the number of evenings spent in the family home was also a protective factor, as those spending 2-3 evenings a week in the family home (OR 0.53 95% CI 0.34-0.81) reduced their odds of failure by just over a half compared to the reference group and those spending 4-5 evenings in the family home (OR 0.58 95% CI 0.35-0.97) slightly increased those odds.

Recruits who attended three or more schools (OR 1.98 95% CI 1.04-3.78) and those recruits who quietly paid attention in their history class

(OR 1.92 95% CI 1.15-3.22) nearly doubled their odds of failure compared to the reference groups. However, as already mentioned, the p value (p=0.052) for classroom behaviour in history was on the threshold for inclusion in the model so this odds ratio should not be overplayed.

Table 18: Predictive model factors associated with training outcome after adjustment for each other (development dataset).

	Odds Ratio (95%CI)	P Value
Siblings		
Same sex	1.0	
Opposite sex	0.54 (0.33-0.88)	
Same & opposite sex	0.54 (0.34-0.84)	0.005
Only child	1.35 (0.61-2.96)	
Coping strategies		
Aggressive strategies	1.0	
Non aggressive strategies	0.6 (0.41-0.9)	0.013
Ecstasy		
In the last year	1.0	
More than a year ago	0.96 (0.43-2.11)	0.02
Never	1.87 (0.97-3.59)	
Evenings per week spent at home		
0-1	1.0	
2-3	0.53 (0.34-0.81)	
4-5	0.58 (0.35-0.97)	0.032
6-7	0.64 (0.34-1.23)	
Played truant		
Never	1.0	
1-2 days	1.3 (0.79-2.16)	
3-5 days	0.91 (0.5-1.65)	0.039
6-10 days	0.56 (0.26-1.2)	
More than 10 days	1.54(0.94-2.53)	
Number of schools attended		
1	1.0	
2	1.45 (0.94-2.24)	0.046
3 or more	1.98 (1.04-3.78)	
Classroom behaviour in history course		
Daydreamed	1.0	0.052
Quietly paid attention	1.92 (1.15-3.22)	
Occasionally asked questions	0.91 (0.56-1.45)	
Often asked questions	1.11 (0.61-2.03)	
Challenged the opinion of the teacher	1.19 (0.64-2.23)	

3.6: Phase 1b: Analysis of test dataset

3.6.1: Accuracy of prediction

To assess the predictive value of the model created on the development dataset a risk score of failure was produced for each recruit in the test data set. To retain the integrity of the model the 'intercept' and 'regression coefficients' were fixed from the model created in the development dataset and dummy variables created using the 'xi' function in Stata (see Table 19).

Table 19: Logistic regression model intercept and regression coefficients of x respectively

	Intercept β_0=-0.26	Explanatory variables	
Regression coefficients	β_1=-0.62	x_1= sisters	(1=yes 0=no)
	β_2=-0.62	x_2= brother and sisters	(1=yes 0=no)
	β_3=0.30	x_3= only child	(1=yes 0=no)
	β_4=0.37	x_4= attended two different schools	(1=yes 0=no)
	β_5=0.69	x_5= attended three or more different schools	(1=yes 0=no)
	β_6=-0.64	x_6= spent 2-3 evenings at home per week	(1=yes 0=no)
	β_7=-0.54	x_7= spent 4-5 evenings at home per week	(1=yes 0=no)
	β_8=-0.44	x_8= spent 6-7 evenings at home per week	(1=yes 0=no)
	β_9=0.65	x_9= quietly pain attention in history class	(1=yes 0=no)
	β_{10}=-0.09	x_{10}= occasionally asked questions in history class	(1=yes 0=no)
	β_{11}=0.11	x_{11}= often asked questions in history class	(1=yes 0=no)
	β_{12}=0.18	x_{12}= challenges the opinion of the teacher in history class	(1=yes 0=no)
	β_{13}=0.27	x_{13}= was truant 1-2 days in last year of school	(1=yes 0=no)
	β_{14}=-0.09	x_{14}= was truant 3-5 days in last year of school	(1=yes 0=no)
	β_{15}=-0.59	x_{15}= was truant 6-10 days in last year of school	(1=yes 0=no)
	β_{16}=0.43	x_{16}= was truant 10 or more days in last year of school	(1=yes 0=no)
	β_{17}=-0.51	x_{17}= copes with stress using non-aggressive strategies	(1=yes 0=no)
	β_{18}=-0.04	x_{18}= taken ecstasy more than a year ago	(1=yes 0=no)
	β_{19}=0.62	x_{19}= never taken ecstasy	(1=yes 0=no)

The intercept in Table 19 shows the value of z (-0.26) when the value of all independent variables is zero. Each of the regression coefficients describes the size of the contribution of that risk factor, a positive coefficient meaning that the explanatory variable increases the probability of failure in training and

a negative coefficient meaning that the explanatory variable decreases the probability of failure in training. A large regression coefficient means that the explanatory variable strongly influences the probability of the outcome and a near zero regression coefficient means that the explanatory variable has little influence on the outcome. Each coefficient represents the log odds of failure and when exponentiated produce the odds ratios reported in Table 18. The model developed in the development dataset predicts the potential risk of a recruit failing in training. To determine the risk of failure in the test dataset the following equation was used:

$\frac{1}{1+e^{-z}}$, where z = -0.26+(-0.62)(x_1)+(-0.62)(x_2)+(0.30) (x_3)+(0.37) (x_4)+(0.69)(x_5)+(-0.64) (x_6)+(-0.54)(x_7)+(-0.44)(x_8)+(0.65)(x_9)+ (-0.09)(x_{10})+(0.11)(x_{11})+(0.18)(x_{12})+(0.27)(x_{13})+(-0.09)(x_{14})+ (-0.59)(x_{15})+(0.43)(x_{16})+(-0.51)(x_{17})+(-0.04)(x_{18})+(0.62)(x_{19})

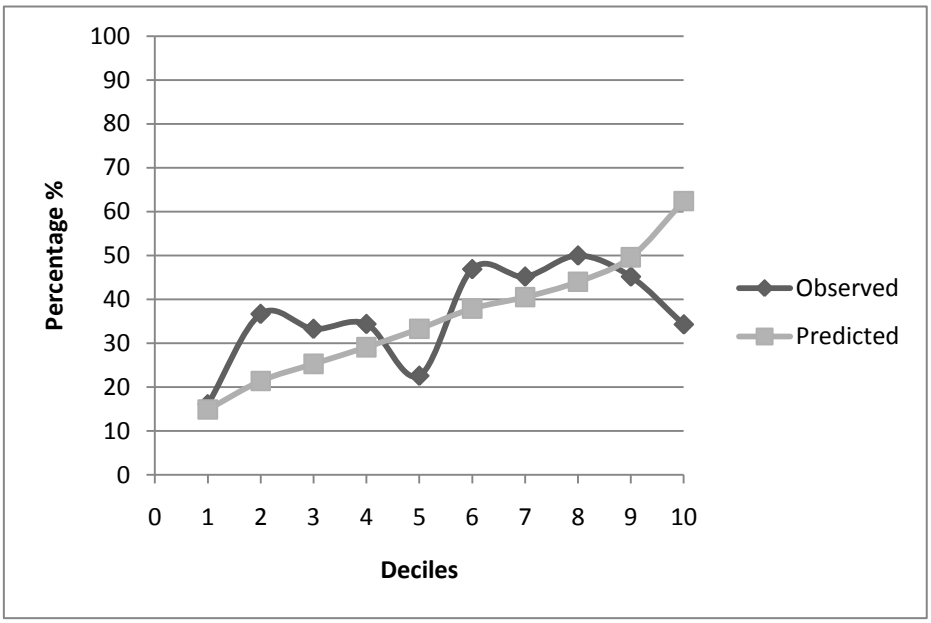
Below is an example of a calculation (regression coefficients and explanatory variables taken from Table 19) for a recruit who grew up in a family with brothers and sisters, attended three or more different schools, spent six to seven nights a week in the family home, challenged the opinion of their teacher in history class, was truant for more than ten days in the last year of school and had taken ecstasy more than a year ago. The calculation produces a risk score of 0.64 indicating that this recruits potential risk of failure is 64%.

$\frac{1}{1+e^{-z}}$, where z = -0.26+(-0.62)(0)+(-0.62)(1)+(0.30) (0)+(0.37) (0)+(0.69)(1)+(-0.64) (0)+(-0.54)(0)+(-0.44)(1)+(0.65)(0)+(-0.09) (0)+(0.11)(0)+(0.18)(1)+(0.27)(0)+(-0.09)(0)+(-0.59)(0)+(0.43)(1)+ (-0.51)(0)+(-0.04)(1)+(0.62)(0)

Table 20 shows how the logistic model performed when applied to the test dataset. The predicted risk was divided into deciles and a mean risk calculated for each deciles. The predicted outcome of training was then tabulated with the actual outcome of training to demonstrate how the model performed. Table 20 shows that there was greater variation between observed and

predicted outcomes for participants with higher predicted scores and a fluctuation above and below the predicted line throughout the deciles.

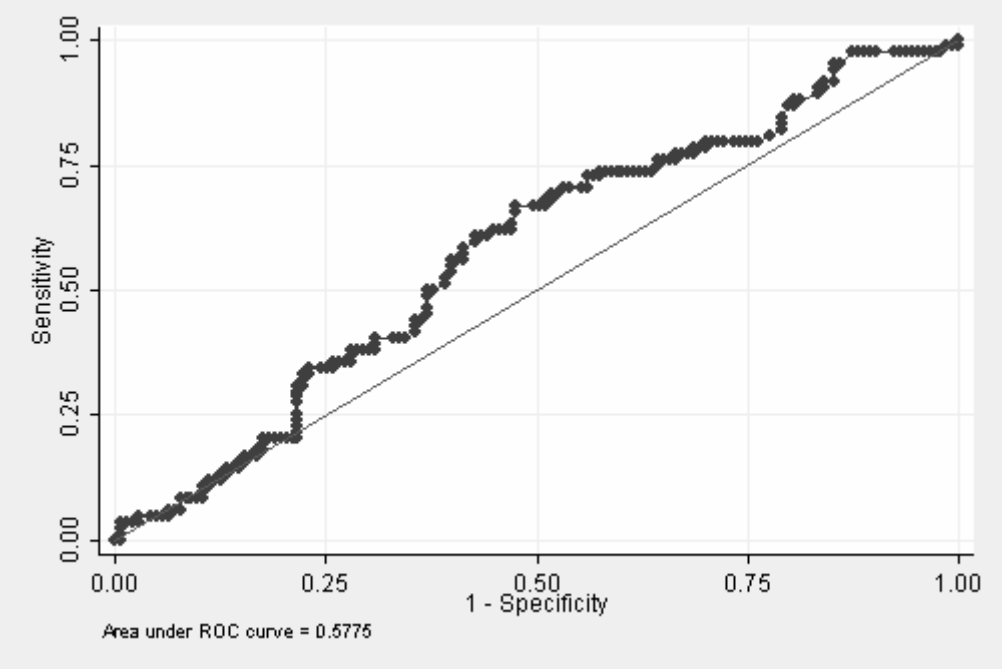
Table 20: Accuracy of prediction in test dataset



3.6.2: Sensitivity and Specificity

After the recruits in the test dataset were placed in predictive value deciles the results were tested for how well the model differentiated between pass and fail with a Receiver Operation Characteristic Curve (Table 21). The area under the curve on the test dataset was 0.58 (95% CI 0.501-0.65), indicating that although the predicative ability of the model is better than chance (with the lower confidence interval just excluding 0.5) the proportion of recruits whom it could correctly predict a training outcome for is too small to recommend its use in routine practice .

Table 21: Receiver operating curve on test dataset



To calculate sensitivity, specificity, and the correctly classified value the cut point at greater than and equal to 38.0 (cut point 05) is used as an example (Table 22).

Table 22: Sensitivity and specificity example at cut point 05 (>=38.0)

Cut point 05 (>=38.0)

Actual outcome	Positive	Negative	Total
Abnormal (fail)	62	53	115
Normal (pass)	79	121	200
Total	141	174	315

The positive column demonstrates that the model at the selected cut point correctly predicted 62 recruits who failed in training, giving a sensitivity of $^{62}/_{115}$ or 53.9%. The negative column demonstrates that at the selected cut point 121 were correctly identified as not being at risk of failing and subsequently passed training, giving a specificity of $^{121}/_{200}$ or 60.5%. In addition the model identified 79 recruits who subsequently passed and missed 53 recruits who failed.

To generate the positive predictive values the sum of those correctly identified as failing is divided by the total of all those predicted to fail, generating a positive predictive value of $^{62}/_{141}$ or 44%. To generate the negative predictive value the sum of those correctly predicted to pass training is divided with the total of all those who passed, generating a negative predictive value of $^{121}/_{174}$ or 69.5%. To generate a correctly classified outcome for each cut point the true positive (n=62) and true negative (n=121) were added together and divided with the entire total of recruits in the observation, giving a correctly classified value of $^{62 + 121}/_{315}$ or 58.1%.

Table 23: Sensitivity and specificity (test dataset)

Score Cut Point	Sensitivity	Specificity	Correctly Classified	PPV	NPV
>=14.9	96.5%	4.5%	38.1%	36.8%	69.2%
>=21.6	89.6%	18.5%	44.4%	38.7%	75.5%
>=25.3	80.0%	29.5%	47.9%	39.5%	72.0%
>=29.0	71.3%	38.5%	50.5%	40.0%	70.0%
>=33.3	64.3%	51.0%	55.9%	43.0%	71.3%
>=38.0	53.9%	60.5%	58.1%	44.0%	69.5%
>=40.7	39.1%	68.5%	57.8%	41.7%	66.2%
>=44.0	29.6%	78.5%	60.6%	44.2%	66.0%
>=49.8	14.8%	86.0%	60.0%	37.8%	63.7%
>=62.3	4.3%	95.5%	62.2%	35.7%	63.5%

Table 23 shows the positive and negative predictive values at deciles cut points. The highest positive predictive value was 44.2%, at the cut-point greater than or equal to 44.0, which would indicate that if the model was used to predict training failure, 55.3% of recruits would be incorrectly classified as potential training failures when they would have passed. As with the results of the receiver operating curve, this positive predictive value further supports the evidence that the model does not have an acceptable enough degree of accuracy for predicating training outcome for it to be recommended as a training selection tool.

3.7: Summary

The aim of this phase of the study was to identify the role that antecedent personal, social and demographic factors play in predicting a British Army recruit's ability to complete basic training, and to investigate the possibility of identifying those at risk of being unable to cope with the psychological transition to life in the British Army.

The biographical questionnaire has identified seven personal, social and demographic variables associated with training outcome, and provided an insight into the demographic and educational background as well behavioural traits that are associated with training failure.

The predictive ability of the logistic model was relatively poor, and even though the predictive ability of the model is better than chance, the proportion of recruits that it could incorrectly predict a training outcome for is too great to recommend its use as a screening tool.

CHAPTER 4: PHASE 2 RESULTS

4.1: Introduction

This chapter presents the results of the interviews that were undertaken with 100 recruits who failed to complete training. As explained earlier, framework analysis was used to build up the findings over five stages (familiarisation, thematic framework, indexing, charting and mapping and interpretation). One of the charts has been included in the text as an example to illustrate the process and the remainder are included in the appendices.

4.2: Familiarisation

The familiarisation process was systematically applied to the interview notes to ensure full immersion in the textual notes once data collection had been completed. The case notes from each interview consisted of the hand written notes of the interview that I conducted and each recruit's Commanding Officer leaving report. Initially, these two sets of data were read separately and patterns of responses were mapped in two separate familiarisation frameworks (see Figure 9 and Figure 10) show the early groupings of data that helped to explain more about the recruit journey and why infantry recruits were leaving training[21].

Figure 11 demonstrates the initial process of framework analysis (familiarisation), using the original areas of enquiry as a starting point (see Box 1 of Figure 11). In bold can be seen initial thoughts about this data's meaning

[21] Figure 9 shows a group heading for bullying, which was specifically asked about because of adverse media publicity surrounding the mistreatment of recruits prior and during the study period. Each recruit interviewed was asked if he had been bullied and as can be seen from Table 1 there were no reports of bullying.

which were eventually grouped into emerging themes and the basis for a thematic framework (Box 2 of Figure 11).

As the emerging themes developed there was evidence that they overlapped. In Figure 9 Group 2 the recruits talk about their experience not being what they expected, and in Figure 9 Group 3 the recruits again discuss the demands of training and the concept of fitting into service life. It is clear they were not expecting the harshness of the discipline and the extent of the physical training, and these observations suggest recruits were unprepared for the impact of enlistment.

Group 4 Figure 9 came about after reading through the data numerous times. There was a feeling that some recruits started interviews with a clear reason for leaving such as family illness or their girlfriends having problems in pregnancy. The recruit expressed that they had no control over that decision and that they had to sacrifice their employment to return home. Underlying that however was evidence that this group of recruits experienced the same difficulties that all the other recruits did. It appeared that there was a sense of embarrassment for failing and that the individual was constructing a mitigation to save face amongst his peers. To further get a feel for this at this phase of the analysis a brief cross reference with the objective data (Commanding Officer reports) revealed that there was definitely a conflict between the story the recruits told to the me and the reasons given to the Commanding Officers. This was an unexpected phenomenon and therefore was carried through as part of the thematic framework.

Group 5 Figure 9 addressed a question posed by training staff who believed that if recruits were made to stay for the duration of the basic training then

there would be an increase in self-harming behaviour or an escalation of bad behaviour to force discharge. To test that assumption, recruits who were leaving were asked to reflect on compulsory National Service and how they would feel if they had to serve a minimum time. The response received was unexpected as many stated that they would “just get on with it”.

Figure 9: Familiarisation of subjective data (recruit interviews)

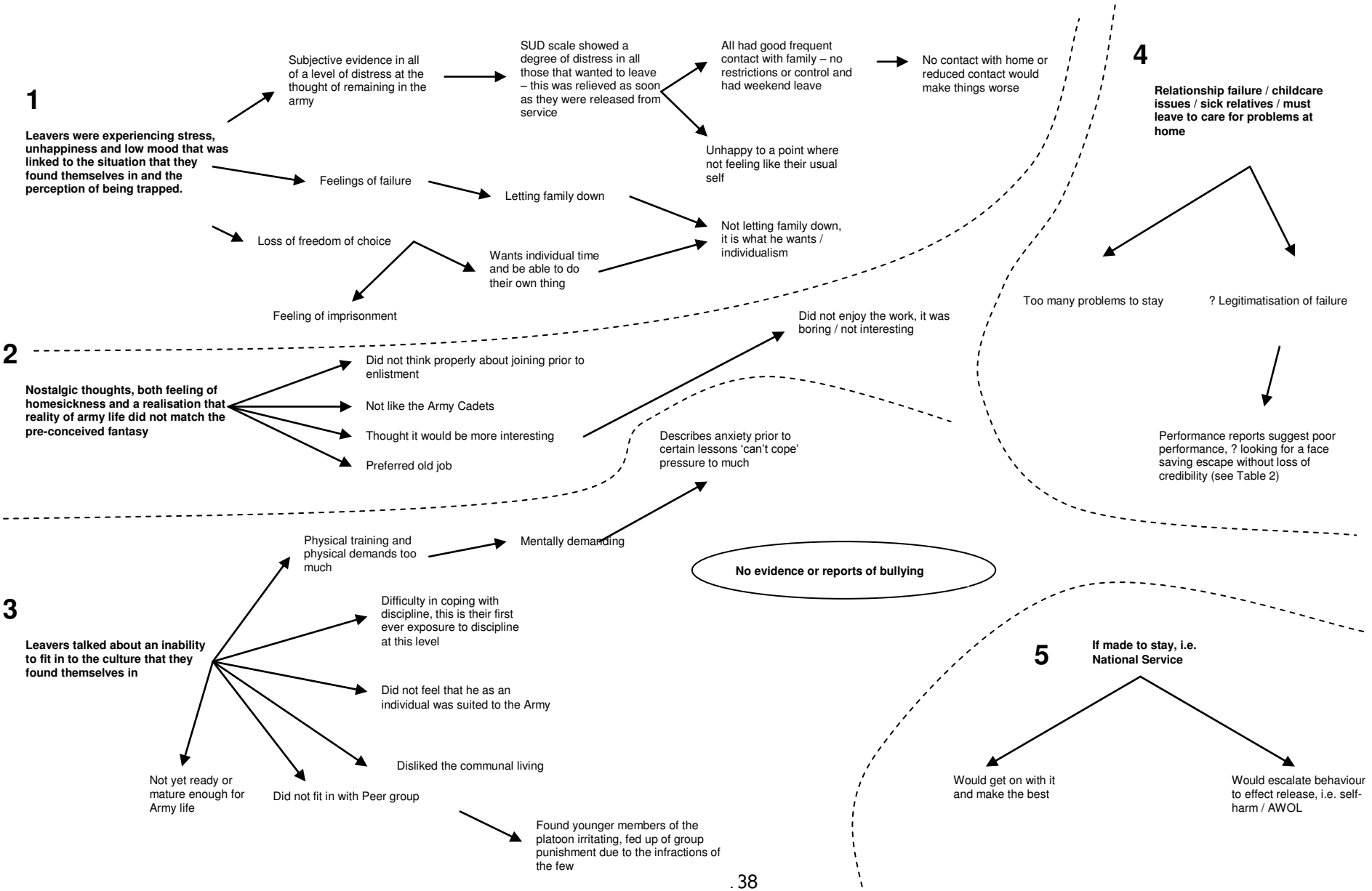


Figure 10: Familiarisation of objective data (Commanding Officer reports)

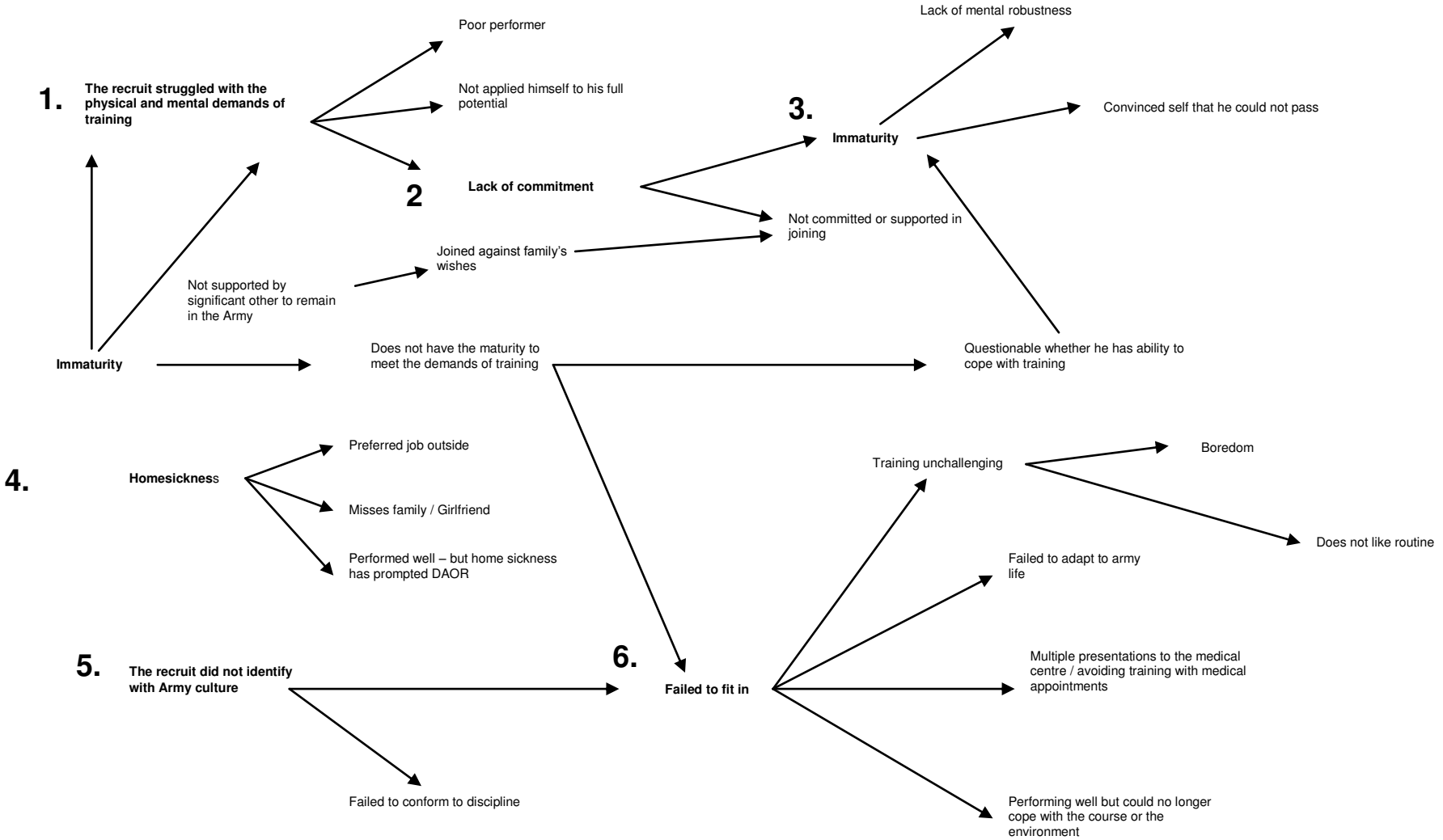
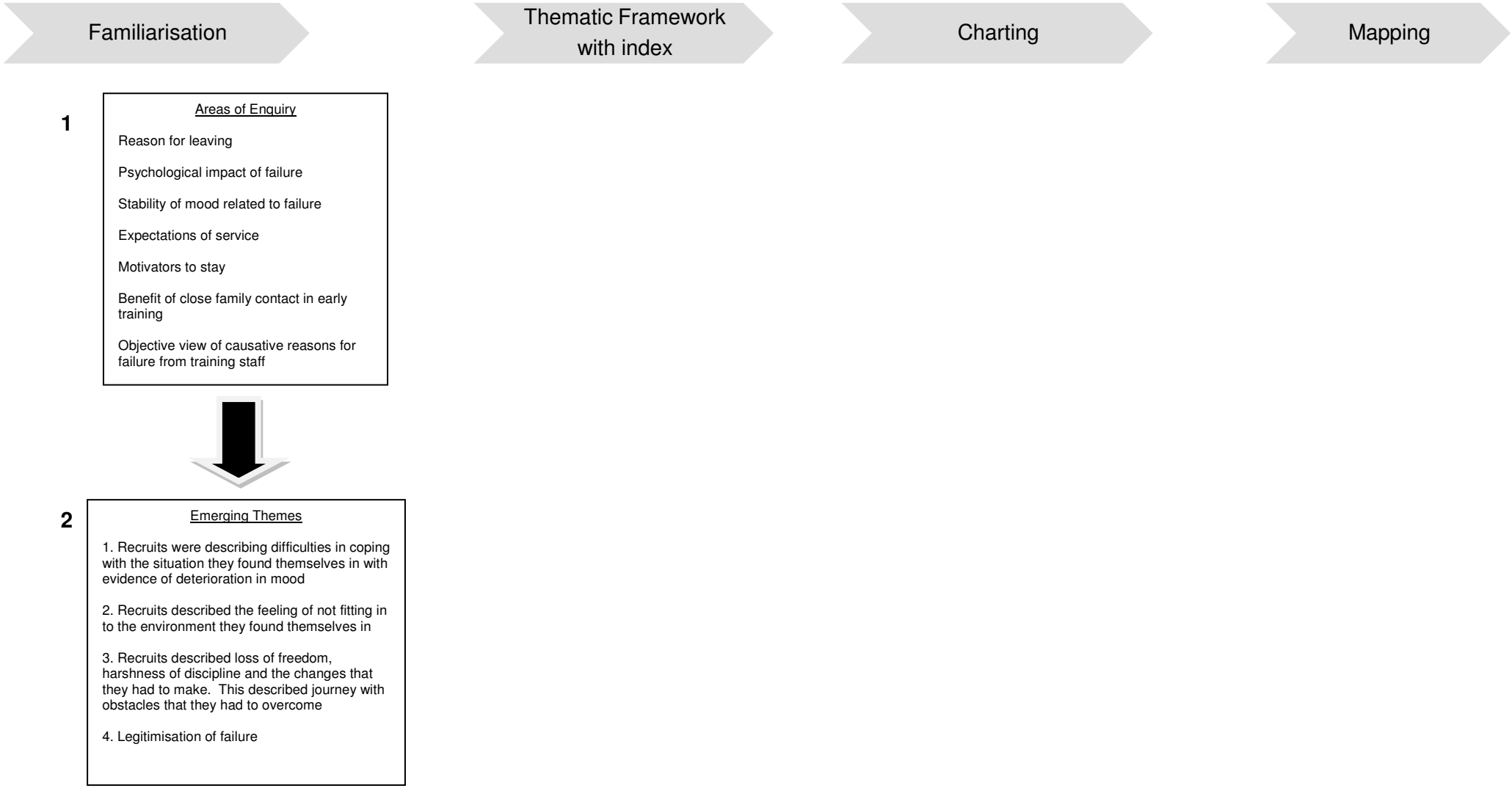


Figure 11: Process of analysis: Familiarisation



An important theme that did emerge in the familiarisation process can be seen in Figure 9, group 1. There was evidence from the Subjective Units of Disturbance scores that recruits (n=33) experienced a level of distress as a result of their military experience. The stress caused by joining the Army was an important factor for many of the recruits, and there was evidence that in the majority of the cases of those interviewed, the recruit had experienced some degree of lowered mood (mean Subjective Units of Disturbance score was 3.8 (SD=2.5) where 10 = normal mood and 0 = most unhappy they had ever felt).

The objective data was less easy to group during this phase as can been seen in Figure 10. Many of the emerging themes appear to be interlinked and separating them out or de-contextualising them would probably remove the subtle but important relationships that this data shows. The Commanding Officers did, however, give a number of distinct reasons for these recruits leaving:

1. Physical and mental demands of training too challenging
2. Lack of commitment
3. Immaturity
4. Homesickness
5. Lack of identification with Army culture
6. Failure to fit in

These observations concur with the recruit's own accounts to suggest unrealistic expectations amongst the recruits that failed and a lack of preparation for training - both physically and psychologically. Very much linked to the perception of lack of commitment were the notion of psychological immaturity within the recruit; the element of childlike surrender

rather than the expected “mature” approach of suffering the hardship of training for the eventual gain of success. What was clearly observed in both sets of data was the underlying notion that the individual must adapt to the Army and ‘fit-in’ to the culture; failure to do so seemed to precede failure of Army Infantry training.

4.2: Thematic Framework

The evidence provided by the familiarisation process (Figure 9 and Figure 10) led to the formulation of four emerging themes (coping, fitting in, transition and legitimisation of failure) that were used to establish the thematic framework headings and subsequently the index. It is fully accepted that at the stage of creating the thematic framework not only should the areas of enquiry and familiarisation be drawn upon, but the researcher should also reflect on *a priori* knowledge to ensure that the aims of the research that constructed the questions are tested for validity in the data (Ritchie and Spencer, 2002).

4.2.1: Coping

The familiarisation data identified that a transitional phase occurs, where the recruit either adapts to service life or fails in training. To adapt, the recruit appears to need an emotional resource to cope with the transitory phase. When recruits fail to cope with the adaptation, there is a visible deterioration in their emotional wellbeing and training performance, as they acknowledge that they have reached the limit of their ability to cope. This emotional or psychological deterioration was observed in the majority of those interviewed. The thought processes that the recruit expressed as their mood deteriorated was important, as the subsequent shift in thinking from “I am not coping” to “I can’t cope” appears to be the definitive point at which the recruit accepts his fate and fails in training. It was evident that the deterioration in mood and decline in performance was gradual, and the reasons that recruits gave to explain their unhappiness and disillusionment were multiple (Figure 12, Box 3 (1.1 – 1.6)). The effect on mood appeared to be progressive until a point of realisation that they could no longer cope with the environment they found themselves in. In order to fully understand this process, the impact on mood

and the individual's ability to cope was examined within each of the thematic groupings.

4.2.2: Fitting In

The concept of fitting in was a global notion given in conjunction with another, more specific reason. For example a recruit would talk about not being allowed out and would then conclude that they did not fit into the Army or the Infantry Training Centre because they had lost their freedom. Figure 12, Box 3 (2.1-2.5) identifies the reasons given within the thematic group for not fitting in. At this stage of the analysis it was already emerging that the notion of 'not fitting in' carried far more weight than the data might have first suggested.

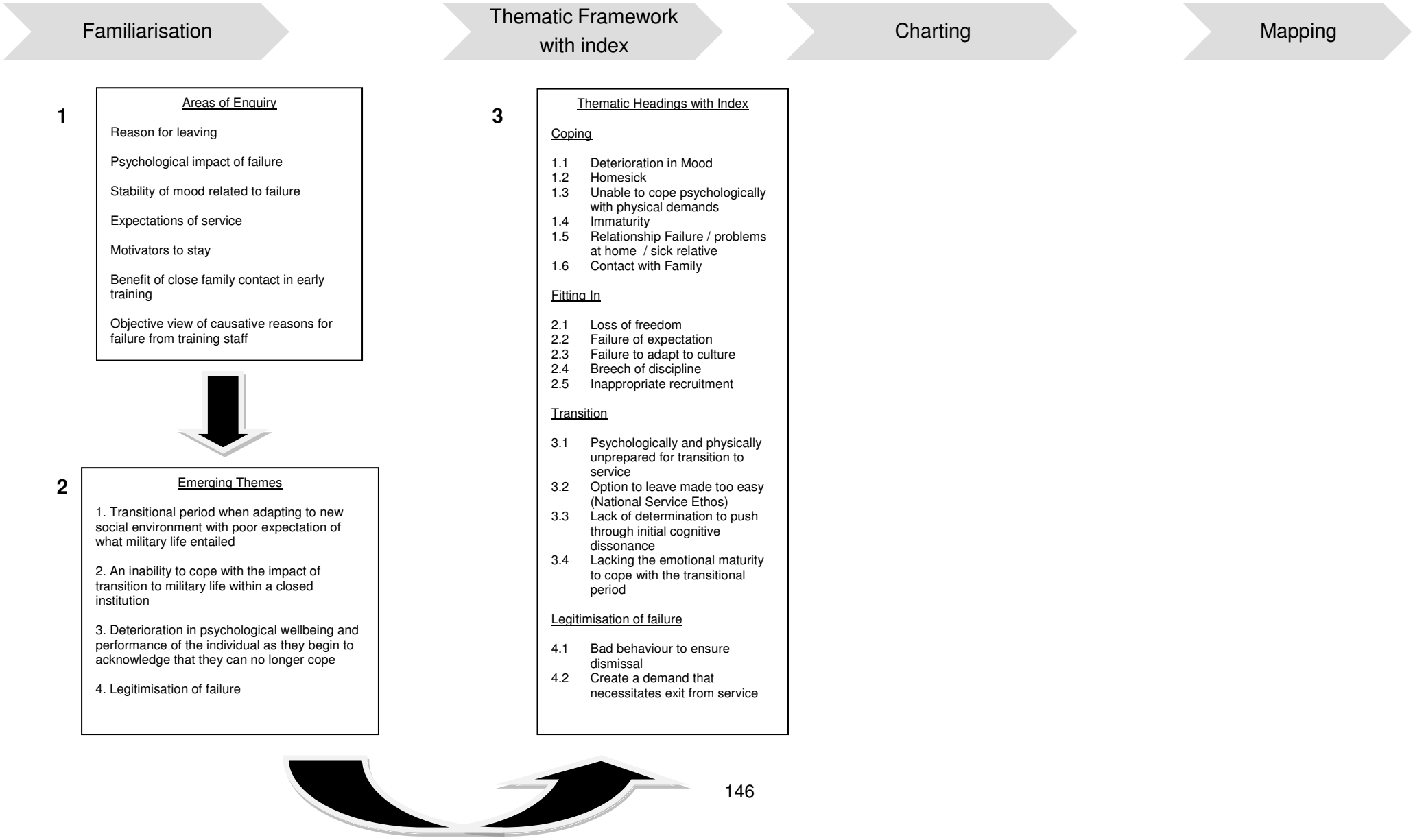
4.2.3: Transition

A clear picture of a recruit journey was emerging. This started with ambition and excitement and concluded with failure to achieve their ultimate goal: to successfully pass out of training as a trained infantry soldier. It appears that failure occurred during this transitional period, when the individual's adaptation to service life was blocked or when they perceived the challenges of the situation to be too great. During the familiarisation process it became clear that a key causative factor in the individual's failure to adjust to this new culture was poor preparation, secondary to unrealistic or uninformed expectations. Figure 12 Box 3 shows how 'fitting in' along with the notion of 'transition' have been given equal priority, with 'coping' in the thematic framework as they appear to define key qualities in the recruits' journey.

4.2.4: Legitimisation of Failure

As described above, a separate theme that emerged unexpectedly from the familiarisation data was the phenomenon that some recruits were creating institutionally acceptable reasons as to why they had to leave when in reality they were struggling to cope in the same way as their peers. In addition to this there was some suggestion by Commanding Officers that some individuals were also manufacturing their own discharge by deliberately behaving in a way that would get them dismissed.

Figure 12: Process of analysis: Thematic Framework and Index



4.3: Index

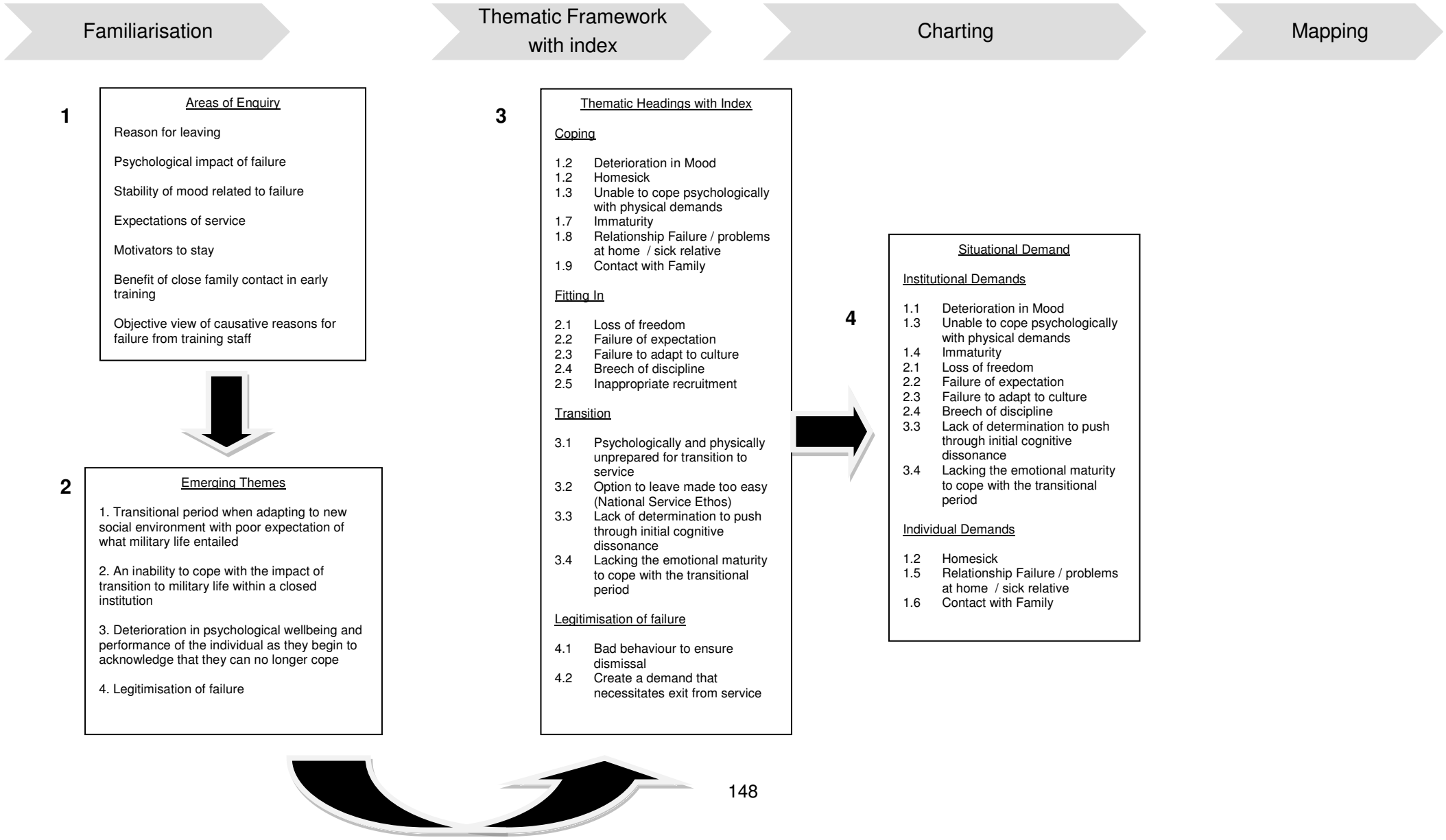
The initial index was applied to the data and developed as each additional multiple of 10 case files were added. This process continued until data saturation was reached (n=33 case files) and no additional index headings appeared. Figure 12 Box 3 shows the completed index for the study.

4.4: Charting

The charting process involves rearranging the data according to the appropriate part of the thematic framework to which they relate and forming charts (Pope et al., 2000). The textual data was systematically labelled using the index and initially organised into tables (or charts) under the headings in Box 3 of Figure 12. This then enabled the data to be constructed so that the whole picture of what the data was describing could be seen (Ritchie and Spencer, 2002). This process of refining the initial thematic (chart) groups into a mature stage of analysis required a considerable degree of abstraction and synthesis, as the charts were constructed from distilled summaries, views and experiences from within the textual data (Pope et al., 2000).

As the charting process progressed, it became apparent that the recruit was subjected to situational stressors on enlistment (this is stress caused by the physical environment that they find themselves in). These stressors or situational demands can be divided, as shown on Figure 13 Box 4, into institutional or individual demands, each with their own particular stressors. The individual demands on the recruit were relatively straight forward, i.e. their girlfriend became pregnant or a relative was ill. However, the institutional demands were far wider ranging and the impact that the institution had on the recruit was dependent on how that individual recruit coped with that particular stressor.

Figure 13: Process of analysis: Charting



4.5: Mapping and Interpretation

As the analysis entered the mapping and interpretation process clear themes had already emerged. It became apparent that enlistment into the Army Infantry was a journey, and during that journey the recruit had to cope and adapt psychologically and physically to fit into their new surroundings. What was also clear was that during the journey or transitional process they had to cope with multiple situational demands. Those demands were situational stressors of an institutional or individual nature (see Figure 14) and their cumulative effect appeared to erode the recruit's ability to cope with training. Figure 14 illustrates two points: (1) it appears that it is the psychological response to the situational stressors that causes failure, and (2) it rarely appears to be a single situational stressor in isolation that impacts on the individual, but multiples of stressors that have a cumulative effect. The cumulative effect of these stressors is that the recruit reaches a point where they feel that they can no longer cope. It is at this point, when the recruit's capacity to cope is exhausted, that they seem to make the decision that they no longer belong or (as described by many recruits) they feel they no longer 'fit-in'.

Figure 14: Impact of multiple situational stressors on the recruit's ability to complete training

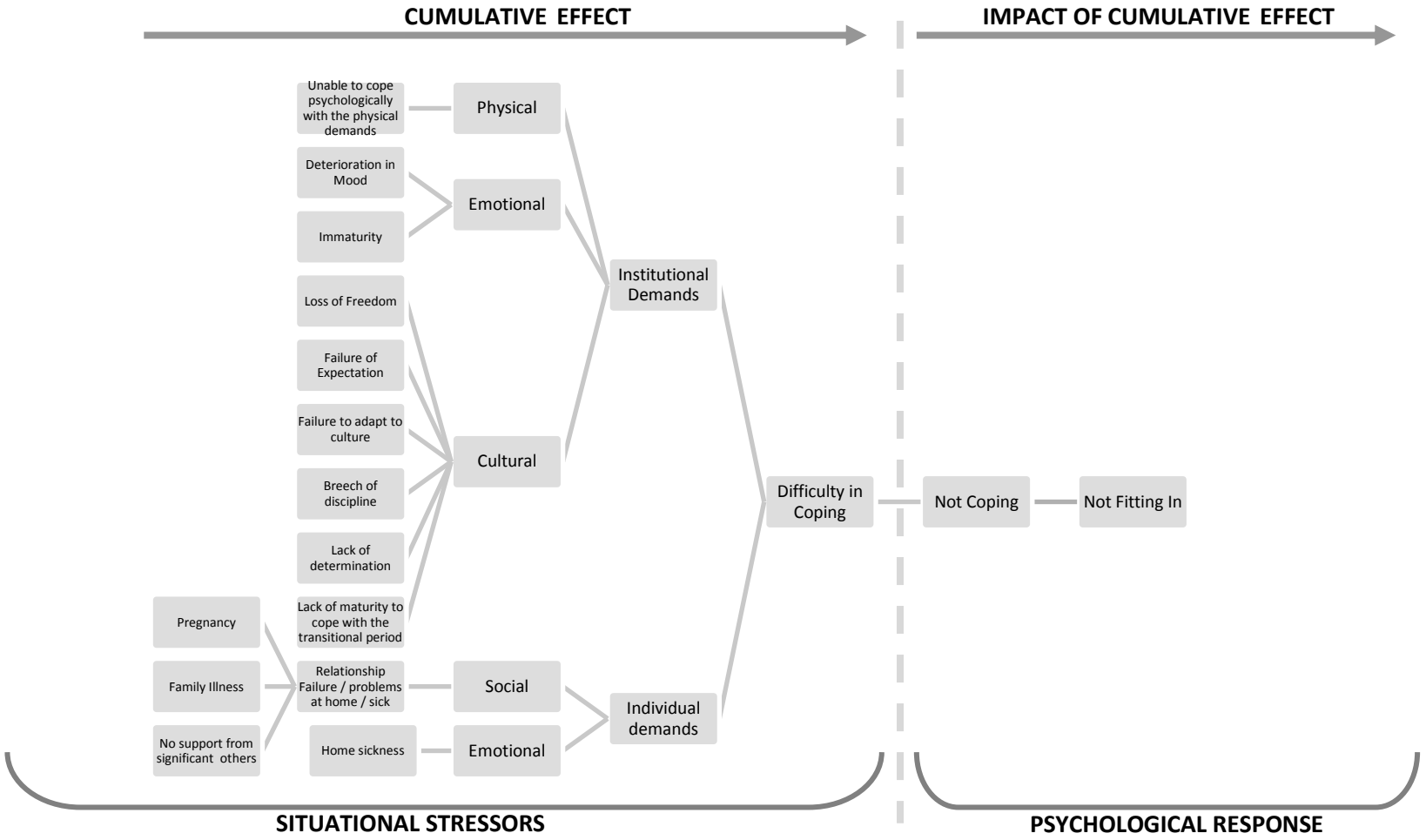
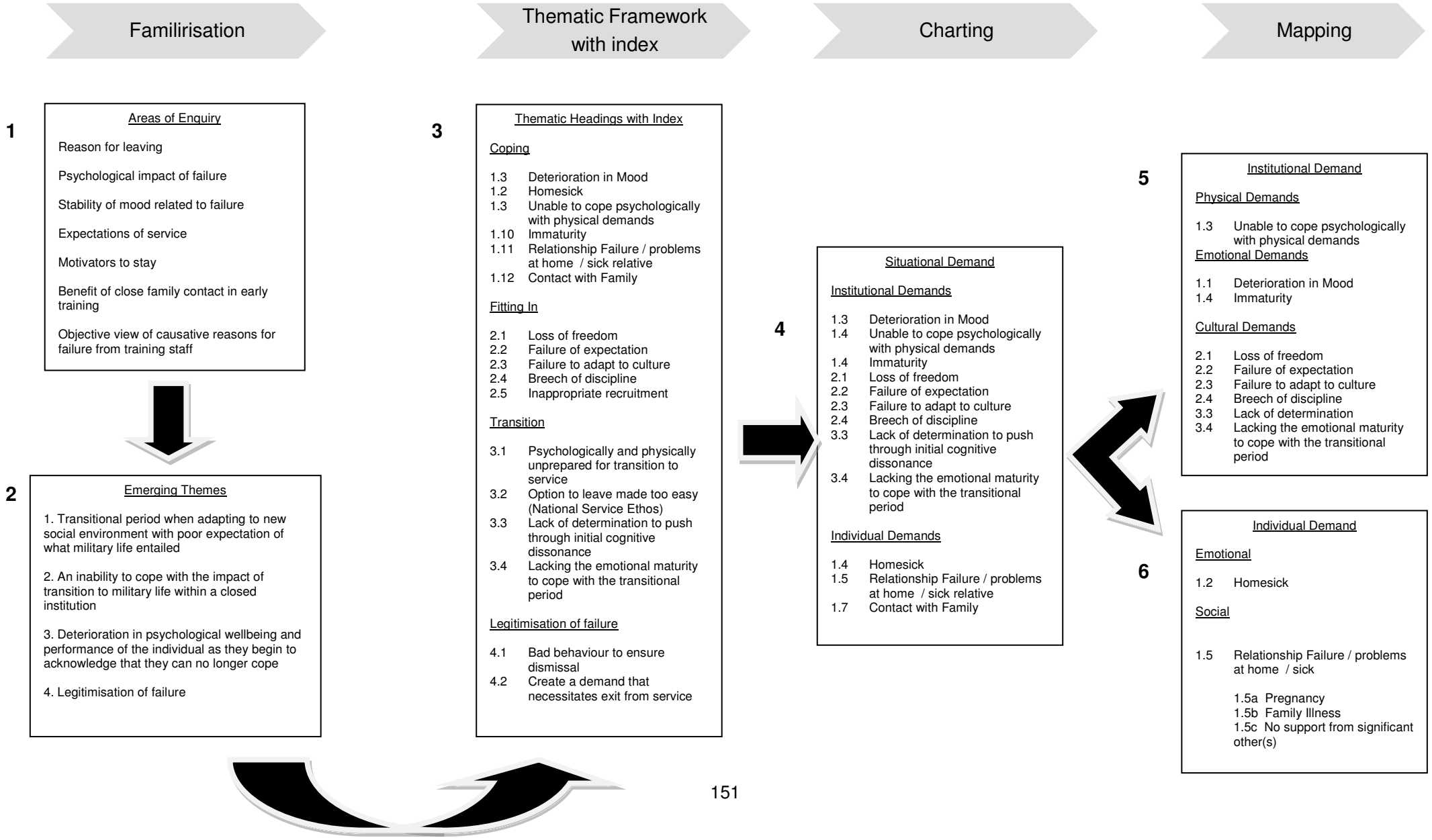


Figure 15: Process of analysis: Familirisation, Thematic Framework with index, Charting, Mapping



4.5.1: Coping

Within the mapping process the data analysis identified the situational demands placed on the individual recruit. During this process it was imperative that whilst examining the textual data at such a detailed level, the more broad overarching factors were not lost. The concept of coping and fitting in are both broad concepts within the textual data, whereas the situational demands that have been identified give the reasons as to why the recruit did not fit in and ultimately did not cope. Whilst progressing through the mapping process each situational demand was considered in relation to fitting in and coping.

It has already been identified that the recruit's ability or inability to cope with the situational stressors or demands of the enlistment journey is fundamental to their success or failure. The impact of those demands was not linear; they appeared to have a cyclic action on each other, leading to a domino effect as each demand in turn challenged the recruit's ability to cope.

This association is most prominent in the data when observing the effect that performance and mood appear to have of each other. By looking at the response of the recruits, and comparing them with their Commanding Officer's assessments, it was possible to distinguish a cycle of behavioural decline taking place (Figure 16).

Figure 16: Cycle of decline

Figure 16 demonstrates the typical pattern observed as the recruit began to fail in training. The data suggested that as a recruit's mood declined so did his training performance, which in turn made him question his reasons for being there. There was no clear starting point of the decline, because it appeared that the institutional and individual stressors subtly started the cycle as each stressor eroded the individual's ability to cope. These stressors appeared as multiples in each recruit's story for leaving. The stressors built up to a point when the individual could no longer cope with how they were feeling. The time that this level was reached was clearly different in each individual, as demonstrated by the timings when recruits left (some after four weeks, some after four months). What was clear was that self doubt began to creep in and impacted on both mood and performance. The outcome of this cyclic process was that the recruit made the conscious decision that the Army was not for him (or alternatively that he did not belong there or fit in).

Each reason for leaving was unique and the data demonstrated that small stressors, if isolated, would most probably not have caused the recruit any difficulty. However the stressors were multiple and they were associated with

the recruit being away from their normal social support network. The psychological and physical combination resulted in the situation becoming overwhelming:

' I found the training very hard; I was always playing catch up..'

Recruit 4 (Discharge as of Right)

'I don't like being away from home for long periods….I feel homesick….I miss my son..'

Recruit 11 (Discharge as of Right)

'I find the training and discipline hard….I am in trouble most days…I make lots of mistakes and the platoon gets beasted'[22]

Recruit 15 (Discharge as of Right)

If extracts from the Commanding Officer's reports are examined for Recruits 4 and 15 it is possible to detect that not only did their ability to cope decline and their mood deteriorate, but also their ability to perform and achieve the most basic demands of training declined to such an extent that if they had not decided to leave then that decision would have been made for them:

'…has failed to adapt to Army life….presented himself to the medical centre daily from week one with a range of ailments….I suspected there was nothing wrong…just avoiding training'

Commanding Officer of Recruit 4 (Discharge as of Right)

[22] 'Beasting' is a term used by soldiers to describe being given extra physical training as a punishment for the platoon or individuals within the platoon not achieving the desired standards.

'…has irritated instructors and peers to such an extent that he has been removed from training and supervised in Head Quarters…….training that he did complete was poor with no determination to succeed no chance of him ever passing basic…should not be allowed to re-enlist'

Commanding Officer of Recruit 15 (Discharge as of Right)

As Recruit 15 described, his performance began to deteriorate which caused him to get the whole platoon punished for his mistakes. His peers then ostracised him as they very quickly became irritated by his inability to keep up with training. This resulted in him questioning his compatibility with the infantry, which led to him being further ostracised as he began to question the reason for being there. Ultimately he made the conscious decision that he did not belong, and this appears to be the point at which all attempts to cope ceased and Recruit 15 gave up. This suggests that once a recruit reaches the point where they have decided that they no longer can cope then the cycle of decline, Figure 16, becomes terminal.

4.5.2: Fitting In

The sense of not 'fitting-in' can be a reason given for not coping, the end result of not coping or an amalgam of all factors relating to coping. What is clear is that when a recruit decides he no longer fits in it is the critical factor in deciding whether he stays or goes. The data shows that once recruits decided that they no longer fitted in, leaving was inevitable. However what was also apparent was that there was very rarely any singular reason for why the recruit believed that they did not fit-in. Rather, it was a complex framework of personal beliefs and thoughts stimulated by the multiple

stressors that they have been exposed to. It was the complex collection of thoughts and beliefs behind the decision to leave that was of primary interest, as they provide the understanding and evidence of commonality of thought process in most of the recruits that left training, most notably the belief, for whatever reason, that they did not fit into life in the Army.

'I do not fit in with army culture; I find it too mentally demanding……I have tried to get on with it..'

Recruit 1 (Discharge as of Right)

'I don't like it…..I don't enjoy the work….I don't fit into the lifestyle….I have let my family down by leaving but I feel I rushed my decision to join.'

Recruit 5 (Discharge as of Right)

'this was a big mistake; I do not fit into the 24 hour life style – 24 hour job. I find other recruits immature.'

Recruit 7 (Discharge as of Right)

'army life is not for me, I don't like it….I was not ready for it…it was harder than I thought.'

Recruit 12 (Discharge as of Right)

'I don't' like the way that they speak to me……..I don't fit into army life, I have made friends but I don't like the culture here.'

Recruit 13 (Discharge as of Right)

Recruit 4 found the training hard and felt that he was always physically playing catch up. A point came when he began to feel that he did not fit in and became increasingly homesick, wanting to return to his family. Ultimately he requested to Discharge as of Right. His Company Commander however made the following observations:

'he was very homesick……failed to adapt to Army life…he has the capability to pass but would need to show far more commitment'

Commanding Officer Recruit 4 (Discharge as of Right)

4.5.3: Institutional Demands

4.5.3.1: Physical Demand

The recruit's response to the situation that they found themselves in, the way in which they thought about that situation and how they tried to cope with it became important factors within the data. All the study recruits were exposed to similar situational and environmental stressors; however each recruit reacted differently to the situation that they found themselves in as they tried to make sense of what was happening to them. It appeared that the recruits who failed had difficulty in understanding or comprehending why they were being subjected to certain rules and expectations. For example, recruit 6 could not understand why discipline was so hard and why this experience was so different to what he had experienced in the Army Cadets.

'I don't like the army…..I don't like the hardness of the physical training…….far more disciplined than the Army Cadets'

Recruit 6 (Discharged as of Right)

The psychological impact of activities such as physical training appeared to erode the recruits' resolve to continue. At the point where they could no longer find any relevance in their own mind for the tasks they were being asked to perform, the situation became overwhelming very quickly.

Alternatively, initial training is also about ensuring that unsuitable candidates, who would not cope with the Infantry role, are excluded at an early stage. There are always going to be recruits who could never meet the physical demands as they were unsuitable for Army services from the outset. Recruit 9 is a good example of this, as his Commanding Officer's reports suggest that he lacked the emotional maturity and robustness to make the transition to Army life and succeed in training. Recruit 9 clearly made a distinct adverse impression on his Commanding Officer:

'I miss my girlfriend …….my freedom…I am too young for this life at the moment'

Recruit 9 (Unsuitable for Army Service)

'he is severely depressed and cannot handle the regime within the training establishment…….he is not physically or mentally strong enough for the Army and should not be allowed to rejoin as he is not suited in any shape or form'

Commanding Officer Recruit 9 (Unsuitable for Army Service)

4.5.3.2: Emotional Demands

The lasting impact that the situational stressors had on the recruits mood was an unexpected finding. Personal experience of treating situational mental health problems in the military had led me to assume that a low mood was to be expected whilst the individual was experiencing the situational stressor;

once removed from that stressful situation the mood would recover spontaneously to normal. This was not the case with all the recruits interviewed. Chart 1[23] (see Figure 17) shows two Subjective Units of Disorder (SUD) scores for each recruit interviewed, firstly at the point that they were thinking about leaving and secondly when they knew they could go. Prior to making the decision to leave, the mean SUD score was 3.8 (SD = 2.5) for the 32 recruits recruits interviewed (one recruit refused to give a score). This score was not unexpected as recruits had been in a stressful environment, which on the whole they probably did not enjoy. What was unexpected was that in just under half of those interviewed (n=16) the mood score remained below eight even though they had been removed from training and knew that they were returning home. In seven of the cases the mood score failed to recover above five. The recruits made the following comments:

'I find the training hard….discipline hard….I am in trouble most days for making mistakes and then the whole platoon gets punished….I don't fit in…..I have been crying myself to sleep at night..' (SUD score 5/10 on leaving)

Recruit 15 (Discharge as of Right)

'…I found training to hard……I was always playing catch up…..(SUD score 3/10 on leaving)

Recruit 4 (Discharge as of Right)

These findings suggest that in just under half of those interviewed (n=16) the experience of training and failure has an impact on their mood which is not automatically alleviated by removing them from a stressful situation. In just

[23] All charts can be found in Appendix 4.

under a quarter of those interviewed (n=7) the impact on the mood is arguably moderate to severe, as their mood does not recover above five prior to leaving. This raises a question that was not anticipated by this research as regards the longer term impact that training failure has on the recruit's mental health after leaving training.

Although in the mapping process the demands of the situation have been split between individual and institutional (Figure 14) the reasons for leaving were not confined to any single area. In all the recruits interviewed there were numerous reasons for leaving across the demands of the situation and, as identified, it is the accumulation of those reasons that overwhelmed the ability to cope. For example, Recruit 3 was identified by his Commanding Officer as having all the ability to complete basic training, but had very little support from his mother or girlfriend as regards enlistment. The Commanding Officer also observed that Recruit 3 lacked the maturity to overcome the pressures of enlistment as well as his mother's and girlfriend's feelings. If he was immature but had full family support he would possibly have been able to get through the initial distress of enlistment; however the lack of support coupled with his observed level of immaturity were a combination for failure, as Recruit 3 was an individual who appeared to still be very dependent on the support of his family, who on the whole were not supportive of him joining the Army. The pressure on him from his mother and girlfriend caused him a great deal of confusion. He clearly wanted to join the military and he felt guilty about letting his father and himself down:

'I get on well with the lads and the instructors but not what I was really expecting……I have problems at home…my girlfriend does not want me to stay here and my mum

wants me to come home….my father feels I have let him down by leaving….I feel I have let myself down'

Recruit 3 (Discharge as of Right)

His Commanding Officer's succinct report sums up the psychological dilemma this recruit faced:

'..struggled to come to terms with the reality of training..not applied himself well, poor levels of concentration, he fell behind in training….lack of commitment following pressure from home…..faced considerable pressure from girlfriend and family to leave….he is a young immature 17 year old who does not have the character to force through his initial desire to join the infantry'

Commanding Officer Recruit 3 (Discharge as of Right)

His Commanding Officer acknowledges that he was under an immense amount of psychological pressure as he came to terms with training and life in the Army, however he did not possess the emotional maturity to succeed.

Figure 17: Chart 1: Coping

Case Number	1.1 Deterioration in Mood	1.1 Likert Mood Score in training + week + cognition when stated	1.1 Likert Mood Score on interview + cognition when stated	1.2 Homesickness	1.3 Unable to cope psychologically with physical demands	1.4 Immaturity	*3.4 Lacking the emotional maturity to cope with the transitional period	1.5 Problems at home	*4.2 Create a demand the necessitates exit from service	1.6 Contact with Family
Recruit 1		3/10 felt overwhelmed with the pressure of training	8/10 pressure relieved, going home		feels overwhelmed by the pressure of training, experiencing anxiety before certain lessons					phoned home every 4/7 and had W/E leave
Recruit 2		3/10 on 2nd & 3rd Week	8/10	misses his family and friends		enjoys the fitness but does not feel he is ready for army life yet, feels he is letting himself down by leaving			missing his family and girlfriend and social life, parents support his decision to leave	phoned family every 2-3 days and has been home twice
Recruit 3		1/10 @ week 4, went home on W/E pass didn't want to come back, felt very homesick and tearful	5/10				he is a young immature immature 17 year old who does not have the character to force through his initial desire to join the infantry	problems at home, his girlfriend has asked him to leave, she is not supportive of him serving, mum wants him home, father feels he has let him down by leaving, he feels he has let himself down	faced considerable pressure from girlfriend and family to leave	Contacted family x2 week and phoned girlfriend x5 a day. Also had 24hr pass
Recruit 4		2/10	3/10 mood remains low, fed up	feels very homesick, weepy just wants to go home	found training very hard, always playing catch up				very homesick	
Recruit 5		3/10 week 4/5	8/10 not 10 as he is still here waiting to go.							
Recruit 6		2/10 following W/E pass, did not want to come back	9/10 now as he is leaving	Feels homesick	does not like army life, does not like the hardness of the physical training		very immature and lacked the commitment necessary to get through the course		felt homesick throughout the course	
Recruit 7		4/10 lowest point day 5	9/10							

*Shaded areas denote comments made by Commanding Officer

Case Number	1.1 Deterioration in Mood	1.1 Likert Mood Score in training + week + cognition when stated	1.1 Likert Mood Score on interview + cognition when stated	1.2 Homesickness	1.3 Unable to cope psychologically with physical demands	1.4 Immaturity	*3.4 Lacking the emotional maturity to cope with the transitional period	1.5 Problems at home	*4.2 Create a demand the necessitates exit from service	1.6 Contact with Family
Recruit 8	very difficult interview, very guarded, discharged 2 yrs previous on medical grounds	Would not give score	Would not give score					needs to leave army to care for son, split with girlfriend who no longer wishes to care for son, he will have custody.		
Recruit 9		8/10	8/10 has not disliked the experience, just prefers to be at home			feels he is too young for army life at this time				
Recruit 10	hated being in training, and wanted to leave, felt low and now his CO has told him he must stay for another 2 weeks until he can DAOR	1/10	9/10	missed parents, girlfriend and family, feels homesick						
Recruit 11	finds communal living hard at times	3/10 lowest point was evenings	7/10 now knows that he is leaving	does not like being away from home for periods of time, homesick misses son	does not like drill and weapons lessons finds them too difficult				has been homesick throughout the course and misses young son	phoned 3 times per week, no visits
Recruit 12		3/10 when he did not know how or when he could leave	10/10 now he knows he is going	misses civilian life, misses friends and family		was not ready for it	has struggled with different aspects of the course and has shown a high level of immaturity			phones daily and has been home x6 W/Es
Recruit 13		3/10 felt weepy low and sad	3/10 still here		found the PT hard					daily by phone and family visited
Recruit 14		2/10	4/10				would support his return to the army in the future when he matures			phoned daily + WEL
Recruit 15	has cried himself to sleep most nights	3/10 when continually shouted at for messing up	5/10	feels very homesick	finds training hard, discipline hard, in trouble most days, infantry not for him, has made lots of mistakes and the Plt has been punished			mother disabled, difficult family dynamics, feels he needs to be at home		phone daily

*Shaded areas denote comments made by Commanding Officer

Case Number	1.1 Deterioration in Mood	1.1 Likert Mood Score in training + week + cognition when stated	1.1 Likert Mood Score on interview + cognition when stated	1.2 Homesickness	1.3 Unable to cope psychologically with physical demands	1.4 Immaturity	*3.4 Lacking the emotional maturity to cope with the transitional period	1.5 Problems at home	*4.2 Create a demand the necessitates exit from service	1.6 Contact with Family
Recruit 16	considered DSH but believed it was wrong and he must leave the right way	4/10	4/10 as he is still here		parents want him to stay, believes that he has let them and himself down, believed he could succeed		his homesickness has been exacerbated by his lack of maturity			phone daily
Recruit 17	does not like it here, has wanted to leave since day1, hates poor block facilities, does not like food	6/10	10/10 when he leaves here		found PT hard, gets shin splints		he believes he made a mistake in joining the army and believes that he has a lot more growing up to do before he re-enlists			speaks with home every 2-3 days
Recruit 18		10/10	1/10 devastated to be leaving							
Recruit 19		2/10	5/10							spoke x2 per week plus long W/E at home
Recruit 20		4/10	8/10 knows he is going home 10/10 now that he knows he is leaving	feels homesick	finds ITC depressing, not the life he is looking for, feels he cannot hack it, does not like weapons handling & PT as he feels he has not got it					has had contact with relatives, did not want to return from W/E pass
Recruit 21		10/10	10/10					girlfriend pregnant with twins	girlfriend sick in hospital carrying twins, feels he should be there supporting her, can not cope any more in the army due to worrying about his girlfriend	Speaks daily, has been home once
Recruit 22		8/10	8/10						misses his family and friends and homesickness has set in	phones most nights, has been home most weekends
Recruit 23		4-5/10 when he decided that he wanted to leave	7/10	feels homesick			immature		slightly homesick	phones home x2 per week and has been home once

*Shaded areas denote comments made by Commanding Officer

Case Number	1.1 Deterioration in Mood	1.1 Likert Mood Score in training + week + cognition when stated	1.1 Likert Mood Score on interview + cognition when stated	1.2 Homesickness	1.3 Unable to cope psychologically with physical demands	1.4 Immaturity	*3.4 Lacking the emotional maturity to cope with the transitional period	1.5 Problems at home	*4.2 Create a demand the necessitates exit from service	1.6 Contact with Family
Recruit 24	felt sad	1/10 felt sad, very weepy	5/10	homesick, misses his son and girlfriend						daily by phone, no visits home, no contact would have made things worse
Recruit 25		1/10 contemplated self harm and suicide	4/10						he considers himself to have considerable personal problems	little or no contact with home
Recruit 26		8/10 now and all along	8/10						suffered outside pressures to leave during the course	phones daily and has been home once
Recruit 27		3/10	7-8/10 now he knows he is leaving					prefers to be nearer home to support his family		phones home every 3 days and has visited once
Recruit 28		3/10	10/10 now that he knows he is leaving	does not like army life, homesick					he is homesick and has enjoyed no part of the course to date	phones every 2-3 days
Recruit 29		2/10	10/10 now he knows he is going	homesick, does not like the way Scots are treated						phones every night
Recruit 30		2-3/10 contemplated self harm to effect release due to feeling of entrapment	8-9/10 now that he knows he is leaving		has been having medical tests since week one unable to train					phones regularly and has WEL
Recruit 31		4/10	6-7/10 will be happier when he leaves	misses girlfriend and son				girlfriend wants him to come home	has suffered homesickness, misses' partner and child.	WEL + phones daily
Recruit 32		4/10 feels down about being here, thinks he will feel better once he leaves	9/10	Homesick			he is immature and young, he is homesick and misses the relative freedoms of home life			texts home regularly + WEL
Recruit 33	feels tearful all the time	4/10	6/10	Homesick	finds discipline side of things hard as well as communal living		very young and relatively immature		very homesick	phones daily, and mother has visited

* Shaded areas denote comments made by Commanding Officer

4.5.3.3: Cultural Demands

The concept of freedom and the loss of it were very prominent amongst the institutional factors. The military is easily defined as a closed institution (Goffman, 1961), especially during the basic training phase where recruits are not allowed to leave the establishment and live together 24 hours a day. This restriction of movement and an inability to come and go when they pleased had a detrimental effect on those that were clearly used to being in control of their own daily routine and movements.

'I want to be my own person; I don't want to be told what to do all the time….I don't like the lack of privacy'

Recruit 7 (Discharge as of Right)

' I hate being confined in the barracks and the people I have to mix with….the Army has prevented me from making friends as we are always in competition with each other' 'I don't fit in here, the sacrifices are too great….the training is bullshit….the blokes are idiots who I would never associate with outside of here'

Recruit 30 (Discharge as of Right)

'*I am finding the communal living and the loss of freedom difficult…….it's difficult to be around younger recruits who mess around a lot and cause trouble'*

Recruit 27 (Services no Longer Required)

These responses convey the variety of meanings attached to the loss of freedom. Some recruits focus on the lack of privacy and the communal living, others find the fact that they cannot do what they want when they want the

hardest. What is most interesting is that all these reasons seem to be over-arched by the question of what the recruit's expectation of life in basic training was. It is evident that amongst the recruits who failed there was a either a nostalgic view or little comprehension of what to expect on enlistment. Recruit 6 reflects on the discipline and his experiences in the Army Cadets and is genuinely surprised that he finds it too hard; he also finds it difficult to understand why enlistment in the regular Army is so different. Recruit 9 reflects on his experiences in the Territorial Army:

'I feel trapped….I have lost my freedom…. The Army is always on my mind, the discipline is too hard…..far more discipline than the Army Cadets'

Recruit 6 (Discharge as of Right)

'*I used to be full time in the Territorial Army…..this is very different here…….we get picked on for other's mistakes…….I feel I am more experienced than a lot of the people here'.*

Recruit 9 (Unsuitable for Army Service)

It is evident that Recruit 9 had created an image of what training was in his own mind, and in that image the instructor recognised his experience and maybe set him above his peers. In reality he was treated no differently to his peers and had great difficulty comprehending this perceived injustice, which eventually led to him choosing to leave.

When recruits talked about the lack of privacy, the confinement in the establishment, or the difficulty getting along with peers in such close proximity, they appear to have failed to anticipate or prepare for the environment that they were going to live in. They seem to have had no idea what to expect. When confronted with the environmental reality of what life in a training barracks entailed they were unable to adapt and cope, Recruit 16 is an example of the results of those stressors when they become overwhelming:

' I do not want to be in the army, I find it too hard and would rather not do it…..my parents want me to stay……they feel I am letting myself down… let them down. I have thought of harming myself but I know it is wrong, I just need to leave now'

Recruit 16 (Discharge as of Right)

To succeed in training, the findings suggest that the recruits must possess the psychological and physical capability to face the challenges and stressors related to enlistment. The recruit begins the journey of enlistment full of motivation to succeed; they enter training where a single or numerous stressors have an impact on them, which in turn begins a cycle of decline both in mood and performance. Finally they feel unable to stay any longer as they believe that they do not belong and become de-motivated and exit service (Figure 18). Figure 18 identifies three phases on the journey to failure; the coping phase, the difficulty in coping phase and the not coping phase. This structural view is important as it identifies key gates within the process of recruit failure where recruits could possibly be helped to succeed rather than fail in their training. What the data also shows is that when the de-motivated stage is reached, the recruit appears to have entered a journey of no return

and exit appears to be the only solution to the way they feel, indicating that early recognition of potential failure is imperative for training success.

During the process of analysing reasons for leaving, timing became a recurrent theme when talking to training staff. More junior staff believed that leaving was made too easy and too soon, and more senior staff were worried that if recruits were made to stay then they would engage in whatever behaviour was necessary to effect discharge, be that through self harm or breech of discipline. Amongst senior officers this was a real worry in light of media attention surrounding suicide and dissuaded officers from making exit from service more difficult than it already was. To look at the impact that early release at day 28 of training had on their ability to continue, and on their decisions to stay or go, recruits were asked to compare their service to national service in the 1950s, and to consider what they would do if they had not got the option to go and that they must stay by law for 2 years. When that question was posed to the leavers interviewed, of the 33 recruits interviewed over two thirds (n=24) reflected that they would not feel happy about staying but 'would just get on with it':

'…if I had to stay I would probably get on with it as I get on with people…'

Recruit 1 (Discharge as of Right)

'…would feel down however would just get on with it, would not take any drastic action…'

Recruit 5 (Discharge as of Right)

'…would feel bad but would get on with it because I'd have to…'

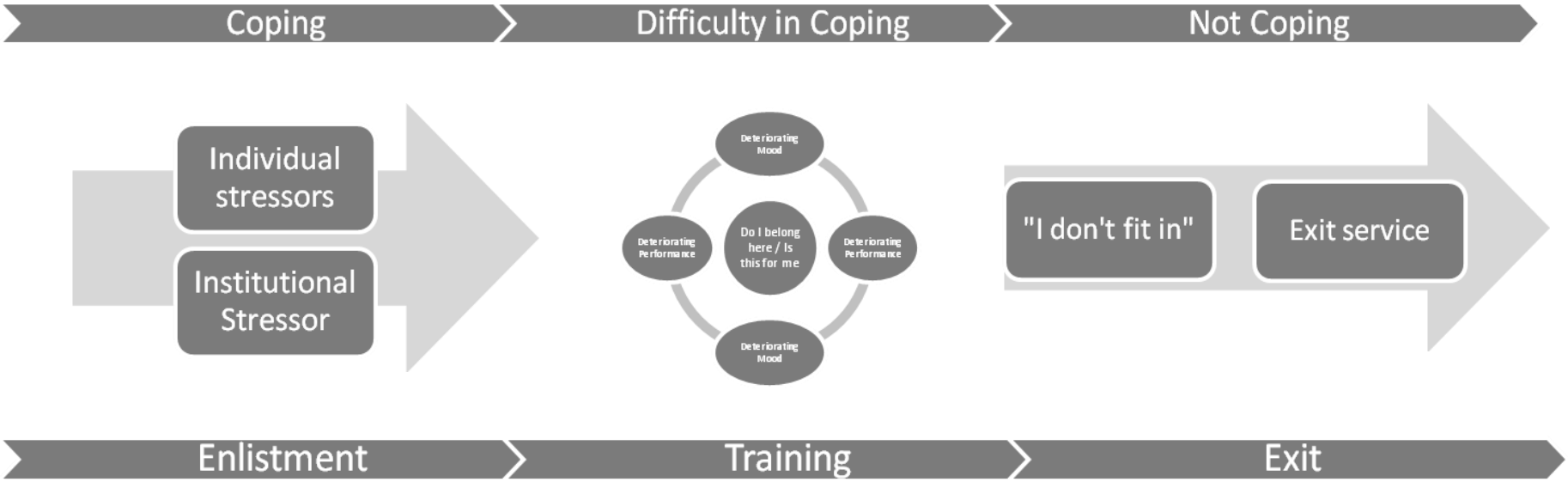
Recruit 5 (Discharge as of Right)

Two separate issues were drawn from these responses, initially, feelings of self harm were relatively rare amongst respondents, only three recruits expressed that they would consider self harm and of those three only one expressed that he would use self harm as a method of manipulating a release from service, even though he could have exercised his right to discharge at that time:

'if I had to stay I don't know what I'd do….I would probably try and escape by taking another overdose'

Recruit 10 (Unsuitable for Army Service)

Figure 18: Journey to discharge



It is questionable whether recruit 10 was suitable for service from the outset, as he was expressing a desire to leave by week two. His behaviour was not that of someone who was becoming depressed and withdrawn as a result of the environment. On the contrary, during that brief period of service he was involved in two fights, one resulting in his opponent suffering facial fractures. The Commanding Officer believed that his overdose was a direct act to try to avoid criminal charges being brought against him for assault. What is not clear in this case is whether the recruit got into trouble and then wanted to leave to escape the consequences, or behaved like this to affect a release. However, it was clear on interview that he was not depressed but was willing to use whatever behaviour was required to get his own way. I believe that this is the type of case that training staff were anecdotally referring to when they were explaining extremes of behaviour to effect release. What appears evident is that it is the extreme of behaviour that makes it notable, not the frequency of the behaviour: this behaviour seems to be the exception and not the rule.

The other two recruits who expressed intent to self harm were clearly very affected by their experience of service life and had become so desperate that they could not see beyond the misery that they were feeling at that time:

'if I could not leave I would probably try and kill myself'

Recruit 4 (Discharge as of Right)

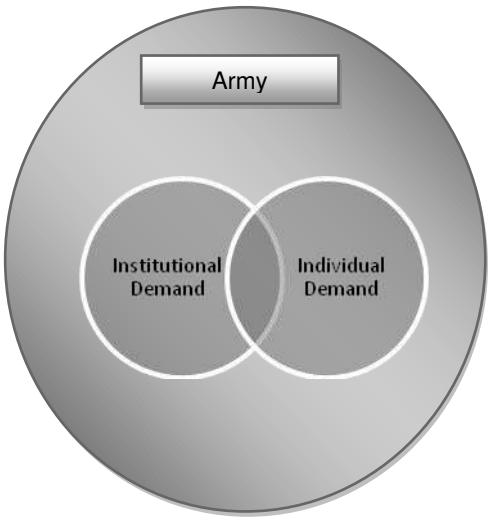
Recruit 4's despair was identified by his Commanding Officer, who also recognised that he was extremely homesick and low in mood.

The other respondents who disclosed that they would escalate their behaviour in order to leave talked about going Absent Without Leave; again there was evidence of despondency and doubt over their ability to cope and going absent might be one of the ways to relieve how they were feeling.

The majority response to this question was that if faced with this dilemma they would press on and complete their training. There was good evidence that they would not be happy about this and that their experience to date had affected their mood, but it appears that these recruits were choosing to leave because they had been given the choice.

Returning to Figure 14, it is apparent that culture was referred to as one of the institutional demands, and the elements of cultural demand are indentified in Figure 15, Box 5. However what became evident as the mapping process developed was that the demands that enlistment placed on the recruit were related to its primary and secondary rules of obligation; that is the Army's goals and values that construct its organisational identity. It is this identity that underpins the Army culture and as a consequence creates the environment that produces the institutional stressors. The primary and secondary rules of obligation also prevent the recruit from having the freedom to resolve individual demands due to the closed nature of the organisation and its expectations of recruit behaviour. Reflecting on all of the identified situational demands in Figure 15, it raises the question as to which of these demands would cause the individual difficulty if he worked outside of the Army or any other military institution. The very fact that the recruit is joining the Army is a cultural demand in its own right, as they are expected to live their lives differently from the point of recruitment.

Figure 19: Hierarchy of demand



To simplify, Figure 19 shows how the Army as an organisation creates an overall situational demand on the recruit in which all the other demands sit. All the demands are caused by enlistment into the Army; if the recruits had not enlisted they would either not have experienced these demands in such an intense time frame or would have had the social support network in place to better cope with the demands. Most significantly, it appears that within the situational demand that is created by the Army culture, adapting to the norms and values of the Army appears the most stressful.

4.5.4: Individual Demands

4.5.4.1: Homesickness

Homesickness was reported in just under half of those interviewed (n=15) but was never given as the primary cause for leaving. Homesickness was always presented as an aside to other reasons and was in most cases related to missing parents and girlfriends. This raises the question as to whether the individual was missing the physical environment of home, or more probably the support and companionship of those at home. This appears to corroborate with the textual data, as in all the interviews undertaken the recruits who stated that they were homesick would provide a primary reason for leaving first before saying that they were homesick, e.g. Recruit 12 is finding training hard and has decided to leave, giving the following reason:

'army life is not for me…..I don't like it…not ready for it…..harder than I thought'

He then goes on to say:

'I miss my friends and family'

Recruit 12 (Discharge as of Right)

This suggests that as the recruit begins to have difficulty in training and finds it harder to cope he begins to become homesick for his usual social support network. Prior to enlistment this would have been the friends and family that he would turn to in times of difficulty; however on enlistment he leaves them behind. Therefore it appears that homesickness is a general word used to cover many things, but what it actually means in this study is that the recruit is

missing his social support network at a time when they are struggling to cope with training.

4.5.4.2: Family Problems

The stress of family problems is not unlike homesickness. In all of the cases where family problems were cited as a reason for leaving (n=6), they were accompanied by other institutional reasons for not continuing. As mentioned earlier in the chapter, this gave rise to the notion that family problems may have been used as an acceptable reason for leaving instead of the admission of failure. Recruit 27 is a good example of this phenomenon:

'I prefer to be nearer home to support my family'

Recruit 27 (Service No Longer Required)

He also states that he found the younger recruits hard to live with as they messed around a lot and caused trouble. There is no acknowledgement in his account that he behaved in a way that was unacceptable, he just wanted to be nearer home. His Commanding Officer provided the following report:

'adamant that he does not want to be in the Army and has adopted a completely negative attitude towards the training regime……should be discharged Unfit for Army Service and should not be allowed to re-enlist'

Commanding Officer Recruit 27 (Service No Longer Required)

In his interview with me, Recruit 27 created a picture of the Army not being for him and his need to be with his family. In his Commanding Officer's opinion, his behaviour was so disruptive he was discharged Services No Longer required, which equates to a dismissal from employment on discipline grounds.

Of the six cases where family problems were cited as the reason for leaving only one case was corroborated by the Commanding Officer. Recruit 21's girlfriend was expecting twins when he enlisted and became very unwell during training. His Commanding Officer acknowledges that she was in hospital and states in his report that Recruit 21 can no longer cope with his training due to worry, and he was released under Discharge as of Right.

4.6: Summary of Findings

What the data describes is a journey of extreme situational demands that the recruits experience throughout their transition from civilian life to service in the British Infantry. It is the cumulative effect of the situational stressors, combined with the recruit being dislocated from their established support network, that appears to be the catalyst for failure amongst recruits. Failure occurs when the recruit can no longer cope with the situational stressors. It is the recruit's psychological response to the cumulative effect of the stressors that makes him leave. The situational demands that the recruit experiences can be divided into two categories:

- Institutional Demands
- Individual Demands

Multiple combinations of both of these types of demands were reported by those interviewed. They did not fail as a direct result of the demands, but more importantly as a result of how the demands made them feel. Once the stress of the demands became too much for them to cope with it triggered a sequence of thought processes that led into an irreversible cycle of events and ultimately training failure. All leavers, both those who chose to leave and those whose services were no longer required, discussed a pivotal point in their recruit journey when they made the conscious decision that they did not 'fit-in' to the culture and environment of the military. It appears that once this belief had been adopted it became a self-fulfilling prophecy. Performance was observed to deteriorate and the recruit reported a subjective lowering of mood, which in turn compounded the belief that they did not belong and subsequently alienated them from their peers. The data suggested that once

the recruit goes into the cycle of decline (Figure 16) it appears to be irreversible. What is encouraging, however, is that there appears to be a domino effect process which provides key points or gates where a possible intervention could take place to either break this cycle or prevent its initiation.

CHAPTER 5: DISCUSSION

5.1: Introduction

The overall aims of this study were: to achieve an understanding of the role that antecedent personal, social and demographic factors play in a British Army recruit's ability to complete basic training; to investigate the possibility of identifying predictive factors that would identify infantry recruits who were at risk of being unable to cope with the transition to life in the British Army; and to explore the reasons given by those recruits who failed to complete basic training in order to develop a more comprehensive understanding of why recruits fail.

Of the 999 recruits in the study cohort, 36.2% (n=362) failed. Factors associated with higher odds of failure were: absence of female siblings, aggressive coping strategies, use of ecstasy, evenings per week spent at the family home, truancy, an increased number of schools attended and classroom behaviour. The area under the receiver operating characteristic curve on the test dataset was 0.58. The predictive ability of the logistic model was relatively poor, and the proportion of recruits that it could correctly predict a training outcome for is too few to recommend its use as a screening tool. However, it was identified that there were important differences between the socio-personal identity of recruits who failed training and the organisational identity of the British Army Infantry. These differences in beliefs, values and goals coupled with the nature of the infantry training organisation caused varying levels of cognitive dissonance and disordered mood in those recruits who failed. For nearly three quarters (74.4% [n=269]) of those recruits, failure was attributable to difficulties in adapting to infantry training and living at the infantry training centre.

The discussion in this chapter begins with the consideration of identity and the disparity between military identity and the social identity that recruits are drawn from. With the setting established, the difficulties of transition into a closed institution are explored, ultimately returning to the question of whether predicting training outcome through the use of biographical questionnaires is possible. In conclusion, the discussion will consider the implications of the findings in relation to other branches of the Armed Service and wider society as well as identifying areas for further research.

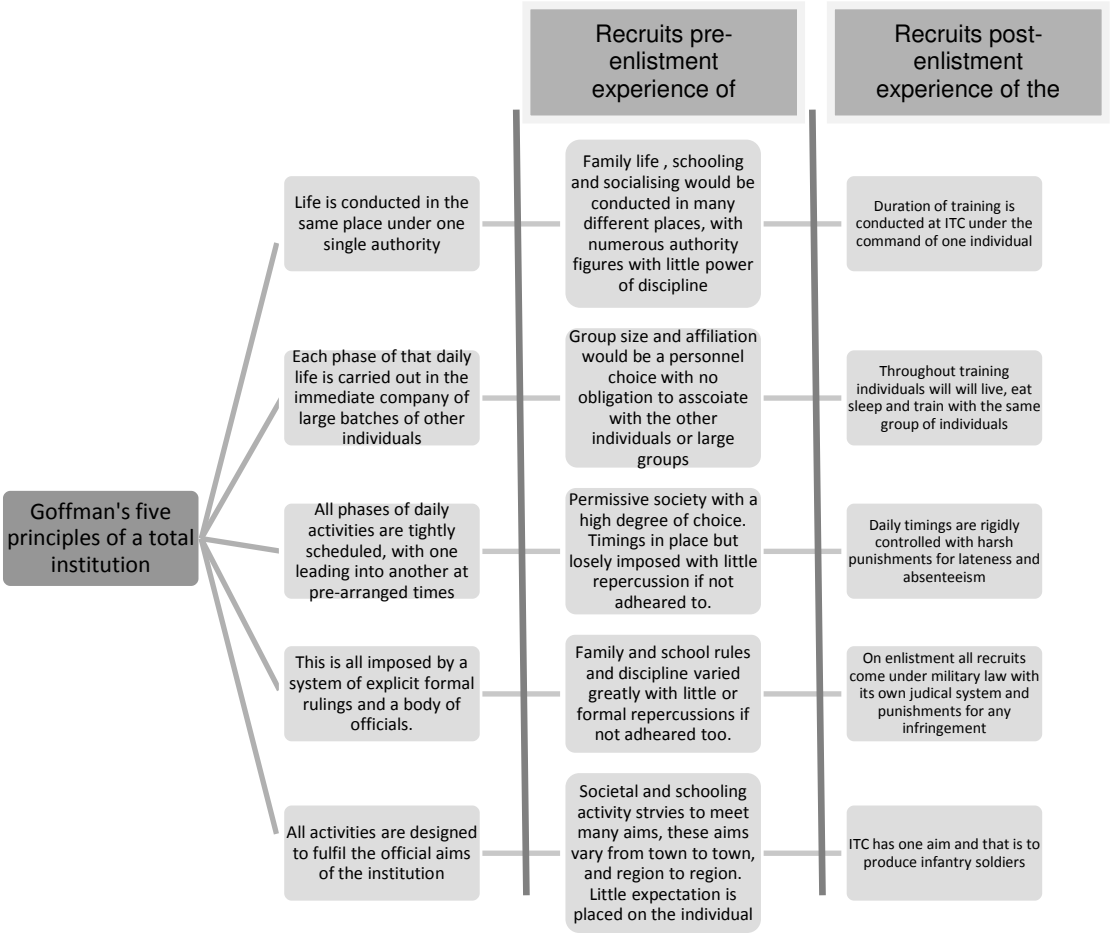
5.2: Bridging the gap: Transition from socio-personal identity to military identity

Military identity is timeless because its reason for existence never changes. Clausewitzian (Clausewitz, 1832) theory considers the military as an institution which has one overarching primary purpose, to deliver war as an extension of the political will of a nation state. The nature of war is enduring and never changes; it will always involve violence, destruction and death. The aim of war is to further political aim through the defeat of an enemy, preventing that enemy from being able to wage any further war (Clausewitz, 1832). However, the character of wars has changed dramatically over the last six decades. There has been a move away from wars of attrition, such as the First and Second World Wars, designed to destroy not only the opponent's military but also their nation, to manoeuvreist wars aimed at removing a nation's and its military's will to fight. These step changes have made little difference to the role of the infantry soldier. The nature of war provides the values and beliefs that underpin the organisational identity of the infantry because its values, goals and beliefs are shaped by the role in war that it must undertake. Infantry training prepares the recruit solely for war fighting, and so the infantry training centre is totally immersed in infantry organisational identity. This identity is maintained through its primary rules of obligation, which are deeply rooted in its social structure. These are the unwritten codes and laws (Hart, 1961) that underpin tradition and expected behaviour. This study has identified the differences between the organisational identity of the Army and the social identity of the incoming infantry recruit. The Armed Forces have a unique if not antiquated identity, constructed over many decades or even centuries in order to fulfil its role.

Goffman (1961), in his essays on asylums, identifies the military as a total institution within his list of five groupings of total institutions in society (see Figure 20). He explains the pre-requisites of defining a total institution by focusing on key aspects of daily living. Individuals within society will usually sleep, play and work in different places, with different co-participants, under different authorities and without an overall rational plan. It can be argued that the military as a whole is a quasi-closed institution, that is it fulfils some aspects of Goffman's (1961) five principles of a total institution, with its identity only really being understood by those who experience it from within. Figure 20 demonstrates how Army infantry training fulfils Goffman's (1961) five principles of a total institution when compared with the recruit's life prior to enlistment. The findings of the biographical questionnaire give a generalised picture of the experience recruits have had prior to service and living within a formal, hierarchical, total institution. Figure 20 demonstrates the contrast between the social identity which a recruit is coming from and the organisational expectations which the Army expects the recruits to fit.

The findings of the study demonstrate that the values, beliefs and attitudes of recruits raised in modern British society differ vastly from the expected values, beliefs and attitudes of the infantry. As recognised in chapter one, Goffman's (1961) theory of the total institution is not without its critics who believe that both his methods and his claims for external validity were flawed (Scott, 2010, Weinstein, 1994, Perry, 1974, Levinson and Gallagher, 1964). Perry (1974) acknowledges Goffman's argument that many of the attributes of the total institution are not exclusive to a closed community such as a psychiatric hospital. What is unique is the intensity of these attributes within a total institution.

Figure 20: Comparison of the infantry training institution and recruits pre-enlistment youth culture within the five principles of Goffman's total institution[24]



Perry (1974) argues that within a psychiatric institution 'inmates' are not subjected to one single authority, as observed by Goffman, but at least a minimum of two (medical staff and hospital administrators). He argues that rarely will an institution's members have one single aim, arguing that a merchant ship with 35 men onboard would be divided into approximately 20 different occupational titles each with its own aim. What Perry (1974) does recognise is that Goffman's observations of the institutions control of daily activity and enforced activity to achieve the aims of the institution are more akin to the military and concentration camps than a psychiatric institution.

[24] ITC: Infantry Training Centre

Perry (1974) makes the argument that Goffman's theory of the total institution is valid, if overstated in the psychiatric institution setting. If Goffman had applied his theory to military initial training, he might have seen a better fit for his theory. Returning to Perry's (1974) arguments, the soldier in the larger Army may have multiple authorities, but in training is under the command of one person. Each daily activity is tightly controlled with one activity leading into the next and the Infantry Training Centre has only one aim, which is to produce infantry soldiers.

Another contested aspect of Goffman's observation is his assertion that members of a total institution are passive and lack autonomy to determine their own fate (Scott, 2010). It is argued that organisational structures shape the behaviour of individuals, but Goffman's pessimistic view of the 'actor' as a passive participant controlled by the institution overlooks the ways in which 'inmates' within an institution negotiate and define their own reality. In fact one of Perry's (1974) key criticisms of Goffman is that his observation of the total institution is one sided (only the inmates' perspective) and distorts reality. Recruits do control their own fate, they can leave after 28 days and if they wish to leave beforehand they can engage in behaviour that will ensure that they are discharged (taking drugs or severe indiscipline). Alternatively they can choose to conform and adapt to the institution. Scott (2010) argues that the total institution is a dynamic entity and reshapes and redefines an individual's identity so that they construct a new reality within which they function. This redefining is reflected in Jenkins' (1996) and Ashforth and Maels' (1989) arguments regarding the construct of social identity. Individuals will adapt their social identities to the situation that they find themselves in by adding or removing identities so that they function in their current environment. In nearly two thirds of the study population we see this happen,

recruits construct a new reality that is their existence within the infantry training centre and adjust and renegotiate their social identity to encompass infantry identity. As identified in chapter 1 (Figure 1), the recruit's social identity is formed from many social categorisations within society with each category influencing the individual's values and beliefs. In the present study, by the point of entry into training, these individual belief systems were well established and formed the core beliefs of the individuals.

It is of concern that a third of the recruit population were unable to adapt to military life. It would appear that the military and infantry identity forms a society of its own, the norms and values of which challenge the individual's established beliefs, creating psychological turmoil and cognitive dissonance. The challenge that enlistment and military identity can make to a recruit's own personal identity has been explored by the Israeli armed forces. Although the British and Israeli military differ in the fact that Israel has a conscript army, the experiences of the Israeli recruit are not dissimilar to the experiences indentified in this study's population. Levy et al (1987) identify the drastic change in lifestyle that the recruit undergoes, the transition occurring in a matter of hours where they instantly become soldiers. Levy et al (1987) identify (without explicitly making the connection) the five principles of Goffman's (1961) total institution within their description of the enlistment process and their description of the training environment. British studies (Hampson, 1997, Sirett, 1999) also inadvertently describe a total institution and the impact that it has on British recruits.

The military, with its unique organisational identity, arguably sits on the edge of the nation's social and cultural identity. The military, especially the infantry, cannot afford to be drawn into reflecting the wider society as this would

confuse its identity and potentially cause a level of organisational dissonance where the organisation (and, arguably those working within it) would become confused about its roles and functions. In recent times an example of a collapse in military identity and a loss of direction as regards primary purpose was the Dutch Army's mission in Srebrenica during the Bosnian War. Dutch and United Nations commanders allowed political decision making to influence their tactical decisions, resulting in the lives of 100 Dutch soldiers being judged worth more than the lives of 8000 Muslim men and boys (Van Der Wind, 1995)[25]. What was observed to have occurred with the Dutch troops supports Baumeister's (1986) assertion that if the goals and values of the group become inadequately defined and the group loses its sense of self, this in turn leads to a lack of commitment to goals and values and the basis for consistent decisions and actions is lost. Ashforth and Mael (1996) argue that there is a balance to be struck in relation to how an organisation manages its identity as organisations are always under pressure to evolve. This is the crux of the argument with infantry identity as Ashforth and Mael (1996) recognise that strong organisational identities can be resistant to change. Organisations are built on values and goals that form their identity, and to move away from those values and goals would present a weakness in the identity and possibly introduce conflict into the organisation. The military has to be a servant of politics and observe neutrality at all times; it can never afford to be part of the political process as this would politicise the military (as seen with the Dutch military example) and introduce not only conflict into the organisation but loss of identity as to what the essence of its existence is. It can be argued that the

[25] During the United Nations intervention in the Bosnian war of 1991-1994, the Dutch military were given the responsibility of creating a safe haven for Bosnian Muslims at Srebrenica which is on the border between Bosnia and Serbia. The safe haven came under attack from the Bosnian Serb forces and the Dutch garrison surrendered to the Bosnian Serbs without a shot being fired. This resulted in 8000 Muslim men and boys being executed in one of the worst atrocities of the war.

Dutch infantry forgot that they were infantry soldiers and adopted an identity more akin to civil policing. When it came to fighting (their reason for existence) they had no cohesion or fighting spirit as that identity had been lost. The role that an organisation's identity plays in the achievement of its aims cannot be underestimated. Hatch (1993) argues that organisational beliefs are grounded in the organisation's cultural assumptions, but more importantly organisational identity only involves those cultural assumptions that are self defining for the organisation. If the cultural assumptions are eroded, the organisation loses the bedrock on which it bases its organisational identity. Returning to the Dutch military example, the constant UN and political interference in the mission on the ground coupled with highly restrictive rules of engagement with the Bosnian Serb forces meant that the Dutch unit lost its sense of self-definition and with that any cohesion to perform the duties that were asked of it.

This thesis therefore argues that infantry identity is sacrosanct and the institution within which infantry soldiers are trained has to be strictly maintained in order to achieve its aim. It is therefore accepted that the total institution that is the Infantry Training Centre is a 'necessary evil' to accomplish the organisational aim. What is of interest is whether or not the totalitarian nature of the institution as a whole is causing the problem of high attrition, or alternatively is it how the Army introduces the individual to that institution and integrates them into it that causes the problem. Israeli studies have shown that it is the rapid transition to military life, not the military institution itself which causes identity conflict, confusion, mental health problems and recruit attrition (Levy et al., 1987, Bleich and Levy, 1986).

As British society has become more civilised and the population as a whole has not experienced war, it has become more risk adverse. The military therefore reflects the society which it serves less and less. It could be argued that military forces from different nations have more in common than they do with their own nation state's national identity. It is the extreme nature of the military identity, its beliefs, values and attitudes which appears to account for failure and voluntary withdrawal from training amongst infantry recruits. The values, beliefs and attitudes of the infantry identity are so diverse from those of the infantry recruits social and personal identity that the recruit is unable to cope with the psychological demands that the transition to the Army organisation puts upon them. This is the process identified by Turner (1984), in which the recruit has to recategorise his social identity to incorporate a new military identity. This is achieved by the recruit defining themselves within the military environment in relation to other recruits, instructors and the physical environment (Tajfel and Turner, 1985). Social identity is very fragile during this process as the recruit re-establishes the hierarchy of his social categories based on his sense of belonging to the social group that is the infantry (Abrams and Hogg, 1990, Jenkins, 1996). If the recruit is unable to define himself as a member of this new and very different social group, then he becomes at risk of leaving. It is the difference in the identities that forms the catalyst for attrition in infantry training. Societal identity has become so detached from military identity that the gap between the two identities is vast, the chasm between the two being too great for many to cross.

To demonstrate this cultural difference Figure 21 identifies key situational demands that were identified by recruits as factors in their failure. Physical, emotional and social demands were identified as the main cause of transitional demand and stress. It is these demands and the expectation of

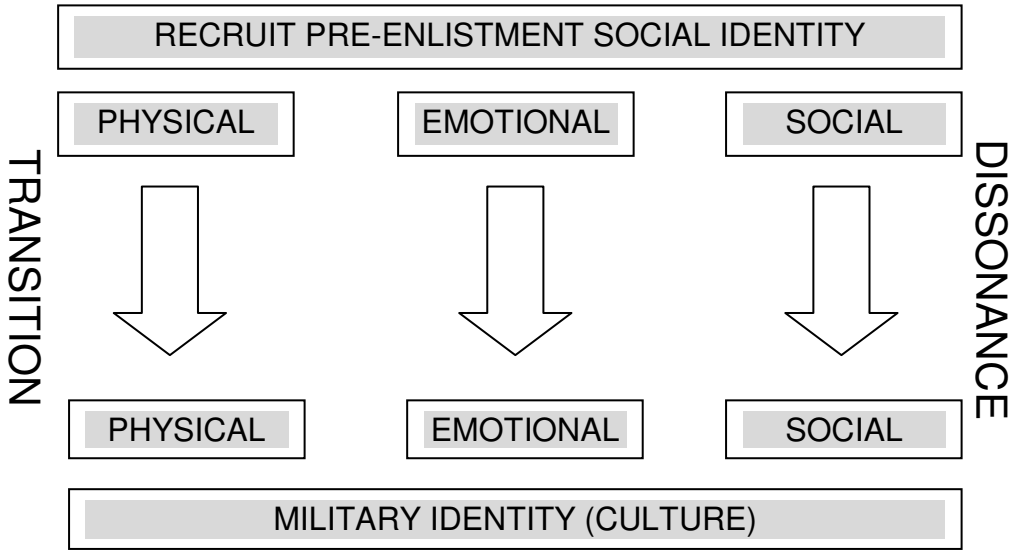
military organisational identity that creates the chasm between the two identities.

There are three fundamental areas where the military expects the individual to adapt to and adopt the cultural values and beliefs of the organisation (Figure 21). Physicality is at the heart of military identity as physical fitness equals better fighting effectiveness. The physical expectation of the military surpassed all of the expectations of those recruits who failed, even though the majority of recruits within the failure group of phase 1a participated in rugged outdoor activity and more than six hours of team sports per week prior to enlistment. It was not the lack of physical ability that caused them to fail, but the inability to psychologically cope with the physical expectations of the organisation. None of the previous British studies (Holland, 1985, Long, 1990, Hampson, 1997, Sirett, 1999) identified an association between poor fitness and failure, but more importantly, they do not make the association between physical expectations of the organisation and psychological failure. A recent US military study (Niebuhr et al., 2008) found that attempting to use physical fitness as an indicator of performance was very difficult, as the majority of discharge in that study were related to conduct, personality and mood disorders.

It is an important finding of this study that recruits generally have the physical capability to complete training, what they lack is the emotional robustness and social support required to succeed. The military expect high degrees of physical output at a point when the individual believes that they can no longer carry on. It requires team work and cohesion to overcome these difficulties and achieve success. In reality what is expected by the military and what the individual recruit can deliver differs and as a result the military has to

acknowledge that in excess of 30% of infantry recruits are not able to cope with the current method of transition from civilian life to life in infantry training.

Figure 21: **Recruit identity transition**



Those that failed appeared to lack the emotional maturity to make the transition, and once separated from their social support network and their established coping strategies, induction into training was too much for them to cope with. As identified in the results, if the recruit was living at home with his family then the physical demands would most probably not have caused the level of psychological stress that it did. In turn if the emotional or social factors were faced individually then again the recruit most probably would have coped. It is the culmination of these factors that impact on the individual, creating not only a cultural chasm that has to be crossed but also the complete loss of prior social and emotional support. This transitional period creates psychological turmoil, or cognitive dissonance within the recruit as he tries to make sense of the situation he finds himself in and develop new strategies to cope. As identified by Ashforth and Mael (1989) the opposing identities conflict as the recruit attempts to integrate the hierarchy of the

military organisational identity within his own social identity, causing the psychological inconsistency recognised in Festinger's (1957) cognitive dissonance theory (the dissonance being perpetuated by multiple individual and institutional demands). It is the impact of the dissonance and the recruit's inability to cope with it that is the primary cause of failure.

5.3: Trans-cultural difficulties during the transitional phase

5.3.1: Coping

Jenkins' (1996) theory of social identity suggests that coping is a learnt strategy that human beings develop from exposure to their social surroundings. Individually, we learn behaviour and how to cope by observing the behaviour of others (Bandura, 1977). As humans progress through life, their ability to cope generally increases unless damaged by a psychologically traumatic event. The findings within this study support the position of the established literature; that individuals in stressful situations do better if they have access to established social support mechanisms (Kobasa et al., 1982). Katz & Kahn (1978) conceptualised this notion of social support as: assistance from others, affirmation of beliefs, sharing practices with the 'group', being liked by others and knowing a lot of people who all know each other. Prior to enlistment, individual recruits would have well established support mechanisms. However, enlistment itself strips away almost all of Katz & Kahn's (1978) key components that define social support. In essence the recruit is stripped of his entire social support network through physical separation. What the findings suggest is that if the individual does not have a robust and established concept of self to cope with separation from their support network on enlistment into the Army, they progress rapidly from coping to not coping and fail in training. If coping is a learnt strategy (Jenkins, 1996) then it might be hypothesised that actions can be taken to help the individual to cope during inductions into the organisation.

The findings of this study show recruits failing to convert stressful stimuli into healthy coping strategies. Difficulty in coping instigated a sequence of self

doubt as regards belonging, which in turn undermined their own confidence in their performance ability and their self-esteem. What was observed in effect was a self-fulfilling prophecy. The recruit began to believe that he did not belong which in turn affected his performance; this evoked poor feedback from the instructors which reinforced the recruits own thoughts of self doubt. Very quickly the recruit moved from having difficulty in coping to not being able to cope with the situation he found himself in. As identified in Kobasa et al's (1982) study, the failure to cope with the stressful stimuli and adapt to their surroundings led to high levels of stress and a deterioration in mental health. This was most prominently observed in the mood scores taken from each recruit interviewed after failure.

It can be argued that what is being observed is an example of Goffman's process of self-mortification. It has already been argued that the infantry training centre provides a near perfect example of the total institution. It has also been argued from the outset of this thesis that the consensus of opinion amongst Goffman's critics is that if such a total institution existed then it has the potential to be harmful to some of those that are inmates within it when they experience the 'shock period' (Scott, 2010, Homer, 1981, Karmel, 1969). Self mortification is the loss of self-concept and self esteem when an individual enters a total institution and the institutional processes that contribute to the 'grinding down of self' (Karmel, 1969, Homer, 1981). Goffman (1961) observed that admission procedures either intentionally or unintentionally begin a series of abasements, degradations, humiliations and profanations of self. He suggests that individuals entering a total institution undergo a change in self-concept, arguing that after admission the inmate is not the same as prior to admission, as the individual takes on a different self-concept. This is the process of the recruit redefining their social identity within

the military organisation as they struggle with the difficulties and psychological conflict that being an organisational newcomer brings (Jenkins, 1996, Ashforth and Mael, 1989, Fisher, 1986). Karmel (1969) and Homer (1981) argues that Goffman's belief that the individual reassembles his concept of self after the shock period is over simplified, and that other factors come into play. He argues that individuals base their concept of self on feelings about significant others, and therefore the degree of self-mortification experienced by the individual is based upon how significant he considers those who are in charge of the institution. In relation to this study it could be argued that those recruits who cared little for the instructor's opinion of them (as they did not consider them significant) fared better than those for whom it mattered more. Being able to 'play the game' and not take seriously the activities designed to abase acted as an insulator to the process of self-mortification, with the attitudes and behaviour of the institution not affecting their self-esteem and social identity. What is important is Tittle's (1972-1973) observation that integration into the institution improves self esteem, which conversely would mean that those that were not able to integrate experience a loss of self esteem.

The findings of this study clearly support Karmel's (1969) assertion that the process of self mortification can occur in various different kinds of total institutions. However, the way in which it affects the individual varies greatly. Within the failure group in this study, the process of self-mortification caused loss of self-esteem, low mood and a loss of the sense of belonging. What is important for organisations such as the Army is its process of induction; there appears to be a fine line between integration and mortification. Organisations have to be conscious that their induction processes are integrating organisational newcomers and not mortifying them, as the latter clearly is not in the interest of the organisation or the individual.

5.3.2: Expectation

It was evident amongst those recruits that failed that the transition to military life was a greater challenge than they had expected. When met with the demands of basic training they were overwhelmed and believed themselves incapable of meeting the expectations placed upon them; subsequently their commitment towards training appeared to wane. They failed to anticipate or prepare for the environment in which they were going to live and the physical realities of military life. They seemed to have had no understanding of what military culture and service entailed and failed to make sufficient social or emotional preparation. However, it is not the fault of the recruit that they have a poor perception of what life in the Army entails. This thesis has asserted that the Army is a closed institution, so the only source of credible information for recruits entering training has to come from the recruitment process. It would be too easy to place the blame for false expectations on the recruit and for the organisation to avoid any reflection on their organisational practice. It is evident that the Army portrays a positive image, as it has a constant flow of willing volunteers to join. However, as identified by Tüzün and Cağlar (2009) organisational trust is the bridge between organisational attractiveness and organisational identification and commitment, and if recruits are deceived with regards to their expectation of service life and infantry training, all trust will be lost when they are met with the reality of the organisation. When recruits spoke about how they had not anticipated the regime in training, they were verbalising their annoyance at being misled about what infantry training consisted off. This in turn caused a breakdown of trust between the recruit and the Army with the recruit no longer being attracted to the organisation or willing to stay.

The problem of recruits being misinformed about service life is not isolated to this study. Hampson (1997) and Sirett (1999) have previously identified that there was a mismatch between the expectations of recruits and the reality of training. Sirett (1999) referred to this failure in expectation as 'culture shock', and stated that the recruits had a poor expectation of the discipline and the loss of personal freedom. Recruits in this study also cited the loss of freedom and the unexpected harshness of discipline as reasons for leaving, and reported that their expectations did not match the reality of training. Hampson (1997) also observed that there was a failure in expectation as to what the recruit experience would be like. Hampson (1997) identified that the reasons for failure were multiple and that a combination of factors affected different recruits; the recurrent theme being that there was no expectation by the recruit of how difficult training could be. Both Hampson (1997) and Sirett (1999) identified that the initial demands of the first weeks of training were the major cause of discharge and suggested strategies that would ease the transition from civilian life to Army service, as well as ways in which the expectations of the recruit could be improved. Their findings are consistent with the present study as regards the cumulative demands that are associated with failure. What this study adds is an understanding of those cumulative demands through the personal accounts of recruits, and how their decision to leave training or their inability to continue training psychologically manifests itself. As identified in the findings of this study, it is the inability to cope with the psychological impact of the cumulative demands of training and military life that causes failure.

5.3.3: Cognitive Dissonance

It has been argued that a recruit's unrealistic or misinformed expectations of service life are a fundamental cause of the breakdown of trust between him and the Army. A subsequent effect of this conflict between what the recruit believes Army life will be like, and what they are actually faced with in reality, is that a significant proportion of the recruits experience debilitating cognitive dissonance. Festinger (1962) proposed that an individual prefers and seeks consistency, and will change attitudes and behaviours to reach a consistent state. Dissonance refers to the personal tension or stress experienced when an individual's actions contradict or are inconsistent with his or her values or beliefs (Gruber 2003). Kowol (2008) argues that individuals, such as the recruits in this study, will hold information regarding what they believe Army life to be like prior to enlistment. These will be beliefs created from Army recruitment material, the media, television and films and will lead the recruit to establish idealistic notions of what Army life will be like. Naturally they will seek information that will support these beliefs, but when they are exposed to the reality of military training they are confronted with non-supportive information that challenges their established beliefs causing cognitive dissonance (Kowol, 2008, O'keefe, 2002). However, O'Keefe (2002) does question the significance of mass media and misinformation. He argues that individuals will seek information to support their beliefs even when the beliefs lead to behaviour that is not in the individual's best interest. What was observed in this study was that recruit failure is the result of psychological inconsistencies not logical inconsistencies. It can be argued that leaving training is not a logical action for the recruit to take. They have expended a great amount of energy, commitment and time to get in to the Army and they are leaving a career that offers long term job security and guaranteed incremental pay increases. The level of psychological discomfort overwhelms

logical thought, which makes the recruit seek information that supports his belief that he is better off leaving the Army. Therefore it is important to acknowledge that the dissonance is caused by psychological inconsistency, not logical inconsistency (Festinger, 1957), with the recruit rejecting the logical course of behaviour, i.e. 'training is only for a short period of time and then things get better'. This is a critical point for the Army to acknowledge as they must focus on what is causing the psychological discomfort as this is what makes the recruit behave in a way that might appear not to be considered rational or objective.

Another significant factor is the very short period of time during which the Infantry Training Centre attempts to fashion the individual's beliefs. If an individual's beliefs are inconsistent with that of the institution, trying to impose institutional beliefs over a matter of days potentially causes a polar response; the individual has to decide whether they belong or not and no time is given for attitudinal change. Festinger (1957) believes that cognitive dissonance is a motivational state which drives the individual to attitudinal change in order to seek consonance. To achieve consonance the recruit will have to either change his beliefs to those that are in tandem with the Army or attempt to change the Army's beliefs to match his. With little time to achieve either, what is potentially happening is that the recruit does not change his beliefs about the Army but actually enters into a period of 'post-decisional' dissonance (Littlejohn and Foss, 2005) where the recruit begins to deliberate over whether he has made the correct decision regarding joining. Littlejohn and Foss (2005) refer to this as 'postpurchase dissonance' (sic) and describe how the individual will seek information to support their beliefs. If the recruit believes that he has made a mistake by joining he will seek information that supports his own sense that he should leave. It is at this point of dissonance that Smith

and Taylor (2004) argue that sellers (the Army) should support buyers (the recruit) with reassurance and additional support so that the individual believes that they have made the right choice in joining.

This thesis argues, therefore, that poor recruitment information and the portrayal of service life in the media causes the recruit to create misguided nostalgic beliefs about service life. These idealised beliefs are not congruent with the reality of infantry training and become dissonant with the Army's beliefs. The pressure and speed of expectations to accept the Army's beliefs do not allow for attitudinal change which in turn drives the recruit to seek consonance through leaving.

This problem is not isolated to the British military, as similar psychological conflict has been observed in young Israeli Army recruits (Bleich and Levy, 1986). Bleich and Levy (1986) observed a psychological crisis that occurs when young Israelis are conscripted into the Army. They identified that conscripts were generally late adolescents who were at the height of 'exploration' and 'crystallisation' of their identities. Enlistment interrupted this crystallisation process causing a crisis as regards their 'status and role'. Bleich and Levy (1986) view the conflict from an individual developmental prospective but what they describe is not dissimilar to the dissonance observed in this study's population.

The challenge for the Army is to assist those recruits that have the potential to be successful in transiting the period of dissonance and achieving consistency in their thoughts, beliefs, values and attitudes. The aim being to better prepare them to face the physical, emotional and social challenges associated with the transition into the Army. The key to success lies in providing the recruit with a

suitable bridge to cross the divide between their social identity and the military organisational identity and allow for attitudinal change. It will take time to cross the gulf between the two identities as the individual has to adapt and learn to cope with their new life and surroundings as well as the expectations of their new cultural setting.

This returns to the question of whether current Army discharge policy is supporting the recruit or inadvertently placing them under pressure to leave. The Army's 'Discharge as of Right' policy potentially hinders the recruit's transition to military life by providing an attractive option of escape and reinforcing the belief that if they don't belong they can seek consonance by returning to what they know and avoiding attitudinal change. When recruits that failed were asked about how they would feel should service now be akin to National Service of the 1950s; surprisingly the majority stated that they would 'get on with it'. The option to leave is too easy at the fundamental point during the crossing of the chasm between the two identities.

Ashforth and Mael (1989) and Jenkins (1996) identify this point both in organisational newcomers and when transiting social identities. The recruit is adapting their social identity to incorporate the new military organisational identity. They are struggling to resolve the category conflict as they psychologically process the norms and values of the military organisation and attempt to place them in a hierarchy of importance within their own social identity. During this transitional phase where the recruit is adjusting and adapting to his new surroundings the emphasis should be on encouraging commitment and staying through support, rather than inviting them to leave.

However, the resolution of this problem is not as simple as moving the Discharge as of Right period further into the recruit's training and making them stay. On the contrary, the Army has to capitalise on the recruit's initial attraction to the organisation and make staying attractive by making the transition to the military more achievable. The recruits left because they had convinced themselves that they did not fit in or did not have the ability to succeed in training; the Army's challenge is to adapt their enlistment process so that the recruit's confidence in his own ability is improved. Training should be designed to help overcome the challenges faced. Until the recruits have adapted they should be gradually introduced to their new organisation one challenge at a time.

The benefits of the organisation investing time in newcomers and developing trust is identified by Puusa and Tolvanen (2006) who believe that capitalising on the initial attractiveness of the organisation and developing trust between the organisation and the individual is the key to assisting the individual in crossing the 'mental bridge' between the two. They believe that slowly introducing the recruit to the organisation's identity will engender trust, maintain attractiveness and provide the recruit with the time to resolve the identity conflict and cognitive dissonance that enlistment causes. The ultimate aim is that the recruit internalises some, if not all of the norms and values of the Army and places Army identity within the top of the hierarchy of their social identity.

5.3.4: Factors affecting transition

The qualitative findings showed that there were multiple situational demands that influenced the recruits' abilities to adapt and cope with the transition to

Army life. The period of transition between cultures is when the recruit is at the highest risk of failure. This is not a new finding as both Hampson (1997) and Sirett (1999) formed the same conclusions based on a broader Army population. However, to accept the above reason for failure is over simplified and places the blame for failure firmly with the recruit. This does not reflect the role that the organisation plays in recruit failure. This study not only identifies the multiple situational demands that recruits are exposed to but also identifies the effect which it has on them, and the cognitive processes that are a result of them. Most importantly, it identifies when the recruit is most vulnerable to failure and how they make the decision to leave.

The importance of this new information cannot be under estimated if the organisation is motivated to recognise its own role in attrition and improve the recruit wastage figures. The Army now have the information to identify when a recruit is most vulnerable and target interventions at specific times in the enlistment process to reduce the impact of situations that cause attrition. To achieve a greater chance of reducing attrition rates, multiple solutions are required to reduce the impact that the situational demands have during transition. For example recruits spoke of a loss of freedom after initial entry as they did not go home for seven weeks. To reduce the impact of enlistment this restriction could be removed. This would allow the recruit to go home at the weekends, providing an integrated approach to them learning to cope and adapt. This would help to reduce the amount of dissonance experienced as the recruit would still remain firmly in contact with his established social support network whilst slowly building a new support network in the Army, making the transition at a pace that he is able to cope with and allowing attitudinal change. Coupling this with moving the opportunity to leave further

into training could help to reduce the psychological impact of the initial transition and provide a realistic time for adaptation.

The challenge for the military organisation during the transitional period is to help the recruits adapt their established behaviours to those behaviours that are expected within a military institution. The findings from Phase 1 of the present study suggest that prior to enlistment, avoidant behaviours and difficulty with coping are traits associated with those who went on to fail, indicating that within the failure group difficulties experienced at school are being replicated in the initial phase of Army infantry training. It seems that failure in training is more common among individuals who have difficulty with discipline, and use absenteeism and aggression as a coping strategy. Their commitment to make the transition to the military is overwhelmed and they revert to their previously established avoidant behaviours, adopting a childlike surrender rather than the Army's expected "mature" approach of suffering the hardship of training for the deferred gratification of success. Commanding Officers wrote about the lack of maturity and the lack of desire to pass, and reported how recruits used medical or welfare appointments as a tool to avoid the hardships of training.

Findings from phase 1 of this study also suggested that individuals with poor self discipline had difficulty conforming to the Army's expectation of discipline. It can be argued that recruits who failed placed little importance on the value of self discipline and the need to behave to a set of rules. Whilst in school they probably had no desire to be there and did not conform to the school's expectations of behaviour and achievement. Their concept of self-discipline and their values and norms would have come from the experiences that created their social identity; the evidence suggests that they did not value

education, structure and discipline and therefore showed little or no interest in school. However, what this study found is that when they did find something that they valued and were attracted to (the Army), they did not know how to cope and adapt with the hardship that went with achieving what they wanted (success in recruit training). As identified, prior to enlistment those within the failure group appear to have established avoidant behaviours rather than dealing with the hardships that commitment and achievement caused. Mael and Ashforth's (1995) study on US recruits was based on the premise that if the US Army selected those recruits that identified with the values and beliefs of the US Army then recruit attrition would be reduced. This proposed that established behaviour would repeat itself in training and recruits would remain loyal to the military as they had shared beliefs. Although prediction of failure in both this study and Mael and Asforth's (1995) study is limited, this study supports Mael and Asforth's (1995) findings as the recruits that failed displayed behaviour in training which was evident in their school history. This behaviour led to poor achievement at school and a similar outcome in the Army. They repeated their pattern of school behaviour which ultimately was a factor in their failure in infantry training.

The argument that patterns of avoidant behaviours and failure to succeed repeat themselves in adult life following schooling suggests that recruits who have difficulty with commitment and achievement do not possess the social and psychological maturity to achieve success at the point when they most desire it. This question of social and psychological maturity is vitally important as the military needs to recognise that their recruitment methods have not changed dramatically for three decades. However, the schooling system and its approach to competitiveness and discipline have. The Army needs to reflect upon whether recruits have the level of emotional maturity and life

experience required to endure the rigors of infantry training. Not only does the Army need to consider its current recruitment process, but also it potentially needs to acknowledge that some recruits may not able to commence military training at the point of entry and would require a period of transitional training and socialisation.

5.3.5: Fitting in

What appears to be the most critical point during the transitional phase is the period when the recruit begins to doubt whether he belongs or fits in. Reflecting on the argument that the transitional phase causes cognitive dissonance, Kowol (2008) argues that if a dissonant cognition violates the individual's concept of self (the realisation that the Army is not what they expected and they doubt whether they are good enough to succeed) the recruit will engage in ego-defensive, dissonance reducing behaviour. As individuals reduce their dissonance they aim to maintain a positive image of themselves, an image that depicts the individual as being good, smart or worthwhile (Kowol, 2008). Aronson (2004) argues that people are not rational beings but rather rationalising beings, motivated to believe that they are right and to justify their own actions and beliefs, convincing themselves that when they do something it is a reasonable and logical thing to do. What was observed in this study were recruits engaging in dissonance reducing behaviour that is ego-defensive. There is no recognition that they are at fault; on the contrary they state that it is the Army's way of life that is unacceptable and they don't belong or fit into it. More interestingly, this might explain the unexpected phenomenon of recruits who clearly had difficulty in training creating elaborate and noble reasons for why they had to leave (sick relative,

mother or girlfriend not coping without them etc) that did not appear to be substantiated or supported by their Commanding Officers' reports.

The notion of this sense of fitting in was observed by Shabtay(1995a) when looking at Ethiopian immigrants achieving Israeli naturalisation. Shabtay(1995a) observed that national identity was an achieved status and that the Ethiopian recruits had to adapt to Israeli society and serve in the military not only to be seen to fit in, but also to feel that they fit in. The need for the recruit to feel that they belong cannot be underestimated. Ashforth and Mael (1989) argue that organisational newcomers are particularly vulnerable as they are unsure of their role and status within the new organisation and will build a self definition of the organisation based on their initial experience, using that to determine whether they belong or not.

The present study identified that the recruit had to adapt and earn his status in the military organisation. When the recruit was accepted by the organisation, he felt accepted in himself and part of the larger group. The point when the recruit questioned this sense of belonging was the point where he had most difficulty in fitting in. As the recruit tried to cope with the multiple demands being placed upon him, in conjunction with adapting to his new environment, he soon reached the limit of his ability to cope. Eventually, when he could cope no longer, he made the decision that he did not belong and from that point forward the recruit sought only to distance himself from the Army as soon as possible. Prior to that point the recruit was coping; he may have had difficulty in coping, but he was coping nonetheless. What is important about this finding is that the qualitative evidence suggests that once a recruit decides that he no longer belongs and has made the decision to leave there is

little hope of return. From a retention perspective this suggests that any intervention to increase recruit success has to be performed prior to this point.

5.3.6: Mood and Performance

The emotional impact of training on those recruits who failed was the part of the study which was most surprising. What was observed in the failure group was a marked deterioration in their subjective mood, which in turn had an adverse effect on their performance. This appeared to be the start of a cycle of decline as the recruit struggled with the impact of initial training and how it made him feel. Once the mood began to deteriorate, the recruit soon lost any hope of completing training and doubted the purpose of the training that they were being exposed to. They appeared to be unable to see that the discipline and hardship aimed to test them and to stimulate cohesive unity amongst the recruits.

The need to impose its cultural or organisational identity is imperative to achieving the organisation's requirements. The individual's inability to process and internalise the beliefs and values of the organisation is probably not only due to them being at odds with their own beliefs, but also due to the methods with which they are imposed. Levy et al (1987) identified a similar conflict between 'youth identity' and 'military identity' amongst Israeli conscripts. They observed 'youth identity' with its own interests, cultural norms and values and contrasted that with 'military identity', which is a 'rational, formal, grown-up ideology, the purpose of which is to defend the country'. Very similar observations concerning this conflict of identities have been observed in this study, as there is a chasm between the values and beliefs of the recruit and those of the infantry. The current training process appears to thrust the

infantry's identity upon the individual recruit with such rapidity that it threatens their sense of personal identity, causing psychological conflict and dissonance and subsequently deterioration in mood. However, it is not just the rapidity of transition that causes problems, although that is potentially one of the major contributing factors. It has already been argued that the nature of the infantry training institution is total and that symptoms of the self-mortifying process were observed amongst the failure group. The impact on mood is caused by a complex mix of environment, staff behaviour and identity conflict which results in persistent low mood. This is not an uncommon phenomenon amongst military communities and similar symptoms were observed in the psychiatric casualties from the Second Gulf War (1993). During that war 178 casualties were evacuated for psychiatric reasons, of which 50.8% (n=59) were diagnosed with adjustment disorders and 30.2% had no diagnosable psychiatric disorder on return to the UK (Turner et al., 2005). Turner et al (2005) argue that as the fighting was brief and of low intensity the mental health problems observed were characteristic of adjustment disorder. This almost always included low mood and was not dissimilar to that observed in the peace time military population. Most relevant to this study is that 78% of those evacuated cited difficulties in coping with the physical environment and separation from family as the cause of their symptoms. Turner et al (2005) argue that the casualty rate observed was a result of situational stressors and that longer term mental health problems and relatively poor military identity were a cause and not a consequence of military personnel failing to cope.

Phase 2 of the present study identified that for just under half of those recruits interviewed, their subjective mood failed to fully recover prior to discharge. Under a quarter of all interviewees' subjective mood failed to recover above five (scale 0-10) prior to discharge. It is argued that the most likely cause of

the sustained low mood is that an adjustment disorder[26] was observed in the failure group not dissimilar to that observed in the psychiatric casualties from the Second Gulf War. What is of most importance is that evidence of mood deterioration was observed in the failure group interviewed, caused directly by the situation in which they found themselves. Evidence of stress and mood deterioration in such a substantial number of failing recruits adds further pressure to review the method of induction into training and how the transition into the infantry is managed.

[26] International Classification of Disease, F43.2 States of subjective distress and emotional disturbance, usually interfering with social functioning and performance, and arising in the period of adaptation to a significant life change or to the consequences of a stressful life event (including the presence or possibility of serious physical illness).

5.4: Predicting recruitment outcome using a risk score

Although the study has developed a comprehensive understanding of the cause of failure in infantry recruits, the biographical questionnaire proved to offer only a slightly better than chance ability to predict failure. The proportion of recruits that it would incorrectly place as either being successful or unsuccessful was too great to recommend its routine use. The highest positive predictive value was 44.2% at a cut-point of greater than or equal to 44.0 (n=32), indicating that if the model was used to screen recruits into additional training, and the threshold was set at a cut-point of greater than or equal to 44, 55.3% of those screened into additional training at extra cost would not have required that training.

This raises an important question about the biographical questionnaire itself and its overall relevance with regards to predicting recruit attrition. Mael and Ashforth (1995) developed the biographical questionaire to identify the dimensions of organisational identity within the US military. The focus of their study was on the relationship between a recruit's antecedent biographical factors and identification with the US Army. The impact of organisational identification in relation to recruit attrition was measured as a practical concern. Their results identified four biographical factors which were associated with increased organisational identification (pre-enlistment participation in rugged outdoor activity, solid citizen, participation in group orientated team sports and intellectual and achievement orientated pursuits). Mael and Ashforth (1995) acknowledge that the relationship between organisational identification and attrition was not the focus of the study. However a positive relationship between good organisational identification and reduced attrition was observed. What their study did not comment on was

the effectiveness of biographical data alone in predicting attrition. This study used Mael and Ashforth's (1995) biographical data tool as indicator of organisational fit and whether it was possible to discriminate between those that pass and those that fail. The tool was relatively successful in identifying the behavioural traits that were associated with failure, but potentially fell down on its inability to identify those emotional traits that were most prominent in the failure group. The study did identify that there were pre and post enlistment patterns of behaviour. However, it has been argued that the most prominent factor attributable to failure was an inability to cope with the nature of the training institution, poor expectation of service life, identity conflict, and the cumulative cognitive dissonance and self-mortification caused by all of these factors.

This is not to say that the biographical data gathered is of no use. On the contrary, as already evident in this chapter some of the variables that were statistically associated with failure are consistent with the findings of phase 2 of the present study, showing patterns of behaviour repeating themselves in the Army which were evident in the recruit's pre-military life. These findings are not dissimilar to Mael and Ashforth's (1995) as they observed that certain patterns of behaviour such as 'solid citizen behaviour' were associated with training success and low attrition.

The present study supports Long's (1990) and Hampson's (1997) assumption that predicting attrition in military training is problematic as the cause of failure is multi-faceted. This is the only study into military training attrition to attempt to use biographical data to predict training attrition, and of the studies reviewed it is the only one to test its findings on a separate validation dataset. The findings of this study also reflect more recent studies of predicting military

training outcomes (Niebuhr et al., 2008, Armstrong et al., 2000, Larson et al., 2002), and again share the conclusion that predicting training success or failure is notoriously difficult due to the significant level of false positives. What has been learnt from the present study, which supports Mael and Ashforth (1995) and Hampson's (1997) findings, is that there is an association between pre-enlistment behaviour and training outcome. However this association is not significant enough to be used for prediction.

Some of the variables within the predictive model are more difficult than others to interpret. The recruits were asked how they responded to stressful situations; the options available to them ranged from 'aggressive outburst' to 'methodical problem solving'. Those that responded to stressful situations non-aggressively decreased their odds of failure by over a half. Similarly, those who grew up with female siblings had odds of failure which were half that of those who only had brothers. Being an only child showed no association with failure, indicating that having a sister was a protective factor. This poses the question as to whether there is a link between the formation of limited aggressive coping mechanisms and the lack of peer female influence in the formative years. Being able to communicate well and talk about problems was a protective factor and potentially reduced the cognitive dissonance experienced. Those recruits with good communication skills were more able to establish new friendships which in turn provided them with a social support network which enabled them to cope better with the expected attitudinal change that was required for success. Arguably, recruits that grow up with sisters have learnt to negotiate and compromise, as aggression towards sisters would have been unacceptable in the family home; aggression towards a male sibling may have been less of a problem.

Spending between two and five evenings at home per week also decreased the odds of failure by half in comparison to only spending one evening at home. Spending more than five evenings a week at the family home was not associated with training failure. This would suggest that those recruits who had a balance between spending evenings in with their family and some evenings out increased their chances of training success. Potentially, what is being observed in these recruits is a gradual achievement of independence away from the family unit. By going out a few nights a week they are developing their independence and ability to cope outside of the family unit, making their own decisions and friends. By the time they enlist in the military they are used to having their own independence but still have strong links with the family unit and the support that the family provides. Wintre and Ben-Knaz (2000) examined the effect that parenting style played on an individual's ability to cope with stressful life events. They employed a model developed to investigate the transition in young adults from home to military service on 114 male Israeli conscripts which consisted of the use of eight psychometric scales.[27] The study examined three parental approaches (authoritative, authoritarian and permissive[28]) to investigate the impact which these different parenting styles had on the individual's ability to cope on leaving home and commencing compulsory military service within the Israeli Defence Force.

[27] Parental Authority Questionnaire (Buri 1991), Perception of Parental Reciprocity Scale (Wintre et al 1995), Social Provisions Scale-Present Version (Cutrona 1989), Individual Adequacy Subscale of the Psychosocial Maturity Inventory (Greenberger 1974), Self-Esteem Scale (Rosenberg, 1965), Beck Depression Inventory (Beck et al 1961) and Perceived Stress Scale (Cohen 1983) in Wintre, M. G. & Ben-Knaz, R. 2000. It's Not Academic, You're in the Army Now: Adjustment to the Army as a Comparative Context for Adjustment to University. *Journal of Adolescent Research,* 15**,** 145-172.

[28] Authoritative parents as monitors of their children's behaviours and the setters of age related expectations and good communicators. Authoritarian parents are seen as controlling, highly demanding and discouraging of communication whereas permissive parents are seen as undemanding. Baumrind Baumrind, D. 1971. Current Patterns of Parental Authority. *Development Psychology Monographs,* 4**,** 1-103.

Wintre and Ben-Knaz (2000) argue that there is a consensus of opinion that authoritative parenting practices seem to be the most beneficial means of child rearing. They identify that this is specifically so with regards to academic achievement, autonomy, self-esteem, social competence and personal and social responsibility. In addition they argue that children raised in an authoritative style displayed less depressive symptomology than those raised in an authoritarian or permissive way. Their study tested the hypothesis that authoritative parenting best prepares the individual to cope with the rigours of military service. An explanation as to why permissively reared adolescents did better in an authoritarian organisation was that the imposed structure of the army provided an unambiguous situation with clear expectations and outcomes, which may be perceived as less stressful and more esteem enhancing by the permissively reared (Wintre and Ben-Knaz, 2000). In addition to this it can be argued that permissively reared children develop a far more comprehensive ability to cope with life in general out of necessity due to lack of parental guidance. More importantly, authoritative and authoritarian parental styles possibly stunt the individual's development of coping skills due to either cosseting or the insistence that they adopt the skills and traits of the parents. What is observed in this study is that recruits that sit between the permissive (always allowed out and never spend a night at home) and the authoritative (spend more nights in than out) parenting styles do better with the transition to military service. What Wintre and Ben-Knaz (2000) and this study identify is that those recruits that are afforded a degree of independence during school years appear to cope better with stressful life events. Arguably this is linked to increased emotional maturity, a lack of which was identified by instructors as a factor associated with failure. However the biographical data questionnaire did not measure parenting directly and its difficult to draw direct relationships between parenting style and recruit success. Alternatively,

depressive symptoms described by Wintre and Ben-Knaz (2000) were observed in this study's failure population; it would be of interest in future research to see if there is also a link between parenting style and poor recruit adjustment and performance.

Classroom behaviour was identified as being associated with failure indicating that those who sat quietly and paid attention were potentially twice as likely to fail compared with those who daydreamed. However, as discussed in the results section, this variable had a p value of 0.052 and was on the threshold for inclusion.

What was clear from the results was that attending three or more schools nearly doubled the odds of failure. What makes this variable difficult to interpret is that it does not differentiate between those that moved schools for family reasons and those that attended multiple schools for disciplinary reasons. Without knowing why so many schools were attended little meaning can be drawn from this finding. However, what it potentially indicates is an individual who finds it difficult to settle and fit in. This assumption would corroborate with the phase 2 findings where difficulty in adjusting and fitting in was given as the fundamental reason for recruits leaving.

What is evident from the statistical model is the collective picture that it produces of a recruit more likely to fail. We are provided with an image of a recruit who is more inclined to adopt aggressive strategies when under stress and had a disrupted childhood or difficulty in settling into schools. In comparison with the phase 2 results there are striking instances of repeat behaviour; that is the recruit who fails in training is repeating behaviour

already established at school. The recruits that failed reported difficulties in coping with the training and also found it hard to settle and fit into army life.

5.5: Implications of findings: Next steps for further study

The current level of attrition at the British Army Infantry Training Centre is unacceptable for both financial and humanitarian reasons. This study identifies three areas in which the Army needs to examine its current recruitment and enlistment practices if it is truly motivated to reduce the amount of attrition that is currently observed in the infantry training population.

5.5.1: Recruitment process

This study has argued that recruits who failed had unrealistic expectations of life and training in the Infantry Training Centre. They had established idealised beliefs of what infantry training would be like which were not matched by reality. Subsequently, on arrival to training they experienced a high degree of cognitive dissonance which eventually resulted in discharge. Recruits need to be able to prepare for enlistment both physically and mentally, so it is vitally important that they are given the most accurate information as possible regarding what life in training is like. It is particularly important that this preparation includes information about the environment, instruction technique and the training program which recruits will experience. Army careers offices need to review their current information and ensure that it portrays a realistic representation of infantry training. In addition, it would be beneficial if potential recruits were given a short presentation followed by a question and answer session by a recruit who has just successfully completed training. This again would give potential recruits a pragmatic view of what training will consist of and allow them to ask questions. The benefit of this would be that potential recruits would be in a better position during the recruitment process to make an informed decision as to whether or not they are truly suited to infantry life.

5.5.2: Prediction of training failure

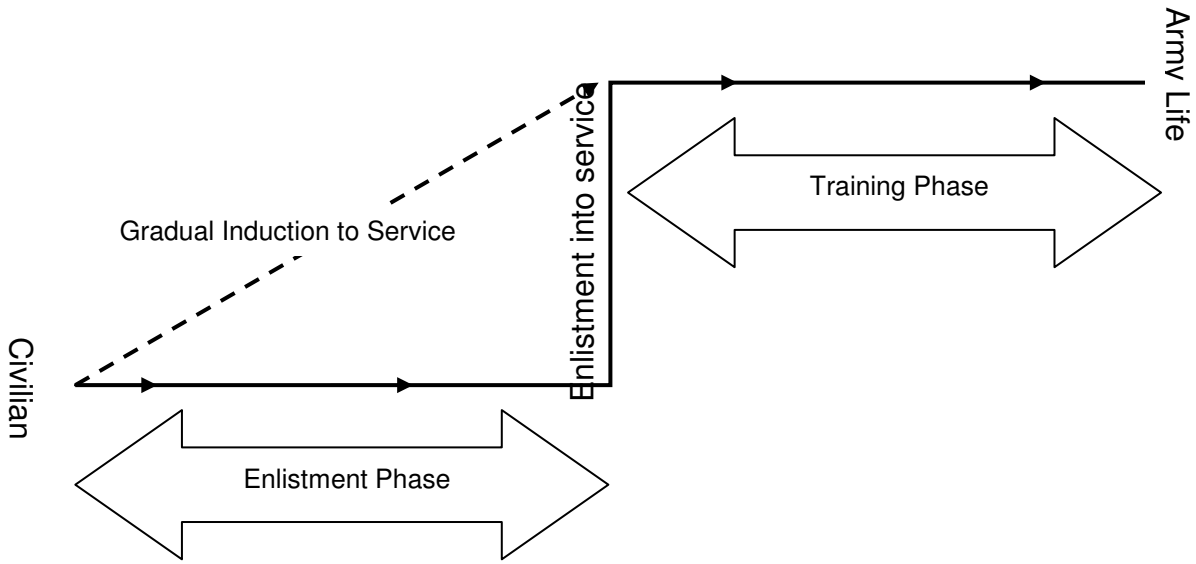
Although the British Army Recruit Battery is relatively useful at identifying an intellectual and physical capacity for training, it does not appear to predict organisational fit well (Hampson, 1997). The biographical data tool identified behavioural characteristics which were associated with training, but did not have the ability to identify those emotional factors which were associated with training failure. For decades the British military has attempted to develop a psychometric test to assist in predicting success in recruit training. This study has shown that biographical data has potential to assist in predicting recruit failure and occupational fit, but not as a standalone tool. It was the emotional factors which were the most prominent cause of failure. Future research might beneficially look at how successful an amalgamation of current psychometric measures, biographical questionnaires and a scale that measures the emotional factors is at predicting training failure or success. The US military have adopted this approach and use a non-cognitive two scale test battery which includes an 'assessment of individual motivation' tool and a 'biographical inventory questionnaire' (Borman et al., 2004a). Of considerable note regarding this current US military research is the inclusion in the 'biographical inventory questionnaire' of self-report measures related to reactions to specific life events that are indicative of the targeted personal characteristics. The US military have identified the need for emotional robustness and are attempting to measure that in relation to previous emotional responses to specific life events. The study is longitudinal and currently ongoing; however, initial findings are encouraging with regards to the ability to identify those at an increased risk of failure. If the UK military is to continue to be reliant on predictive tools it needs to reflect the progress made by the US military and develop a multiple scale recruitment battery.

5.5.3: Enlistment process

The enlistment process is arguably the area where the most impact could be achieved to reduce attrition. The present study suggests three areas for further research and intervention strategies: the enlistment phase, the training phase, and the exit phase. Within the qualitative findings it was identified that among recruits who don't complete training there appear to be gateways that recruits pass through on a journey to failure, where they make the transition from coping to not coping. The findings in the present study suggest that once a recruit has entered the exit phase then there is little hope of recovery. Therefore, research and interventions at the exit phase would not be recommended as the financial cost of letting recruits progress that far into training with little chance of successful recovery would not make it financially viable. This leaves the enlistment phase and the training phase as potential areas for intervention. This identified training cost is a key factor when considering potential interventions during the enlistment phase. The longer that the recruit who fails in training remains the greater the cost of that training failure. The goal is to achieve a balance between attaining minimal manpower wastage and maximising training success, thereby reducing the financial cost of training wastage overall.

Figure 22 provides a diagrammatic picture of the recruit's enlistment journey. The point of entry into service is described by the recruits who failed and is illustrated here as vertical challenge, a cliff which they must climb. This vertical climb incorporates the demands of enlistment, and all of the demands which apply pressure to the recruits coping strategies.

Figure 22: **Enlistment journey**



The dotted line in Figure 22 demonstrates a potential solution which could reduce the transitional impact that enlistment has on the recruit in the early stages of recruit training. This study has identified that it is the sudden impact of the situational demands which causes their ability to cope to be overwhelmed. Therefore a slower integration may be one way in which the impact of the transition to the military can be minimised. Figure 22 proposes that rather than presenting the recruit with a short, intense, overwhelming transition into training that risks high attrition, it would be better to introduce the recruit to the Army through a graduated transitional period.

It is recommended, on the basis of this study, that the enlistment process consist of a series of familiarisation days that build up to a two week transitional training course. This course would involve enjoyable activities such as adventurous training as well as team building and socialisation

exercises. In addition to this, group sessions would focus on informing potential recruits about the infantry's ethos, values, beliefs, goals and culture, clearly stating to them what will be expected of them in training. A key recommendation is that this period of transitional training should be conducted in civilian attire, and that the recruit should be allowed to leave at any point should he decide that the infantry is not for him. Such an approach potentially removes the sense of being trapped, as the recruit is essentially having an introduction to the infantry and using this process to gain an informed insight prior to making his decision to join. In turn, the infantry would also have a period of time to assess the recruit's suitability for training prior to full enlistment. This process of transitional training would aim to coach the recruit through the initial period of transition, introducing the individual to Army identity and culture in manageable chunks, allowing the recruit to become accustomed to the training institution. This integrated introduction would potentially give the recruit time to understand the military's values, beliefs and goals and adapt his socio-personal identity and attitudinal beliefs so that they fit into the new environment. It would be hoped that by introducing a gradual integration, stronger ties with family and friends (established social support networks) would be maintained. By removing the sense of being trapped, the recruit would experience less cognitive dissonance which reduces the chance of an adjustment disorder. There will of course be attrition, but those who are unsuitable would leave earlier, even before they entered uniformed service. This would reduce significantly the financial cost of wastage. Such a process, if integrated into the enlistment phase, would help the recruit to make a graduated psychological and physical transition into the infantry.

An intervention during the enlistment phase would have to be proactive and aim to prepare the recruit for all aspects of training, hopefully ensuring that

unsuitable recruits do not progress to subsequent phases. However, as prediction of failure is very difficult to achieve, this approach would require all recruits to pass through the transitional training introduction to the Army. Whether this would be economically viable would depend upon how much the attrition rate would need to be reduced to warrant the cost compared to the current attrition rate. That would equate to providing training for over 60% of individuals that would have passed through training anyway. An additional benefit would be that those who were clearly unsuitable for the infantry would potentially leave during the first two weeks of the transitional training period, reducing the cost of wastage as it would avoid the requirement of equipping and paying recruits for four weeks before letting them leave. If such a randomised trial was to be undertaken it would need to show that the additional cost of training was less than the current cost of wastage and that wastage rates for those commencing the common infantry course were significantly reduced for it to be deemed a successful intervention.

The second recommendation for further research in the enlistment phase would be a targeted intervention strategy, with recruits to be monitored for early signs of difficulty in training. This process of monitoring would be aided by the findings in the biographical data. It is accepted that the risk score does not provide the accuracy to predict those who will have difficulty in completing training; however, the findings from this study potentially give training staff direction as regards behavioural traits that are associated with failure. By incorporating those findings into the training interviews that instructors have with recruits, it could aid training staff to identify early signs of difficulty in coping with the transition to military life. That early identification could then lead to a similar process that is used for recruits currently who experience physical injuries. Recruits who experience physical injuries, or are unable to

meet the physical requirements of training, go into a training platoon which provides remedial training, bringing them to the required standard before re-introducing them back into main infantry training. Those that experience psychological difficulties with the transition to the infantry could also be directed to a training platoon that provides additional specialised training to help the recruit to develop both the physical and psychological requirements for continuation of training. The benefits of this approach would be that it adds minimal additional cost to training, as the infrastructure is in place for accommodating recruits whose training is on hold. However, there is the disadvantage that additional training will be wasted on those who will choose to leave anyway.

One potential difficulty is that this approach would involve re-training the current instructors. There is a clear barrier between instructor and recruit. As identified in the findings, there is a fine line between difficulty in coping and not coping, and in reality to achieve retention you would need to identify when the recruit moves from the 'coping phase' to the 'difficulty in coping' phase. This is a very subtle transition, especially in the face of the stigma associated with the recruit admitting that they are having some difficulties early on. A great deal of responsibility would be placed on the infantry instructors to monitor the recruit's psychological state, when their primary focus is to produce highly trained infantry soldiers. It is the conflict of roles that potentially makes this intervention difficult. Stigma would also be a significant barrier for this approach, as those removed from training for psychological reasons would potentially draw attention from fellow trainees and training staff.

5.5.4: Summary

In summary, there are clearly defined areas where either further research or changes to current practice may provide a better understanding of, and ultimately reduce, the current attrition rates experienced by the Infantry Training Centre. More openness and honesty by the Army during the recruitment process will allow potential recruits to make a more informed decision as to whether they are suited to the infantry role. In addition, more knowledge of the training and what is expected of them will help recruits to better prepare both physically and psychologically for training.

The Army should consider approaching the problem of recruit wastage from two perspectives. First, they must reduce the number of recruits lost during the training process and second, reduce the financial cost of wastage. Though related, these are distinct objectives. The Army appears to accept that there will always be training wastage, however, this must be minimised by a more supportive and graduated transitional process, which will allow recruits who are unhappy to withdraw with immediate effect. There has to be a distinction between the transitional period and the commencement of professional infantry training, as this would go some way to ensuring that only those who are motivated and accepting of military life enter the common infantry course. This approach would potentially reduce the amount of attrition on the common infantry course and reduce the cost of wastage as recruits would leave during the transitional phase prior to commencement of training. On the basis of my own findings I am recommending that research to examine the effectiveness of introducing a transitional period of training is of primary importance. A randomised controlled trial should be used to test the use of transitional training in comparison to the current method of enlistment,

specifically to compare costs and the attrition rate on the common infantry course.

The present study has shown that biographical data alone does not have a sufficient level of accuracy to predict those recruits who will fail in training. In addition the current British Army Recruit Battery is also an inaccurate predictor of recruit failure. If the Army remain focused on using a test battery for recruit selection then it needs to re-develop those tests so that they more accurately reflect the factors that cause recruit attrition. This study has contributed to an understanding of why recruits fail. It has identified that emotional factors are the main cause of training failure, which is predominately an individual's difficulty in coping with stressful life events. The biographical data tool used identified behavioural traits associated with failure, but did not have the ability to measure emotional traits. Further research in this area should draw from the US military research and focus on a test battery that measures not only general trainability, but also emotional and behavioural traits that are associated with training success and failure. This study focused on training failure and subsequent factors associated with that. Before work could begin on developing a new test battery, research into emotional and behavioural factors associated with success would need to be undertaken.

The findings of this research are not isolated to the infantry alone as training wastage remains a problem across all three armed services. Presently there is little collaboration between the Services in tackling this problem and each Service remains dependent on recruitment batterys, which are predominantly based on psychometric testing, and subjective interviewing for measuring occupational fit. The British Armed forces are currently experiencing a golden period for recruitment and retention as there are currently few vacancies due to the downturn in the British economy. As a result of the current state of the

economy, few Servicemen are leaving the Services and there are plenty of recruits willing to join. However, the Ministry of Defence cannot afford to be complacent. Now is the time for all three Services to take a radical look at how they recruit and enlists their Service personnel. With impending cuts to the budgets of all three services, they can no longer rely on outdated and ineffective recruitment and enlistment selection processes. When the economy recovers the Armed Forces potentially will be left with three problems: (1) The number of recruits will dramatically fall as civilian job opportunities return; (2) retention of soldiers will become an issue as better job opportunities become available in civilian life; (3) front line units, such as the infantry, will be left chronically undermanned as was witnessed during the height of the economic boom in the late nineties. Hypothetically, reducing budgets and poor recruit selection coupled with outdated training methods and service induction could create a situation where the British government's military policy could be dictated by available trained infantrymen and not strategic aim. To put this into context, if faced with another Bosnia or Kosovo crisis, the UK may not be able to respond as it would wish too as it would not have the amount of trained infantry personnel to safely do so.

The Ministry of Defence needs to develop a recruitment and enlistment process that is able to identify suitable individuals for service careers and be able to place them in the most appropriate occupational role for them. The enlistment process must be explicit and supportive in a way which enables the individual to understand and internalise the values and beliefs that are essential to fitting in to the Armed Services. There should be a move away from draconian and punitive retention measures in training, as they only prove to waste resource and have a detrimental psychological effect on the recruits involved.

Some caution has to be taken when generalising from the findings of this study. The British military is a unique organisation which volunteers choose to join, experiencing some of the most arduous military training in the world. Findings from this study suggest that it is the uniqueness of the infantry training organisation and the totality of the institution that has led to high levels of recruit attrition. Caution is exercised because one of the key criticisms of Goffman's (1961) work was his attempt to over generalise his findings and make his model of the total institution fit other quasi-total institutions (Scott, 2010, Weinstein, 1994, Perry, 1974, Levinson and Gallagher, 1964). The effect that a total institution has on individuals is dynamic and will vary according to the nature of the institution that an individual finds themselves in. For instance, there may be some institutional similarities between a soldier in training and a prison inmate as they both enter a total institution. However, a soldier is a willing volunteer embarking on a life career, who has the freedom to decide whether he stays in the institution or not; a prisoner has no choice as he is incarcerated for breaking the law.

This study has shown that primarily it is the transition between organisations or social identities that causes a degree of dissonance and unease in an individual. The findings of this study are potentialy useful for any residential organisation, be it a university, boarding schools, the police or a prison as it provides good evidence of the effect that transition has on the individual. Any organisation or institution that brings individuals into a residential setting should reflect on their induction and transitional practices, in order to ensure that they are causing the least amount of dissonance necessary and encouraging the individual to settle and embrace the organisations values and norms.

5.6: Strengths and limitations

5.6.1: Research bias and validity

From the outset of this study it was acknowledged that the research was being conducted from within the military, and that there would always be a risk of personal identification with the military influencing how observations were made and interpreted. It would be very easy from 'within' to place the blame for recruit failure at the feet of the recruit and paint the military in a good light. However, by acknowledging from the outset that there would always be a risk of bias, the methodology was developed to counteract unintentional bias through its transparency. Not only does the framework analysis provide transparency for the reviewer, it also provides a methodological approach that reduces the risk of *a priori* knowledge biasing the findings. For every assumption, there must be textual evidence. The framework methodology provided a systematic approach to the data that allowed for *a priori* knowledge, but minimised the influence of that knowledge in the analysis phase. A strength of conducting this research from within the military was that there was knowledge and understanding of how the military works. This thesis has argued that the military is a closed institution and therefore it would have been very difficult for an outsider to gain both the access, and have the credibility that enabled and encouraged individuals within the study population to speak openly and candidly. Prior knowledge and experience of the recruitment process was invaluable during the study design phase.

5.6.2: Regression modelling

The rule of thumb for logistic models is ten cases per independent variable (Vittinghoff and Mcculloch, 2007) with an absolute minimum of five cases per independent variable (Tabachnik and Fidell, 1989). Tabachnik and Fidel

(1989) recommend that to increase the power of the findings 20 cases per independent variable is ideally the correct ratio for regression analysis. However, access to recruits and time limitations forced a compromise. The collection of biographical data for 1000 recruits took in excess of 12 months, with every intake during that period being included in the study. To have doubled the sample size would have meant that the first phase of data collection would have taken in excess of 18 months, meaning that all of the outcomes would not have been known until two years from the commencement of data collection. Funding implications and available time for the study meant that a compromise had to be made as regards sample size. As identified by Vittinghoff and McCulloch (2007), the rule of thumb of 10 or more cases per independent variable is not a 'well defined bright line', and when a statistically significant association is found in a regression model with five to nine cases per independent variable only a minor degree of extra caution is warranted. The decision was therefore taken to have a cohort of 1000 so that there were ten cases per independent variable for the entire population and seven cases per independent variable for the development dataset. This ensured that the proportion of cases to independent variables remained within Vittinghoff and McCulloch's (2007) acceptable range of 5-9 cases per independent variable for use in logistic regression.

5.6.3: Semi-structured interview data collection

A semi-structured (rather than an open) interview was used to explore the reasons given for leaving by recruits undergoing discharge. It is acknowledged that these interviews could have been taped rather than recorded with hand written notes. However, as identified in the methodology, there was only a small window of opportunity available to have sole access to

the recruit for an interview and recording equipment might have made the recruits reluctant to speak openly about their experiences. In addition, it is also acknowledged that many interviews would have to be conducted in order to ensure that the correct population coverage was achieved, and that the interview had to be brief, concise and target key areas of inquiry. To manage the amount of data collected, coupled with the access and time constraints, the decision was taken to record interviews by hand. A balancing factor for this was that all the interviews were carried out by me and I was able to decipher my detailed abbreviations and fill in gaps immediately after the interview. In practice, conducting many of the interviews was a frantic affair, involving rapidly securing a private vacant space within the Headquarters at the Infantry Training Centre, and conducting the interview wherever possible. The benefit of this was that data was collected which reflected the entire population, rather than just one small regional group of recruits.

5.6.4: Consent and Coercion

From the outset of this study, it was acknowledged that a great level of care had to be taken to ensure that new recruits did not feel pressurised into taking part. The hierarchical nature of the military could easily place pressure on a recruit to take part in the study for the fear of being punished. Steps were taken to de-militarise the information and consent phase in order to remove potential feelings of coercion in the recruits. During the presentation regarding study participation the research team wore civilian clothing, all the training staff were asked to leave and although the research team identified that they were military, they stressed that they were medical personnel. They also introduced themselves by their first name and surname and did not use any form of rank. Although every physical effort was taken to avoid coercion,

it is accepted that some recruits might have felt an obligation to take part as they would not want to draw attention to themselves by opting out in the first days of training. To counter this, each individual was reassured when given the biographical data collection questionnaire to complete that they did not have to take part and that they could withdraw from the study at any point. Some candidates expressed a reticence to take part, but in all cases this was found to be related to their embarrassment surrounding their literacy ability and not to do with disclosing the information. The data collection team had anticipated this problem and readers were provided for those recruits if they were happy to continue.

5.6.5: Use of mental health assessment tools

The impact on the mood of those who failed was significant and underestimated at the outset of the study. Previous experience had suggested that recruits were unhappy when they left training; to measure that unhappiness a subjective mood score was taken using the Shapiro method of measuring subjective mood (Shapiro and Forrest, 2004). On reflection, this was probably not adequate to truly reflect the impact which the situation had upon the individual recruit's mental health. Any future studies would be advised to utilise more complete and comparable measures of depression (e.g. Beck's Depression Inventory (Beck et al., 1961, Hawton, 1989) and the Impact of Events Scale (Horowitz et al., 1979) to truly assess the level of impact that training has on those who fail.

5.7: Conclusion

This study has identified that there is a significant and diverse difference between military identity and the socio-personal identity of the infantry recruit. The challenge of transit into military culture causes significant dissonance and stress in recruits as they adapt to the values and beliefs of the military organisation. The military has been identified as a unique organisation within society as it meets almost all of the requirements of a total institution, which puts an additional pressure on recruits as they are dislocated from their established social support networks.

The highest risk period for failure appears to be the transitional phase, early in training, as the recruit becomes overwhelmed by the cumulative effects of the situational demands of enlistment. It is the psychological impact of these demands upon the individual's ability to cope which causes them to fail. They make the conscious decision that the demands of training are too great and that they do not belong in the Army. To alleviate the dissonance that they are experiencing they leave in order to restore consistency in their thoughts. Failure in training clearly has an impact on the mood of those who failed, and in just under a quarter of failed recruits that mood had failed to significantly recover at the point of returning home. What is not known is the long term psychological effect on those who failed.

This study has demonstrated that a biographical questionnaire is unable to predict failure in training with enough accuracy for it to be viable as a screening method; but those factors relating to coping, family composition and behaviour during secondary education, are associated with a poor training outcome. This study has added to the already established literature

surrounding failure in military training by providing a comprehensive understanding of why recruits fail to make the transition to military life and choose to leave infantry training. This study has advocated the idea that the British Army should explore the benefits of transitional training to reduce the amount of infantry training wastage.

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APPENDIX 1: INFORMATION SHEET

PARTICIPANTS INFORMATION LEAFLET FOR THE STUDY INTO THE CAUSES OF ATTRITION AMONGST INFANTRY RECRUITS

INTRODUCTION

You have been asked to participate in the above study in which the investigator wishes to carry out research to better understand why infantry recruits choose to or are discharged during phase 1 & 2 of basic training. The proposed research has been scrutinised scientifically as well as being approved by an ethics committee.

PURPOSE

In recent years there has been an increase in infantry soldiers leaving the army during phase 1 & 2 of basic training as well as an increased difficulty in recruiting soldiers. The purpose of this research is to examine how recruits lifestyle prior to joining the army affects their ability to fit into army life.

AIM

The aim of the research is to identify those groups of recruits that find it more difficult to initially fit into the army and suggest ways in which this could be overcome.

DURATION

Your participation in the research will take approximately half an hour and this will involve completing a questionnaire. It is important that you answer the questionnaire as honestly as possible as this will help the researcher achieve the best picture possible of the lifestyles of new recruits. To make you feel more comfortable in doing this the questionnaires will be strictly confidential. There will be no names on the questionnaires, but you will be given a unique identification number known only to the researcher. This is to enable to follow-up the reasons why, should you leave the army during basic training.

THE INFORMATION ON THE QUESTIONNAIRES WILL ONLY BE VIEWED BY THE RESEARCHER AND THEN DESTROYED AT THE END OF THE STUDY.

PROCEDURE

Within the first week of enlistment you will complete the questionnaire as a company under the supervision of the researcher. There will be no training staff present when the questionnaire is being completed. On completion, the questionnaire will be taken to the researchers permanent place of duty where it will be entered onto a database for statistical analysis. The system that it is entered on and the database will be password protected.

RESULTS

It is hoped that results will benefit future recruits and therefore the results may be published. This will contain no reference to the identity of individuals and your personal details will remain strictly confidential.

APPENDIX 2: BIOGRAPHICAL DATA QUESTIONNAIRE

Army Biographical Inventory

Confidential Questionnaire

You are being asked to complete this questionnaire as part of a study looking at reasons why some recruits find it more difficult to initially fit into the army. We aim to suggest ways in which this can be overcome.

It is important that you complete the questionnaire fully, and answer each question honestly.

Do not put your name on the questionnaire.

All the information you provide will be treated in the strictest of confidence – it will be seen only by the researcher and will be destroyed at the end of the study.
IT IS IMPORTANT THAT YOU TICK ONE BOX ONLY PER QUESTION

Thank you for taking part.

Matthew Kiernan
Captain
QARANC

Note: contents of questionnaire have been removed from the library copy as they are the property of the United States Army Research Institute and loaned for the purpose of the study only.

APPENDIX 3: SEMI-STRUCTURED QUESTIONNAIRE

LEAVING INTERVIEWS

Why are you leaving?

(have they been bullied?)

How would you feel / what behaviour would you engage in if you could not leave? (Give national service example / have they contemplated self-harm/suicide?)

How are you coping between making the decision / being told, to leave and now waiting to leave?

How is your mood at this point in time? What was the worst time? (ask to rate their mood on a SUD Scale of 1-10)

Did contact with your family whilst serving make things better or worse?

Could you suggest any changes or support that would enable you to stay in the army?

APPENDIX 4: CHARTS

CHART 1: COPING

Case Number	1.1 Deterioration in Mood	1.1 SUD Mood Score in training + week + cognition when stated	1.1 SUD Mood Score on interview + cognition when stated	1.2 Homesickness	1.3 Unable to cope psychologically with physical demands	1.4 Immaturity	3.4 Lacking the emotional maturity to cope with the transitional period	1.5 Problems at home	4.2 Create a demand the necessitates exit from service	1.6 Contact with Family
C1		3/10 felt overwhelmed with the pressure of training	8/10 pressure relieved, going home		feels overwhelmed by the pressure of training, experiencing anxiety before certain lessons					phoned home every 4/7 and had W/E leave
C2		3/10 on 2nd & 3rd Week	8/10	misses his family and friends		enjoys the fitness but does not feel he is ready for army life yet, feels he is letting himself down by leaving			missing his family and girlfriend and social life, parents support his decision to leave	phoned family every 2-3 days and has been home twice
C3		1/10 @ week 4, went home on W/E pass didn't want to come back, felt very homesick and tearful	5/10				he is a young immature 17 year old who does not have the character to force through his initial desire to join the infantry	problems at home, his girlfriend has asked him to leave, she is not supportive of him serving, mum wants him home, father feels he has let him down by leaving, he feels he has let himself down	faced considerable pressure from girlfriend and family to leave	contacted family x2 week and phoned girlfriend x5 a day. Also had 24hr pass
C4		2/10	3/10 mood remains low, fed up	feels very homesick, weepy just wants to go home	found training very hard, always playing catch up				very homesick	Daily phone calls + visit, no contact would have made things much worse
C5		3/10 week 4/5	8/10 not 10 as he is still here waiting to go.							WE leave since wk 6

C6		2/10 following W/E pass, did not want to come back	9/10 now as he is leaving	Feels homesick	does not like army life, does not like the hardness of the physical training		very immature and lacked the commitment necessary to get through the course		felt homesick throughout the course	Phone daily and has had W/E passes
C7		4/10 lowest point day 5	9/10							phone daily
C8	very difficult interview, very guarded, discharged 2 yrs previous on medical grounds							needs to leave army to care for son, split with girlfriend who no longer wishes to care for son, he will have custody.		
C9		8/10	8/10 has not disliked the experience, just prefers to be at home			feels he is to young for army life at this time				phones home every night and has gone home most W/Es
C10	hated being in training, and wanted to leave, felt low and now his CO has told him he must stay for another 2 weeks until he can DAOR			missed parents, girlfriend and family, feels homesick						daily contact bt phone
C11	finds communal living hard at times	3/10 lowest point was evenings	7/10 now knows that he is leaving	does not like being away from home for periods of time, homesick misses son	does not like drill and weapons lessons finds them too difficult				has been homesick throughout the course and misses young son	phoned 3 times per week, no visits
C12		3/10 when he did not know how or when he could leave	10/10 now he knows he is going	misses civilian life, misses friends and family		was not ready for it	has struggled with different aspects of the course and has shown a high level of immaturity			phones daily and has been home x6 W/Es
C13		3/10 felt weepy low and sad	3/10 still here		found the PT hard					daily by phone and family visited

C14		2/10	4/10				would support his return to the army in the future when he matures			phoned daily + WEL
C15	has cried himself to sleep most nights	3/10 when continually shouted at for messing up	5/6	feels very homesick	finds training hard, discipline hard, in trouble most days, infantry not for him, has made lots of mistakes and the Plt has been punished			mother disabled, difficult family dynamics, feels he needs to be at home		phone daily
C16	considered DSH but believed it was wrong and he must leave the right way	4/10	4/10 as he is still here		parents want him to stay, believes that he has let them and himself down, believed he could succeed		his homesickness has been exacerbated by his lack of maturity			phone daily
C17	does not like it here, has wanted to leave since day 1, hates poor block facilities, does not like food	6/10	10/10 when he leaves here		found PT hard, gets shin splints		he believes he made a mistake in joining the army and believes that he has a lot more growing up to do before he re-enlists			speaks with home every 2-3 days
C18		10/10	1/10 devastated to be leaving							
C19		2/10	5/10							spoke x2 per week plus long W/E at home
C20			8/10 knows he is going home	feels homesick	finds ITC depressing, not the life he is looking for, feels he can not hack it, does not like weapons handling & PT as he feels he has not got it					has had contact with relatives, did not want to return from W/E pass

C21								girlfriend pregnant with twins	girlfriend sick in hospital carrying twins, feels he should be there supporting her, can not cope any more in the army due to worrying about his girlfriend	Speaks daily, has been home once
C22		8/10	8/10						misses his family and friends and homesickness has set in	phones most nights, has been home most weekends
C23		4-5/10 when he decided that he wanted to leave	7/10	feels homesick			immature		slightly homesick	phones home x2 per week and has been home once
C24	felt sad	1/10 felt sad, very weepy	5/10	homesick, misses his son and girlfriend						daily by phone, no visits home, no contact would have made things worse
C25		1/10 contemplated self harm and suicide							he considers himself to have considerable personal problems	little or no contact with home
C26		8/10 now and all along							suffered outside pressures to leave during the course	phones daily and has been home once
C27			7-8/10 now he knows he is leaving					prefers to be nearer home to support his family		phones home every 3 days and has visited once
C28		3/10	10/10 now that he knows he is leaving	does not like army life, homesick					he is homesick and has enjoyed no part of the course to date	phones every 2-3 days
C29		2/10	10/10 now he knows he is going	homesick, does not like the way Scots are treated						phones every night
C30		2-3/10 contemplated self harm to effect release due to feeling of entrapment	8-9/10 now that he knows he is leaving		has been having medical tests since week one unable to train					phones regularly and has WEL

C31			6-7/10 will be happier when he leaves	misses girlfriend and son				girlfriend wants him to come home	has suffered homesickness, misses' partner and child.	WEL + phones daily
C32		4/10 feels down about being here, thinks he will feel better once he leaves		homesick			he is immature and young, he is homesick and misses the relative freedoms of home life			texts home regularly + WEL
C33	feels tearful all the time			homesick	finds discipline side of things hard as well as communal living		very young and relatively immature		very homesick	phones daily, and mother has visited

Chart 2: Fitting In

Case Number	2.1 Loss of freedom	2.2 Failure of Expectation	2.3 Failure to adapt to culture (Subjective)	2.3 Failure to adapt to culture (Objective)	2.4 Breech of Discipline (Subjective)	2.4 Breech of Discipline (Objective)	2.6 Inappropriate recruitment (Objective)
C1	misses his freedom and preferred his old job		does not fit in with army culture, finds it mentally demanding but has tried to get on with it				
C2							
C3		gets on well with peers and instructors, army not what he was expecting, not really enthusiastic about the job					
C4	does not like the way of life, misses freedom, wants to be with family doing his own thing		feels he does not fit in	failed to adapt to army life, presented himself to the medical centre daily from week one with a range of ailments, suspected nothing wrong just avoiding training			
C5			don't like it, don't enjoy the work, don't fit into the lifestyle, feels he has let his family down by leaving, felt he rushed his decision to join	he has stated to the OC that he cannot cope with the course			
C6	feels trapped, feels he has lost his freedom, army is always on his mind, the discipline is hard, far more discipline than the army cadet corps.		feels that he has not fitted in, not getting on with some of his peers, does not like the culture				

C7	wants to be his own person, doesn't like to be told what to do all the time - doesn't feel disappointed in himself, glad of the experience. Does not like communal living and lack of privacy		big mistake, doesn't fit in to the 24 hr lifestyle/24hr job. Feels some peers are immature	strong willed, decided army not for him nothing we will say or do will make him change his mind			
C8			states that he has enjoyed himself, if he had to stay would not be bothered as he wants to be in the army, feels he has too many problems to stay. What he states does not reflect his performance report.				
C9	misses civilian life and seeing his girlfriend, misses his freedom			he is severely depressed and can not handle the regime within the training establishment			he is not physically or mentally strong enough for the army, should not be allowed to rejoin as he is not suited in any shape or form
C10				failed to fit in or work as part of a team	had a fight with one of his room mates, then had another fight breaking the other mans nose, thought he was in trouble and could not leave so then took an overdose	fear of being disciplined led to OD	has shown himself to be a liar, untrustworthy and unable to work as part of a team, if ever in a position of authority would be a bully.
C11			he is a quite person				
C12			army life not for him, does not like it, feels he was not ready for it, harder than he thought	ill prepared for the rigours of training, has struggled and failed to adapt to infantry training.			

C13			does not like the way he is spoken too, feels he does not fit into army life, gets on with his peers but dislikes the culture	failed to adapt to army life, found the initial loss of freedom hard to accept and did not adapt to the loss of privacy found in communal living			
C14	not for him, feels restricted, wants to live own lifestyle. Finds communal living to much sometimes						joined because his brother was in the army
C15			feels he does not fit in	highly unusual individual who has totally failed to fit in with his peers or adapt to military life, has not coped with having to do things for himself.			Has irritated instructors and peers to such an extent that he has been removed from training and is supervised in HQ. Training that he did complete was poor with no determination to succeed no chance of him ever passing basic should not be allowed to re-enlist
C16			does not want to be in the army, not for him finds aspects of army life difficult, rather not do it	has struggled to come to terms with the loss of freedom and separation from the family			
C17							
C18					had some thoughts of DAOR, used cocaine recreationally prior to joining, took whilst on W/E leave after drinking, did not think that he would be caught, enjoyed training and is disappointed in himself. Went to pub during exercise	been found positive on drugs test and had recent lapses in discipline	

C19		used to be full time TA, this is very different here, gets picked on for others mistakes, feels he is more experienced than a lot of the people here		had some problems with his fitness and found settling in to army life hard to cope with. While personable found rigours of infantry training difficult and needs to understand the concept of teamwork			
C20			finds the younger recruits irritating, feels he does not fit into the life/culture	performed poorly in some aspects of the course, struggled to assimilate and apply much of the information taught him, his physical fitness is weak. Decided that the army was not for him and dose not wish to give it any more of a chance			
C21							
C22		a lot different from what he expected, does not like field craft exercises'	does not feel the army is for him				
C23	does not like pt and communal living		wanted to give it a go as friends had joined but does not feel that he fits in				
C24				found separation from son and girlfriend difficult to handle, does want to be a soldier but the thought of separation for operational tour would be detrimental to his family			
C25			wanted to join as a youngster, has interest in weapons, joined for that. Feels he does not fit in with military culture, dislikes routine, finds it boring and tedious				self-harmed during training, he has a history of self harm and psych services intervention as a child, totally unsuited to a military career at the moment, unfit army service

C26			does not like army life or the discipline, not for him, first experience of true discipline, army life is crap, does not fit into the culture	he has had problems adapting to army life, he has had problems fitting into the Plt and Coy and this has led to his DAOR			
C27	finds communal living and loss of freedom difficult		found it difficult to be around younger recruits who mess around a lot and cause trouble, found discipline hard most of the time	had previously been in the army but DAORd before, not settled into the training regime and has been disruptive within the platoon.			
C28	found lack of freedom and privacy hard						
C29			feels he does not fit into army life and culture, finds it hard to adapt and feels he has lost his freedom				
C30	hates the confinement and the people he has to mix with, feels the institution has prevented him from forming real friendships due to competition,		not fitting in, sacrifices are to great, his personality clashes with the culture, a lot of the training is bullshit, found peers idiots who he would not choose to associate with				seen by child psychological services at school
C31	does not enjoy being told what to do, does not like communal living		does not like communal living and feels he does not fit in with army culture, feels that he is too set in his ways				
C32		different to what he expected it to be, a lot of long hours and hard discipline					
C33			does not feel he fits into army life	found discipline difficult to cope with			

Chart 3: Transition

Case Number	3.1 Psychologically and Physically Unprepared for Transition to Service	3.2 Option to leave made to easy (National Service Ethos)	3.3 Lack of determination to push through initial cognitive dissonance	3.4 Lacking the emotional maturity to cope with the transitional period
C1		if I had to stay I would probably get on with it as I get on with people, does not think he would rejoin, but if he did he would join a different corps, nothing would make him stay	he is a drifter with no direction in his life and actively working to keep it that way. Had no intention of staying just joined to see what it was like	
C2		would not mind, would just get on with it...would consider re-enlisting in the army in 2 yrs time		
C3	struggled to come to terms with reality of training	would keep trying to get out and go AWOL if unsuccessful, may join at a later date when older	not applied himself well, poor level of concentration, fell behind in training, lack of commitment following pressure from home	he is a young immature 17 year old who does not have the character to force through his initial desire to join the infantry
C4		if he could not leave would be very sad and states that he would probably try and kill himself	has the capability to pass but would need to show far more commitment	
C5		would feel down however would just get on with it, would not take any drastic action	not committed to staying, committed to leaving, not enjoying the course	

C6	had given himself the impression that the course was to hard for him to pass, his lack of confidence was to ingrained even though he had the ability to succeed	if he had to stay would be upset and annoyed but if he had too would get on with it		very immature and lacked the commitment necessary to get through the course
C7		would make the best of it	very confident, very able soldier, however knows his own mind, decided that he no longer wanted to be a soldier	
C8	performance deteriorated significantly and he became incapable of concentrating on his job, claimed to be depressed, deemed TU by MO	states he would not be bothered		
C9		would stick at it because he would have to, more money would make him stay……would consider re-enlisting		
C10		if he had to stay wouldn't know what to do, would probably try and escape by taking another overdose.		
C11		would just try and get on with it……..would consider rejoining if he could not get a job in civie street		

C12		would try and get on with it, but not sure…….would only stay if desperate for money or in debt		has struggled with different aspects of the course and has shown a high level of immaturity
C13		would be very unhappy but would get on with it……..would not rejoin dislikes the culture	lack the commitment to see him through the initial period of enlistment	
C14		would get on with it		would support his return to the army in the future when he matures
C15		would rejoin in the future to another CEG		
C16		if he had to stay would not like it but would try and get on with it, believes he would not cope though…..would consider in the future as a driver		his homesickness has been exacerbated by his lack of maturity
C17	missed some training due to minor injury, made his intention to leave very clear in the first few days of training	would feel gutted if made to serve, would consider AWOL		he believes he made a mistake in joining the army and believes that he has a lot more growing up to do before he re-enlists

C18		Caught on drugs test, does not want to leave, would like to stay		
C19		would have to knuckle down and get on with it...would consider re-enlisting through the TA as a linguist		
C20		if made to stay would probably go AWOL……..would consider TA but not regular		
C21		would have to get on with it……...plans to re-enlist after birth of twins		
C22		would feel gutted but would try and get on with it		
C23		would feel bad but would get on with it because would have to		immature
C24		if he had to do it he feels he would get on with it with no problems…….would not rejoin with current domestic circumstances	would need to show far more commitment to the army if he was to rejoin	

C25		if he had to stay would be depressed and would probably contemplate suicide……...would contemplate re-joining at a later date		
C26		would have to get on with it but would consider AWOL…….would consider re-enlistment when he is older and more disciplined		
C27		would have to stick with it		
C28		would get on with it		
C29	fitness below par and something of a know-all, not sufficient backbone to stick out the course	would try to knuckle down and get on with it but would feel angry……...may consider re-enlistment into a Scottish regiment		
C30	failed training medical with heart murmur, took system 12 weeks to investigate him at which point he had lost all interest to not being allowed to train	would just get on with it		
C31	struggled with the immaturity of the younger recruits	would feel desperate and consider going AWOL		
C32		would get on with it if he had to		he is immature and young, he is homesick and misses the relative freedoms of home life

C33	physical demands have been to much for him to cope with	does not know how he would cope		very young and relatively immature

Chart 4: Legitimisation of Failure

Case Number	4.1 Bad behaviour to ensure dismissal	4.2 Create a demand the necessitates exit from service	3.2 Option to leave made to easy (National Service Ethos)
C1			if I had to stay I would probably get on with it as I get on with people, does not think he would rejoin, but if he did he would join a different corps, nothing would make him stay
C2		missing his family and girlfriend and social life, parents support his decision to leave	would not mind, would just get on with it...would consider re-enlisting in the army in 2 yrs time
C3		faced considerable pressure from girlfriend and family to leave	would keep trying to get out and go AWOL if unsuccessful, may join at a later date when older
C4		very homesick	if he could not leave would be very sad and states that he would probably try and kill himself
C5			would feel down however would just get on with it, would not take any drastic action
C6		felt homesick throughout the course	if he had to stay would be upset and annoyed but if he had too would get on with it

C7			would make the best of it
C8	on arrival claimed to have taken drugs, refused initial entry medical, placed on CSMs formal drugs warning but vowed to soldier on		states he would not be bothered
C9			would stick at it because he would have to, more money would make him stay……would consider re-enlisting
C10	appeared petulant, sulky and resented authority. Intimidated and harassed other platoon members resulting in violent confrontation. A combination of fear of the consequences of his behaviour and his desire to leave resulted in self harm		if he had to stay wouldn't know what to do, would probably try and escape by taking another overdose.
C11		has been homesick throughout the course and misses young son	would just try and get on with it……..would consider rejoining if he could not get a job in civie street
C12			would try and get on with it, but not sure…….would only stay if desperate for money or in debt
C13			would be very unhappy but would get on with it……..would not rejoin dislikes the culture
C14			would get on with it

C15			would rejoin in the future to another CEG
C16			if he had to stay would not like it but would try and get on with it, believes he would not cope though…..would consider in the future as a driver
C17			would feel gutted if made to serve, would consider AWOL
C18			Caught on drugs test, does not want to leave, would like to stay
C19			would have to knuckle down and get on with it...would consider re-enlisting through the TA as a linguist
C20			if made to stay would probably go AWOL……..would consider TA but not regular
C21		girlfriend sick in hospital carrying twins, feels he should be there supporting her, can not cope any more in the army due to worrying about his girlfriend	would have to get on with it……..plans to re-enlist after birth of twins
C22		misses his family and friends and homesickness has set in	would feel gutted but would try and get on with it
C23		slightly homesick	would feel bad but would get on with it because would have to
C24			if he had to do it he feels he would get on with it with no problems…….would not rejoin with current domestic circumstances

C25		he considers himself to have considerable personal problems	if he had to stay would be depressed and would probably contemplate suicide……...would contemplate re-joining at a later date
C26		suffered outside pressures to leave during the course	would have to get on with it but would consider AWOL…….would consider re-enlistment when he is older and more disciplined
C27	Adamant that he does not want to be in the army and has adopted a completely negative attitude towards the training regime should be discharged UFAS and should not be allowed to re-enlist		would have to stick with it
C28		he is homesick and has enjoyed no part of the course to date	would get on with it
C29			would try to knuckle down and get on with it but would feel angry……...may consider re-enlistment into a Scottish regiment
C30			would just get on with it
C31		has suffered homesickness, misses' partner and child.	would feel desperate and consider going AWOL
C32			would get on with it if he had to
C33		very homesick	does not know how he would cope

Chart 5: Objective evidence from Commanding Officers reports

Case Number	7.1 Struggled with physical & mental demand	7.2 Lack of commitment, failed to identify with the Army	7.3 Homesick & External Pressure to leave / Not supported to stay by family/relatives	7.4 Failure to adapt / cope / fit in	7.5 Immature	7.6 Failure to conform / accept discipline	7.7 Inappropriate recruitment / lack of ability	7.8 Lapse in discipline / drugs
C1		he is a drifter with no direction in his life and actively working to keep it that way. Had no intention of staying just joined to see what it was like						
C2			missing his family and girlfriend and social life, parents support his decision to leave					
C3	struggled to come to terms with reality of training	not applied himself well, poor level of concentration, fell behind in training, lack of commitment following pressure from home	faced considerable pressure from girlfriend and family to leave		he is a young immature 17 year old who does not have the character to force through his initial desire to join the infantry			
C4		has the capability to pass but would need to show far more commitment	very homesick	failed to adapt to army life, presented himself to the medical centre daily from week one with a range of ailments, suspected nothing wrong just avoiding training				
C5		not committed to staying, to leaving, not enjoying the course		he has stated to the OC that he cannot cope with the course				

C6	had given himself the impression that the course was to hard for him to pass, his lack of confidence was to ingrained even though he had the ability to succeed		felt homesick throughout the course		very immature and lacked the commitment necessary to get through the course			
C7		very confident, very able soldier, however knows his own mind, decided that he no longer wanted to be a soldier		strong willed, decided army not for him nothing we will say or do will make him change his mind				
C8	performance deteriorated significantly and he became incapable of concentrating on his job, claimed to be depressed, deemed TU by MO					on arrival claimed to have taken drugs, refused initial entry medical, placed on CSMs formal drugs warning but vowed to soldier on		
C9				he is severely depressed and can not handle the regime within the training establishment			he is not physically or mentally strong enough for the army, should not be allowed to rejoin as he is not suited in any shape or form	

C10				failed to fit in or work as part of a team		appeared petulant, sulky and resented authority. Intimidated and harassed other platoon members resulting in violent confrontation. A combination of fear of the consequences of his behaviour and his desire to leave resulted in self harm	has shown himself to be a liar, untrustworthy and unable to work as part of a team, if ever in a position of authority would be a bully.	fear of being disciplined led to OD
C11			has been homesick throughout the course and misses young son					
C12				ill prepared for the rigours of training, has struggled and failed to adapt to infantry training.	has struggled with different aspects of the course and has shown a high level of immaturity			
C13		lack the commitment to see him through the initial period of enlistment		failed to adapt to army life, found the initial loss of freedom hard to accept and did not adapt to the loss of privacy found in communal living				
C14					would support his return to the army in the future when he matures		joined because his brother was in the army	
C15				highly unusual individual who has totally failed to fit in with his peers or adapt to military life, has not coped with having to do things for himself.			Has irritated instructors and peers to such an extent that he has been removed from training and is supervised in HQ. Training that he did complete was poor with no	

							determinatio n to succeed no chance of him ever passing basic should not be allowed to re-enlist	
C16				has struggled to come to terms with the loss of freedom and separation from the family	his homesickness has been exacerbated by his lack of maturity			
C17	missed some training due to minor injury, made his intention to leave very clear in the first few days of training				he believes he made a mistake in joining the army and believes that he has a lot more growing up to do before he re-enlists			
C18								been found positive on drugs test and had recent lapses in discipline
C19				had some problems with his fitness and found settling in to army life hard to cope with. While personable found rigours of infantry training difficult and needs to understand the concept of teamwork				

C20				performed poorly in some aspects of the course, struggled to assimilate and apply much of the information taught him, his physical fitness is weak. Decided that the army was not for him and dose not wish to give it any more of a chance				
C21			girlfriend sick in hospital carrying twins, feels he should be there supporting her, can not cope any more in the army due to worrying about his girlfriend					
C22			misses his family and friends and homesickness has set in					
C23			slightly homesick		immature			
C24		would need to show far more commitment to the army if he was to rejoin		found separation from son and girlfriend difficult to handle, does want to be a soldier but the thought of separation for operational tour would be detrimental to his family				
C25			he considers himself to have considerable personal problems				self-harmed during training, he has a history of self harm and psych services intervention as a child, totally unsuited to a military career at the moment, unfit army service	

C26			suffered outside pressures to leave during the course	he has had problems adapting to army life, he has had problems fitting into the Plt and Coy and this has led to his DAOR				
C27				had previously been in the army but DAORd before, not settled into the training regime and has been disruptive within the platoon.		Adamant that he does not want to be in the army and has adopted a completely negative attitude towards the training regime should be discharged UFAS and should not be allowed to re-enlist		
C28			he is homesick and has enjoyed no part of the course to date					
C29	fitness below par and something of a know-all, not sufficient backbone to stick out the course							
C30	failed training medical with heart murmur, took system 12 weeks to investigate him at which point he had lost all interest to not being allowed to train						seen by child psychologic al services at school	
C31	struggled with the immaturity of the younger recruits		has suffered homesickness, misses' partner and child.					

C32					he is immature and young, he is homesick and misses the relative freedoms of home life			
C33	physical demands have been to much for him to cope with		very homesick	found discipline difficult to cope with	very young and relatively immature			

APPENDIX 5: STATA ANALYSIS (DO-FILES)

***Table 1: Demographic and social characteristics of sample (n=1000)**

```
summarize
summarize age
summarize heightm
summarize WEIGHTKG
summarize BMI
tab q78ethnic fail
tab q34 fail
tab q42coll fail
tab q68 fail
```

Table 2: Training outcomes with reason for failure

Data taken from training outcome data

Table 3: Comparison of distribution of key factors in development (n=667) and test datasets (n=332)

```
*use "Matt & Tony 1000.dta"
sample 667, count
gen dev=1
sort ID
save develop, replace
clear
use "Matt & Tony 1000.dta"
sort ID
merge ID using develop
tabulate _merge
rename _merge dataset
recode dataset (3=1) (1=2)
label define dataset 1 "develop" 2 "test"
label values dataset dataset
save "Matt & Tony 1000.dta"

*run following on development and test dataset

summarize
summarize age
summarize heightm
summarize WEIGHTKG
summarize BMI
tab q78ethnic
tab q34
tab q42coll
tab q68
```

Table 4: Comparison of physical measurements by outcome in development dataset

```
ttest  heightm, by(fail)
ttest  WEIGHTKG, by(fail)
hist BMI (BMI normally distributed)
ttest  BMI, by(fail)
```

Table 5: Comparison of family factors by outcome in development dataset

```
tabulate q4 fail, chi2 row
tabulate q33 fail, chi2 row
tabulate q34 fail, chi2 row
tabulate q35 fail, chi2 row
tabulate q3coll fail, chi2 row
```

Table 6: Comparison of personal information by outcome in development dataset

```
tabulate q55 fail, chi2 row
tabulate q77 fail, row
ranksum q77, by(fail)
tabulate q7coll fail, chi2 row
tabulate q5coll fail, chi2 row
tabulate q66age fail, row
ranksum q66age, by(fail)
tabulate q78ethnic fail, chi2 row
tabulate q80coll fail, row
ranksum q80coll, by(fail)
```

Table 7: Comparison of education factors by outcome in development dataset

```
tabulate q8 fail, row
ranksum q8, by(fail)
tabulate q12 fail, chi2 row
tabulate q69 fail, row
ranksum q69, by(fail)
tabulate q11coll fail, row
ranksum q11coll, by(fail)
tabulate q48coll fail, chi2 row
tabulate q75skipped fail, chi2 row
tabulate q75failed fail, chi2 row
tabulate q42coll fail, row
ranksum q42coll, by(fail)
```

Table 8: Comparison of team activity factors by outcome in development dataset

```
tabulate q10coll fail, row
ranksum q10coll, by(fail)
tabulate q21coll fail, chi2 row
tabulate q62team fail, chi2 row
```

Table 9: Comparison of outdoor activity factors by outcome in development dataset

```
tabulate q54outdoor fail, row
ranksum q54outdoor, by(fail)
tabulate q54practical fail, row
ranksum q54practical, by(fail)
```

Table 10: Comparison of individual physical activity factors by outcome in development dataset

```
tabulate q28 fail, row
```

```
ranksum q28, by(fail)

tabulate q29 fail, row
ranksum q29, by(fail)
```

Table 11: Comparison of Individual non-physical activity factors by outcome in development dataset

```
tabulate q26a fail, chi2 row
tabulate q26b fail, chi2 row
tabulate q26c fail, chi2 row
tabulate q26d fail, chi2 row
tabulate q36 fail, row
ranksum q36, by(fail)
tabulate q38 fail, row
ranksum q38, by(fail)
tabulate q39 fail, row
ranksum q39, by(fail)
tabulate q61 fail, row
ranksum q61, by(fail)
tabulate q46coll fail, chi2 row
tabulate q54domestic fail, row
ranksum q54domestic, by(fail)
tabulate q54babysit fail, row
ranksum q54babysit, by(fail)
```

Table 12: Comparison of employment history factors by outcome in development dataset

```
tabulate q13 fail, row
ranksum q13, by(fail)
tabulate q32 fail, chi2 row
tabulate q73 fail, chi2 row
tabulate q14coll fail, chi2 row
tabulate q15coll fail, row
ranksum q15coll, by(fail)
tabulate q31coll fail, chi2 row
tabulate q72coll fail, chi2 row
```

Table 13: Comparison of behavioural history factors by outcome in development dataset

```
tabulate q37 fail, row
ranksum q37, by(fail)
tabulate q41 fail, row
ranksum q41, by(fail)
tabulate q43 fail, chi2 row
tabulate q52 fail, row
ranksum q52, by(fail)
tabulate q57 fail, chi2 row
tabulate q58 fail, chi2 row
tabulate q67 fail, row
ranksum q67, by(fail)
tabulate q68 fail, row
ranksum q68, by(fail)
tabulate q70 fail, row
ranksum q70, by(fail)
tabulate q76 fail, row
ranksum q76, by(fail)
```

```
tabulate q44coll fail, row
ranksum q44coll, by(fail)
```

Table 14: Comparison of coping behaviours by outcome in development dataset

```
tabulate q18 fail, chi2 row
tabulate q24 fail, row
ranksum q24, by(fail)
tabulate q25 fail, row
ranksum q25, by(fail)
tabulate q59 fail, chi2 row
tabulate q60 fail, chi2 row
tabulate q74 fail, row
ranksum q74, by(fail)
tabulate qreligion fail, chi2 row
```

Table 15: Comparison of group affiliation behaviours by outcome in development dataset

```
tabulate q22 fail, chi2 row
tabulate q30 fail, row
ranksum q30, by(fail)
tabulate q40 fail, chi2 row
tabulate q56 fail, row
ranksum q56, by(fail)
gen q63score=20-((q63a+q63b+q63c+q63d+q63e)-5)
alpha q63a q63b q63c q63d q63e
hist  q63score (q63score normally distributed so ttest used)
ttest q63score, by (fail)
tabulate q64 fail, row
ranksum q64 if q64<6, by(fail)
tabulate q65 fail, row
ranksum q65, by(fail)
tabulate q71 fail, row
ranksum q71, by(fail)
```

Table 16: Comparison of Drug and alcohol use history by outcome in development dataset

```
tabulate qd1 fail, row
ranksum qd1, by(fail)
tabulate qd2 fail, row
ranksum qd2, by(fail)
tabulate qd3 fail, row
ranksum qd3, by(fail)
tabulate qd4 fail, row
ranksum qd4, by(fail)
tabulate qd5 fail, row
ranksum qd5, by(fail)
tabulate qd6 fail, row
ranksum qd6, by(fail)
tabulate qd7 fail, row
ranksum qd7, by(fail)
tabulate qd8 fail, row
ranksum qd8, by(fail)
tabulate qd9 fail, row
ranksum qd9, by(fail)
tabulate qd10 fail, row
ranksum qd10, by(fail)
```

```
tabulate qd11 fail, row
ranksum qd11, by(fail)
tabulate qd12 fail, row
ranksum qd12, by(fail)
tabulate qd13 fail, row
ranksum qd13, by(fail)
tabulate qd14 fail, row
ranksum qd14, by(fail)
tabulate qd15 fail, row
ranksum qd15, by(fail)
tabulate drugs fail, row
ranksum drugs, by(fail)
tabulate nocan fail, row
ranksum nocan, by(fail)
tabulate qa1audit fail, row
ranksum qa1audit, by(fail)
```

Table 17: Variables shortlisted for inclusion in in the multivariable logistic regression model (development dataset)

Table created from above findings

Table 18: Predictive model factors associated with training outcome after adjustment for each other (development dataset)

Round 1

```
*FULL MODEL - ALL 21 COVARIATES INCLUDED;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4;
est store A;
*SUBSEQUENT MODELS WITH EACH COVARIATE IN TURN REMOVED;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71  i.qd4 if q65!=.;
est store C;
lrtest A C;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74  i.q65 i.qd4 if q71!=.;
est store D;
lrtest A D;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25  i.q71 i.q65 i.qd4 if q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
```

```
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q74 i.q71 i.q65 i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q25
i.q74 i.q71 i.q65 i.qd4 if q24!=.;
est store G;
lrtest A G;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q76!=.;
est store I;
lrtest A I;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q37!=.;
est store M;
lrtest A M;
```

Round 2

```
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4;
est store A;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q73!=.;
est store N;
lrtest A N;
```

```
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.q65 i.qd4 if q15!=.;
est store P;
lrtest A P;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if q42coll!=.;
est store R;
lrtest A R;

xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if q77!=.;
est store U;
lrtest A U;
xi:logistic fail WEIGHTKG i.q77 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q77 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.q65 i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 3

```
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 if qd4!=.;
est store B;
lrtest A B;

xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
```

```
i.q25 i.q74 i.qd4 if q71!=.;
est store D;
lrtest A D;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25  i.q71 i.qd4 if q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q74 i.q71 i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q25
i.q74 i.q71 i.qd4 if q24!=.;
est store G;
lrtest A G;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q24 i.q25
i.q74 i.q71 i.qd4 if q17coll!=.;
est store H;
lrtest A H;

xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q76!=.;
est store I;
lrtest A I;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q37!=.;
est store M;
lrtest A M;
```

Round 4

```
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q15!=.;
est store P;
lrtest A P;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if q77!=.;
est store U;
lrtest A U;
xi:logistic fail WEIGHTKG i.q77 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q77 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q76 i.q17coll i.q24
i.q25 i.q74 i.q71 i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 5

```
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 if qd4!=.;
est store B;
```

```
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q71!=.;
est store D;
lrtest A D;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q71 i.qd4 if q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24
i.q74 i.q71 i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74
i.q71 i.qd4 if q24!=.;
est store G;
lrtest A G;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q24 i.q25 i.q74
i.q71 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q37!=.;
est store M;
lrtest A M;
```

Round 6

```
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
```

```
i.q71 i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q15 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q15!=.;
est store P;
lrtest A P;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q42coll
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q11 i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q80coll i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q77 i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q77!=.;
est store U;
lrtest A U;
xi:logistic fail WEIGHTKG i.q77 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q77 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 7

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q71!=.;
```

```
est store D;
lrtest A D;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q71 i.qd4 if q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24
i.q74 i.q71 i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74
i.q71 i.qd4 if q24!=.;
est store G;
lrtest A G;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q24 i.q25 i.q74
i.q71 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.q71 i.qd4 if q15!=.;
est store P;
lrtest A P;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q69!=.;
est store Q;
```

```
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.q71 i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 8

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.qd4 if q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24
i.q74 i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74
i.qd4 if q24!=.;
est store G;
lrtest A G;

xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q24 i.q25 i.q74
i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
```

```
i.q15 i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q15!=.;
est store P;
lrtest A P;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q80coll!=.;
est store T;
lrtest A T;

xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q15 i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25
i.q74 i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 9

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.qd4
if q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24  i.q74
i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if q24!=.;
est store G;
lrtest A G;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q24 i.q25 i.q74 i.qd4 if
q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.q24 i.q25 i.q74 i.qd4
if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.q24 i.q25 i.q74 i.qd4
if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74 i.qd4
if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74 i.qd4
if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74 i.qd4
if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74 i.qd4
if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q69!=.;
est store Q;
```

```
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q24 i.q25 i.q74
i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 10

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 if
qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
q74!=.;
est store E;
lrtest A E;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q74 i.qd4 if
q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q25 i.q74 i.qd4 if
q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.q25 i.q74 i.qd4 if
q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.q25 i.q74 i.qd4 if
q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4 if
```

```
q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4 if
q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4 if
q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4 if
q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.q74 i.qd4
if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 11

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q25!=.;
est store F;
lrtest A F;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q25 i.qd4 if q17coll!=.;
```

```
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.q25 i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.q25 i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.q25 i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.q25 i.qd4 if
WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 12

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll if qd4!=.;
```

```
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;

xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q69!=.;
est store Q;
lrtest A Q;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll i.q69
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 13

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11 i.q42coll
i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
q42coll!=.;
est store R;
lrtest A R;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11 i.q42coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 14

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
```

```
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q73 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q73 i.q37 i.q57 i.q68 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q73 i.q37 i.q67 i.q68 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q73 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q73!=.;
est store N;
lrtest A N;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11
i.q31 i.q73 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if
WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 15

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q68 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
```

```
i.q31 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q68!=.;
est store J;
lrtest A J;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q68 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q67 i.q68 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q31!=.;
est store O;
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q68 i.q17coll i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 16

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q37 i.q67 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q31 i.q57 i.q67 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q31!=.;
est store O;
```

```
lrtest A O;
xi:logistic fail WEIGHTKG i.q4 i.q80coll
i.q31 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11
i.q31 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11
i.q31 i.q37 i.q57 i.q67 i.q17coll i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 17

```
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q37 i.q57 i.q67 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q37 i.q57 i.q67 i.qd4 if q17coll!=.;
est store H;
lrtest A H;

xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q37 i.q57 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q37 i.q67 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail WEIGHTKG i.q4 i.q80coll i.q11
i.q57 i.q67 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail WEIGHTKG i.q4 i.q80coll
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail WEIGHTKG i.q4 i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail WEIGHTKG i.q80coll i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
xi:logistic fail i.q4 i.q80coll i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if WEIGHTKG!=.;
est store W;
lrtest A W;
```

Round 18

```
xi:logistic fail i.q4 i.q80coll i.q11
```

```
i.q37 i.q57 i.q67 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail i.q4 i.q80coll i.q11
i.q37 i.q57 i.q67 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail i.q4 i.q80coll i.q11
i.q37 i.q57 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail i.q4 i.q80coll i.q11
i.q37 i.q67 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail i.q4 i.q80coll i.q11
i.q57 i.q67 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail i.q4 i.q80coll
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail i.q4 i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q80coll!=.;
est store T;
lrtest A T;
xi:logistic fail i.q80coll i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q4!=.;
est store V;
lrtest A V;
```

Round 19

```
xi:logistic fail i.q4 i.q11
i.q37 i.q57 i.q67 i.q17coll if qd4!=.;
est store B;
lrtest A B;
xi:logistic fail i.q4 i.q11
i.q37 i.q57 i.q67 i.qd4 if q17coll!=.;
est store H;
lrtest A H;
xi:logistic fail i.q4 i.q11
i.q37 i.q57 i.q17coll i.qd4 if q67!=.;
est store K;
lrtest A K;
xi:logistic fail i.q4 i.q11
i.q37 i.q67 i.q17coll i.qd4 if q57!=.;
est store L;
lrtest A L;
xi:logistic fail i.q4 i.q11
i.q57 i.q67 i.q17coll i.qd4 if q37!=.;
est store M;
lrtest A M;
xi:logistic fail i.q4
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q11!=.;
est store S;
lrtest A S;
xi:logistic fail i.q11
i.q37 i.q57 i.q67 i.q17coll i.qd4 if q4!=.;
est store V;
```

```
lrtest A V;

xi:logistic fail i.q4 i.q11 i.q37 i.q57 i.q67 i.q17coll i.qd4
```

Table 19: Accuracy of prediction in test dataset

```
xi:logistic fail2 i.q4 i.q11 i.q37 i.q57 i.q67 i.q17coll i.qd4,
coef;
gen zed=-.255516+(-6179765*_Iq4_2)+(-
0.6209054*_Iq4_3)+(0.2966278*_Iq4_4)+(0.3715339*_Iq11coll_2)
+(0.6853131*_Iq11coll_3)+(-0.6441025*_Iq37_2)+(-
0.5367342*_Iq37_3)+(-0.4412237*_Iq37_4)+(0.6532425*_Iq57_2)
+(-
0.0921207*_Iq57_3)+(0.1058099*_Iq57_4)+(0.1771966*_Iq57_5)+(0.2
65794*_Iq67_2)+(-0.0913999*_Iq67_3)
+(-0.5886231*_Iq67_4)+(0.4331621*_Iq67_5)+(-
0.5051842*_Iq17coll_2)+(-
0.0417124*_Iqd4_2)+(0.6248513*_Iqd4_3);
gen risk=(1/(1+(exp(-zed))));

*calculating a new variable preddec that places subjects in
predicted value deciles;
egen predcut = cut(risk), group(10);

*reports mean predicted value in each decile;
mean risk, over (predcut);

*reports proportion of group with outcome (i.e. observed);
tab predcut fail2;
```

Table 20: Receiver operating curve on test dataset

```
roctab fail2 risk, graph summary detail;
```

Table 21: Sensitivity and specificity (test dataset)

```
gen cut00=risk
recode cut00(min/.1461491=0)(.1492777/max=1)
gen cut01=risk
recode cut01(min/.2135306=0)(.2185863/max=1)
gen cut02=risk
recode cut02(min/.2507335=0)(.2529496/max=1)
gen cut03=risk
recode cut03(min/.2913713=0)(.2939135/max=1)
gen cut04=risk
recode cut04(min/.3308644=0)(.334787/max=1)
gen cut05=risk
recode cut05(min/.3792795=0)(.3825074/max=1)
gen cut06=risk
recode cut06(min/.402624=0)(.4080716/max=1)
gen cut07=risk
recode cut07(min/.4401153=0)(.4443169/max=1)
gen cut08=risk
recode cut08(min/.4920982=0)(.5028661/max=1)
gen cut09=risk
recode cut09(min/.61968=0)(.6256762/max=1)
```

```
diagt  fail2 cut00
diagt  fail2 cut01
diagt  fail2 cut02
diagt  fail2 cut03
diagt  fail2 cut04
diagt  fail2 cut05
diagt  fail2 cut06
diagt  fail2 cut07
diagt  fail2 cut08
diagt  fail2 cut09
```